Issued to(Name of Firm):	
Date of Issue	

CADET COLLEGE PETARO

District Jamshoro, Sindh, Post Code: 76120, Phone: 022 2022021-8, Fax: 022 2022227

RE-CONSTRUCTION OF OFFICE BLOCK

(CIVIL, PLUMBING & ELECTRICAL WORKS)

TENDER DOCUMENTS

- Tender Notice,
- Scope of Work,
- Instructions to Tenderers
- Conditions of Contract,
- Special Stipulations,
- Form of Tender
- Draft Forms
- Technical Specifications
- Bill of Quantities
- Drawings

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NOTICE INVITING TENDER

CADET COLLEGE PETARO
District Jamshoro(Sindh), Post Code: 76120,
Tel: 022 2022021-8, Fax: 022 2022227, Email: cadet.collegepetaro@hotmail.com

No: CCP/FNC(Dev)/2026/**497** 22 April, 2026

NOTICE INVITING TENDERS

1. Cadet College Petaro (CCP) invites E-bids only through E-Pak Acquisition and Disposal System (EPADS) on standard bidding documents, tenders for the following Works, from the interested firms/contractors of repute, registered with EPADS, Tax and other relevant authorities. Bidding documents can be viewed/downloaded from the website https://portalsindh.eprocure.gov.pk/ and also available and can be viewed & downloaded from Cadet College Petaro website – http://www.ccpetaro.edu.pk

#	Description	Tender Fee (Non-Refundable)	Bid Security	Procurement Method	Bid Validity	Completion Time
01	Construction of Parking Area at Main Gate and M.T Gate – Civil, Electrical & Plumbing Works	Rs. 5,000/-	Rs.1350,000/-	Single Stage – Two envelope	90 Days	15 Calendar months
02	Re-construction of Office Block – Civil, Electrical & Plumbing Works	Rs. 5,000/-	Rs.1250,000/-	Single Stage – Two envelope	90 Days	15 Calendar months

2. Eligibility: Valid registration with Tax Authorities & Pakistan Engineering Council in relevant category and discipline (C-5 and above with CE-10 & EE- 05, as mandatory).

3. Pre-bid meeting is scheduled to be held at Conference Hall, Cadet College Petaro at 1200 hours, one week after publication of this NIT. i.e. on Saturday 02 May, 2026; where in all the queries raised by the Contractors will be addressed.

4. Bidding / Tender Documents:

(i) **Issuance:** Bidding / tender documents may be obtained by downloading from SPPRA EPADS website web link: https://portalsindh.eprocure.gov.pk/ or from CCP's website i.e. www.ccpetaro.edu.pk from Friday, 24th April, 2026 to Tuesday, 12th May, 2026 up to 1000 hours. Tender fee of Rs. 5,000/- (Rupees Five thousand) only non-refundable may be paid through bank pay order / draft drawn in favor of **Principal, Cadet College Petaro** or in cash at HBL Petaro during office hours i.e. 0900 – 1400 hours. The Tenders will be accepted for bid opening only upon uploading duly filled and completed in all respects on SPPRA EPADS & upon submission of valid Bank draft/pay order of Tender Fee or valid paid copy of Tender Fee receipt.

(ii) **Submission & Opening:** Prospective bidders will upload their bids up to 1100 hours on Tuesday, 12th May, 2026 on EPADS. along with scanned photos of valid Bank Draft/Pay Order of Bid Security. Bids will be opened on Tuesday, 12th May, 2026 at 1200 hours (same day). Bids shall only be accepted/allowed through EPADS. No physical tender/bid will be accepted.

(iv) **Place:** The Bidding / Tender documents shall be opened on EPADS at: Conference Hall, Cadet College Petaro, District Jamshoro, Sindh on 12th May, 2026 on same day at 1200 hours.

5. Bid Security: Scanned photo of valid Bank Draft/Pay Order of Bid Security of amount as mentioned above, must be uploaded on EPADS drawn from any scheduled bank, drawn in favor of **Principal Cadet College Petaro.** The Bank Draft/Pay Order of Bid Security and Tender Fee must be submitted in original on the Bid opening venue, time and date as mentioned above. No tender will be allowed to be opened without Tender Fee and Bid Security.

6. Under following conditions bid / proposal will be rejected:

(a) Conditional and telegraphic bid / tenders.
(b) Bids not accompanied by tender fee, bid security of required amount and form.
(c) Bid received after the specific date and time.
(d) Bids of black listed firms.
(e) Bids short of mandatory documents as required in the eligibility criteria.

7. Contact: For further information, Contact: Bursar, Cadet College Petaro, Phone # 022 2022021-8.

PRINCIPAL
CADET COLLEGE PETARO

CRITERIA OF QUANTIFICATION/QUALIFICATION

(a). The following documents should be attached with the Technical Proposal.

i) Name of Firm, Postal Address, Telephone, Fax Number, E-mail Address and Organization Chart.

ii) Legal Status of Firm.

iii) Copy of valid PEC Contractor's License in category C-5 and above with disciplines CE-10 & EE-05 (Mandatory).

iv) Copy of NTN Certificate (Mandatory). Status Active – Filer.

v) Copy of Sindh Revenue Board registration certificate.

vi) Copy of Prequalification letters issued by other Govt. /Semi Govt. autonomous bodies and Organizations.

vii) Certificate of satisfactory completion of works by the clients.

viii) List of Key Permanent Technical Staff Members along with their latest affidavit on judicial stamp paper of Rs.100/- that they are working with the applicant.

ix) List of works completed in last five years with name and telephone No. of the clients and value of project (Mandatory).

x) List of work in hand including all details required in (viii) above.

xi) Affidavit on Rs.100/- Non Judicial Stamp Paper declaring that the firm has never been Blacklisted by any Govt./Semi Govt. Autonomous body or organization. (Mandatory).

xii) List of Equipment/Plants available with the firms which can be verified.

xiii) Latest Bank Statement of Accounts of the firm.

(b). Scope of Contract.

The Scope of Contract is not limited to the following:

a). Building Works.

b). Plumbing / Drainage Works (Specialized for RE-CONSTRUCTION OF OFFICE BLOCK).

c). Electrical Works. (Internal Only)

Note: 1). Verification of the information provided by the applicants in the submissions for short listing may be made. In case the information is found to be wrong or incorrect in any material way or the applicant is found to be lacking in the capability or resources to successfully perform the contract, the application shall not be entertained.

2). The document not containing Mandatories will not be entertained.

(c). Criteria for quantification & qualification

A	**Legal Status of Firm**	**Maximum 3 Points**
(i)	Limited Co.	3 Points
(ii)	Partnership	2 Points
(iii)	Individual	1 Point
B	PEC Registration C-5 and above with CE-10 & EE-05	Mandatory
C	NTN Registration	Mandatory
D	Registration with SRB	Mandatory
E	Certificate of completion of works (building) with cost undertaken. (attached certificates)	3 Point per Certificate (Max 24) Points.
F	List of works (construction of buildings) in hand. Provide Documentary Evidence (work orders with cost)	5 Point for each work order (Max 15 Points).
G	List of permanent technical Staff	Max 15 Points
H	Affidavit on Rs. 100/- stamp paper declaring that the firm has never been black listed.	Mandatory
I	List of equipment & plant	**(Max 8 Points)**
(i).	Concrete Mixers	2 Points
(ii).	Concrete Hoist	2 Points
(iii).	Vibrators	1 Point
(iv).	Tractor with Trolley	1 Point
(v).	Leveling instrument / Theodolite	1 Point
J	**Audited Financial Statements of the Firm**	3 Points for each year (Max 15 Points)
K	**Bank Statements (verifiable) last 05 years.**	2 Points for each year (Max 10 Points)
L	**Income Tax Returns (Last 05 Years).**	2 Points for each year (Max 10 Points)
	Total	100 Points

Qualifying Score: 75 Points

For Category C-5 (EE-05) and above

Signature with Official Seal

SECTION – II

SCOPE OF WORK

SCOPE OF WORK
(FOR CIVIL, PLUMBING, ELECTRICAL WORKS) FOR RE-CONSTRUCTION OF OFFICE BLOCK)

Cadet College Petaro intends for RE-CONSTRUCTION OF OFFICE BLOCK as per the drawings and specifications appended hereto on percentage above / below basis.

The work is to be executed through Contractors of repute having valid PEC license in relevant category, whose bid is accepted by the Owner.

The scope of Work shall also include the work detailed in Contract Documents.

The owner may increase or decrease the quantum of work given in the BOQ at his sole discretion and no such increase or decrease shall give rise to any claim or compensation in this account.

The scope of work given in Contract Document includes items based on unit rates as indicated in schedule of rates, Govt. of Sindh (2024) for which Specifications of standing rates committee Govt. of Sindh be followed. (If Specification of any item is not indicated in Technical Specification of Tender Document) and / or items based on market rates for which Technical Specifications are given in the nomenclature and in section "Technical Specification"

Time of completion is essence of this contract. In case of delay beyond the completion date without any cogent reason approved by the Owners, the Contractor will lose all privileges to claim any escalation what so ever even announced by Govt. of Sindh after the date of award of work.

It will be responsibility of Contractor to collect working drawings from the College Engineer before start of execution.

SECTION – III

INSTRUCTIONS TO TENDERERS

INSTRUCTIONS TO TENDERERS

1. GENERAL

   a) M/s CADET COLLEGE PETARO, DISTRICT JAMSHORO (SINDH) (hereinafter referred to as the 'OWNER') invites firms and contractors of repute to submit tenders on %age above / below basis and/or items based on market rates. For the RE-CONSTRUCTION OF OFFICE BLOCK as described in the scope of work in accordance with specifications and drawing requirements.

   b) Only contractors of repute having valid P.E.C License in relevant category are eligible to submit tenders for Civil, Plumbing & Electrical works to the Owner for the construction of the subject work.

   c) Tenders shall be prepared and submitted to the Owner strictly in accordance with the instructions set forth herein.

   d) All entries in the tender are to be in ENGLISH LANGUAGE. Corrections, over writings etc, shall be signed by the authorized persons.

   e) The rate should be written in figures and also in words, the rates written in words will be treated as being correct and will be used for calculations.

   f) Every page of this Tender Document should be signed with date and stamped.

   g) Bid validity is 90 days.

2. TENDER DOCUMENTS

   a) All documents / papers indicated in FORM OF AGREEMENT shall form integral part of AGREEMENT subsequently.

3. INSPECTION OF SITE AND DOCUMENTS

   a) The Tenders shall inspect the site of work and surroundings and shall satisfy themselves before submitting their Tenders as to the qualities and nature of the work, the requirements and availability of manpower, labour, materials, water, electricity and roads, the means and access to the site. The tendered rates shall be considered to include all these factors as well as any, or all other factors which may influence the cost of construction.

   b) The rates shall include the cost of all material, but in case, owner agrees to supply any or all the building materials to the contractor, the deduction for the cost of these materials shall be made from the bills (Interim or final as the case may be) of the contractor as indicated in Special Stipulations.

4. SUFFICIENCY OF TENDER

   a) Each tenderer shall be deemed to have fully satisfied himself before submitting the Tender as to the Correctness and sufficiency of his Tender and prices stated in the bill of quantities, which rates and prices, except in so far as it is otherwise expressly provided in the Conditions of contract, must cover all his obligations under the Contract and all matters and things necessary for the proper completion of the project.

   b) No tenderers shall have the right to make any objection, excuse or claim about correctness and sufficiency of his tender by the owner.

5. INSPECTION OF SITE AND DOCUMENTS

a) The Owner shall not assume any responsibility for information, interpretation and deductions the Tenderers may make from the date furnished by the Owner.

b) ALL VERBAL INSTRUCTIONS BE IGNORED

No verbal instructions understanding, agreement or conversation with any officer, employee or agent of the Owner, either before during or after the execution of the contract, shall affect or modify any of the terms or obligations contained in the tender documents.

6. EXPLANATION OF DOCUMENTS

Any tenderers who may have any doubt or question as to the true meaning of any part of the tender documents should deliver to the Owner a written request for a clarification or answer thereof, prior to two days of the date set for opening of the Tender. Any explanations, revisions, additions or deletions to the tender documents will be made only by formal addendum, duly signed and issued by the Owner and mailed or delivered to each tenderer who has received a set of tender documents. Such addendum will become an integral part of the tender documents and receipt thereof must be acknowledged by return of the form issued with the addendum. Each addendum shall be signed by the Tenderers. The Owner shall neither be responsible nor bound by any explanations, revisions, additions or deletions to the Tender Documents except those contained in the formal addendum signed and issued by the Owner.

7. DRAWINGS

The drawings showing the proposed work are also being issued with the Tender. The OWNER, however, reserve the right to make any addition, alteration, modification and/or deletion in the drawings, specifications and / or BOQ (Scope of Work) at any time in the best interest of the work. The written Dimensions on drawings be followed missing Dimensions should not be scaled. In case of any doubt it should be referred to the Consultant.

8. COST OF TENDERING

Tenderers shall have no claim for reimbursement of any expenses of any kind whatsoever incurred in connection with the preparation and submission of their tenders.

9. INCOMPLETE TENDER

Incomplete Tender shall be liable for rejection by the Owner.

10. SUPPLY OF MATERIALS

No materials except if otherwise mentioned required for execution of the work shall be supplied or arranged by the OWNER. It shall be the responsibility of the Tenderer to procure all materials required for timely completion of the work. In case, water and electricity are provided by the owner, on specific request of the contractors, and if within the purview of the owners to supply the same, a sum equal to 1% of the bills will be deducted for each of the items supplied, from every R/A bill of the Contractors. This however does not become the contractual obligation of the owners and does not entitle the contractors to claim, stop or delay the execution of work.

11. EARNEST MONEY

a) The original tender shall be accompanied by Earnest Money as specified in NIT in the form of pay order / demand draft issued by a schedule bank of Pakistan. The money will be adjusted in Retention Money of the successful bidders. The Earnest Money will be refunded to unsuccessful

bidders immediately after award of work to the successful bidders but not later than 30 days from the date of opening.

12. Advance Payment:

Contractor may apply for advance Payment/Mobilization Advance on following conditions:

Mobilization Advance/Advance Payment:

(i) Mobilization advance up to 10 % of the Contract Price may be paid to the Contractor on following conditions:

(a). On submission by the Contractor of a mobilization advance guarantee for the full amount of the advance in the specified form, from a Scheduled Bank in Pakistan, acceptable to the client;

(b). Contractor shall pay interest on the mobilization advance at the rate of 10% per annum on the advance; and

(ii) This Advance including the interest shall be recovered in 5 equal installments from the 5 R.A bills and in case the number of bills is less than 5 then 1/5 of the advance inclusive of the interest thereon shall be recovered from each bill and the balance together with interest be recovered from the final bill. It may be insured that there is sufficient amount in the final bill to enable recovery of the Mobilization Advance.

13. SUBMISSION OF TENDER

The Tender Document duly signed on each page, corrections and over writing alongwith the Earnest Money for the tender shall be properly signed and sealed and clearly marked as TENDER FOR RE-CONSTRUCTION OF OFFICE BLOCK – Civil, Electrical & Plumbing Works and delivered in person of by registered mail or through courier service to the following address.

THE PRINCIPAL
CADET COLLEGE PETARO
DISTRICT JAMSHORO (SINDH)
POST CODE – 76120
PHONE NO. 022-2022021-28

So as to reach on or before the time and date given in the notice of tender at which time and place they will be opened in presence of the representatives of the tenderers who may wish to be present. Only the name of the tenderers and the total prices shall be announced by the owner at the time of opening of the tenders.

In case of any calculation errors detected during scrutiny of the Tenders, the ____% age above / below quoted by the Tenderer shall be taken as final and the tender value corrected accordingly. For items based on non-schedule/market rates the unit rate shall be considered final and correction if any will be made accordingly.

14. AWARD OF CONTRACT

a) The OWNER does not bind himself to award the Contract to the lowest or to any other Tenderer but will take into consideration all aspects as are deemed relevant and applicable. Once the OWNER has arrived at the decision, he will issue a written letter of Award to the successful tenderer. Thereafter, the successful tenderer will be required to execute a formal agreement. Failure of the successful tenderer to sign the agreement within the prescribed time-schedule shall be a just cause for the annulment of the award of the contract and in the event of such annulment, the Earnest Money of the successful tenderer will be forfeited by and to the OWNER.

15. MOBILIZATION

a) If the tenderers to whom the notice of award is issued by the Owner does not mobilize at the site of work within the stipulated time and take all appropriate steps to commence the work, the Earnest Money deposited by him alongwith his tender shall stand forfeited in favour of the owner in liquidated damages.

16. COMPLETION TIME

a) The work is to be satisfactorily completed in all respects within the period set forth in the Tender. Failure of the Tenderer to complete the whole of the work within the specified time will result in imposition and recovery of liquidated damages under the conditions of contract.

17. MAINTENANCE PERIOD

The maintenance period of the work shall be Twelve months effective from the date of issue of completion certificate by the OWNER.

18. UNIT RATES & SPECIFICATIONS

Unit rates indicated in B.O.Q are the rates indicated in Schedule of Rates Govt. of Sindh (2024). Specification of Standing Rate Committee Govt. of Sindh be followed (If specification of any item is not indicated in Technical Specification of Tender Documents) and / or items based on market rates, for which Technical Specifications are given in the nomenclature and in section "Technical Specification"

19. S.R. CEMENT (S.R.C)

Whenever specified S.R.C (Type v) should be used in sub-structure work. No extra payment will be made for the use of S.R.C.

20. CARTAGE / TRANSPORT EXPENSES

No separate cartage will be paid to the Contractor. It is understood that Contractor has included Cartage in the above / below percentage.

21. SPECIAL STIPULATIONS

In case of doubt special stipulations will take precedence over all other conditions of Contract.

SECTION – IV

GENERAL CONDITIONS OF CONTRACT

GENERAL CONDITIONS OF CONTRACT

1. DEFINITIONS AND INTERPRETATIONS

DEFINITIONS

In the Contract (as hereinafter defined), the following words and expression shall all have the meanings herein assigned to them unless the context otherwise requires)

a) 'OWNER' means the PRINCIPAL CADET COLLEGE PETARO, his legal successors and assignees.

b) 'ENGINEER' means the person or agency for the time being or from time to time designated or appointed in writing by the Owner to perform the duties set-forth in article-4 hereof.

c) "ASSOCIATE" means a firm / company hired to work in the trades of Electrical Installations / Air-Conditioning Installations or any other special trade having valid P.E.C. License in relevant category and also valid license issued by Electrical Inspector or by any other license granting Agency for the respective trades.

d) 'WORKS' means RE-CONSTRUCTION OF OFFICE BLOCK by virtue of the contract to be executed, whether temporary or permanent and whether original, altered, substituted or additional in accordance with the contract.

e) 'CONTRACTOR' means the person, firm or company whose tender has been accepted by the Owner and includes the Contractor's representatives, successors and permitted assignees.

f) 'DRAWING' means the drawings showing the related details of architectural and structural, and other works including the layout plans, elevation, sections, details, perspectives, sketches and other details and also the drawings referred to in the specifications, and any modifications of such drawings approved in writing by the Owner, an such other drawings as may from time to time be furnished or approved in writing by the Owner.

g) 'SITE' means the lands and other places on, under over, in or through the works are to be executed or carried out and any other lands or places provided by the owner for the purpose of the Contract together with such other places as may be specified in our pursuant to the contract as forming part of the site.

h) 'TENDER' means the offer tendered by the Contractor for the works governed by the Contract.

i) 'SPECIFICATIONS' means directions, provisions and requirements contained in the drawings or in the nomenclature or descriptions given in the Contract Documents and / or the verbal instructions of the OWNER (to be confirmed in writing)

j) 'CONTRACT DOCUMENT' means and includes the Letter of Award, agreement, conditions of contracts, specifications, schedule of quantities, Tender drawings, details, sketches performance, insurance guarantee, Insurance Policies and all other papers pertaining to the construction work of this project. It shall also included any and all supplementary documents which may be necessitated to complete the work as required by the Owner.

k) 'APPROVED' means approved in writing by Owner including subsequent written confirmation of previous verbal approval and 'approval' means approval in writing as aforesaid.

2. SINGULAR AND PLURAL

Words purporting the singular include the plural and vice-versa.

3. EXECUTION OF WORK

All works to be executed under the contract shall be executed under the overall direction and subject to the approval in all respects of the owner or his assignee.

4. ENGINEER

4.1. DUTIES AND POWER OF THE ENGINEER.

The duties and power of the Engineer are to watch and supervise the works and to test and examine any materials to be used or workmanship employed in connection with the works. He shall have no authority to relieve the contractor of any of his duties or obligations under the contract nor to make any variation of or in the work nor except as expressly provided hereunder order any work involving delay or any extra payment by the owner.

i) Failure of the Engineer to disapprove any work or material shall not prejudice the power of the Owner thereafter to disapprove such work or materials and to order the pulling down, removal or breaking up thereof.

ii) If the Contractor shall be dissatisfied by reason of any decision of the Engineer, he shall be entitled to refer the matter to the Owner who shall thereupon confirm, reverse or vary such decision. The Owner's decision in such a case shall be final and binding upon the Contractor.

iii) The fact that the Owner or Engineer for whatever reasons, fail to detect defects in the layout or in the quality of the works executed shall not relieve the Contractor of his liability for rectifying the said defects in the layout or in the quality of the works at his own cost.

4.2. EMERGENCY POWERS OF THE ENGINEER.

Notwithstanding the provisions of Section 4.1 hereof, if in the opinion of the Engineer an emergency occurs affecting the safety of life or of the works or adjoining property he may direct the Contractor in writing to carry out all such work or to do all such things as may be necessary in the opinion of the Engineer to abate or reduce the risk. The contractor shall forthwith comply without appeal with any such direction of the Engineer.

5. CONTRACT DOCUMENTS

5.1. LANGUAGE

The Language according to which the Contract is to be construed and interpreted shall be English.

5.2. DOCUMENTS MUTUALLY EXPLANATORY

The several documents forming contract are to be taken as mutually explanatory of one another, but in case of ambiguities or discrepancies the same shall be explained and adjusted by the Consultant, who shall thereupon issue to the Contractor instructions directing in what manner the work is to be carried out. The provisions of special conditions of Contract shall prevail over the General conditions of contract and General conditions over those of any other documents forming part of the Contract.

5.3. CONTRACT DOCUMENTS COMPRISING CONTRACT.

All documents / papers indicated in FORM OF AGREEMENT shall form integral part of AGREEMENT subsequently.

5.4. MANDATORIES.

Every intending Contractor must hold a valid PEC registration in Category C-5 with field of specialization under Code EE-05. This is a mandatory requirement without which the document will be liable for rejection.

6. PERFORMANCE BOND

The Contractor shall, within fourteen days after written Notice of Award has been issued by the Owner, provide a Bond from an approved Insurance Company to be jointly and severally bound with the Contractor to the Owner for the due performance bond in the form appended to tender an amount equal to 10% (ten percent) of the Contract price.

The performance bond shall be valid till the completion and end of the period of Maintenance. The cost of the bond so entered into shall be at the sole expense, of the Contractor.

6.1. INSURANCE OF WORKS ETC.

The Contractor shall insure in the joint names of the Owner and the Contractor, against all loss or damage from whatever cause arising for which he is responsible under the terms of the contract and in such manner that the Owner and Contractor are severed during the period of the commencement to the completion of the works and are also covered during the period of maintenance for loss or damage arising from a cause occurring prior to the commencement of the period of maintenance and for any loss or damage occasioned by the Contractor in the course of any operations carried out by him for the purpose of complying with his obligations.

i) The works and temporary works to the full value thereof executed from time to time.

ii) The maintenance, constructional plant and other things brought on to the site by the Contractor for the purposes of the contract to the full value of such materials, constructional plant and other things.

a) Provided always that without limiting his obligations and responsibilities as aforesaid nothing in this clause contained shall render the Contractor liable to insure against the necessity for the repair or reconstruction of any work constructed with materials or workmanship not in accordance with the requirements of the Contract.

b) Such insurance shall be affected with an insurer and in terms approved by the Owner and the Contractor shall whenever required produce to the Owner the original policy or policies of insurance and the receipt for payment of the correct premiums. The contract price shall be deemed to include the Contractor's cost for the provision of such insurance.

c) All money received under any insurance mentioned in the Section shall be applied in or towards the cost of making good the loss or damage which has occurred but this provision shall not affect the contractor's liabilities under the contract.

6.2. DAMAGE TO PERSONS AND PROPERTY

The Contractor shall (except if and so far as the contract otherwise provides) indemnify and keep indemnified the Owner against all losses and claims for injuries or damage to any person or any property whatsoever which may arise out, or in consequence, of the performance of the Contract and against all claims, demands, proceedings, damages, costs, charges and expenses whatsoever in respect thereof or in relation thereto. Provided always that nothing herein contained shall be deemed to render the Contractor liable for or in respect of or to indemnify the Owner against any compensation or damages for or with respect to:

i) The permanent use or occupation of land by the work for any part thereof.

ii) Surface or other damage (caused by tenants or occupiers) to land or plants within the site which land or plants will be disturbed or damaged as an unavoidable result of the execution of the works.

iii) The right of the Owner to construct the work for any part thereof on, cover, under, in or through any land.

iv) Interference, whether temporary or permanent with any right of light, air, way, water or support or other easement or quasi easement which is the unavoidable result of the performance of the contract.

6.3. a) THIRD PARTY INSURANCE

Before commencing the execution of the works, the contractor shall, without limiting his obligations and responsibilities insure and, of the duration of the performance of the Contract, keep insured, in the joint names of the Owner and the Contractor against any damage, loss or injury which may occur to any property or to any person (including any employee of the Owner or Engineer or Consultants) by or arising out of the execution of the works or temporary works.

b) MINIMUM AMOUNT OF THIRD PARTY INSURANCE.

Such insurance shall be effected with an insurance company and in terms approved by the Owner and for at least the amount stated in the Tender and the Contractor shall whenever required produced the original policies of insurance and the original receipts for payment of the current premiums. The Contract prices shall be deemed to include the contractor's costs of premium and incidental to the provision of such insurance.

6.4. a) ACCIDENT OR INJURY TO WORKMEN

The Owner shall not be liable for or in respect of any damage or compensation payable in law in respect or in consequence of any accident of injury to any workman or other person in the employment of the Contractor or any of his sub-contractors and the Contractor shall indemnify and keep indemnified the Owner against all claims, demands, proceedings, costs, charges and expenses whatsoever in respect thereof or in relation thereto.

b) INSURANCE AGAINST INJURY TO WORKMEN

The Contractor shall insure against any such liability with an insurer approved by the Owner and shall continue such insurance during the whole of the time that any persons that are employed by him on the works and shall when required produce to the Owner, in original, such policy of insurance and the receipt for payment of the current premium. Provided always that in respect of any persons employed by any of his sub-contractors, the Contractor's obligation to insure as aforesaid under this clause shall be satisfied if the sub-contractor shall have insured against the liability in respect of such persons in such manner that the Owner is indemnified under the policy but the Contractor shall require such sub-contractor to produce in the original to the Owner when required such policy of insurance and the receipt for payment of the correct premium. The contract price shall be deemed to include the costs of such insurance by the Contractor and his sub-contractors.

6.5. a) REMEDY ON CONTRACTOR'S FAILURE TO INSURE

If the Contractor fails to effect and keep in force the insurances or any other insurance which he may be required to effect under the terms of the contract or any applicable Laws / Bye-Laws, then in any case the Owner may (without prejudice to any other right or remedies) effect and keep in force such insurance and pay such premium or premiums as may be necessary for that purpose and from time to deduct the amount so paid by the Owner as aforesaid from any moneys due or which may become due to the Contractor or recover the same as a debt due from the Contractor.

b) CONTRACTOR TO NOTIFY INSURERS

The Contractor shall notify the insurers of any of the insurance any matter or event which by the terms of such insurances are required to be so notified and the Contractor shall indemnify and keep indemnified the Owner against all losses, claims, demands, proceedings, costs, charges and expenses whatsoever arising out of or resulting from any default by the Contractor in employing with the requirements of this Section whether on account of the avoidance of any such insurance or otherwise.

7. GENERAL OBLIGATIONS

7.1. AGREEMENT

The Contractor shall, within fifteen days after the written Notice of Award has been issued to him by the Owner, enter into and execute and Agreement (to be prepared at the cost of the Contractor) in the form appended to the Tender with such modifications as may be considered necessary by the Owner.

7.2. SITE INFORMATION

The Contractor shall be deemed to be in possession of all necessary information of the site and its surrounding, to have satisfied himself as to the nature of roads and as to possible interruptions thereto and the access to and exist from the site, to have made inquires as to the available accommodation for his staff and labour, to have made inquiries as to the sub soil water levels and the variations thereof, and drains, storms, prevailing winds, climatic conditions generally and other similar matters, to have satisfied himself as to the courses and means of obtaining adequate supplies of skilled and unskilled labour and also all materials required for the works and the transport thereof, to have considered the possibility of delays or inconvenience that may be caused to his operations by any reasons of the breakdown of communications, storms, floods, adverse weather conditions to have acquainted himself as to his liability for payment of Government taxes another charges, to have examined the contract document generally to have obtained information on all matters whatsoever that might affect the carrying out of the works. The Contractor shall not be entitled to any claim if he fails to fulfill his obligation in acquiring the information before submitting his tender.

7.3. WORK TO BE DONE TO THE SATISFACTION OF THE OWNER

The Contractor shall execute, complete and maintain the works in strict accordance with the Contract to the satisfaction of the Owner and the whole of the materials, plant, labour and other things to be provided by the Contractor in pursuant to the contract and the mode, quality, manner and speed of execution and maintenance of the works shall be of a kind conducted in manner to the satisfaction of the Owner.

7.4. COMPLIANCE WITH OWNER'S INSTRUCTIONS

The Contractor shall comply and adhere strictly to the OWNER'S instruction and directions (subject to the limitations referred to in Article 3, 4 hereof) from the Engineer on behalf of the Owner regarding any matter (whether mentioned in the Contract or not) touching or concerning the works.

7.5. a) CONTRACTOR'S AGENT

The Contractor shall with the approval of the Owner (which approval may at any time be withdrawn) employ and arrange whole time presence of a duly authorized agent or representative at the site. The said agent or representative shall have full authority to act for and on behalf of the Contractor and to bind the Contractor. The said agent or representative shall give his whole time superintendence to the works and shall act in harmony with the Owner and the Engineer. The said agent or representative shall not be remove by the Contractor from the works or the site without consent in writing of the Consultant.

b) AGENT TO RECEIVE INSTRUCTIONS

The agent and representative shall receive on behalf the Contractor the instruction of the Owner or (subject to the limitation of Article 3 , 4 , 5 hereof) the Engineer.

7.6. CONTRACTOR'S EMPLOYEES.

The Contractor shall employ in and about the execution and maintenance of the works and provide at the site.

i) Only such technical assistants, foremen and leading hands are careful, skilled and experienced in their respective trades and are competent to give proper supervision to the work they are required to supervise, and

ii) Such skilled, semi-skilled and unskilled labour as may be necessary for the proper and timely performance of the Contract.

7.7. ASSIGNMENT AND SUB-LETTING ASSIGNMENT

The Contractor shall not assign the Contract or any part thereof or any benefit or interest therein or there under without the prior written consent of the Owner.

SUB-LETTING

The Contractor shall not sub-let the whole of the works, except where otherwise provided by the Contract. The contractor shall not sub-let any part of the works without the prior consent of the Owner and such consent if given not relieve the Contractor from any liability or obligation under the contract and he shall be responsible for the acts, defaults and neglects of any sub-contractor, his agents, servants or workman.

7.8. SECURITY DEPOSIT

The security deposit of the Contractor to be retained by the Owner shall be 10 % of the total cost of the work carried out by the Contractor and it shall be deducted from each of the interim bill as well as from the final bill submitted by the Contractor and 50 % of this amount will be released after issue of completion certificate and 50 % shall be retained by the Owner until the expiry of defects liability period as guarantee of the good workmanship and good material used for the construction of Project.

8. MODE OF PAYMENT

The Contractor shall submit 3 (three) copies of the interim bill accompanied by three copies of the details of measurement to the Owner after achieving the value of work done upto the amount indicated in special stipulations.

The payment made on the basis of interim bills shall be regarded as an advance against the total cost of work till the final bill is scrutinized and the cumulative amount paid by the Owner to the Contractor shall be adjusted against the overall amount of the final bill.

9. TIME ALLOWED FOR COMPLETION

The time allowed for completion and handing over the work complete in all respects to the Owner shall be as specified and shall be deemed to be effective from the date of Letter of Award. The contractors shall commence the work within 15 (fifteen) days of award of work. In case the contractor fails to commence the work within the stipulated time, the contract may be awarded to any other tenderer or party which serves the best interest of the Owner. The Contractor will pay as penalty Rs.0.10% (Rupees Point One Zero Percent) per day for the number of days the work remains un-commenced upto the value of 02% of the Tender Cost.

10. EXTENTION IN COMPLETION TIME

The Owner reserves the right to refuse / grant reasonable extension in completion time under special circumstances which the Owner deem to regard as beyond the control of the contractor, and the Contractor has within One month after such circumstances have arisen or as soon thereafter as is practicable, delivered to the Owner full and detailed particulars of any claim to extension of time to which he may consider himself entitled in order that such claim may be investigated at that time.

11. PENALTY

The completion time stipulated is the essence of this contract and for each day for which the work remains un-commenced or unfinished after the proper dates, the Contractor shall pay to the Owner a sum of RS. 0.10% (Point One Zero Percent) of the contract value per day till such time the Project is completed in all respects and formally be handed over to the Owner, subject to a maximum of 10 % of the cost of the total works.

12. CONSTRUCTION SCHEDULE

Within 15 (fifteen) days of the Award of the work the contractor shall submit to the Owner a detailed phasing of the Construction program he process to adopt for completing the project within the stipulated period. If the Owner is not satisfied with this program they may ask to revise the same to their satisfaction and the Contractor shall carry out the changes accordingly and will strictly adhere to this program throughout the progress of the construction work. The Contractor will pay Rs.500/- (Rupees Five Hundred Only) per day for the delay beyond 15 day after the date of work order / Agreed Date of Commencement.

13. RIGHT TO ACCESS

The Owner reserve the right to enter upon the site at all times and the contractor or his representatives shall extend them all the cooperation for inspection of the quality and the progress of the Construction works.

14. REMOVAL OF EMPLOYEES WORKMEN AND FOREMEN.

The Owner shall have full powers at all times to object to the employment of any of the workmen, foremen or other employees on the works by the contractor and if the contractor shall receive a notice from the Owner, requiring the removal of any person or persons from the works, the contractor shall comply with the instruction forthwith. The Contractor shall not be entitled to demand the reason from the Owner for such notice.

15. SETTING OUT

The Contractor shall be fully responsible for correctly setting out the work on the site as per dimensions indicated in the drawings and if any error is found at any stage of the work, the contractor shall rectify the same at his own risk and expense accordingly.

16. DISCREPANCY IN DRAWINGS

Only the written dimensions shall be followed for all the drawings and details. However, it will be the responsibility of the Contractor to study, check and tally the drawing/details issued to him by the consultants. Before proceeding with the construction, he shall be deemed to have thoroughly satisfied himself about the accuracy of all drawing/details. If any discrepancy is detected by him, he should immediately bring it to the notice of the consultants through Owner and get the same rectified before proceeding with the work or else the responsibility for the faulty construction shall rest with the contractor.

17. REPLACEMENT OF DEFECTIVE WORK

The Contractor shall be responsible for strictly observing his obligations as regards the correct interpretation of the drawings, details, specifications, schedule of quantities or any other relevant part of the contract documents. If during the progress of the work any defect is discovered either in the use

of materials or the workmanship the contractor shall at once demolish such work on receiving instructions from the Owner, Agent or their accredited representative & replace the same as directed.

18. OWNER'S RIGHT TO IMPOSE PENALTY MEASURES

The Contractor shall strictly carry out the entire work according to the tender documents. However, at any stage of the execution of the work, if it is discovered that work carried out by the Contractor as regards the materials or the workmanship, or both, is not as per the drawings, details, specifications, and the instructions of the Owners agent, the Owner reserve the right to impose the lump-sum penalty on the contractor disown / order to dismantle, or to reduce the tendered rates of the contractor to commensurate with the actual quality of the work as carried out by the Contractor.

19. GUARANTTEE FOR GOOD MATERIALS AND WORKMANSHIP

The Contractor shall execute a guarantee specimen draft valid for entire liability period after completion and handing over the works to the owner as regards the use of good construction materials and workmanship for the entire work, if any defect is discovered after completion within the said period, the Contractor shall replace the defective works at his own expenses. However, in the event of the failure on the part of the Contractor to rectify and replace the defective works, the Owner instruct the Contractor to rectify the same at the expenses of the Contractor and to adjust such amount from his Security Deposit. In case the cost of replacement of defective works exceeds the amount of Security Deposit lying with the owner, the extra, expenditure so incurred shall be recovered from the Contractor.

20. CLERK OF WORK

The Owner may appoint the site engineer or site supervisor who may henceforth be referred to as the clerk of works, under the orders of the Owner and having the powers and authority so delegated to him by the Owner. The duties of the clerk of works shall be to inspect and supervise the works according to the specifications laid down by the Owners. He shall have no power to relieve the Contractor of any obligation under the Contract nor to make any variation order nor to order any work involving delay or extra expenditure.

21. INTIMATIONS FOR INSPECTION

The Contractor shall inform the Owner when any parts of the work is ready for checking. No earth shall be backfilled until the Owner agent has inspected the foundations and plinth work. Any part of the work which shall not be visible in the subsequent stage of its completion shall be got inspected / measured.

22. OBSERVANCE OF OWNER INSTRUCTIONS

The Contractor shall abide by the instruction of the Owner or their duly accredited engineer or representatives as regards the progress and quality of the Construction. No work shall be continued without the approval of the Owners. No concrete shall be poured in R.C.C. structures unless the reinforcement is checked and approved by the Owner / Engineer Incharge in writing (Pour Slip).

23. PROGRESS REPORT AND PHOTOGRAPHS

The Contractor shall regularly submit to the Owner every month, the progress reports in quadruplicate so as to reach them in the first working day of every month. If the Owner find the progress slow as compared to the Construction schedule already submitted and approved he may instruct the Contractor to increase the rate of progress and warn him about the possible enforcement of penalty clause and in that case the Owner shall take the necessary measures to accelerate the work. In the event of failure by the Contractor to comply with such instruction or such warnings, the penalty clause shall be strictly imposed upon the Contractor if the contractor falls behind the stipulated completion

period. The report of every fourth week shall be fully supported with photographs of post card size depicting the completed stages of the work. R.A Bill may not be paid unless Progress Report, Photographs, cube strength results and test results (from approved laboratory). When R.C.C work is claimed in the bill.

24. (A) MEETINGS ON PROGRESS OF WORK

The Contractor and his Agent shall attend any or all meetings when called by the Owner to discuss progress of the work and other matters related to the works and the contract.

(B) LIQUIDATED DAMAGES FOR DELAY.

Time shall be deemed to be the essence to the contract.

a) It is agreed that the amounts specified hereinafter are reasonable compensation to the Owner without reference to the actual loss or damage sustained and whether or not any damage has or has not been sustained.

b) If the work remains un-commenced at the expiry of the commencement period stipulated in the Tender, the contractor shall be liable (in addition to any other penalties liable under the contract) to pay to the Owner a sum of Rs. 0.10% (Point One Zero Percent) of the Contract Value for each day that the work remains un-commenced provided that the maximum amount under this sub-clause (excluding penalty or penalties under other sub-clause) shall not exceed 10 % (ten percent) of the contract price of the work.

c) The contractor shall ensure good progress during the execution of the works and shall be bound in all cases to strictly comply with the programme submitted by him and approved by the owner under this contract.

In case the execution of work falls so much in arrears, behind the programme so as to necessitate a fresh programme the approval by the Owner of the revised programme shall not be deemed to prejudice the power of the Owner to levy penalty under this sub-clause with scale prescribed in sub-clause(s) above and the contractor shall remain liable to pay, Rs. 0.10% (Rupees One Thousand Only) per day for the period revised programme had not been approved.

d) If the Contractor shall fail to complete the works within the time prescribed by section 9 hereof or extended time, then the contractor shall pay to the Owner liquidated damages for such default and not as a penalty of Rs. 0.10% (Point One Zero Percent) of contract amount for each calendar day which shall elapse between the time prescribed by section 9 hereof or extended time as the case may be and the date of completion of the works but not exceeding a maximum of ten percent (10%) of the contract price. The Owner may, without prejudice to any other method of recovery deduct the amount of such damages from any moneys in his hands due or which may become due to the contractor. The payment or deduction of such damages shall not relieve the contractor from any other of his obligations and liabilities under the contract.

e) If the contractor fails to complete the works in all respects or abandons in an incomplete state, or where his contract is rescinded due to breach of Agreement, the contractor shall be liable to pay to the Owner a sum equal to 10 % (Ten Percent) of the contract price as penalty.

f) The Contractor shall not claim exemption from the penalties as aforesaid without obtaining a written approval of the Owner. Mere fact that the contractor has applied for such exemption would be granted. No such application for exemption shall be

considered unless it is submitted within 15 days of the occurrence of the handicap resulting in the levy of penalty.

g) The Owner may without prejudice to any other method or recovery, deduct the amount of the penalties including the amount paid to as remuneration for supervision beyond the time of completion a prescribed by the section 9 hereof or extended time as aforesaid from any moneys in their hand due or which may become due to the contractor.

h) The payment or deduction of such penalties and / or liquidated damages shall not relieve the contractor from his obligation to complete the works or from any other of his obligation and liabilities under the contract.

25. FACILITIES TO OTHER CONTRACTORS

During the progress of the work, the contractor shall extend his full cooperation and coordination to other contractors for Civil, Plumbing & Electrical contractors or any other work in connection with the project to facilitate the early completion of the work.

Co-operations means supply of scaffolding, water, electricity and storage facility etc. etc. The Contractor may add expenses incurred in his premium for extending facilities to other contractor.

26. VALUABLE / ANTIQUES ETC

If during the excavation on the site any valuable or antiques are found, their ownership shall rest with the owner and the Contractor shall immediately hand these over to the owner.

27. SUB CONTRACTING

The sub-contracting of this work or part thereof shall not be allowed, however, in case the Contractors wants to sub-contract a part of the work, requiring specialized experience, he may ask for the permission of the Owner to do so, but in no case the Contractor shall sub-contract with the work or any part thereof without the permission of the Owner.

28. STORAGE

It shall be the responsibility of the Contractor to protect the materials stored on the site for the use at appropriate stage of work, against weathering for that he shall provide adequate storage depots on the site at his own expenses. In the event of the damage to these materials on account of negligence of the Contractor, the Owner shall order for removal of the materials from the site and replacement with fresh materials at the expense of the Contractor.

29. SAMPLES

The Contractor shall submit to the Owner for approval the samples of the material, fittings and fixtures which he may propose to use for the construction. He shall also provide the details of the origin of such samples to the Owner.

The Owner may allow the use of these materials if he is satisfied with their quality. However, if he finds these samples not in conformity with the specification, he may reject them and ask the contractor to produce the required quality products. The contractor shall use only the materials fittings and fixtures of the approved quality.

30. USE OF SITE

The site handed over to the contractor by the owner for carrying out the tendered work shall not be used for any purpose other than the construction. Any activity other than related to the tendered work shall be considered to be illegal and tantamount to be the breach of the contract.

31. IDEMNIFICATION OF OWNER

The Contractor shall indemnify the owner in respect of all claims, damage, compensation or expenses by any workman or other persons in the employment of the contractor or not, while in vicinity or upon the said works or the site of the same and the owner shall not be responsible to defend all the suits, claims, damages etc. arising out of any activity or consequences thereof connected with the construction. Such activity shall include upon an alleged infringement of a prevented invention and or acts improperly carried out or omission to carry out a proper or delay in carrying out proper work.

32. SITE OFFICE AND STORAGE

The Contractor shall construct at his own expense the necessary site offices and toilet facilities both for his use and for the use of the owner. He shall also construct at his own expense the necessary godowns and storages and access roads if needed. He shall demolish if required by the owner all these structures and clear the site by removing debris.

33. TESTING OF MATERIALS

The contractor shall from time to time carry-out the testing of materials used for the construction as and when desired by the Owner at his own expenses, in the laboratories as approved by the Owner. In the event of the un-satisfactory test results, the Owner shall reject such materials and order demolition of the work constructed from these materials & further order the replacement of the same to meet the required specification at contractors own expense.

34. DEFECT LIABILITY

The Contractor shall be responsible for making good all the defects appearing within 12 (Twelve) months after the satisfactory completion of works. The security deposit of the contractor shall be retained until after the expiry of this defect liability period.

If the Contractor fails to rectify the defects which are brought to his notice by the Owner, the owner shall get these defects rectified from the security deposit at the risk and cost of the Contractor. The owner may release the security deposit before the expiry of this period, in lieu of the suitable BANK Guarantee which shall be entirely to Owner's discretion.

35. FULFILMENT OF CONTRACT

On completion of the contract work, the contractor shall intimate the owner in writing and arrange for joint inspection of the completed works by the owner. Who will scrutinize the completed work as regards its quality and adequacy in keeping with the contract documents.

If they find the completed works falling short of any of the specifications or other obligations under the contract, they may ask the contractor to rectify the same. If they find the works duly completed as per contract, they may issue the final certificate for payment to the contractor. However the fulfillment of contract shall not be considered until after the acceptance of the completed work.

36. FORFEITURE

If the contractor shall become insolvent to have an order admitting a petition in insolvency made against him or shall present his petition in insolvency or shall make an arrangement with or assignment in favour of his creditors or shall agree to carry-out the contract under a committee of inspection of his creditors or (being a corporation) shall go into liquidation (other than a voluntary liquidation for the purpose of amalgamation or reconstruction) or if the contractor shall assign the contract without the consent in writing of the owner first obtained or shall have an execution levied on his goods or if in the opinion of the OWNER the Contractor:

a) Has abandoned the contract, or

b) Without reasonable excuse has failed to commence the work or has suspended the progress of work for 15 (fifteen) days.

c) Has failed to proceed with the works with due diligence, or

d) Has failed to meet the desired schedule of progress of work, or

e) Has failed to remove materials from the site or pull down and replace work for 15 (fifteen) days after the said material or work has been condemned and rejected by the Owner under these conditions, or

f) Is not executing the works in accordance with the contract or is persistently or flagrantly neglecting to carry out his obligations under the contract, or

g) Has to the detriment of good workmanship or in defiance of the Engineer 's instructions to the contrary sub-let any part of the contract, and so often as any of the events aforesaid shall occur, then the owner may adopt any of the following courses as it may deem best suited to the interest of the owner (without prejudice to any rights it may have against the contractor) after giving fifteen days notice in writing to the contractor.

i) Terminate the contract, enter upon the site and the works and expel the contractor there from in which case the security deposit of the contractor shall stand forfeited and be absolutely at the disposal of the owner.

ii) Enter upon the site and the works and expel the contractor there-from without there by voiding the contract or releasing the contractor from any of his obligations or liabilities under the contract or affecting the rights and power conferred on the owner by the contract and may itself complete the works or may engage any other contractor to complete the works at the risk and cost of the contractor.

iii) To complete the works or part of works by the owner at the cost of the contractor, viz to supply labour paid by the owner and to supply materials to carry out the works or any part of the works debiting the contractor with the cost (as hereinafter specified) of labour and materials and crediting with the value of the work done in all respects under same manner and at the same rates as if it had been carried out by the contractor under the terms of his Contract. For the purpose of this clause cost of labour shall be actual expenditure plus 25% to cover overhead charges, if the materials have been supplied by the owner, the cost of material will be based on the market rate or stock issue rate whichever is greater plus 10 % overhead charges. The certificates of the authorized representative of the owner as to the value of the work done and as to the cost shall be final and conclusive against the contractor.

37. i) VALUATION OF VARIATION

The Owner shall determine the amount (if any) to be added to or deducted from the sum named in the tender in respect of any extra or additional work done or work omitted by his order. All such work shall be valued at the rate set out in the contract, if in the opinion of the Owner the same shall be applicable if the contract shall not contain any rates applicable to be the extra additional work then reasonable prices shall be fixed by the Owner.

ii) POWER OF OWNER TO FIX RATE

Provided that if the nature or amount of any omission or addition relative to the nature or amount of the whole of the contract work or to any part hereof shall be such that in the contract for any item or the works is by reason of such omission or additions rendered unreasonable or inapplicable the Owner shall fix such other rate or price as in the circumstances he shall think reasonable and proper. In the event of dispute the decision of the Owner shall be final.

38. VARIATIONS

a) CONTRACTOR NOT TO VARY WORKS.

The Contractor shall not make any variation in the works except in accordance with a written variation order of the Owner.

b) VARIATION ORDER

The Owner may from time to time make any variation in the form, quality or quantity of the works or any part thereof that may in his opinion be necessary and for that purpose or if for any other reason it shall in his opinion be desirable shall have power by a written variation order to order the contractor to do and the Contractor shall do any of the following:

c) (i) NOT TO INVALIDATE CONTTRACT

No variation order shall in any way vitiate or invalidate the Contract but the value if any of all such variations ordered shall be taken into account in ascertaining the amount of the Contract price.

(ii) CHANGE IN QUANTITIES

No such variation shall be made by the Contractor without an order in writing by the Owner or his authorized representative provided that no order in writing shall be required for increase or decrease in the quantity of any work where such increase or decrease is not a result of an order given under the clause but is the result of the quantities exceeding or being less than those stated in the bill of quantities. Provided also that if for any reasons the Engineer shall consider it desirable to give any such order verbally, the Contractor shall comply with such order. Any confirmation in writing of such verbal order given by the Engineer whether before or after carrying out of the order shall be deemed to be an order in writing within the meaning of this clause.

(iii) NOTICE OF INTENDED CLAIMS

No claims for any variation shall be allowed except as per the provision contained in section 37. No increase of the Contract price under clause (ii) of this section shall be made unless as soon as practicable and not later than thirty days from the date of the variation order notice shall have been given in writing subject to the approval of the Owner.

(iv) CLAIMS

The Contractor shall send to the Owner once in every month an account of full and detailed particulars of all claims for any additional expense to which the Contractor may consider himself entitled and of all extra or additional work ordered by the Owner as per provision of clause (37) which he has executed during the preceding month and no claim for payment for any such work will be considered which has not been included in such particulars, provided always that the Owner shall be entitled to authorize payment to be made for any such work notwithstanding the Contractor's failure to comply with this condition if the Contractor has at the earliest practicable opportunity notified the Owner that he intends to make claim for such work.

39. MEASUREMENT

(i) RECORD OF MEASUREMENT

The contractor shall submit the interim bills to the Owner in triplicate with complete detailed measurements for scrutiny and approval.

The contractor shall be solely responsible for correct recording of the measurement of the items & get them checked by consultants before covering the hidden items.

40. SETTLEMENT OF DISPUTES

Disputes will be settled as per prevailing law in Pakistan.

SECTION – V

SPECIAL CONDITIONS OF CONTRACT

SECTION – V

SPECIAL CONDITIONS OF CONTRACT

1. CONTRACTOR TO PROVIDE EVERY THING

The Contractor is to provide everything of every sort and kind which may be necessary and requisite for the proper execution of the works included in the contract whether original or altered according to the intent and meaning of the drawings and specification taken together, which are to be signed by the Owner and the contractor whether the same may or may not be particularly described in the specification or shown in the drawings provided that the same are reasonably to be inferred there-from and in case of any discrepancy between the drawings and the specifications the Owner is to decide which shall be followed. The contractor shall also provide all necessary fencing and lights required to protect the public from accident, & shall be bound to bear the expenses of defense of every suit, action or other proceedings at law that may be brought by any person for injury sustained owing to neglect of the above precautions, and to any damages and cost which may be awarded in any such suit, action or proceedings to any such person or which may with the consent of the Contractor be paid to compromise any claim by any such person.

2. ESCALATION

No escalation on any of the materials or labour will be paid.

3. TEMPORARY POWER AND WATER

The contractors shall make their own distribution system for carrying the supply at the required location. The owners shall deduct 1 % each for water & electric supply provided to contractors from each interim payment towards the cost of supply as given in “Special Stipulations”

4. ANTITERMITE TREATEMENT

The Contractor shall furnish an undertaking on judicial stamp paper of Rs. 100/- of satisfactory application of appropriate chemical and that they shall remain responsible for any attack of termite to the building for a period of 10 years from the date of handing over. The contractor shall also remain responsible to replace / repair of any building material damaged due to termite attack upto a period of 10 years. The payment shall be made on plinth area basis.

5. BAR BENDING SCHEDULE (FOR CIVIL WORKS CONTRACTOR ONLY)

The Contractor shall prepare bar bending schedule for commencing the work of cutting, bending and binding of the steel reinforcement of any structural member for approval of the Owner and for entering in measurement book.

6. AS BUILD DRAWING

After the completion of the project the following as build drawings should be submitted to the Owner. (To whom applicable)

i) Complete Architectural Plans.

ii) Plumbing / Drainage Layout Plans.

iii) Electrical Installations.

In service drawings all sizes and routing of pipes, cables and wires should be clearly indicated in different colours.

SECTION – VI

APPENDIX – 'A'
APPENDIX – 'B'

SECTION – VI

APENDIX – 'A'

SPECIAL STIPULATIONS

(FOR CIVIL, PLUMBING & ELECTRICAL WORKS)

1	Works	RE-CONSTRUCTION OF OFFICE BLOCK – Civil, Electrical & Plumbing Works
2	Owner	The Principal Cadet College Petaro.
3	Owner's Representative	Civil Engineer Cadet College Petaro.
4	Bid Security	Rs. 1,250,000/- (Rupees one million two hundred fifty thousand) only.
5	Bid Validity	90 Days
6	Time for commencement of works	Within Fifteen (15) days from the date of receipt of Owner's letter of Award.
7	Time for furnishing construction Schedule	Within Fifteen (15) days from the date of receipt of letter of Award
8	Time of completion	15 (Fifteen) Calendar months from the date of receipt of Owner's Letter of Award.
9	Defects liability period	365 days from the effective date of taking over / completion certificate whichever is later.
10	Amount of liquidated damages	Rs.0.10% of value of Contract amount for each day of delay in Commencement / Completion of the works subject to a maximum of 10 % of contract price stated in the Letter of Award.
11	Retention Money	5 % of the amount of interim payment certificate. (Includes 5% of Bid Security)
12	Limit of Retention Money	5 % of Final cost of the Project a) 50% amount will be released after issuance of completion certificate of substantial completion of works by the Consultants and Owners. b) 50% amount will be released after completion of Defects Liability Period and handing over the site by the Contractor and taken over by the Owners in writing.

13	Insurance cover for works.	It shall be a contractor's, all risk policy and workman's compensation policy & cover an amount equal to full contract value & cost of equipment the labour employed by the Contractor as well as the Owner. Visitors and guests, insurance cover will be arranged by the company approved by the owner.
14	Performance Security: Bond issued by a schedule Bank in Pakistan.	10% of the contract price (stated in the Letter of Award) in the form of a Bond issued by a schedule bank approved by the Owners.
15	Mobilization Advance	(i) Up to 15% of the Contract Price on submission of Bank Guarantee from any gazette bank acceptable to the client equal to the amount of Advance.
16	Time required to enter into and execute the Agreement	15 (Fifteen) days from date of Award of Work.
17	Escalation in the cost of Material & Labour	No Escalation will be paid by the Owner, unless notified by Government of Sindh after award of work.
18	Time of interim payment(Running Account Bill of the works)	Within 30 days from the date of delivery of the certificate by the Owner after recording the Measurement Book of the works.
19	Charges for supply of water and power for construction work (if available)	1% of the cost of Bill for each facility (1% for water 1% for electricity)
20	Tax Deduction	As per Law.
21	Working Drawings	Contractor to collect working drawings from the College Engineer before start of execution.

ACCEPTED

_____

Contractor's Signature
With Stamp & Date

APPENDIX – B

FORM OF TENDER

RE-CONSTRUCTION OF OFFICE BLOCK

THE PRINCIPAL
CADET COLLEGE PETARO
DISTRICT JAMSHORO (SINDH)
POST CODE 76120

Dear Sir,

1. Having examined the instructions to Tenderers, Conditions of Contract, Special Stipulations, Appendices, Specifications, Bill of Quantities and Drawings for the construction, completion and maintenance of the above named works, we, the undersigned Tenderer, offer to construct, complete and maintain the whole of the said works in accordance with the said Conditions of Contract, Special Stipulations, Appendices, Specifications, Bill of Quantities and Drawings for the Tender Price of Pakistani Rupees _____.

2. Should a Notice of Award accepting this Tender be issued to us, we undertake;

   a) to abide by and fulfill all the terms and provisions of the Conditions of Contract contained in the documents mentioned above.

   b) to commence the works within 15 (fifteen) days of receipt of the OWNER's written order to commence, and to complete and deliver all the works comprised in the contract on or before the expiry of 18 (Eighteen) calendar months, after receipt of the said order to commence.

   c) to sign within 15 (fifteen) days following the issue of the said Notice of Award and Agreement with such alterations and additions thereto as you may require to adopt such Agreement to the circumstances of this tender, and for this purpose, to attend or to cause one or more representatives duly authorized by us under appropriate power(s) of attorney to attend you office.

3. We agree that this Tender shall remain valid for a period of 90 (ninety) days from the date set for opening the Tenders and it shall remain binding upon us and may be accepted by you at any time before the expiration of the said period.

4. We further agree to pay all costs towards the execution of the formal agreement including the cost of stamps.

5. We understand that unless and until a formal Agreement is prepared and executed, this Tender together with the Tender Documents and Notice of Award accepting this Tender, shall constitute a binding contract between us.

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

7. As a guarantee for the performance of the undertakings and obligations of this Tender, we submit herewith Earnest Money of equivalents to 5% of total tender cost of Rs. _____ (Rupees _____) in the form of a Pay Order / Demand Draft No. _____ dated _____ of the _____Bank Ltd, Branch _____ being a Scheduled Bank, made in you favour and made payable to you,

without any reference to us, and valid for 90 (ninety) days from the date established for opening of Tenders.

8. We certify that we clearly understand the terms and conditions of agreement as explained in the Tender Documents.

WITNESSES

1. _____

   _____

2. _____

   _____

Name and Address
Of Tenderer _____

Title of Person
Signing the Tender _____

Seal _____

SECTION –VII

Draft forms

Letter of Intent/Work Order, Form of Agreement/Contact, Performance Security, Mobilization Advance Bond/Guarantee

DRAFT AGREEMENT

This agreement made on this _____ day of _____ 2026 between Principal Cadet College Petaro, District Jamshoro (Sindh) hereinafter called the 'OWNER", of the one part and M/s _____, hereinafter called the 'CONTRACTOR', party of the other part

WHEREAS the Owner is desirous to construct of **RE-CONSTRUCTION OF OFFICE BLOCK** should be carried out and has accepted a Tender by the Contractor for the construction, completion and maintenance of the above work.

NOW THIS AGREEMENT WITNESSTH AS FOLLOWS:

1. In this agreement, words and expression shall have the same meaning as are respectively assigned to them in the Conditions of Contract hereinafter referred to.
2. The following documents shall be deemed to form and be read and construed as, part of this agreement, viz;
    a Tender Notice.
    b. Instructions to Tenders.
    c. General Conditions of Contract.
    d. Special Conditions of Contract.
    e. Special Stipulations.
    f. Addenda and Corrigenda, if any, issued by the Owner and duly accepted by the Contractor at the signing of the Contract.
    g. Earnest Money.
    h. Form of Tender.
    i. Notice of Award by the Owner.
    j. Performance Bond.
    k. Form of Agreement. / Contract Agreement.
    l. Owner's Order to Commence the Works.
    m. Limit of Retention Money.
    n. Any correspondence by the Owner/Contractor mutually accepted by the Owner and the Contractor.
    o. Technical Specifications.
    p. Bill of Quantities.
    q. Detailed / Working Drawings.
3. In consideration of the convenience and agreement to be kept and performed by the Contractor, and for the faithful performance of this contract and the completion of the works embraced therein, according to the specifications and conditions herein contained and referred to or agreed to in the course of subsequent negotiations and in accordance with the "General Conditions of Contract", the Owner shall pay and the Contractor shall receive full compensation for everything furnished and done by the Contractor under this agreement, the contract price stipulated in the Contractor's tender, or such other sum as may be ascertained in accordance with such conditions of contract, etc, and rates quoted against each item or work and agreed to and accepted by the parties as one instrument and at the time in the manner prescribed by the conditions of contract.
4. The contractor, at his own proper cost and expense shall do all work and furnish all labour, materials, supplies, _____, tools, machinery and other equipment and constructional plant that may be necessary for the execution of the work.
5. The maintenance of a rate of progress in the work which will result in its completion within the specified time, is an essential feature of this contract and the contractor agrees to proceed with all due diligence and care at all times and take all precautions to ensure the time of completion as defined herein, time being deemed to be the essence of the contract on the part of the Contractor.
6. The said works shall be started within 15 (fifteen) days of the issue of Letter of Award from the Owner to the Contractor to proceed with the works, and the Contract shall be dully completed on or before _____.

7. The Contract documents (Including any addenda thereto) consisting of the Instructions to Tenderers, the Tender for works, General Conditions of Contract, Special Provisions and Stipulations, Bill Of Quantities & rates Technical Specifications, Drawing, Posting Performance Bond, Construction Schedule submitted by the Contractor, Letters of Award, forming part of this contract, are each and all made a part hereof, and have the same force and effect as if set forth at length herein.
8. Insurance Cover will be arranged by the Contractor at his cost from the Insurance Company approved by the Owner, and submitted within 30 days from the receipt of Letter of Award.
9. The contractor shall provide Performance Bond from an approved Insurance Company equal to ten percent (10%) of the accepted contract value valid up to completion of work plus the end of maintenance period.
10. The Owner shall deduct and retain an amount equal to 10% (ten percent) of the amount payable to the Contractor under each "On Account" bill submitted by the Contractor as security deposit for the due and faithful discharge by the Contractor of his obligations under this agreement. The sum of such security deposit will be refundable to the Contractor after the successful completion and acceptance of works on expiry of six months of the maintenance period in a manner indicated in special stipulations. A sum of every bill submitted by the Contractor shall be recovered as income tax in compliance with Government directive from each payment.
11. That this contract agreement shall be executed in four original signed copies, three copies where of shall be filed in the office of the Owner and one given to the Contractor.
12. The owner shall make all possible efforts to pay off the running bills on account of work done, submitted by the Contractor as early as possible.

IN WITNESS WHEREOF, the Owner and the Contractor have executed this Agreement on the day and year mentioned above.

For and on behalf of Contractors
Official Seal :_____

Principal
Cadet College Petaro(Owner)
Official Seal:_____

Witness:
Signed and delivered by the Contractor above named in the presence of :

1. Sign: _____
Name: _____
CNIC #:_____

2. Sign: _____
Name: _____
CNIC #:_____

Witness:
Signed and delivered by the Owner above named in the presence of :

1. Sign: _____
Name: _____
CNIC #:_____

2. Sign: _____
Name: _____
CNIC #:_____

Draft Letter of Intent / Work Order

No:FNC(Dev)/ /2026

Date_____

M/s. _____
_____
_____

Subject: **RE-CONSTRUCTION OF OFFICE BLOCK – (CIVIL, ELECTRICAL & PLUMBING WORKS)**

References:
A. _____

1. I am pleased to accept your Tender for subject work at an approximate cost of Rs. _____ (Rupees _____) only, as offered by you vide reference 'C' above.

2. You are requested to commence the work immediately after taking over the site from Principal, Cadet College Petaro.

3. This letter may be treated as Work Order. The works is to be carried out in accordance with the Scope of work, Terms & Conditions, Special Stipulations, Drawings, Technical Specifications and other requirements laid down in the Tender Documents.

4. The copies of working Drawings may please be collected from this Office for execution of work. You are also hereby requested to make arrangements for 03 copies of Tender Documents submitted by you vide reference 'B', duly signed and stamped on each page, and submit it to College for future reference.

5. The date of commencement of work will be reckoned after 15 days of issue of this letter as indicated in 'Special Stipulations' (i.e. _____).

6. You will complete the work within 06(Six) calendar months from the date of issue of this Work Order. In case you fail to execute the Contract and mobilize the site as per stipulations of Tender Documents, the Earnest Money/Bid Security deposited by you with the Tender Documents shall stand forfeited in favor of Principal, Cadet College Petaro.

7. You will be entitled to claim cartage of material as per cartage statement given in the Tender for the material actually consumed in every R.A. Bill. No escalation would be allowed unless announced and finally approved by the Government of Sindh hereafter.

8. You will be liable to undertake any items of work as part of Contract under variation orders issued by the Principal, Cadet College Petaro in terms of Clause 37 & 38 of General Conditions of Contract at the rates approved by the Competent Authority. The items of various orders available in Schedule of rates, Government of Sindh shall be executed by you on the same premium/rebate quoted in your bid and the rates of non-schedule items shall be based on Rates analysis prepared by Engineer. No claim of any type shall be accepted on such item executed under a variation order.

9. Complete construction including development of surrounding area is to be undertaken within project cost.

10. The period of maintenance will be Twelve (12) Calendar Months/365 days from the date of issue of FINAL SUBSTANTIAL COMPLETION CERTIFICATE by the PRINCIPAL, CADET COLLEGE PETARO.

11. This letter of Award shall be treated as part of Contract unless the FORMAL CONTRACT is signed.

12. DRAFT FORM OF CONTRACT/AGREEMENT (Already attached in Tender Documents) shall be submitted to the undersigned duly typed and signed on Non-Judicial Stamp Paper of Rs.100/- and attested from a Notary Public/Oath Commissioner.

13. You should submit tentative Construction Program/project schedule showing the date of commencement and completion of various stages within 15(Fifteen) days from date of issue of Work Order.

14. Soil testing and Test Report of Steel carried out in the Testing Laboratory of Mehran University of Engineering & Technology, Jamshoro will be acceptable.

15. Cube crushing strength for all R.C.C. members should be obtained from Mehran University of Engineering & Technology, Jamshoro and to be submitted to the OWNER.

16. You will submit concrete mix design of different ratios to be used for this work designed in an approved laboratory.

17. You will also have to meet the following requirements during entire construction period.

    i. To deploy a full time, Graduate Engineer (Civil) at site for full time detailed supervision.
    ii. Progress Report and Progress Photographs should be submitted to the office of the Undersigned with every R.A. Bill otherwise the Bill will not be processed.
    iii. Inspection request should be submitted for approval of any C.C. and R.C.C. work well before casting of concrete.
    iv. Pour slip to be submitted for approval of any C.C. and R.C.C. work well before casting of concrete.
    v. Sample of all material (to be incorporated in permanent works) should be submitted to the OWNER for approval.
    vi. All the workers during execution of work should wear hard helmets and full boots.

18. You are requested to acknowledge receipt of this WORK ORDER as token of acceptance for undertaking the work as per Terms and Conditions mentioned in the Tender Documents.

PRINCIPAL
CADET COLLEGE PETARO

DRAFT PERFORMANCE SECURITY BOND

1. By this bond, M/s: _____ (hereinafter called the Contractor) and M/s : (Name of Insurance Company/Bank & Complete Address, as surety (hereinafter called "The Surety") are held any firmly bond unto the Commandant & Principal, Cadet College, Petaro (hereinafter called "The Employer") in the amount of Rs. _____ (Rupees: _____) only for the payment of which some well and truly to be made in Pak Rupees in which the Contract price is payable, the Contractor and the surety bond themselves, firmly by these present.

2. Whereas the Contractor has awarded the work by letter of Award No. _____, dated _____, by the Employer, for Execution of Contract "**RE-CONSTRUCTION OF OFFICE BLOCK – (CIVIL, ELECTRICAL & PLUMBING WORKS)"** (hereinafter referred as the Contract).

3. NOW, THEREFORE, the condition of this Obligation is such that, if the Contractor shall promptly and faithfully perform the said Contract (including any amendments thereto), then this obligation shall be null and void, otherwise it shall remain in full force and effect. Whenever the contractor shall be, and declared by the employer to be, in default under the contract the employer having performed the Employer's obligations there under, the surely may promptly remedy the default, or shall promptly:

   (1) Complete the Contract in accordance with its terms and condition; or.
   (2) Obtain a Bid or bids from qualified bidders for submission with its terms and conditions, and upon determination by the Employer and the Surety of the responsive Bidder arrange for a Contract between such Bidder and Employer and make available as work progresses (even through should be a default or a succession of defaults under the contract or contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the balance of the contract Price, but not excess, including other costs and damages or which the surety may be liable hereunder, the amount set forth in the first paragraph, shall mean the total amount payable by the employer to the Contractor under the contract, less the amount properly paid the employer to the Contractors, or.

   (3) Pay the Employer the amount required by the Employer to contract in accordance with its terms and conditions up to a total not exceeding the amount of this Bond.
   No right of action shall accrue on this Bond to or the use of any person of corporation other than the Employer named herein or the heirs, executors, administrators successors and assigns of the Employer. In testimony whereof, the Contractor has hereunto set its hand and affixed this seal, and the Surety has caused these to be sealed with its corporate seal duly attested by the Signature of its legal representative, this (date).

For and on behalf of Contractors
Official Seal :_____

Witness:
Signed and delivered in presence of :

3. Sign: _____
Name: _____
CNIC #:_____

4. Sign: _____
Name: _____
CNIC #:_____

For and on behalf of Bank / Insurance Co.
Official Seal :_____

Witness:
Signed and delivered in presence of :

3. Sign: _____
Name: _____
CNIC #:_____

4. Sign: _____
Name: _____
CNIC #:_____

No. _____
Date: _____
Expiry : _____
Amount : _____

MOBILIZATION ADVANCE GUARANTEE

WHEREAS the Principal, Cadet College Petaro, (hereinafter called "the Employer") have entered into a Contact with **M/S. _____,** Contractor, Address _____**,** (hereinafter called Contractor) for the Construction of "**RE-CONSTRUCTION OF OFFICE BLOCK – (CIVIL , ELECTRICAL & PLUMBING WORKS)"** (hereinafter referred as the Contact).js

And Whereas, the Employer has agreed to advance to the Contractor, at the their request an amount of **Rs. _____/- (Rupees:_____)** to be used for the Mobilization and Procurement of equipment plant and thing for the above written works. In consideration of the Employer making the above advance we hereby guarantee that the **Contractor M/S _____**., shall use the advance for the above written works, and if they commit default, of which employer shall be sole judge, in fulfillment of any of their obligation for which the advance payment is made, we shall be liable to the Employer for the payment of the amount in respect of which they have so failed not exceeding the aforementioned sum.

NOTICE in writing of any laps or default as aforesaid on the part of the Contractor shall be given by the Employer to us written the validity hereof and on first demand for a sum up to the limit of the guarantee amount from the employer, payment of the amount demanded shall be made without reference to the Contractor and without question as to whether there was default or laps and the Employer's decision in this behalf shall be final and binding on us and no dispute or question will be raised by us before the payment is made to Employer.

This said advance payments is to be adjusted against payment(s) form the running bills of the Contractor the Guarantee shall remain in force until the adjustment of the Mobilization Advance against payment from the running bills of the Contractor or **till _____** which ever date is earlier. This Guarantee shall be effective form the date of receipt of the **Mobilization Advance Rs. _____/- (Rupees _____only)** by the Contractor in the account of _____., with ourselves.

Notwithstanding anything to the contrary stated above, the Company shall be released & discharged of its liability hereunder if no claim is lodged with the Company an or before _____**,** the aforesaid guarantee is binding onus and is irrevocable during its validity. That our maximum liability under this guarantee shall not exceed **Rs. _____/- (Rupees. _____) only** is any manner or whatsoever. This guarantee shall remain valid until _____**.** Thereafter it shall cease to operate. Claim if any under this guarantee must be lodged with us on or before _____**.** Thereafter it shall cease to operate. Claim if any under this guarantee must be lodged with us on or before _____ failing which no claim shall be entertained and admitted & we shall be discharged from our liability under this guarantee. Upon expiry this guarantee shall become NULL & VOID whether returned to us for cancellation or not.

For and on behalf of Bank / Insurance Co.
Nam:_____
Title: _____
Official Seal :_____

Witness:
Signed and delivered in presence of :

5. Sign: _____
Name: _____
CNIC #:_____

Witness:

5. Sign: _____
Name: _____
CNIC #:_____

SECTION – VIII

TECHNICAL SPECIFICATIONS

SECTION – VIII

TECHNICAL SPECIFICATIONS
CIVIL WORK

SCOPE OF WORK

1. EXCAVATION AND BACK FILLING

As specified in the Bill of Quantities and Book of specifications for executing of works issued by standing Rates Committee Government of Sindh (Chapter No.17)

1.1 DISPOSAL OF SURPLUS EARTH AND RUBBISH

All surplus earth and rubbish shall be disposed off by the Contractor at his cost as directed by the OWNER. The terms of disposal shall include all operations of loading, unloading, stacking, spreading filling depressions, consolidating & ramming in layers not exceeding 12" (300 mm) thickness.

1.2 CARTAGE OF EARTH FILL BROUGHT FROM OUTSIDE SOURCE

Cost of cartage of earth fill under floors and surroundings of Buildings beyond one chain would be paid @ the rate approved by Govt. of Sindh for actual lead.

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 DESCRIPTION:

This section specifies cast-in-place structural concrete and material and mixes for other concrete.

1.2 RELATED WORK:

A. Materials testing and inspection during construction shall be done by an accredited testing laboratory.
B. Concrete roads, walks, and similar exterior site work shall be as specified by the engineer in charge.

1.3 TOLERANCES:

A. ACI 117.
B. Slab Finishes: ACI 117, F-number method in accordance with ASTM E1155.

1.4 REGULATORY REQUIREMENTS:

A. ACI SP-66 ACI Detailing Manual
B. ACI 318 - Building Code Requirements for Reinforced Concrete.

1.5 SUBMITTALS:

A. Submit in accordance with procedure specified by the engineer in charge.
B. Concrete Mix Design.
C. Shop Drawings: Reinforcing steel: Complete shop drawings.
D. Manufacturer's Certificates: Air-entraining admixture, chemical admixtures, curing compounds.

1.6 APPLICABLE PUBLICATIONS:

A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by basic designation only.

B. American Concrete Institute (ACI):

117-10	Specification for Tolerances for Concrete Construction, Materials and Commentary
211.1-91(R2009)	Standard Practice for Proportions for Normal, Heavyweight, and Mass Concrete
211.2-98(R2004)	Standard Practice for Selecting Proportions for Structural Lightweight Concrete
301-10	Specifications for Structural Concrete
305.1-06	Specification for Hot Weather Concreting
306.1-90(R2002)	Standard Specification for Cold Weather Concreting
SP-66-04	ACI Detailing Manual
318-11	Building Code Requirements for Structural Concrete and Commentary
347-04	Guide to Formwork for Concrete

C. American Society for Testing and Materials (ASTM):

A185/A185M-07	Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete Reinforcement
A615/A615M-09	Standard Specification for Deformed and Plain Carbon Steel Bars for Concrete Reinforcement
A996/A996M-09	Standard Specification for Rail Steel and Axle Steel Deformed Bars for Concrete Reinforcement
C31/C31M-10	Standard Practice for Making and Curing Concrete Test Specimens in the Field

C33/C33M-11a..... Standard Specification for Concrete Aggregates

C39/C39M-12..... Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens

C94/C94M-12..... Standard Specification for Ready Mixed Concrete

C143/C143M-10..... Standard Test Method for Slump of Hydraulic Cement Concrete

C150-11..... Standard Specification for Portland cement

C171-07..... Standard Specification for Sheet Material for Curing Concrete

C172-10..... Standard Practice for Sampling Freshly Mixed Concrete

C173-10..... Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method

C192/C192M-07..... Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory

C231-10..... Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method

C260-10..... Standard Specification for Air-Entraining Admixtures for Concrete

C330-09..... Standard Specification for Lightweight Aggregates for Structural Concrete

C494/C494M-11..... Standard Specification for Chemical Admixtures for Concrete

C618-12..... Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete

D1751-04(R2008) ..... Standard Specification for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types)

D4397-10 ..... Standard Specification for Polyethylene Sheeting for Construction, Industrial and Agricultural Applications

E1155-96(2008) ..... Standard Test Method for Determining F_F Floor Flatness and F_L Floor Levelness Numbers

PART 2 - PRODUCTS

2.1 FORMS:

Wood, plywood, metal, or other materials, approved by Resident Engineer, of grade or type suitable to obtain type of finish specified.

2.2 MATERIALS:

A. Portland Cement: ASTM C150, Type I or II.
B. Fly Ash: ASTM C618, Class C or F including supplementary optional requirements relating to reactive aggregates and alkalis, and loss on ignition (LOI) not to exceed 5 percent.
C. Coarse Aggregate: ASTM C33, Size 67. Size 467 may be used for footings and walls over 300 mm (12 inches) thick. Coarse aggregate for applied topping and metal pan stair fill shall be Size 7.
D. Fine Aggregate: ASTM C33.
E. Lightweight Aggregate for Structural Concrete: ASTM C330, **Table 1**
F. Mixing Water: Fresh, clean, and potable.
G. Air-Entraining Admixture: ASTM C260.
H. Chemical Admixtures: ASTM C494.
I. Vapor Barrier: ASTM D4397, //0.38 mm (15 mil)//.

J. Reinforcing Steel: ASTM A615 or ASTM A996, deformed. See structural drawings for grade.
K. Welded Wire Fabric: ASTM A185.
L. Expansion Joint Filler: ASTM D1751.
M. Sheet Materials for Curing Concrete: ASTM C171.
N. Abrasive Aggregates: Aluminum oxide grains or emery grits.
O. Liquid Hardener and Dustproofer: Fluosilicate solution or magnesium fluosilicate or zinc fluosilicate. Magnesium and zinc may be used separately or in combination as recommended by manufacturer.
P. Liquid Densifier/Sealer: 100 percent active colorless aqueous siliconate solution.
Q. Grout, Non-Shrinking: Premixed ferrous or non-ferrous, mixed and applied in accordance with manufacturer's recommendations. Grout shall show no settlement or vertical drying shrinkage at 3 days or thereafter based on initial measurement made at time of placement, and produce a compressive strength of at least 18mpa (2500 psi) at 3 days and 35mpa (5000 psi) at 28 days.

2.3 CONCRETE MIXES:

A. Design of concrete mixes using materials specified shall be the responsibility of the Contractor as set forth under Option C of ASTM C94.
B. Compressive strength at 28 days shall be not less than **// 30 MPa // (// 4000 psi //) or as specified in the drawings.**
C. Establish strength of concrete by testing prior to beginning concreting operation. Test consists of average of three cylinders made and cured in accordance with ASTM C192 and tested in accordance with ASTM C39.
D. Maximum slump for vibrated concrete is 100 mm (4 inches) tested in accordance with ASTM C143.
E. Cement and water factor (See **Table I**):

TABLE I - CEMENT AND WATER FACTORS FOR CONCRETE

Concrete: Strength	**Non-Air-Entrained**		**Air-Entrained**	
Min. 28 Day Comp. Str. MPa (psi)	**Min. Cement kg/m³ (lbs/c. yd)**	**Max. Water Cement Ratio**	**Min. Cement kg/m³ (lbs/c. yd)**	**Max. Water Cement Ratio**
35 (5000)[1,3]	**375 (630)**	**0.45**	**385 (650)**	**0.40**
30 (4000)[1,3]	**325 (550)**	**0.55**	**340 (570)**	**0.50**
25 (3000)[1,3]	**280 (470)**	**0.65**	**290 (490)**	**0.55**
25 (3000)[1,2]	**300 (500)**	*	**310 (520)**	*

1. If trial mixes are used, the proposed mix design shall achieve a compressive strength 8.3 MPa (1200 psi) in excess of f'_c. For concrete strengths above 35 Mpa (5000 psi), the proposed mix design shall achieve a compressive strength 9.7 MPa (1400 psi) in excess of f'_c.
2. Lightweight Structural Concrete. Pump mixes may require higher cement values.
3. For concrete exposed to high sulfate content soils maximum water cement ratio is 0.44.
4. Determined by Laboratory in accordance with ACI 211.1 for normal concrete or ACI 211.2 for lightweight structural concrete.

F. Air-entrainment is required for all exterior concrete and as required by the engineer in charge. Air content shall conform to the Table 2. For lightweight aggregate concrete air content shall conform to Table 3.

TABLE 2 - TOTAL AIR CONTENT
FOR VARIOUS SIZES OF COARSE AGGREGATES (NORMAL CONCRETE)

Nominal Maximum Size of Coarse Aggregate	**Total Air Content Percentage by Volume**
10 mm (3/8 in)	6 to 10
13 mm (1/2 in)	5 to 9
19 mm (3/4 in)	4 to 8
25 mm (1 in)	3 1/2 to 6 1/2
40 mm (1 1/2 in)	3 to 6

TABLE 3 TOTAL AIR CONTENT
AIR CONTENT OF LIGHTWEIGHT STRUCTURAL CONCRETE

Nominal Maximum size of Total Air Content	**Coarse Aggregate, mm's (Inches) Percentage by Volume**
Greater than 10 mm (3/8 in) 4 to 8	10 mm (3/8 in) or less 5 to 9

2.4 BATCHING & MIXING:

A. Store, batch, and mix materials as specified in ASTM C94.
   1. Job-Mixed: Concrete mixed at job site shall be mixed in a batch mixer in manner specified for stationary mixers in ASTM C94.
   2. Ready-Mixed: Ready-mixed concrete comply with ASTM C94, except use of non-agitating equipment for transporting concrete to the site will not be permitted. With each load of concrete delivered to project, ready-mixed concrete producer shall furnish, in duplicate, certification as required by ASTM C94.
   3. Mixing structural lightweight concrete: Charge mixer with 2/3 of total mixing water and all of the aggregate. Mix ingredients for not less than 30 seconds in a stationary mixer or not less than 10 revolutions at mixing speed in a truck mixer. Add remaining mixing water and other ingredients and continue mixing. Above procedure may be modified as recommended by aggregate producer.

PART 3 - EXECUTION

3.1 FORMWORK:

A. Installation conforms to ACI 347. Sufficiently tight to hold concrete without leakage, sufficiently braced to withstand vibration of concrete, and to carry, without appreciable deflection, all dead and live loads to which they may be subjected.

B. Treating and Wetting: Treat or wet contact forms as follows:
   1. Coat plywood and board forms with non-staining form sealer. In hot weather cool forms by wetting with cool water just before concrete is placed.

   2. Clean and coat removable metal forms with light form oil before reinforcement is placed. In hot weather, cool metal forms by thoroughly wetting with water just before placing concrete.

   3. Use sealer on reused plywood forms as specified for new material.

C. Inserts, sleeves, and similar items: Flashing reglets, masonry ties, anchors, inserts, wires, hangers, sleeves, boxes for floor hinges and other items specified as furnished under this and other sections of specifications and required to be in their final position at time concrete is placed shall be properly located, accurately positioned and built into construction, and maintained securely in place.

D. Construction Tolerances:

1. Contractor is responsible for setting and maintaining concrete formwork to assure erection of completed work within tolerances specified to accommodate installation or other rough and finish materials. Remedial work necessary for correcting excessive tolerances is the responsibility of the Contractor. Erected work that exceeds specified tolerance limits shall be remedied or removed and replaced, at no additional cost.
2. Permissible surface irregularities for various classes of materials are defined as "finishes" in specification sections covering individual materials. They are to be distinguished from tolerances specified which are applicable to surface irregularities of structural elements.

3.2 REINFORCEMENT:

Details of concrete reinforcement, unless otherwise shown, shall be in accordance with ACI 318 and ACI SP-66. Support and securely tie reinforcing steel to prevent displacement during placing of concrete.

3.3 VAPOR BARRIER:

A. Except where membrane waterproofing is required, place interior concrete slabs on a continuous vapor barrier.
B. Place 100 mm (4 inches) of fine granular fill over the vapor barrier to act as a blotter for concrete slab.
C. Lap joints 150 mm (6 inches) and seal with a compatible pressure-sensitive tape.
D. Patch punctures and tears.

3.4 PLACING CONCRETE:

A. Remove water from excavations before concrete is placed. Remove hardened concrete, debris and other foreign materials from interior of forms, and from inside of mixing and conveying equipment. Obtain approval of Resident Engineer before placing concrete. Provide screeds at required elevations for concrete slabs.

B. Before placing new concrete on or against concrete which has set, existing surfaces shall be roughened and cleaned free from all laitance, foreign matter, and loose particles.

C. Convey concrete from mixer to final place of deposit by method which will prevent segregation or loss of ingredients. Do not deposit in work concrete that has attained its initial set or has contained its water or cement more than 1 1/2 hours. Do not allow concrete to drop freely more than 1500 mm (5 feet) in unexposed work nor more than 900 mm (3 feet) in exposed work. Place and consolidate concrete in horizontal layers not exceeding 300 mm (12 inches) in thickness. Consolidate concrete by spading, rodding, and mechanical vibrator. Do not secure vibrator to forms or reinforcement. Vibration shall be carried on continuously with placing of concrete.

D. Hot weather placing of concrete: Follow recommendations of ACI 305R to prevent problems in the manufacturing, placing, and curing of concrete that can adversely affect the properties and serviceability of the hardened concrete.

E. Cold weather placing of concrete: Follow recommendations of ACI 306R, to prevent freezing of thin sections less than 300 mm (12 inches) and to permit concrete to gain strength properly, except that use of calcium chloride shall not be permitted without written approval from Resident Engineer.

3.5 PROTECTION AND CURING:

Protect exposed surfaces of concrete from premature drying, wash by rain or running water, wind, mechanical injury, and excessively hot or cold temperature. Curing method shall be subject to approval by Resident Engineer.

3.6 FORM REMOVAL:

Forms remain in place until concrete has a sufficient strength to carry its own weight and loads supported. Removal of forms at any time is the Contractor's sole responsibility.

3.7 SURFACE PREPARATION:

Immediately after forms have been removed and work has been examined and approved by Resident Engineer, remove loose materials, and patch all stone pockets, surface honeycomb, or similar deficiencies with cement mortar made with 1 part Portland cement and 2 to 3 parts sand.

3.8 FINISHES:

A. Vertical and Overhead Surface Finishes:

1. Unfinished Areas: Vertical and overhead concrete surfaces exposed in unfinished areas, above suspended ceilings in manholes, and other unfinished areas exposed or concealed will not require additional finishing.

2. Interior and Exterior Exposed Areas (to be painted): Fins, burrs and similar projections on surface shall be knocked off flush by mechanical means approved by Resident Engineer and rubbed lightly with a fine abrasive stone or hone. Use an ample amount of water during rubbing without working up a lather of mortar or changing texture of concrete.

3. Interior and Exterior Exposed Areas (finished): Finished areas, unless otherwise shown, shall be given a grout finish of uniform color and shall have a smooth finish treated as follows:

    a. After concrete has hardened and laitance, fins and burrs have been removed, scrub concrete with wire brushes. Clean stained concrete surfaces by use of a hone or stone.
    b. Apply grout composed of 1 part portland cement and 1 part clean, fine sand (smaller than 600 micro-m (No. 30) sieve). Work grout into surface of concrete with cork floats or fiber brushes until all pits and honeycomb are filled.
    c. After grout has hardened, but still plastic, remove surplus grout with a sponge rubber float and by rubbing with clean burlap.
    d. In hot, dry weather use a fog spray to keep grout wet during setting period. Complete finish for any area in same day. Confine limits of finished areas to natural breaks in wall surface. Do not leave grout on concrete surface overnight.

B. Slab Finishes:

1. Scratch Finish: Slab surfaces to receive a bonded applied cementitious application shall all be thoroughly raked or wire broomed after partial setting (within 2 hours after placing) to roughen surface to insure a permanent bond between base slab and applied cementitious materials.

2. Floating: Allow water brought to surface by float used for rough finishing to evaporate before surface is again floated or troweled. Do not sprinkle dry cement on surface to absorb water.

3. Float Finish: Ramps, stair treads, and platforms, both interior and exterior, equipment pads, and slabs to receive non-cementitious materials, except as specified, shall be screened and floated to a smooth dense finish. After first floating, while surface is still soft, surfaces shall be checked for alignment using a straightedge or template. Correct high spots by cutting down with a trowel or similar tool and correct low spots by filling in with material of same composition as floor finish. Remove any surface projections on floated finish by rubbing or dry grinding. Refloat the slab to a uniform sandy texture.

4. Steel Trowel Finish: Applied toppings, concrete surfaces to receive resilient floor covering or carpet, future floor roof and all monolithic concrete floor slabs exposed in finished work and for which no other finish is shown or specified shall be steel troweled. Final steel troweling to secure a smooth,

dense surface shall be delayed as long as possible, generally when the surface can no longer be dented with finger. During final troweling, tilt steel trowel at a slight angle and exert heavy pressure on trowel to compact cement paste and form a dense, smooth surface. Finished surface shall be free of trowel marks, uniform in texture and appearance.

5. Broom Finish: Finish all exterior slabs, ramps, and stair treads with a bristle brush moistened with clear water after the surfaces have been floated.

6. Finished slab flatness (FF) and levelness (FL) values comply with the following minimum requirements:

Slab on grade & Shored suspended slabs	Unshored suspended slabs
Specified overall value F_F 25/F_L 20	Specified overall value F_F 25
Minimum local value F_F 17/F_L 15	Minimum local value F_F 17

3.9 SURFACE TREATMENTS:

A. Surface treatments shall be mixed and applied in accordance with manufacturer's printed instructions.
B. Liquid Densifier/Sealer: Use on all exposed concrete floors and concrete floors to receive carpeting // except those specified to receive non-slip finish //.
C. Non-Slip Finish: Except where safety nosing and tread coverings are shown, apply non-slip abrasive aggregate to treads and platforms of all concrete steps and stairs, and to surfaces of exterior concrete ramps and platforms. Aggregate shall be broadcast uniformly over concrete surface. Trowel concrete surface to smooth dense finish. After curing, rub the treated surface with abrasive brick and water sufficiently to slightly expose abrasive aggregate.

3.10 APPLIED TOPPING:

A. Separate concrete topping with thickness and strength shown with only enough water to insure a stiff, workable, plastic mix.
B. Continuously place applied topping until entire section is complete, struck off with straightedge, compact by rolling or tamping, float and steel trowel to a hard smooth finish.

3.11 RESURFACING FLOORS:

Remove existing flooring, in areas to receive resurfacing, to expose existing structural slab and to extend not less than 25 mm (1 inch) below new finished floor level. Prepare exposed structural slab surface by roughening, broom cleaning, wetting, and grouting. Apply topping as specified.

3.12 RETAINING WALLS:

A. Concrete for retaining walls shall be as shown and air-entrained.
B. Install and construct expansion and contraction joints, water stops, weep holes, reinforcement and railing sleeves as shown.
C. Finish exposed surfaces to match adjacent concrete surfaces, new or existing.
D. Porous backfill shall be placed as shown.

3.13 PRECAST CONCRETE ITEMS:

Precast concrete items, not specified elsewhere, shall be cast using **25 MPa (3000 psi)** air-entrained concrete to shapes and dimensions shown. Finish surfaces to match corresponding adjacent concrete surfaces. Reinforce with steel as necessary for safe handling and erection.

- - - E N D - - -

STEEL REINFORCEMENT

1. SCOPE
The work shall consist of furnishing and placing steel reinforcement for reinforced concrete.

2. MATERIALS
Steel bars for concrete reinforcement shall be Grade 60 deformed billet-steel bars (ASTM A 615). Fabricated deformed steel bar mats shall conform to the requirements of ASTM Specification A 184. Plain steel welded wire fabric reinforcement shall conform to the requirements of ASTM Specification A 185. Deformed steel welded wire fabric for concrete reinforcement shall conform to the requirements of ASTM Specification A 497.

Before reinforcement is placed, the surfaces of the bars and fabric and any metal supports shall be cleaned to remove any loose, flaky rust, mill scale, oil, grease, soil, paint or other coatings or foreign substances. After placement, the reinforcement shall be maintained in a clean condition until it is completely embedded in the concrete.

3. BAR SCHEDULE, LISTS, AND DIAGRAMS
Any supplemental bar schedules, bar lists or bar-bending diagrams required to accomplish the fabrication and placement of reinforcement shall be provided by the Contractor.

4. BENDING
Reinforcement shall be cut and bent in compliance with the requirements of the ACI-315. Bars shall not be bent or straightened in a manner that will injure the material. The minimum bend diameter shall be **6 bar diameters**. Bars with kinks, cracks or improper bends will be rejected.

5. SPLICING BAR REINFORCEMENT
Splices of reinforcement shall be made only at locations shown on the drawings and provided by the steel schedule. Placement of bars at the lap splice locations shown, when not in contact, shall not be farther apart than one-fifth the shown lap length and in any case no greater than **6 inches**.

Unless otherwise specified on the drawings, splices of reinforcing bars shall provide an overlap equal to at least **40 times the diameter of the smaller bar** in the splice for grade 60 steel.

6. SPLICING WELDED WIRE FABRIC
Unless otherwise specified, welded wire fabric shall be spliced in the following manner:

a. Adjacent sections shall be spliced end to end (longitudinal lap) by overlapping a minimum of one full mesh plus 2 inches plus the length of the two end overhangs. The splice length is measured from the end of the longitudinal wires in one piece of fabric to the end of the longitudinal wires in the lapped piece of fabric.

b. Adjacent sections shall be spliced side to side (transverse lap) a minimum of one full mesh plus 2 inches. The splice length shall be measured from the centerline of the first longitudinal wire in one piece of fabric to the centerline of the first longitudinal wire in the lapped piece of fabric.

7. PLACING
Reinforcement shall be accurately placed and secured in position in a manner that will prevent its displacement during the placement of concrete. Tack welding of bars will not be permitted. Metal chairs, metal hangers, metal spacers and concrete chairs may be used to support the reinforcement. Metal hangers, spacers and ties shall be placed in such a manner that they will not be exposed in the finished concrete surface. The legs of metal chairs or side form spacers that may be exposed on any face of slabs, walls, beams or other concrete surfaces shall have a protective coating or finish by means of hot dip galvanizing, epoxy coating, plastic coating, or be stainless steel. Metal chairs and spacers not fully covered by a protective coating or finish shall have a **minimum cover of 3/4 inch** of concrete over the unprotected metal portion except for those with plastic coatings may have a **minimum cover of l/2 inch of concrete** over the unprotected metal portion. Precast concrete chairs shall be manufactured of the same class of concrete as that specified for the structure.

High density or structural plastic rebar accessories, designed to insure maximum concrete bond, may be substituted for metal or concrete accessories in spacer applications. Exposure of plastic rebar accessories at the finished concrete surface shall be kept to a minimum. Plastic rebar accessories, if used, shall be staggered along adjacent parallel bars and shall be placed at intervals **no closer than 12 inches.** Plastic rebar accessories shall not be used in concrete sections **6 inches or less** in thickness.

Weld wire fabric (WWF) shall be sufficiently secured and supported to hold it near the middle of the slab. The final location shall be in the center one-third of thickness with a minimum concrete cover of 1 inch thickness.

Reinforcement shall not be placed until the prepared site has been inspected and approved by the Inspector. After placement of the reinforcement, concrete shall not be placed until the reinforcement has been inspected and approved by the Inspector.

8. STORAGE

Steel reinforcement stored at the work site shall be placed above the ground surface on platforms, skids or other supports and protected from mechanical damage or corrosion.

10. BRICK MASONRY

10.1 SCOPE OF WORK

The work covered under this section of specifications consists of furnishing all labour, material tools and plants for the satisfactory completion of the works in accordance with the drawings as specified herein and subject to the terms and conditions of the contract.

10.2 GENERAL

Each finished brick shall be of first class quality and shall not be less than 3" x 4½" x 9" in size and shall have a ¼" deep frog on the upper face. All the bricks shall be regular, of homogenous texture uniforms in shape and size with sharp and square arises, parallel faces and deep red colour may vary by 1/8" from the standard size. When stuck, they should give a clear ringing sound. They shall not absorb more than 1/6th of their weight of water after being soaked for one hour, and shall show no sign of effervescence on drying. A good brick should not break when struck against another brick or when dropped flat from a height of 3'-0" to 4'-0" on the ground. It should have a surface so hard that it cannot be scratched by finger nail. The average compressive strength of five representative bricks shall not be less than 1,800 P.S.I.

10.3 EXECUTION

a) Unless otherwise specified, bricks shall be laid in English Bond with the frogs upwards. Each brick shall be set with both bed and vertical joints filled with mortar and thoroughly bedded in by tapping with handles of the trowel. No half bricks or bats shall be used except where necessary to complete the Bond. Simple lipping with mortar at the edges shall not be permitted.

b) All bricks work shall be taken up truly plumb and should be so done with a plumb and straight edge.

c) Brick work shall be carried up all round at the same height and during construction one part of wall should not be more than 3'-0" higher than any other part.

d) Brick work constructed shall be of best standard of workmanship obtainable and objectionable offsets in the brick work shall be removed by and at the expense of the contractor.

e) Each course in the wall after being laid should be properly grouted to fill all of the voids in the area. The grout should be fluid enough to perform this function.

11. PLASTERING

The work covered under this section of specifications consists of furnishing all labour, material, tools and plants for the satisfactory completion of the work in accordance with the drawings as specified herein and the terms and conditions of the contract.

a) The joins of brick masonry which is to be plastered shall have ¼" deep grooved joint which should be raked before the mortar sets each day.

b) The concrete surface to receive plaster shall be properly roughened.

c) The Plaster shall be made to a true line and plumb and a straight edge not less than 10'-0" in length. All horizontal lines and surfaces shall be made with a level and all jambs and corners with a plumb bob as the work proceeds. The plaster shall be finished perfectly smooth else or otherwise instructed and shall be without wavy surface. The edges and corners shall be rounded or chamfered as instructed by the OWNER.

12. GLAZED, MATT FINISH WALL AND FLOOR TILES

12.1 GENERAL

The contractor shall supply and fix tiles as described in B.O.Q.

12.2 LAYING

i) All tiles should be soaked in water before laying in sufficient quantity to complete a days work.

ii) All tiles shall be set in bed of cement sand mortar to its correct level and line the mortar shall be evenly spread on the full bottom of tiles.

iii) Joints shall be grouted with white cement mixed with matching colour of tiles as approved by the Engineer Incharge.

13. MARBLE AND TERRAZO TILES.

13.1 GENERAL

a) The contractor shall submit samples of Marble Tiles for flooring and dado required in various locations. The finished floors and dados shall confirm in all respects to the characteristics of approved sample by the OWNER.

b) Marble tiles shall be of first quality, free from cracks chips or any other defects and shall be uniform in tone and colour, as selected by OWNER. Terra Tiles should be 1" thick and Marble Tiles be 3/8" thick, on floors and ¾" thick on steps of staircases where specified.

13.2 LAYING

i) Immediately prior to laying the tiles will be checked the lot and rejected tiles be replaced.

ii) All Tiles shall be set in bed of cement / sand mortar to their correct lines and level and the mortar shall be spread evenly on the full bottom of tiles.

iii) All Tiles should be set without joints (Butt joints) as approved by the OWNER.

iv) Marble Tiles be finished with chemical polish.

14. CARPENTARY, JOINERY AND HARDWARE

14.1 SCOPE OF WORK

The work covered by this section of the specifications consists of furnishing all plant, labour, equipment, appliances and materials and in performing all operations in connection with fabrication and installation of shelves, cupboards paneling, doors / windows frames, shutters etc. as per size, thickness, dimension and details shown on the working drawings, compete schedule of Doors and Windows in strict accordance with this section of the specification and the applicable drawings, finishing schedule, instructions of the Engineer.

14.2 MATERIALS, FITTINGS & SAMPLES

(i) SOFT WOOD

The timber of trees belonging to the botanical group Gymnosperms, commercial timber deodar of this group, with best quality shall be used.

(ii) PLYWOOD

Shall comply in all respects with B.S.S. 1455: 1948. The plywood shall only be obtained from approved manufactures.

The plywood used for doors, paneling and the like shall be of the thickness as specified. The grade shall be first quality. The face and back shall be free from end-joints, dead-knots, overlaps, patches and other defects. Edge joints in veneers shall be well made. Isolated pinworm holes shall be permitted provided they do not run along with plane of the veneer. The face and back shall be free smooth for painting or polishing.

(iii) TEAK VENEER BOARD

Shall be first quality obtained from the manufacture approved by the OWNER.

14.3 HARDWARE AND FITTINGS

Hardware and fittings shall be heavy duty hardware of approved quality and manufacture otherwise mentioned in the drawings and Bill of Quantities.

14.4(i) LOCKS AND DOOR CLOSER

Shall be of the best quality available from the approved manufacturers according to the Samples approved by the OWNER.

(ii) HINGES

Shall of best quality (local) heavy duty steel hinges 3" (75 mm) in windows, 4" (100 mm) in single leaf doors and 5" (125 mm) in Main door every leaf should have 4 hinges fixed with steel screws.

(iii) All other fittings shall be best quality available from approved manufacturer. Samples shall be submitted to the OWNER, for his approval. Cost of hardware shall be included in item of door and no separate payment will be made.

(iv) HARDWARE-SCHEDULE

Each flush door shutter shall be furnished with the following.

- Best quality (aluminum or bronze) Mortice lock / knobset (local)-1 No.
- Tower-blots 8" (200 mm) long chromium plated / Aluminum (local)-2 Nos. Door closers (Japan) of approved Manufacturer where directed by the Engineer-1 No.
- Kick-plates / push plates of stainless steel 6" x 1/8" (150 mm x 3mm) where directed by the Engineer-both sides. All material will be best quality as approved / specified

by the owner of the time of installation.

14.5 WOOD TREATMENTS

In addition to the prior seasoning treatment of timbers, ceilings frame joints, purloins, planks, all the door frames, furring strips blocking grounds, nailing strips in contact with concrete or masonry or wood or other materials, shall first be treated with the pesticides designated in relevant section on Termite control of these specifications and then with solignum or equally approved material in accordance with manufacturers / OWNER'S instructions.

11.6 FLUSH DOORS

Flush doors shall be solid cored as per description in Bill of Quantities covered on both side with commercial ply or Teak veneered block board as specified in drawing. The doors shall be lipped and edges fitted and hung to the frames. The flush door shall be obtained form the source approved by the OWNER and shall be of uniform quality and texture.

11.7 FABRICATION

(a) The contractor shall perform all necessary grooving, notching, toughening, housing, rebating and all other work necessary for the correct jointing. The contractor shall also provide all metal plates, screws, nails and other fixing that may be necessary for the proper execution of the joinery work specified. The contractor shall also required to carry out all works necessary for the proper construction of all framings, etc. and for their support and fixing in the building. All wood work shall be approved and initialed be the OWNER or Engineer before being fixed in position.

(b) Any joinery which may show signs of defects arising from the unsound materials or defective workmanship before the expiry of the maintenance period shall be cut out and replace at contractor's own expense.

(c) All hold-fast are to be cut to size and shall be 1/8" thick M.S. flat iron as shown on the drawing.

(d) Solid wood frames as per BOQ or as shown on drawing are to be prepared with posts tenoned with the beads or as shown on the drawings.

(e) The shutters will be fixed to the frames with approved quality fittings. The frames will be secured with wrought iron clamps.

(f) All doors and windows shutters shall be fabricated in workman like manner in accordance with the drawings or as directed by the Engineer.

(g) All articles of ironmongery to be soundly and strongly made well finished and equal in quality to first grade articles of approved manufacturers.

(h) Steel fittings are to be furnished and oxidized on exposed surfaces. Aluminum fittings are to be anodized on exposed surfaces. Aluminum fittings are to be the best quality of their kind and shall have a base coat of brass or copper.

(i) Locks, or knob sets, handles, heavy handles etc. shall be as per specified and approved by the OWNER.

(j) Paint and Polish shall be carried out as specified in relevant section.

(k) Anti-termite treatment of approved quality shall be applied to frames on the surface in contact with earth, or wall etc. as per directions of Engineer. Contractor's rates in BOQ for doors, windows shelves etc. shall include this item and no additional payment shall be made.

(l) (i) Three coats of Enamel paint should be applied on all wood work after preparing all surfaces.

(ii) Three coats of Enamel paint on all steel works over priming coat of Red oxide.

14.8 SHOP DRAWINGS AND SAMPLES

The contractor should submit the shop drawings for the approval of OWNER or should submit sample of one complete door and window for approval of the Owner.

15. GLAZING

15.1 SCOPE OF WORK

The work covered under this section of specifications consists of furnishing all labour material, tools and plants and performing all operations in connection with fixing of the glass to the doors windows, skylights etc in accordance with the drawings, as specified herein and subject to the terms and conditions of the contract.

15.2 GENERAL

(a) Size of glass indicated on drawings are only approximate actual sizes required shall be determined by measuring all panels. Glass shall be without wave, distortion or bulbs.

(b) For wooden Doors and Windows, where provided, glass shall be secured in place with Deodar wood beading.

(c) All glass shall be of manufacture and quality approved by the OWNER or Engineer. 5 mm thick glass should be used in doors and windows and 3 mm thick glass should be used in ventilators.

15.3 ACCEPTANCE

Glass shall be protected against damage. After inspection any labels, paint smears and the glass shall be washed clean on both sides. Damaged or broken glasses shall be removed and replaced with new ones before acceptance at no additional cost.

15.4. BITUMEN COATING

Unless otherwise specified, all concrete work in contact with earth up to plinth level shall be given an application of hot bitumen “PB-4” at the rate of 7.5 kg per 10 sq.m ensuring that no holes / patches are left out. Bitumen shall be applied after ensuring that the concrete has been cured and dried. Back-filling of earth in foundation upto plinth (if specified on drawings) shall only be carried out after the application of bitumen coat as specified herein and / or as directed by the OWNER, if shown on the drawings.

15.5. POLYTHENE SHEETS

0.5 mm thick Polythene sheet should be laid on all compacted floors before casting concrete with minimum laps of 6”.

15.6 DAMP PROOF SHEETS

According to thickness of wall (as per drag) Bitumen felt (2 ply) should be laid on plinth beams under Masonry to serve as D.P.C.

16. PAINTING AND FINISHING

16.1 SCOPE OF WORK

The work covered in this section of the specifications consists of furnishing all plants, labour, equipment, appliances and materials and in performing all operations in connection with protective and general painting and finishing complete in strict accordance with this section of the specifications and applicable drawings and subject to the terms and conditions of the contract.

16.2 GENERAL

The terms “Paints” as used herein means enamel paints Emulsion Paint, primers, colour washes, chalk washes etc. All colours shall be subject to the approval of the Owner.

16.3 All Paints shall be of first class quality product made by an approved manufacturer ICI or equivalent approved and shall conform to the requirements of current British Standards specifications or ASTM standards.

16.4 All colours and shades shall be as directed by the Owner. The colour of each coat of paint shall not be of a different shade from the following coat.

17. COOPERATION WITH OTHER TRADES

17.1 All work under this section shall be coordinated with the work to be done as specified under other sections of the specifications.

17.2 The contractor shall drill, tap, cut and fit the work included herein as required, to accommodate work of other trades in conjunctions with it.

17.3 SAMPLE

Samples of materials specified shall be submitted for approval when required by the Owner.

SPECIFICATION (Water Supply & Sewerage Work)

SEWERAGE SYSTEM

1. U.P.V.C. PIPING

   The pipe to be used shall be "Nikasi" local made Dadex or approved equivalent the fittings like tee, bends etc. It shall be jointed with solvent / special adhesive. The lines shall be smoke tested before concealing.

2. FLOOR DRAIN

   Cast iron floor traps / P. Traps with deep seal shall be used for floor drain. It should be made water tight while embedding in floor and open-able jali / grating of UPVC 6"x6" shall be provided.

3. GULLY TRAPS

   Cast iron gully traps shall be provided out side the building to receive toilets waste water prior to its discharge in the manholes. The gully trap chamber shall be made in bricks masonry (size 12" x 12" x 12" inside) provided with C. I. cover and frame not less than 8" x 8". It should be cement plastered from inside and out side with 1:3 cement mortar.

4. MANHOLES

   It should be constructed with burnt brick 9" thick wall over C.C. 1:4:8 bed 4" and C.C. 1:2:4 benching provided with C.I. cover and frame double seal not less than 1.75 Cwt (88.95 kg). weight embedded in C.C. 1:2:4 top slab i/c ½" thick cement plaster 1:3 inside (size of manhole 24" x 24" x 3'-6" Max) all complete as shown in drawing and instructions of site incharge.

5. SANITARY WARES

   Indian W.C. (ORRISA type) shall be provided with earthen ware P. trap and flushing tank with flush pipe etc. the unit shall be of PORTA BRAND of prime quality or its equivalent as approved, placed over a base of sand cushion.

6. EUROPEAN TYPE W.C.

   It should be PORTA BRAND or equal approved prime quality with coupled flushing cistern with bacolite / plastic seat and cover.

7. URINAL

   It should be PORTA BRAND or equal & approved prime quality with C.P. spreader, waste and bottle trap of Master or Baig or equivalent approved.

8. KITCHEN SINK

   It should be good quality stainless steel sink with one bowl and draining board 60 inches long provided with C.P. waste bottle trap wall mounted sink mixer of Master or Baig or equivalent approved.

9. WASH BASIN WITH PEDESTAL

   It should be Karam Cera or equivalent approved prime quality basin with pedestal, provided with C.P. waste bottle trap, mixer tap Master or Baig as approved.

WATER SUPPLY

1. COLD WATER SUPPLY LINES

   POLYDEX pipes and fittings (PPR) manufactured by Dadex Eternit Ltd. or equivalent approved shall be used with approved fittings like tee, bends etc. it should be tested to a pressure of 150 psi before concealing. Proper clamps and supports should also be provided as and where necessary.

2. BIB COCK AND T-STOP COCK

   Sanitary fittings should preferably be of Masters, or equivalent and approved.

CADET COLLEGE PETARO

ELECTRICAL WORKS

Consultant

YOUNG ASSOCIATES
ARCHITEC & ENGINEERS
9-C, 24th Commercial street, Phase 2,
Defense Housing Authority, Karachi

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Article II. SECTION-A:

Article III. GENERAL SPECIFICATIONS

1. SCOPE OF WORK

The scope of electrical works related to this Contract are shown on the Drawings, stated in the Specifications and Bill Quantities. The works shall broadly include but not limited to the following:

- LV Distribution Boards
- Internal Illumination
- External Illumination
- Power Cables
- Earthing

The Contractor shall also be responsible to supply any other equipment not specifically mentioned in these Documents but which is necessary for proper operation of the work/system included in the scope if this Contract. The Contractor shall solely be responsible for ensuring proper functional requirements of various equipments. He shall also be responsible for furnishing any additional piece of equipment and for making modification in the equipment as desired and/or approved by the Engineer to achieve proper co-ordination with various equipments offered in the bid and also with those installed by others.

2. RULES & REGULATIONS

The entire electrical installation/work shall be carried out by licensed Contractor, authorized to undertake such work under the provisions of the Electricity Act 1910 and The Electricity Rules 1937 as adopted and modified upto date by the Government of Pakistan.

All works shall be carried out in accordance with the latest edition of IEE Wiring Regulations issued by the Institute of Electrical Engineers-London, the Contract Documents, The Electricity Rules 1937 and bye-laws that are in force from time to time. Any discrepancy between these Specifications and any other rules and regulations shall be brought to the notice of Engineer for his instructions and the discussion of the accepting/controlling shall be final and conclusive.

The Contractor shall be responsible for completing all formalities and submitting the test certificates as per prevailing rules and regulations, and shall have the installation passed by the Government Electric Inspector of that region. All requirements of the Electric Inspector and the electric supply company (KESC) shall be complied with.

3. AMBIENT CONDITIONS

All material and equipment supplied and installed shall be designed, manufactured and tested local environment and to meet the following ambient conditions unless specifically stated otherwise for any material/ equipment.

Maximum indoor ambient temperature : 45 Degree Celcius
Minimum indoor ambient temperature : 5 Degree Celcius
Maximum outdoor ambient temperature: 50 Degree Celcius
Minimum outdoor ambient temperature: Zero Degree Celcius
Maximum Relative humidity : 90 Percent
Maximum Altitude of project : 15 meters above the mean sea level

4. SYSTEM DATA

Unless otherwise specified elsewhere, all material and equipment shall be designed to operate satisfactorily with the following minimum requirements without any de-rating.

a) Voltage Rating of equipment:	400 V, 3 phase +/- 10% 230 V, 1 phase +/- 10%
b) Frequency:	50 Hz + 2 Hz

5. DRAWINGS & DATA TO BE FURNISHED BY THE CONTRACTOR

Four Sets of print & soft copy of As-Built drawings and test reports to be furnished by the Contractor. This shall include the following as a minimum.

Dimensional plans and elevations including door / window / partition wall etc. indicating all electrical items at exact location.

Internal details and section.

Technical literature / manufacturer's drawing for DB's

6. GUARANTEE

The Contractor shall furnish written guarantee of the manufacturer or supplier with respect to satisfactory performance of each equipment. Guarantee shall be given for replacement and repair of part or whole of the equipment which may be found defective in material or workmanship. The guarantee shall cover the duration of Maintenance Period as defined in the Conditions of Contract. This guarantee shall not relieve the Contractor of his obligations and he will be fully responsible for the repair or replacement of any defective material in time, so as not to cause any undue delay in carrying out the repairs and/or replacements.

7. MARKINGS

The Contractor shall provide "Danger Boards" and "Shock Charts" wherever required to comply with the requirements of local Electricity Rules and according to normal practice.

8. ASSOCIATED CIVIL WORKS

Except where separately stated in the Bill of Quantities the cost of all civil works associated with any BOQ item of electrical works, such as excavation and back filling of earth, compaction of the earth, foundation pads, chiseling, making openings, etc. shall be included in the price quoted against respective items. No separate payment for such works will be made. Such works will also include repair of any damage to civil works caused by the Contractor during electrical installation.

9. INSTALLATION INSTRUCTIONS - GENERAL

The Contractor shall furnish all labour, materials, tools and equipment required to install, connect, test and commission all electrical equipment specified herein, whether or not such equipment is furnished by him or by others.
For all equipment to be installed by the Contractor, the Contractor shall supply and install all erection materials such as foundation bolts, washers, nuts etc. as required and without any additional costs.
The Contractor shall set out the works himself as per Specifications and Drawings and shall properly position the equipment on specified foundation/location. In general, the manufacturer's instructions for installation shall be followed. Any defect or faulty operation of equipment due to the Contractor not

following the manufacturer's instructions shall be corrected and repaired by the Contractor at his own cost.
For any deviation from the working drawings or specification that are deemed necessary by the Contractor due to site conditions, he shall submit the details and obtain the Engineer approval before starting such works.

10. TESTINGS

(a) 10.1 FACTORY TESTS

All type and routine tests on transformer, switchgear and all other equipment shall be performed at the manufacturer's works in the presence of the Engineer or his Representative. Type tests may be waived off in case test certificates are submitted as certified by an Engineer approved standard laboratory of international repute; but merely producing the test type certificates will not relieve the manufacturer to carry out the required standard/routine tests.

The Contractor shall inform the Engineer about the date and time of test for each equipment at least two weeks in advance. The witnessing of test by the Engineer or his representative shall not absolve the Contractor from his responsibility for the proper functioning of the equipment and for furnishing the guarantees referred to in clause 7.0. All test results shall be supplied in quadruplicate. All expenses for carrying out the tests and witness by the Engineer shall be borne by the Contractor and deemed to have been included in the tender bid.

(b) 10.2 FIELD TESTS

General

Upon completion of the installation, the Contractor shall perform field tests on all equipment, materials and systems. All tests shall be conducted in the presence of the Engineer for the purpose of demonstrating equipment or system compliance with Specifications. The Contractor shall submit for Engineer's approval complete details of tests to be performed describing the procedure, test observations and expected results.

The Contractor shall furnish all tools, instruments, test equipment, materials, etc., and all qualified personnel required for the testing, setting and adjustment of all electrical equipment and material including putting the same into operation.

All tests shall be made with proper regard for the protection of the personnel and equipment and the Contractor shall be responsible for adequate protection of all personnel and equipment during such tests. The cost of any damages or rectification work due to any accident during the tests shall be the sole responsibility of Contractor.

The Contractor shall record all test values of the tests made by him on all equipment. Four (4) copies of all test data and results certified by the Engineer shall be given to the Engineer for record purposes. These shall also include details of testing method, testing equipment, diagrams, etc.

The witnessing of any tests by the Engineer does not relieve the Contractor of his guarantees for materials, equipment and workmanship, or as any other obligations of Contract.

Insulation Resistance Test

Insulation resistance test shall be made on all electrical equipment by using a megger of 500 Volts for circuits upto 250 Volts and 1000 Volts for circuits between 250 and 500 Volts. For testing of 11 kV circuits, upto 5 kV megger shall be used; the exact voltage shall be as advised by the equipment manufacturer unless otherwise advised by the Engineer.

The insulation resistance values of cables, transformer, switchgears, etc.
shall be as per BSS, IEEE, NEC, ICEA and Pakistan Electricity Rules.

Before making connections at the ends of each cable run or joint between cables, the insulation resistance test of each cable section shall be made. H.T. cables shall be subjected to high voltage test as per recommendations of standard to which the cable is manufactured. Each conductor of a multi-core cable shall be tested individually with each of the other conductor of the group and also with earth. If insulation resistance test readings are found to be less than the specified minimum in any conductor, the entire cable shall be replaced and tests repeated on new cable. If cable joint is provided, then each cable section shall be tested, and joint made only after the tests have been made satisfactorily. Finally the completed cable length including the joints shall be tested.

The transformer and switchgear shall be given an insulation resistance measurement test after installation, but before any wiring is connected. Insulation tests shall be made between open contacts of circuit breakers, switches and between each phase and earth.

If the insulation resistance of the circuit under test is less than the specified value, the cause of the low reading shall be determined and removed. Corrective measures shall include dry-out procedure by means of heaters, if equipment is found to contain moisture.
Where corrective measures are carried out, the insulation resistance readings shall be taken after the correction has been made and repeated twice at 12 hours interval. The maximum range for each reading in the three successive tests shall not exceed 20% of the average value. After alt tests have been made, the equipment shall be reconnected as required.

(c) 10.3 EARTH RESISTANCE TEST

Earth resistance tests shall be made by the Contractor on the earthing system, separating and reconnecting each earth connection.

If it is indicated that soil treatment or other corrective measures are required to lower the ground resistance values, the Engineer will determine the extent of such corrective measures.

The electrical resistance of the ECC together with the resistance of the earthing leads measured from the connection with earth electrode to any other position in the complete installation shall not exceed one ohm.

Earth resistance test shall be performed as per Electrical Inspector's requirements. Where more than one earth electrode is installed, the earth resistance test of each electrodes shall be measured by means o resistance bridge instrument.

The complete lightning protection system shall be tested for continuity and earth resistance. The combined earth resistance at any point in the lightning protection system shall not exceed 10 ohms.

(d) 10.4 SWITCHGEAR

Each circuit breaker shall be operated electrically and mechanically. All interlocks and control circuits shall be checked for proper connections in accordance with the wiring diagrams given by the manufacturer.

The Contractor shall properly identify the phases of all switchgear and cables for connections to give proper phase sequence.

Trip circuits shall be checked for correct operation and rating equipment served. The correct size and function of fuses disconnect switches, number of interlocks, indicating lights, alarms and remote control devices shall be in accordance with approved manufacturer drawings. Name plates shall be checked for

proper designation of equipment served. Protective relays shall be tested and set at site prior to commissioning of the equipment.

(e) 10.5 COMPLETED TESTS

After any equipment has been tested, checked for operation, etc., and is accepted by the Engineer the Contractor shall be responsible for the proper protection of that equipment so that subsequent testing of other equipment do not cause any damage to the already tested equipment.

SECTION-B

Article IV. LT SWITCHBOARDS

1. GENERAL

The LT Switchboard shall be of sheet steel fabricated, floor mounting, cubicle type, totally enclosed, dust tight and vermin-proof. It shall be complete in all respect with material and accessories, factory assembled, tested and finished according to the specifications and to the normal requirements. For indoor installations the protection class shall be IP42.

The switchboard with all components and accessories shall be suitable for front operation only and shall:

- be rated for 415/240 V,3-phase, 4 wire, 50 Hz. System
- have a rated short circuit breaking capacity as stated on the drawings
- be provided with adequate clearance from live parts so that flashovers cannot be caused by switching, vermin, pests, etc.
- all components shall be rated for insulation class of 600 volt minimum
- be designed for flush mounting of all instruments on the front side
- have all incoming and outgoing connection from top or bottom as required
- have the components mounted so as to facilitate ease of maintenance from the front
- have common lamp test facility for all lamps
- have wiring diagram on the inside of each door of the panel
- be labeled with steel name plate on the front side of the door for each incoming and outgoing circuit
- have doors grounded by flexible copper cable/strip
- have arrangements for extension of panels in future

2. MATERIAL

(a) 2.1 SHEET METAL WORK

The switchboard shall be fabricated, welded, grinded, finished with angle–iron framework and cladded with 14 SWG MS sheet. It shall be suitably divided into panels and compartments for accommodating the required numbers of circuit components, instruments and accessories.

The switchboard shall be supplied complete with foundation bolts and other installation materials as recommended by the manufacturers. Proper size cable clamping channels with galvanized steel clamps with epoxy coating and brass cable glands respectively for unarmoured and armoured cables shall be provided. An earth bar of appropriate cross section shall be provided and connected to the bodies of all sections of the switchboard. Two external earth terminals shall be provided for main earth connection to the body of the switchboard. The doors shall be earthed by means of flexible tinned copper strip.

The cabling inside the switchboard shall be suitably numbered and harnessed by means of straps or cords. Wiring to door mounted components shall be in flexible PVC conduit. All indicating, selecting and control equipment shall be suitably arranged and clearly labeled indicting the rating of fuse, switches, etc. The nameplates provided in the front of the panel shall be of flame retardant material preferably stainless steel. Use of plastic or any inflammable material shall not be permitted for nameplates.

All metalwork of the switchboard shall be cleaned downed to bare shining metal, phosphated and the surfaces chemically prepared for epoxy coating.

(b) 2.2 COMPONENTS

The switchboards shall be provided with all components as specified or shown on the Drawings and as necessary for the satisfactory operation of the switchboard and of the electrical system. Typical specifications are given hereunder.

2.2.1 Bus Bars

The bus bars shall be made of high conductivity electrolytic tinned copper and shall be completely isolated and mechanically braced for the specified fault level. The phase identification of the bus bars shall be done by providing coloured sleeves on bus bars and these shall be red, yellow and blue for phases and black for neutral. The earth bus bar shall be green.

The bus bars shall be triple pole and neutral and shall be of appropriate size to meet the electrical and mechanical requirements of the system. The temperature rise shall not exceed 45 degree centigrade at rated current.

2.2.2 Circuit Breakers

The circuit breakers shall be triple pole, manually operated or motor- operated, spring charged type as shown on the drawings with front drive grip handle. ON-TRIP-OFF indication shall be provided on circuit breakers. The circuit breakers shall have the following protections and setting range unless otherwise shown on the drawings.

Adjustable three pole, manual reset thermal overload release of setting range 80 to 100% of rated current

Magnetic triple short circuit release having range according to manufacturer's standard range

The incoming and outgoing circuit breakers of main LT panel (normal and emergency) shall be molded case type, unless stated otherwise on the drawings.

The incoming circuit breaker shall have two numbers normally open and two numbers normally closed auxiliary contacts rated for 2Amps, 230 VAC. The incoming circuit breaker shall also have ON-TRIP-OFF indicating lamps. Where shown indication lamps shall also be provided for outgoing circuit breakers. The circuit breaker shall have specified rupturing capacity without the use of back-up fuses. Auxiliary release and trip coil shall be provided for desired operation and/or interlocking as stated on the drawings.

The motor operated, spring charged type circuit breakers shall be provided with anti-pumping circuit to prevent repeating cycle of TRIP reset and ON even if the close command is given while the circuit breaker has tripped due to fault.

2.2.3 Ammeters and Voltmeters

All meters shall be flush mounting, moving iron, spring controlled. The front dimensions shall be 96x96 mm. for meters.

The meters shall be of accuracy class 1.5 according to BS-89 and 90. The ammeter shall be suitable for connection to 5 Amps secondary of current transformer s or directly through shunt as shown on the drawings. The ammeters and voltmeters shall have measuring range as indicated on the drawings.

2.2.4 Current Transformers

Air-cooled, ring type current transformers shall be provided having transformation ratio as indicated on the drawings. The current transformers shall be of suitable burden having accuracy class 1.0 according to BS 3938. The current transformers shall have 5 Amps secondary.

2.2.5 Selector Switches

Ammeter and voltmeter selector switches shall be complete with front plate and grip handle. R-Y-B and OFF position for ammeters and RY-YB-BR-RN and OFF position for voltmeters shall be marked on the respective selector switches. The selector switches for control s shall be rotary cam type, having required number of positions. It shall be provided complete with knob and front plate showing all positions as required.

2.26 Push Buttons

The push buttons shall be momentary make/break contact type (normally open /normally close) and suitable for flush mounting. The push button for on and off switching shall be red and green respectively.

2.2.7 Air Break Contactor

The contactor shall be air break, triple pole 400 VAC and suitable for the type of duty to performed. The main contacts shall be silver tipped, butt type with double break per pole. Each contactor shall be provided with single phase 230 VAC operating coil and minimum one spare normally open and one normally closed auxiliary contact. The number of working auxiliary contacts shall be provided according to the system requirements.

2.2.8 HRC Fuses

HRC fuses shall be provided complete with fuse bases, fuse etc. The fuses shall have fusing factor as specified for class Q1 in accordance with BS 88.

2.2.9 Indicating Lamps

Indicating lamps shall be suitable for flush mounting, complete with base, 230 volt incandescent lamp and shall have rosettes of suitable color.

2.2.10 Line up Terminals

Line up terminals wherever provided for control or power circuits shall be suitable for voltage and size of conductors as indicated on drawing.

The lineup terminals for controls shall be suitable for channel mounting. All necessary accessories such as end-plates, fixing clips, transparent label holder caps and label sheets with marking shall be provided.

3. INSTALLATION

The LT switchboard shall be installed at location as shown on the drawing. The Contractor shall ensure co-ordination with the civil works for providing any openings, holes, etc to avoid any breakage to completed works. In case the provisions in civil works for installation of electrical equipment are not made or made incorrect he same shall be rectified by the Contractor at his own cost and to the satisfaction of Engineer. The Contractor shall provide foundation bolts and rout them r cement concrete floor using non-shrinkable material with the approval of Engineer.

All installation materials for physically erecting the switchboard, such as bolts, nuts, washers, supporting steel, etc., shall be provided and installed by the Contractor. The switchboard shall be installed upright and in level and shall be firmly and rigidly bolted to the floor and concrete supports.

The switchboard shall be completely erected as per manufacturer's instructions and as approved by the Engineer. Loose parts dispatched by the manufacturer shall be installed and connected as per assembly drawing provided by the manufacturer. Any safety locking of meter, relays, etc., provided by the manufacturer for safe transport shall be released only after the switchboard is erected in position. The incoming and outgoing cables shall be connected as recommended by cable manufacturer. The cable armour shall be connected effectively to ground.

The switchboard body shall be connected to earth as per instructions given in earthing of these Specifications. The switchboard shall be tested and commissioned in the presence of the Engineer.

The tests to be carried out shall be performed before energizing as per instructions contained in article "Testing" of General Specifications for Electrical Works, Section-A of these Specifications.

SECTION-C

Article V. LT DISTRIBUTION BOARDS

4. GENERAL

The Low Tension Distribution Board shall be sheet steel fabricated, epoxy painted and suitable for surface/recessed mounting on wall or floor standing totally enclosed, dust and damp proof complying to Protection Class IP54. The Low Tension Distribution Board installed on roof or in open areas shall be weather proof type complying to Protection Class IP65. It shall be complete in all respect with material and accessories, factory assembled, tested and finished according to the Specifications and to the normal requirements.

The Low Tension Distribution Board shall be front operation type and shall:

- have a rated service short circuit breaking capacity, as stated on the drawings in the BOQ.
- be rated for 415/240 Volts, 3 phase 4 wire, 50 Hz system.
- be designed for flush mounting of all instruments on the front side.
- have incoming and outgoing cable termination arrangement, terminal block / line-up terminals.
- be provided with stainless steel name plate on the front side of door and wiring diagram on inside of door.
- have all incoming and outgoing connections from top or bottom according to site requirements.
- have door grounded by flexible tinned copper strip/cable.
- have pocket on the inside of the door for circuit directory.

5. MATERIAL

2.1 SHEET METAL WORK

The Low Tension Distribution Board shall be fabricated with 16 SWG sheet steel recess/surface mounting. All the components shall be installed on a common component mounting plate inside the enclosure and protected from the front with screwed sheet steel front plate. The enclosure shall be provided with rubber gasketting and a lockable hinged door with cam fastener.

The Distribution board shall be supplied complete with all installation materials as recommended by the manufacturer. The incoming and outgoing cable connections shall be according to the wiring requirements. If required, an adaptor box for accommodating the cables and conduits may be provided. The box shall be of the same material and finish as the DB.

The cabling inside the DB shall be suitably harnessed by means of straps cords. An earth bar of tinned copper shall be provided for connection of incoming and outgoing earth conductors. The earth bar shall be permanently connected to the body of DB at two points. Flexible tinned copper strip shall be provided for earthing of the door of DB.

Circuit numbers / designation on all circuits shall be conspicuously marked to facilitate connection and maintenance.

All metal work of the DB shall be cleaned down to bare shining metal phosphated and the surfaces chemically prepared for epoxy coating.

2.2 COMPONENTS

The Low Tension Distribution Boards shall be provided with components as specified, as shown on the Tender Drawings and required for the satisfactory operation of the distribution board and of the electrical system.

Typical component specifications are given below:

2.2.1 Bus Bars

The Bus bars shall be made of 99.9% pure high conductivity electrolytic tinned copper and shall be completely isolated and mechanically braced for the specified fault level. The identification of bus bars shall be done by providing colours sleeves on bus bars and these shall be red, yellow and blue for phases and black for neutral. The earth bus bar shall be green.

The bus bars shall be for three phase, neutral and earth and shall be of appropriate size to meet the electrical and mechanical requirements of the system. The temperature rise shall not exceed 45°C at rated current.

2.2.2 Moulded Case Circuit Breaker (MCCB)

The MCCBs shall be moulded case triple pole 660 Volts or single pole 250 Volts of current ratings as shown on the drawings. These shall have fixed magnetic short circuit and adjustable/fixed thermal overload protection.

The MCCBs shall be installed such that their switching levers are accessible through the front plate for operation.

The single and triple pole MCCBs shall have short circuit rupturing capacity suitable for the distribution system as approved by the Engineer or as shown on the drawings. The MCCBs shall be suitable for working on lighting and power circuits.

2.2.3 Miniature Circuit Breaker (MCB)

The MCB shall be single or triple pole of current rating as shown on drawing. These shall have fixed magnetic short circuit and thermal overload protection.

The MCB shall be installed such that their switching levers are accessible through front plate inside the panel or DB for operation.

2.2.4 Ammeters & Voltmeters

Ammeters & Voltmeters shall be flush mounting, moving iron, spring controlled. The front dimensions shall be 96 mm square. The meters shall have accuracy class 1.5 according to the BS or IEC. The ammeter shall be suitable for direct connection or suitable for connection to 5 Amp secondary of current transformer. The voltmeters shall have measuring range as indicated on the drawings.

2.2.5 Selector Switch

The ammeter & voltmeter selector switch shall be complete with front plate, grip handle, and RY-YB-BR-RN-YN-BN and OFF position.

2.2.6 Air Break Contactors

The contactor shall be air break, triple pole, 400 Volts. Each contactor shall be provided with a 230 Volt operating coil, one 6 Watt, 230 Volt red coloured signaling lamp, control fuse and two normally open and two normally closed type auxiliary contacts wired upto terminals for electrical interlocking.

2.2.7 Push Buttons

Push Button shall be momentary contact type and suitable for lush mounting on the door of panel and on remote area. The push button for ON and OFF witching shall be spring loaded.

2.2.8 Indicating Lamps

Indicating Lamps shall be suitable for flush mounting, complete with base and 230 Volts incandescent lamp. It shall have rosettes of suitable colours as approved by the Engineer.

6. INSTALLATION

The location of distribution boards are shown diagrammatically on the drawings. The actual location shall be determined at site, keeping in view the site conditions and in accordance with other equipment, as approved by the Engineer.

Low tension distribution board for recessed mounting in wall shall be installed such that the door shall finish flush with the surface of wall. The recess mounted distribution board shall be installed before the plastering of walls. The DB shall be protected against any damage due to the civil work.

All loose parts dispatched separately with the DB shall be installed as per manufacturer instructions and all adjustments or setting shall be made as required. All screws, nuts, and bolts used for fixing the distribution board shall be galvanized.

The distribution boards installation shall include connecting all incoming and outgoing cables. The cable entry in the boards shall be provided from top or bottom as required.
The distribution boards installation shall include connecting all incoming and outgoing cables. The cable entry in the boards shall be provided from top or bottom as required.
The distribution boards shall be tested as per instructions contained in article “Testing” of General Specifications, Section-A of these Specifications.

Article VI. **SECTION-D**

Article VII. **LT WIRES & CABLES**

7. GENERAL

All multicore and single core cables for light circuits, socket outlets and circuits operating upto 250 volts shall be 300/500 volts grade. All single core sheathed cables shall be of 450/750 volt grade. Power cables for main feeders, main to submain feeders, power equipment, etc., armoured or unarmoured shall be of 600/1000 volt grade. Armouring of cables shall be done with appropriate size galvanized steel wire as per codes.

The conductors shall be stranded or solid, high conductivity, soft annealed copper. Conductors of single core cables shall be circular, whereas of multicore cables may be circular or shaped according to standard practices and codes. The PVC insulation shall be extruded with a PVC compound having good flexibility, resistance to ageing and ability to withstand the ambient temperatures as given in General Specifications, Section-A of these specifications.

8. MATERIAL

(a) 2.1 General

The power, lighting and control cables shall be furnished and installed in accordance with the routes and requirements shown on the drawings.

All cables shall have phase identification colors on insulation of each core. The colour code for three phase circuits shall be red, yellow and blue for phase conductors and black for neutral conductor. Where insulated earth conductor is installed, it shall have green or green-yellow color insulation.

Single phase circuits shall have insulation of red color for phase/line, black color for neutral and green or green-yellow color for earth conductor.

The ends of each length of multicore armoured or unarmoured cables shall be properly marked for clock-wise and anti-clock-wise sequence of core colors.

(b) 2.2 CABLES FOR CONDUIT OR channel wiring

All cables/wiring in concealed or surface mounted PVC conduits or in covered channel shall be single core PVC insulated of specified grade and size, unless specifically shown on the drawings or given in BOQ.

(c) 2.3 Cables on surface/concrete trenches

Cables for distribution system to be installed on surface, in cable ducts, in concrete trenches or on trays shall be single or multicore PVC insulated and PVC sheathed of specified voltage grade and size, unless specifically shown on the drawings or given in BOQ.

(d) 2.4 Underground Cables

Cables for laying directly underground shall be PVC insulated, PVC sheathed and armoured with galvanized steel wire. Cables fully installed in underground ducts/pipes and mechanically protected from end to end shall be PVC insulated and PVC sheathed unless specifically shown on the drawings or given in BOQ.

(e) **2.5 Cable Accessories**

All cable accessories shall be provided for the complete cabling and wiring system without any additional cost unless specifically mentioned in BOQ. These shall include but not limited to the items such as saddles, clamps, fixing channels, connectors, cable joints (where necessary and as approved by the Engineer), clips, lugs, tapes, solder, identification tags, bushes, glands, etc.

9. INSTALLATION

(f) 3.1 General

All installation material, labour, tools and accessories for cable installation shall be furnished by the Contractor. The cable and accessories shall be installed as described in accordance with these Specifications, drawings and manufacturer's instructions. Prior to installation of jointing and termination kits, the cable lengths shall be checked and tested to ensure that the cables are in sound condition, and no damage has been done during handling and installation. After installation, these shall again be tested prior to commissioning as per recommendations of the standards according to which the cable is manufactured.

The exact cut lengths for cable shall be confirmed by the Contractor by actual measurements at site prior to the ordering. The cable lengths where shown on the drawings or in BOO are tentative and only for general guidance. The Contractor shall be solely responsible for furnishing correct lengths of cable to avoid joints in cable length except where necessary, after obtaining approval of the Engineer.

(g) 3.2 Conduit or Channel Wiring

The wiring through conduit shall be started only after the conduit and channel system is completely installed and all outlet boxes, junction boxes, etc., are fixed in position.

The wires shall be pulled in conduit or channel with care, preferably without the use of any lubricant. Where necessary and if approved by the Engineer, the cable manufacturer's recommended lubricant may be used. Where several wires are to be installed in the same conduit, they shall be pulled together alongwith the earth conductor. All wires of same circuit shall be run in one conduit.

The wires shall not be bent to a radius less than ten times the overall diameter of the wire, or more if otherwise recommended by the manufacturer.

The wiring shall be continuous between terminations and looping-in system shall be followed throughout. Any joint in wires shall not be allowed. The use of connectors shall only be allowed at locations where looping-in is rendered difficult. The consent of the Engineer shall be required for using connectors. The connector shall be of suitable rating having porcelain body with sunk-in screw terminals. The connector shall be wrapped with PVC insulation tape after its installation. A minimum of 150 mm extra length of cable/wire shall be provided at each termination to facilitate repairs in future.

(h)

(i) 3.3 Cables on Surface/Trenches

All cables for installation on surface of wall, column, ceiling, trenches, etc., shall be fixed to the surface by means of galvanized steel clips secured to a steel channel using suitable stud plate, nuts and washers.

The distance between each cable clip shall be such so as to support the entire weight of the cable and that distance between the cable & surface and also the vertical clearance between two adjacent cables at any point is 50mm minimum. Common mounting channels are to be furnished for cable along the same route. The Contractor can offer alternate cable fixing arrangement, which shall be approved by the Engineer before commencement of installation.

(j) 3.4 Underground cables

The cables to be installed directly underground shall be laid in trenches in single tiers. Unless shown specifically on the drawing the depth of cable below finished ground level shall be 900 mm minimum measured from the top of the largest cable to the general ground level. The burial depth may be increased as required due to site conditions or when crossing other service pipes and roads. Burial depth less than 900mm and more than 1500mm shall require Engineer's approval.

When cables cross road, paved area, other services or other cables, they shall be laid in protective pipes of required size. Cables entering the buildings shall also be laid in protective pipes. The protective pipe ends, after installation of cables, shall be plugged water tight be means of bituminised hesian or equivalent method as approved by the Engineer. A minimum clearance of 250mm vertically and 500mm horizontally shall be maintained between cables and other services.

The cable trench shall be excavated as per route and location shown on the drawings. Before laying of cables in the trench, the bed of the trench shall be leveled and filled with a 100mm thick layer of fine sand (1.3mm diameter maximum particles size). The sand layer shall be leveled and the cables placed thereon. The cables shall be covered with a layer of fine sand 100mm thick measured above the top of the cable. Cable protective bricks shall be placed over the sand cover which shall be of class-C cement concrete, minimum 50mm thick and 300mm square. The bricks shall be placed over the sand layer and end to end to cover the entire length and breadth of the cable trench. After the concrete bricks are placed, the remainder of the trench shall be backfilled with earth in layer 400mm thick. Each layer shall be thoroughly tamped and compacted.

Cable identification tags of corrosion resistant material shall be tied to cables with PVC cable tie at a maximum of 20 meter interval along the cable length for identification of cable and circuit. The earth continuity conductor shall be laid in the trench with the cables.

Sufficient slack shall be left in cables for this purpose the cut lengths of cables shall allow about 3% more in the measured lengths between terminations. At underground joint box, ample slack shall be left to prevent straining of cable joints due to settlement of earth. Payment shall be done as per actual lengths measured at site after installation.
The cut lengths of cables wherever stated are only as a guide. The Contractor shall measure lengths between terminations of each circuit and if the discrepancy between measured lengths at site and the one given on the drawing differ, the Contractor shall report to Engineer and act as directed. Cables, whether installed underground or in concrete trenches, shall not be bent to a radius less than 12 times the diameter of the cable or as recommended by the cable manufacturer, whichever is higher.

Article VIII. SECTION-E

Article IX. CONDUITS, CHANNELS, PIPES & CABLE TRAYS

10. GENERAL

The extent of works shown on the drawing does not indicate the exact position of conduits and pipes. The Contractor shall ensure exact location and route of conduit and pipes in coordination with other services drawings, as per site and as directed by the Engineer.

The quality and material for the accessories of conduits, channels and pipes such as sockets, elbows, bushings, bends, inspection/pull boxes, round boxes, etc necessary for the completion shall be similar to that of conduits or pipes. All the accessories shall be supplied by the Contractor without any extra cost and deemed to have been included in the price of conduits/pipes.

11. MATERIAL

(a) 2.1 PVC Conduits and Accessories

The PVC conduits and accessories for lighting and power circuits shall be furnished by the Contractor as shown in the drawings or given in BOQ. The PVC bends shall have enlarged ends to receive conduit without any reduction in the internal diameter at joint. Manufactured smooth bends shall be used where conduit changes direction. Bending of conduits by heating or otherwise will be allowed in special situations only, for which the consent of the Engineer shall be required. The use of sharp 90 degree bends and tees will not be allowed for concealed wiring.

The round PVC junction boxes for ceiling light or fan points shall have minimum dimensions of 63 mm diameter and depth. The junction boxes for wall light points shall have minimum dimensions of 63 mm diameter and 38 mm deep. Round junction boxes shall be provided with one piece PVC cover plate fixed to the box by means of brass screws.

(b) 2.2 Inspection and Adaptable Boxes

2.2.1 General

Inspection/Pull boxes and adaptable boxes shall be provided in conduit runs above false ceiling only wherever required to facilitate pulling operation. The drawings are diagrammatic and do not indicate the position and spacing of
inspection/pull boxes or adaptable boxes. However, these shall meet the
following requirements:

2.2.2 Inspection/Pull Boxes

The rectangular inspection/pull boxes shall be made of 16 SWG heavy gauge sheet steel of suitable design to receive conduits. The box shall be painted inside and outside with black enamel paint over a base coat of red oxide primer paint. The minimum length of the box shall not be less than four times the cable manufacturer recommended bending radius of the cable. All concealed type boxes shall have a white plastic sheet of appropriate size fixed to the box by means of galvanized screws.

If the spacing between the end points of conduit run with respect to bends exceeds the following, an inspection/pull box of suitable size according to the number and size of cables and as approved by the Engineer shall be provided:

- Straight run without bend : Max. spacing 30 metres
- Run with one 90° bends : Max. spacing 20 metres
- Run with two 90° bends : Max. spacing 15 metres

2.2.3 Adaptable Boxes

Adaptable boxes shall also be made of 16 SWG sheet steel and painted and finished to the same quality as the Lighting distribution boards. The adaptable box shall preferably be fixed adjacent to the DB and have suitable dimensions to match the installation with DB. However, in any case, the depth of adaptable box shall be according to number & size of cables & conduits and shall not be less then the following:

- Conduits upto 25 mm dia. : Mm. depth = 50 mm
- Conduits upto 38 mm dia. : Mm. depth 65 mm
- Conduits upto 50 mm dia. : Mm. depth = 90 mm
- Conduits more than 50 mm dia. : Mm. depth = 2 x dia.

(c) 2.3 PVC Channels

The PVC channels for routing lighting and power circuits on surface shall be furnished by the Contractor as required. The PVC channels shall be rectangular and in two pieces, that is base and a tightly fitting snap-on cover. The PVC channels shall be attractive and smooth without any deformities. The PVC channels shall be "Duraduct" manufactured by M/s. Adamjee Engineering, Pakistan or approved equivalent.

(d) 2.4 PVC Pipes and Accessories

The PVC pipe shall be rigid. All pipes shall be minimum Class 'D' (Working pressure - 12 bar), unless otherwise stated on Drawings or Bill of Quantities. The buried PVC pipe should be able to withstand the external load acting upon it by continuous movement of heavy duty vehicles such as trucks, cranes, fork-lift, etc. Where pipe changes direction, manufactured smooth bends shall be used.

Bending of pipes by heating or otherwise will be allowed in special cases only. Bending by heating shall be carried out by first filling the pipe with sand inside and then immediately removing the sand. The use of sharp 90 degree bends and tees will not be allowed. The bends shall conform to same specifications as given for PVC conduits. For jointing of pipe all precautions and procedures recommended by manufacturer shall be followed.

(e) 2.5 Cable Trays

The cable trays for indoor use shall be perforated whereas cable trays for outdoor use shall be without perforation and top cover. It shall be fabricated from epoxy coated 14 SWG G.I. sheet. The cable tray shall be fabricated in sections not exceeding 8 feet. Suitable tray designs shall be provided for bends, crossings, etc, keeping in view the allowable bending radius of the cables.

12. INSTALLATION

(f) 3.1 Concealed Conduits

Where concealed conduit system is stated on drawings, the conduit shall be installed concealed in roof, wall, column, etc. Conduits shall be laid under floor only where specifically stated. The entire conduit system shall be installed and checked before wiring is carried out. Any obstruction found shall be cleared before the installation of cable.

When concealed, the conduit shall have a minimum of 32 mm cover of concrete measured from the top of conduit to finished surface. In the reinforced cement concrete (RCC) work the conduit shall be laid

before pouring of concrete. Under no circumstances shall chases be made in the RCC structure for concealing conduit and accessories after pouring of concrete. The conduit shall be supported on top of bottom reinforcement of slab. All outlet boxes to be firmly supported and installed such that they finish flush with the soffit of slab or beam.

Where conduits have to be concealed in cement concrete (CC) work after concreting or in block masonry, chase shall be made with appropriate tools and shall not be made deeper than required. The conduit shall then be fixed firmly in the recess and covered with cement concrete mixture. The work of cutting in the cement concrete work or block masonry work shall be coordinated with the civil work. The Contractor shall obtain approval from the Engineer before starting chasing and cutting.

The termination of conduits at or near the equipment/switchboard is shown diagrammatically on the drawings. The exact locations of the termination shall be coordinated with the equipment/switchboard to be installed. Any extension of conduit to suit the site condition shall be made without any extra cost. Conduit ends pointing upwards or downwards shall be properly plugged in order to prevent the entry of foreign materials. All openings through which concrete may leak shall be carefully plugged and boxes shall be suitably protected against filling with concrete. At all terminations of conduit, sharp edges of conduit ends shall be prevented to avoid the cutting or damaging of wires or cables during culling through the conduits.

Under floor conduit shall be installed at a minimum depth of 2 inch from the finished floor level or as shown on the drawings. The conduits shall be installed empty, before finishing of floor or in RCC work, with an 18 SWG steel wire drawn through the conduit for pulling cable. No conduits shall be laid under floor in bathroom.

Wherever the conduit lengths cross the expansion joint either along the columns or slab, suitable arrangement shall be provided so that when the conduit lengths in the expansion joint are stressed, the conduit shall not crack or break.

(g) 3.2 Surface Conduits

The surface conduits shall be installed where shown on drawings only. The conduits shall be installed parallel or perpendicular to the surface of wall, structural members, ceiling, etc., by means of PVC saddles and clamps of approved design. The conduits shall be kept at least 150 mm away from parallel runs of flues, steam pipes and hot water pipes.

The saddles shall be installed on surface by means of nylon or wooden plugs and galvanized screws. Appropriate size of holes in structure shall be made by drilling, the thickness of saddles and clamps shall be at appropriate thickness and prime quality. The surface conduits shall be supported at a maximum of one meter spacing along horizontal and vertical runs. All accessories for complete installation of conduit system shall be provided by the Contractor. The pull boxes, etc. as stated for concealed conduits shall also be applicable for surface conduit system.

(h) 3.3 PVC Channels

The PVC channels shall be installed on surface where required and as shown on drawings. The PVC channels shall be installed parallel or perpendicular to the surface of wall, structural members ceiling, etc. in a straight alignment. The base of the channel shall be installed by means of nylon or wooden plugs and galvanized screws. The spacing of the screws shall not be more than 1 meter apart. At corners a 45° cut shall be made to connect the two joining perfectly without any gaps channels.

(i) 3.4 PVC Pipe & Accessories

Rigid PVC pipes shall be installed under roads, paved areas, at crossing with other services and at cable entering building as shown on the drawings. The depth of the pipe shall very according to the conditions

at site, and approval of Engineer shall be obtained prior to installation. In general the pipes shall be installed underground at the following depths measured from the ton of the pipe:

- Under roads/pavement : _900mm below finished surface
- When crossing : 250/500mm vertical / horizontal services clearances with concrete cover

The trench of required dimensions shall be excavated and the bottom of trench cleaned and leveled. A 75mm bed of fine sand shall be provided over which the PVC pipes installed after proper alignment. Where two or more pipes are installed in the same trench the clearance between pipes shall not less than 50mm. After laying of pipe the trench shall be backfilled with clean screened earth in layers of 75mm, each layer properly tamped and compacted.

Where underground cables enter connection terminal boxes the PVC pipe shall be installed on surface by means of galvanized steel clamps at a maximum internal of 450 mm.

After installation the ends of the pipe shall be plugged with material impervious to water and chemicals. All joints shall be sealed adequately to prevent entry of foreign elements.
The installation of pines shall be completed in all respects including its fixing at terminations before cabling work is started. All sharp edges and burrs shall be removed by using reamer or any approved device. The pipe shall be through cleaned of dirt and dust from inside, the pipes shall be installed in proper coordination with other works.

(j) 3.5 Cable Trays

The cable trays shall be installed on wall and/or suspended from ceiling. All hangers, metal work and cut edges of trays shall be epoxy painted.

The cable trays on roof shall be installed as shown on drawing.

Article X. SECTION-F

Article XI. LIGHT FIXTURES

13. GENERAL

The description of light fixtures is given in the bill of quantities, and stated on the drawings, and all relevant material is described in this Section. The determination of quality is based on certified photo-metric data covering the coefficient of utilization, light distribution curves, construction material, shape finish, operation, etc.

The Contractor shall submit at least two samples of each and every light fixture specified and obtain approval of the Engineer before purchasing. The quality and finishes of the local make light fixtures (if mentioned in BOQ) shall be same as that of standard manufacturer. The accessories such as ballast, lamp/starter holders, starters, lamps, ignitors, etc. for all type of light fixtures shall be of Philips make or approved equivalent. Approved equivalent against those specified will be accepted if the specified one is/will not be available. For any substitution the Engineer's approval is necessary.

All fixtures shall be finished in standard color schemes as mentioned in the manufacturer's catalogue for respective fixtures, unless specifically stated in the Specifications, Drawings or Bill of Quantities or directed by the Engineer.

14. MATERIAL

(a) 2.1 Fluorescent Light Fixtures

The fluorescent light fixtures shall have lamps and ballasts of proper rating as shown on the drawings. Each lamp shall be provided with independent ballast.

The fluorescent lamps shall be tubular, 1214/604mm long, 28 mm dia. for 36/18 watts respectively as specified. Unless specified otherwise, the fluorescent lamp shall be warm with colour rendering and light color of 84 characteristics with an average output of 3350 lumens (+ 5%) for 36 watts and 1350 lumens (5%) for 18 watts after 100 burning hours. The ballast shall be 'Low Loss' polyester filled type, totally enclosed and suitable to operate upto 250 VAC. The power loss shall not be more than 6 watts for 36/18 watts ballast. A wiring diagram, wattage, voltage and current figures shall be printed on the body of the ballast.

The lamp holders shall be rotary lock-in type. The starters shall be glow type with radio interference suppressor/by-pass capacitor. The internal wiring of the fluorescent light fixtures shall be done with heat resistant wires at the manufacturer's factory. Heat resistant sleeves shall be provided on cables passing near ballasts. All light fixtures shall be provided with power factor improvement capacitor to give a minimum power factor of 0.90. Connectors suitable for connecting 2.5 sq. mm cable conductors shall be provided for supply connections.

The body of the fluorescent light fixtures shall be minimum 24 SWG sheet steel, derusted, degreased, finished in heat resistant paint, stove enameled. Appropriate size bushed wire entry holes, fixing holes, and earth terminal shall be provided.

(b) 2.2 Incandescent/ Incandescent reflector/ compact fluorescent Light Fixtures

The incandescent/incandescent reflector/compact fluorescent light fixtures shall be as stated on drawings and bill of quantities. The light fixture shall be finished in standard colours unless otherwise stated on drawings or directed by Engineer. All light fixtures shall be of international standard and

quality. The type of fixtures with manufacturer's catalogue reference are given on the fixture schedule and in bill of quantities. Equivalent fixture may be acceptable provided that the contractor submits for review all necessary data to show that the fixture proposed are of the same type, construction and quality.

The lamps shall be GLS lamps or incandescent reflector (PAR) or compact fluorescent lamp (warm) and shall be supplied and installed according to the wattage/type as indicated on drawings.

Weather proof bulkhead incandescent/compact fluorescent light fixture shall comprise of plastic body and gasketted clear glass cover secured to the body by means of wing nuts/screws to give a weather-proof and water tight fit. The gasket shall be weather resistance type. The lamp holder shall be of bi-pin brass having porcelain outer ring or 2/4 pin base for compact fluorescent lamps with normal control gear as per requirements.

15. LIGHT FIXTURE INSTALLATION

(c) 3.1 General

The mounting heights of light fixtures are indicated on the drawings, and position of fixtures are according to the mentioned scale.

The Contractor must ensure that the light fixtures are installed uniformly with respect to the dimensions of the area. Any modifications due to site conditions may be made with the approval of Engineer. All fixtures shall be carefully aligned before fixing in position.
The wiring between ceiling rose or terminal box and the fixture shall be carried out with 3-core 0.75 sq. mm and 1 sq. mm flexible copper conductor PVC/PVC cable respectively for circuits protected by 10 amps and 15/20 amps mcbs. The wiring inside light fixture body shall be done with heat resistant cables or PVC insulated cable in heat resistant sleeves as approved by the Engineer.

Glasses, shades, reflectors, diffusers, etc., must be in a clear condition after installation. All light fixtures shall be earthed by an earth wire connected to the earth terminal in the fitting.

(d)

(e) 3.2 Fluorescent Light Fixtures

The fluorescent light fixtures on the surface of ceiling shall be installed with the back of the body flush with the ceiling surface, and in a manner so as to facilitate wiring. Nylon plugs and galvanized steel bolts or screws shall be used for fixing the light fixture to the ceiling. For light fixtures installation on false ceiling the installation method/detail shall be coordinated with ceiling design and submitted for approval of Engineer Care shall be taken to prevent the weight of the fixture from being transferred to the false ceiling.

Pendant light fixtures shall have two holes in the top of each casing for supporting to the ceiling by a 3/4" dia. galvanized pipe or any other standard method as approved by the Engineer. Wiring from ceiling rose to the fixture shall be installed through the pipe. Proper arrangements such as long threads with check nuts, etc. for minor adjustment in the mounting heights of the fixtures shall also be provided.

(f) 3.3 Incandescent/ Incandescent reflector/ compact fluorescent Light Fixtures

The incandescent/incandescent reflector / compact fluorescent light fixture shall be installed on the surface of ceiling or wall by means of nylon plugs and galvanized steel screws, such that their back finish flush with the surface for exposed conduits and flush with outlet box for concealed conduit system. Wherever convenient, screws for fixing light fixtures shall be screwed into the holes of the outlet box. The light on false ceiling shall be installed in a manner as described for fluorescent light fixture.

Article XII. SECTION-G

Article XIII. WIRING ACCESSORIES

16. GENERAL

The locations of the wiring accessories such as sockets, switches etc. are tentatively shown on the drawings. The Contractor shall ensure the exact positions and locations of wiring accessories in coordination with other services drawings, as per site requirements and as directed by the Engineer. The Contractor shall be responsible for proper functioning of wiring accessories after installation and commissioning.

17. MATERIAL

(a) 2.1 Switches - Indoor type

Switches for controlling light and fan points shall be single pole, rated for 10 Amps, 250 volts AC. The body of the switches shall be of thermoplastic with white face plate suitable for flush mounting on a sheet steel outlet box. The switches shall be piano type having silver tipped contacts and shall operate with snap action.

Unless otherwise specified wherever switches control only the light points, these shall be plate type gang switches installed on common outlet boxes.

Where specified metal front plates shall be used with single grid type switches. The plate shall be finished in specified colour or as otherwise directed by the Engineer. The bell push switches shall be spring loaded type with the identification symbol embossed on it. Two way switches shall be used to control lights from two different locations as shown on the drawings.

The switches & socket outlets shall be of 'Clipsal' - Australia make or MK-UK or approved equivalent.

(b) 2.2 15 Amp / 10 Amp Switch-Socket Outlets

Switch socket units shall be 2 pin + earth. It shall be on white face plate conforming to the standards requirements of BS and stated above for switches - Indoor type. The outlets shall be heavy duty type suitable for mounting on sheet steel outlet box. The Switch sockets outlets shall have sheltered live contacts and designed such that the earth pin of plug is engaged to socket earth before making of live contacts.

Where metal plate switches are installed, the switch socket units shall also be provided with front plate of similar design.

(c) 2.3 Sheet Steel Box

The sheet steel boxes for installation of switches, fan regulators, dimmers and socket outlets shall be made of 16 SWG sheet steel having appropriate dimensions. The box shall have suitable arrangement for receiving the conduit(s). An earth terminal shall be provided for connecting atleast three earth wires of 4 sq. mm size. The outlet box shall be finished in powder coated paint. The sheet steel box shall be as approved by the Engineer.

(d) 2.4 Ceiling Rose

The ceiling rose shall be suitable for 5 amps 250 volts single phase ac. It shall have white plastic moulded base plate, copper or brass terminals for connecting atleast two wires of 2.5 sq. mm size. The ceiling rose shall have a cover with cable inlet hole suitable for multicore PVC insulated and PVC sheathed cable.

18. INSTALLATION

(e) 3.1 General

The mounting heights of all wiring accessories fixtures are stated on the drawings. In case the mounting height is not mentioned, the instructions of the Engineer shall be obtained before fixing.

(f) 3.2 Switches, and Socket Outlets

All wiring accessories shall be installed on 1.63 mm (16 SWG) thick sheet steel box recessed in wall. Sheet on sheet steel box shall be by means of flat head galvanized screws sunk in the plastic plate so as to finish flush with the surface. The edges of the plastic plate shall be champhered. Where switches and fan regulators are required to be installed to gather, these shall be grouped and suitably installed on common plastic sheet fixed on appropriate size sheet steel box, wooden polished box.

Article XIV. SECTION-H

Article XV. EARTHING

19. GENERAL

The earthling system consists of earth electrodes, earthing leads, earth connecting points, earth continuity conductors and all accessories necessary for the satisfactory operation of the associated electrical system.

20. MATERIAL

(a) 2.1 Earth Electrode

2.2.1 Plate Type

The plate type earth electrode shall comprise a 600 x 600 x 3mm electrolytic copper plate. The surface of the plate shall be tinned for protection. The plate shall have four terminals for connecting the earthing leads. Nuts bolts and washers, shall be either of brass or tinned copper. A 50mm dia. G.I. pipe shall be provided from inspection chamber to earth plate for watering purpose. This pipe shall have 10mm dia. holes at 500mm centre to centre all along the length.

At the ground level an inspection chamber with cast iron cover shall be constructed having dimensions as shown on the drawings. The inspection chamber shall have a cover supported on angle iron frame. The cover shall be hinged type, as approved by the Engineer and shall finish flush with the ground level.

2.2.2 Copper Clad Steel Rod Type

This type of earth electrode shall comprise a 3 meter long, 20 mm dia. copper clad steel rod having flat head at drive end and pointed conical tip at the driven end. The tip shall be hardened to facilitate driving. At the top of the rod, a brass clamp for bolted connections shall be provided suitable for connection to the down conductor or earthing lead as required.

The inspection chamber with C.I. cover shall be provided as specified for plate type earth electrode.

(b) 2.2 Earthing Lead

The earthing lead shall connect the earth electrode to earth connecting point or equipment in the building. It shall be of round hard drawn bare electrolytic copper of size shown on the drawings. The cost of earthing cads deemed to have been included in the price of earth electrode and separate payment shall be made for it.

(c) 2.3 Earth Continuity Conductor

Earth continuity conductor (ECC) shall be hard drawn bare tinned copper wire or single core PVC insulated copper conductor cable of sizes indicated on the drawings. All thimbles, lugs, sockets, nuts, washers & other accessories necessary for the complete installation of ECC shall be provided by the Contractor without any extra cost.

The specifications for single core PVC insulated cables used as ECC shall be same as those given in section “LT Cables” of the technical specifications. PVC insulated cables when used as ECC shall be green or green/yellow.

(d) 2.4 Earth Connecting Point

Earth connecting points shall comprise tinned copper bar, rectangular in shape, having dimensions of 300 x 50 x 6 mm. At least six terminals for connection shall be arranged on the bar, which can be increased or decreased as required by the Engineer.

The terminals shall have brass or tinned copper bolts, nuts and washers for protection against corrosion. Two holes shall be provided off centre of the copper bar for fixing to the wall by means of 10 mm dia. nut and bolt and shall be insulated by means of rubber gaskets/washers.

21. INSTALLATION

(e) 3.1 General

Complete earthing systems as shown on the drawing shall be installed by the Contractor. The earthing system shall give earth resistance, including the resistance of soil, earth leads and ECC equal to or less than one ohm.

At all connections of earth continuity conductor to LT switchboard, LT Distribution Board or any other metallic body, proper size copper or brass sockets, thimbles or lugs shall be used to which the copper wire shall be connected by copper brazing. The soldering of copper wire at joints or terminations shall not be allowed. All tee-off connections shall be by copper brazing using suitable socket and clamps. After brazing, the jointed surface shall be protected by oxide inhibiting compound of low electrical resistance. For connections to metallic body, the surface shall be thoroughly cleaned before bolting the lug or socket.

The earth continuity conductor shall in general run in cable trench or in conduits/pipes as shown on the drawings. For under floor runs, these shall be installed in pipe/conduit of appropriate sizes. Where laid along underground cables these shall be laid directly underground in unpaved areas and in pipes under paved areas.

(f) 3.2 Earth Electrode

3.2.1 Plate Type

The electrode plate shall be installed at a minimum depth of 5 meters from finished ground level or 1 meter below permanent water level whichever is less. The minimum horizontal distance between earth electrodes shall be 3 meters. Proper mixture of lime and charcoal shall be made and buried alongwith the copper plate in the ground to increase the soil conductivity. The electrode shall be installed as per details shown on the drawings. The inspection chambers shall be constructed at locations approved by the Engineer.

(g) 3.3 Earth Continuity Conductor

The earth continuity conductor of sizes shown on the drawing shall be installed all along the cable runs and connected to the earthing bar/terminals provided in equipment. The body of all switchboards shall also be connected to earth by specified size of ECC. All other metal work shall also be connected to earth by specified size of ECC.

At any joint or terminations, the ECC shall be connected using proper accessories. No connection shall be made by twisting of earth conductors.

(h) 3.4 Earth Connecting Point

The earth connecting point shall be installed at locations shown on the drawings. It shall be fixed on wall surface by means of brass screws with nuts, washers and other insulating material as instructed by the Engineer**.**

Article XVI. SECTION-I:

Article XVII. MISCELLANEOUS ITEMS

22. GENERAL

The Miscellaneous Items as described in this section shall comply with other sections of these specifications as applicable. No specific reference to any manufacturer has been made and the Contractor shall ensure that all the miscellaneous items be supplied/fabricated from the reputable manufacturers, which have already supplied/fabricated similar items.

23. MATERIAL

(a) 2.1 CEILING FAN

Ceiling fan shall be capacitor type, suitable for 250 V AC. The air displacement shall be 12,000 cfm for 56" (1422 mm) sweep and 10,000 fm for 48" (1219) sweep at maximum speed. The fan motor shall be capacitor type and bearing shall be groove type to give noiseless operation. The fan regulator/dimmer shall be made if low voltage electronic components, and shall be suitable for the speed control of fans. The body of the regulators shall be made of white bakelite with faceplate suitable for flush mounting on a sheet steel outlet box. Where the regulators are to be mounted with switches, they shall match with the dimensions of switches and shall be fixed on plastic outlet by means of flat head counter sunk galvanized screws, with the head of the screws finish flush with the surface of the plate. The complete fan with blades and canopy shall be finished in white colour.

The fan hook shall be made of 16 mm diameter mild steel rod. It should be in the form of a loop about 75 mm long and about 50 mm wide. The rod should be bent to have atleast 200 mm extension on both sides for trying to reinforcement steel of slab.

(b) 2.2 WALL BRACKET FAN

Wall bracket fan shall be capacitor type, suitable for 250V AC. The fan shall be of size as mentioned in the BOQ. The fan motor shall be capacitor type and bearing shall be groove type to give noiseless operation. The fan regulator shall be made of low voltage electronic components, and shall be suitable for the speed control of fans. The regulator shall be located in the fixed portion of the fan. The complete fan with blades and cover shall be finished in white colour or approved by the Engineer. The fan shall be provided with a rotating mechanism for swinging the fan on its vertical axis.

(c) 2.3 EXHAUST FANS

Exhaust fans shall be three blade or multi-blade type of metal/PVC construction as approved by the Engineer.

Fans shall be direct driven and supplied complete with electric motor, backdraft dampers and anti-vermin screen.
The bearings shall be ball roller or sleeves type of permanently lubricated and sealed type.

Wheels shall be heavily and rigidly constructed and accurately balanced both statically and dynamically and be free from objectionable vibration or noises.

(d) 2.4 MANHOLES WITH CI COVER AND FRAME

Manholes for electric power cables or telephone cables shall be constructed in accordance with the standard Specifications of Civil works. The work shall also include making of concrete chambers and

concrete benching in manholes, complete as shown on the drawings. Top of the cover shall be roughened in an approved pattern. The cover shall tightly fit in the frame and shall be water tight. The manhole shall have appropriate identification code as instructed by Engineer.

CI cover complete with frame shall be of the size specified on the drawings. The specified size means the clear opening. The cover shall be of 100 kg weight or as approved by the Engineer. Suitable locking and lifting arrangement shall also be provided. The frame shall be set in place at the time of pouring of concrete so that the cover shall tightly fit in the frame.

24. INSTALLATION

(e) 3.1 GENERAL

The mounting heights, depths, and other dimensions of all the Miscellaneous Items are stated on the drawings or in general notes. In case of any discrepancy, the instructions of the Engineer shall be obtained before fixing the item.

(f) 3.2 CEILING FAN

Fan hook shall be installed in the RCC ceiling and to the reinforcement before pouring of concrete.

The installation of fan shall include fixing of blades, down rod, clamp, canopy, including testing and commissioning. The down rod shall be of required length having long threads and shall be provided with check nuts to secure it firmly with the clamp and with the body of the fan. A split pin shall be provided both at the fan body end and at the clamp for safety. Any scratches on the body of the fan or fan rod appearing during installation shall be cleaned and painted properly with the same quality paint as provided by the manufacturer.

Wiring between the ceiling rose and the fan terminals shall be carried out with three core 1.0 sq. mm PVC insulated PVC sheathed flexible cables.

(g) 3.3 WALL BRACKET FAN

The wall bracket fan shall be installed on the wall and shall be firmly fixed by means of flat head galvanized screws.

Wiring between the ceiling rose and the fan terminals shall be three core 1.0 sq. mm PVC insulated PVC sheathed flexible cables.

(h) 3.4 EXHAUST FAN

The propeller exhaust fan shall be installed in the opening already made in the wall and shall be firmly fixed by means of flat head galvanized screws.

Wiring between the ceiling rose and the fan terminals shall be three core 1.0 sq. mm PVC insulated PVC sheathed flexible core.

(i) 3.5 MANHOLES WITH CI COVER AND FRAME

The manholes shall be constructed according to the Specifications of the Civil works and standard practice. Proper curing of the concrete shall be done for atleast 15 days. Before constructing, the Contractor shall submit shop drawing of manhole showing steel reinforcement, embedded pipes, clearances, etc, for approval of the Engineer. Quality of cement used in the manhole shall be sulphate resistant.

Article XVIII. **LIST OF RECOMMENDED MANUFACTURERS**

WIRES AND CABLES

- PAKISTAN CABLES LTD.
- PIONEER CABELS
- AGE CABLE

PVC PIPE/CONDUIT

- GALCO
- JEDDAH
- PRINCE

SWITCHES AND SOCKETS

- CLIPSAL
- MK
- HAGER

LT PANEL & DISTRIBUTION BOARD

- SUNBEAM
- HUSSAIN & CO.
- ELECTRECH
- TAJ ENGG.
- UNIQUE ENGG.

CIRCUIT BREAKERS

- MERLIN GERIN
- TERASAKI
- ABB

BACK BOX

- CLIPSAL
- MK
- HUSSAIN & CO

SECTION – IX

FINISHING SCHEDULE
AND
LISTS OF SPECIFIED MATERIAL

CADET COLLEGE PETARO DISTT JAMSHORO SINDH
RE-CONSTRUCTION OF OFFICE BLOCK

FINISHING SCHEDULE

S.No.	Item	Location	Description
1 a).	All Floor	All Floors	20” x 20”& 16” x 16” Porcelain Tiles (Pak Made)
1 b).	Floor and Walls	Lavatory Block	Shabbir or Equivalent approved. Glazed Tiles (8” x 12”) Size and upto 7”-0” height on dado.
2	Painting (ICI Brand)	Internal Walls	Plastic Emulsion Paint.
		External Walls	Weather Shield Paint.
		All Ceilings	Distemper Paint.
		Steel Work	Enamel Paint.
		Wood Work.	Spirit Polish.
3	DOORS	All Rooms	Solid paneled deodar doors
		Lavatory Block	Solid paneled deodar wood doors with (2” x 5”) size Deodar Wood Frame covered with 24” wide 3mm thick Aluminum sheet.
4	Windows & Ventilators	All Windows & Ventilator	Fabricated in Deodar Wood Glazed with 5mm thick Plain Sheet Glass..
5	Staircase		Finished in Verona Marble 12” x ¾” thick to full length of Treads 3/8” x 6” Risers of Verona Marble.
6	Gutka bricks	Front elevation	Providing and fixing on face Brick Gutka of required size, shape and shade with cement mortar 1:2 over 3/4" th cement mortar base curing finishing etc complete
7	Wooden jafri	Principal office	providing and fixing of wooden jafri in 4mm oak ply pressed on 1/2"th. Mdf sheet finished in lacquer polish as per the design provided by the architect.
8	Wood flooring	Principal office	Provide and lay laminated wood flooring of approved brand and quality (7.6"x48") having abrasion class AC5/32 of thickness 8 mm.
9	Oak ply polish finish	Principal office wall	Provide ,install and make panelling on existing walls with 1"x2" solignum treated partal wood frame fixed in plumb and level as required

CADET COLLEGE PETARO DISTT JAMSHORO SINDH
RE-CONSTRUCTION OF OFFICE BLOCK

LIST OF SPECIFIED MATERIAL

S. NO.	MATERIAL	BRAND NAME	MANUFACTURER	SOURCE
1	ORDINARY PORTLAND / SULPHATE RESISTANCE CEMENT	LUCKY		KARACHI
2	WHITE CEMENT	MAPLE LEAF OR ANWARZEB		HYDERABAD
3	CRUSHED STONE			PETARO
4	SAND			BHOLARI
5	STEEL (BILLET)			HYDERABAD
6	BRICKS (ZAMAN BRAND)			HYDERABAD
7	PORCELAIN TILES		MASTER / STILE	HYDERABAD
8	GLAZED TILES		SHABBIR TILES OR APPROVED EQUIVALENT	HYDERABAD
9	APPROVED VERONA MARBLE TILES			LOCAL MARKET
10	C.P. FITTINGS		MASTER / SONEX OR EQUIVALENT APPROVED	KARACHI
11	UPVC / POLY PROPYLENE PIPES (PPR) (FOR WATER) AND PVC PIPES (FOR DRAINAGE)	DADEX OR EQUIVALENT APPROVED		HYDERABAD
12	GULLY TRAP CERAMICS & MANHOLE FRAME & COVER(CI)		ALPINE OR EQUIVALENT APPROVED	
13	WATER PUMP (WATER SUPPLY)	JAVED PUMP / SIEMENS MOTOR OR EQUIVALENT APPROVED		HYDERABAD
14	DAMPA FALSE CEILING	CMC CHICAGO METALIC(0.77mm) THICK	CHINA	KARACHI

BILL OF QUANTITIES

RE-CONSTRUCTION OF OFFICE BLOCK

Civil, Electrical & Plumbing Works

SUMMARY OF COST

1	CIVIL WORK.	Rs. _____
2	PLUMBING WORK.	Rs. _____
3	ELECTRICAL WORK.	Rs. _____
4	DISMANTLING WORK	Rs. _____
	Total: (1 + 2 + 3 + 4)	Rs. _____

Amount in Words:

_____

_____

_____

CONTRACTOR

RE-CONSTRUCTION OF OFFICE BLOCK

Civil, Electrical & Plumbing Works

SUMMARY OF CIVIL WORKS

A.	SCHEDULE ITEMS:	Rs. _____
B.	NON - SCHEDULE ITEMS:	Rs. _____
	Total: (A + B)	Rs. _____

_____

CONTRACTOR

RE-CONSTRUCTION OF OFFICE BLOCK

Civil, Electrical & Plumbing Works

BILL OF QUANTITIES

CIVIL WORKS - Schedule Items

S.#	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	A - SCHEDULE ITEMS				
1	**EXCAVATION**				
(i)	Excavation in Hard rock requirs blasting but blasting is prohibited and disposal of excavated material with 50ft lead(i/e dressing and leveling to designed etc. (f) Grade (vi) Chapter # 1, Page-16, Item # 7 b(f)	3,003	Per Cft	81.18	243,784
(ii)	Excavation in foundation of Building, Bridges and other Structures including dagbeling dressing, refilling around structure with excavated earth watering and ramming lead upto one chain (30 metre) and lift upto 5 ft. (1.5 metre) In ordinary soil Chapter # 1, Page-17, Item # 18(b)	4,699	Per Cft	11.88	55,820
2	**EARTH FILL** Filling, watering and ramming earth under floor with new earth (excavated from outside) lift upto 5 ft and lead upto 10 miles including cost of earth. Chapter # 1, Page-27, Item # 22	7,702	Per Cft	47.02	362,133
3	**LEAN (1:4:8)** Cement concrete plain including placing compacting, finishing and curing, complete (including screening and washing at stone aggregate without shuttering).				
(i)	Ratio. 1:4:8 Chapter # 4, Page-34, Item # 5(i)	1,436	Per Cft	348.83	501,068
4	**REINFORCEMENT STEEL**				

	Febrication of deformed steel reinforcement for cement concrete including cutting, bending, laying in position, making joints and festenings including cost of binding wire (also includes removal of rust from bars).				
(a)	Deformed Bar.				
(i)	Grade - 60 Chapter # 4, Page-36, Item # 8(a)(i)	514	Per Cwt	#######	9,736,820
5	**P.C.C. (1:3:6)** Cement concrete plain including placing compacting, finishing and curing, complete (including screening and washing at stone aggregate without shuttering). Chapter # 4, Page-34, Item # 5(h)				
(h)	Ratio: 1:3:6	352	Per Cft	388.67	136,701
5(b)	**SHUTTERING** Erection and removal of centering for RCC or plain cement concrete works of Partal Wood.				
(b)	Vertical Chapter # 4, Page-37, 19(b)	938	Per Sft	106.48	99,868
6	**D.P.C** Damp proof course with (cement sand and shingle concrete 1:2:4) including 2 coats of asphaltic mixture.				
(b)	2" thick Chapter # 4, Page-38, Item # 28(b)	298	Per Sft	126.97	37,820
7	**BRICK WORK** Pacca brick work in ground floor in (including striking of joints).				
(I)(c)	Cement Sand Mortar (1:4) Chapter # 5, Page-40, Item # 5(I)(c)	2,650	Per Cft	397.85	1,054,164
	Add extra labour in Item # 5 for brick work in:				
	First Floor	318	Per Cft	17.23	5,479
8	**CERAMIC TILES (TOILET) Floor**				

(a)	Laying floor of approved coloured glazed tiles 1/4" thick floor of approved colour & size jointing in white cement and laid over 1:2 cement sand mortar 3/4" thick including grouting with matching colour and finishing. Chapter # 8, Page-56, Item # 25	169	Per Sft	325.40	55,098
(b)	**Dado/Wall** Laying floor of approved coloured glazed tiles 1/4" thick dado of approved colour & size jointing in white cement and laid over 1:2 cement sand mortar 3/4" thick including grouting with matching colour and finishing. Chapter # 8, Page-55, Item # 24	473	Per Sft	389.36	184,124
9	**PLASTER (1/2")** Cement plaster 1:4 upto 12' height.				
(b)	1/2" thick. Chapter # 9, Page-62, Item # 11(b)	14,067	Per Sft	39.83	560,306
10	**PLASTER (3/8")** Cement plaster 1:4 upto 12' height.				
(a)	3/8" thick. Chapter # 9, Page-62, Item # 11(a)	14,067	Per Sft	37.78	531,468
11	**DISTEMPER** Distempering				
(c)	New Surface (iii) Three Coats Chapter # 9, Page-63, Item # 24(c)	2,268	Per Sft	17.23	39,081
12	**WEATHER SHIELD PAINT** Preparing the surface and painting with weather coat including rubbing the surface with rubbing brick / sand paper, filling the voids with chalk / plaster of paris and then painting with weather coat of approved make. Chapter # 9, Page-64, Item # 38(A)	5,276	Per Sft	39.38	207,757
	(b) 2nd and subsequent coat Chapter # 9, Page-64, Item # 38(B)	5,276	Per Sft	23.60	124,507
13	**PLASTIC EMULSION PAINT**				

	Preparing the surface and painting with plastic emulsion paint of approved make including rubbing the surface with sand Paper, filling the voids with chalk / plaster of paris and then painting etc. complete. (A) Three Coats Chapter # 9, Page-64, Item # 40(A)	6,524	Per Sft	38.71	252,525
14	**<u>ALUMINIUM WINDOWS</u>** Supplying and fixing in position Aliminium channels framing for sliding windows and ventilators of made with 5mm thick tinted glass glazing(Belgium) & Aluminium fly screen I/C handles stoppers and locking arrangements etc. (b) Deluxe model (Bronze) Chapter#18, Page#83, item#84(b)	229	Per Sft	2,386.73	546,084
15	**<u>IRON GRILL</u>** Providing & fixing iron steel grill using solid square bars of size 1/2"x1/2" placed at 4" I/c and frame of flat iron patti of 3/4"x3/4" I/c circle shape at 1-0 apart equivalent fitted with screws are pins i/c painting 3 coats with 1st coat of red oxide paint etc. Chapter # 17, Page-86, Item # 30	141	Per Sft	833.27	117,324
16	**<u>GROOVE PLASTER</u>** Extra labour rate for making grooves of 1"x1/4" or 3/4"x1/2" plastered surface with true edges both vertically and horizontally with uniform depth and with groove base smoothly finished etc. complete as per instruction of Engineer Incharge. Chapter # 9, Page-64, Item # 34	1,372	Per Rft	31.19	42,783
17	**<u>ROOF SCREED / FLOOR</u>** Providing & laying 1" thick topping of cement concrete (1:2:4) including Surface finishing and dividing into panels. (c) 2" thick (Under tile floor)	2,073	Per Sft	108.75	225,449
	(d) 3" thick (Roof screeding) Chapter # 8, Page-55, Item # 16(c) & (d)	2,556	Per Sft	145.00	370,691

18	**DRIP COURSE** Making drip course 2"x1/2" (50x12mm) under RCC Slab edges in outer opening, in cement sand mortar (1:2). Chapter # 7, Page-53, Item # 48	172	Per Rft	34.42	5,910
19	**FLY PROOF DOOR SHUTTERS** First class deodar wood wrought joinery work in wire gauze doors and windows with 22 SWG galvanized wire gauze 12x12 mashes per squareinch (625 mm) including iron fittings complete.				
(a)	Deodar framing 1-3/4" (45 mm) with wire guage fixed in position. Chapter # 10, Page-67, Item # 14(a)	189	Per Sft	1,559.16	294,136
20	**FIOOR PORCELAIN TILE** Providing and laying full body Porcelain Tile in Flooring or Facing of approved design set in Gry Cement mortar 1:2 or of 3/4" Thickness I/C washing and joints with white cement slurry using color pigment for matching complete as per specification.				
	(ix) 24"x24"x5/16" Chapter#08, Page#46, Item # 28(ix)	2,366	Per Sft	439.57	1,040,158
21	**WOODEN DOOR SHUTTER** First class deodar wood wrough joinery in doors and windows etc. fixed in position including chowkhats hold fasts, higes iron tower bolts,rubber stop deats/G.I clamp, handles and chord with hooks etc. Deodar pannelled or Pannelled and glazed or fully glazed.				
	2" thick Deduct for wooden frame from rate. Chapter # 10, Page-66, Item # 7(i)	246	Per Sft	3,279.20	807,995
22	**MORTICE LOCKS** Providing & fixing approved quality mortice lock. Chapter # 10, Page-68, Item # 21	10	Each	1,039.05	10,391
23	**G.I DOOR FRAME** P/F G.I frame of size 7"x2"x or 4 1/2"x3" for doors Chapter #17, Page # 76, item # 29	189	P.Sft	690.67	130,675
				TOTAL:	**17,780,118**
				Add / Deduct % above / below	
				GROSS TOTAL:	

RE-CONSTRUCTION OF OFFICE BLOCK
Civil, Electrical & Plumbing Works
BILL OF QUANTITIES
CIVIL WORKS - Non-Schedule Items

S.#	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	B - NON - SCHEDULE ITEMS				
1	**R.C.C**				
	Providing and laying reinforced cement concrete using Hub River crushed stone aggregate 3/4 inch (19 mm) and down gauge having a minimum works cylindrical crushing strength of 3000 psi for foundation, plinth beam, roof beam, slab, wall and for 4000 PSI columns at 28 days of any shape including using SBR and water tight form work and its removal, compacting, leveling vibrating and curing etc. complete but excluding the cost of reinforcement. (Sulphate resisting cement will be used up to Plinth level).				
	(iii) 3000 PSI	3,098	Per Cft		
	(iv) 4000 PSI	290	Per Cft		
2	**STONE SOLING**				
	Providing and laying soling stones 4 inches to 6 inches under Footings, floors including packing with spawls and chips and consolidating compacting watering etc. complete.	1,436	Per Cft		
	vertical chapter#4 19(b) Page#37				
3	**ANTITERMITE**				
	Provide & apply Antitermite treatment using MIRAGE of Ali Abkar Enterpises or equaivelent approved quality in various stages e.g. under ground treatment at various stages and each floor including all wooden work. Plinth area will be measured once for all operations. (The Contractor will give 10 years Guarantee).	2,624	Per Sft		
4	**WATER SPOUTS**				
	Providing & fixing water spout. UPVC 4" dia pipe and 4.5' long	10	No.		

5	**GLASS PARTITION WALL** Providing and fixing 12mm thick glass with aluminium frame or wooden frame.	251	P.Sft		
6	**THERMOPORE (For Expension Joint)** Providing anf fixing thermopole sheet in horizontal and vertical expansion joints. 2" thick	297	P.Sft		
7	**FACECADE** P/F Sawat Stone tile of approved quality and colour, and shade fixing on wall surface over 1:2 Grey cement sand 3/4" thick base of cement mortar including complete finishing.	600	P.Sft		
				TOTAL:	

RE-CONSTRUCTION OF OFFICE BLOCK

Civil, Electrical & Plumbing Works

SUMMARY OF PLUMBING WORKS

A.	SCHEDULE ITEMS:	Rs. _____
B.	NON - SCHEDULE ITEMS:	Rs. _____
	Total: (A + B)	Rs. _____

_____

CONTRACTOR

RE-CONSTRUCTION OF OFFICE BLOCK
Civil, Electrical & Plumbing Works
BILL OF QUANTITIES
PLUMBING WORKS - Schedule Items

S.No	Description	Qty	Rate (Rs)	Unit	Amount (Rs.)
	A - SCHEDULE ITEMS				
1	Providing & Fixing 24" x 18" lavatory basin in white glazed earthen ware complete with i/c the cost of W.I or C.I Cantilever brackets 6 inch built into wall, painted white in two coat after a primary coat of red lead paint a pair of ½" dia chrome plate pillar traps 1½" dia rubber plug & chrome plated brass chain 1-1/4" dia malleable iron or cp brass traps malleable iron or brass union & making requisite number of holes in walls plinth & floor for pipe connection and making good in cement concrete 1:2: (standard pattern) Chapter # 01, Item # 8, Page-205	3	9,495.14	Each	28,485
2	Add extra for labour for providing and fixing of eathern ware pedestal white or colored glazed (standard pattern). Chapter # 01, Item # 9, Page-205	3	3,276.00	Each	9,828
3	Providing and fixing in position nyloon connections complete with ½" dia brass stop cock with pair of brass nuts and lining joints to nyloon connection. Chapter # 01, Item # 22, Page-207	10	760.50	Each	7,605
4	Providing and fixing chrome plated brass towel rail complete with brackets fixing on wooden cleats with 1" long C.P. brass screws. (iii) Towel Rail 30" Long Chapter # 02, Item # 1(iii)(a), Page-208	3	945.07	Each	2,835

5	Supplying and fixing soap tray made of plastic of superior quality and design with fine finishing with C.P. screws etc. complete. Chapter # 02, Item # 5, Page-208	3	585.00	Each	1,755
6	Add extra labour for concealed pipe and fittings i/c making recess in the wall for pipe and making good in cement mortar etc. complete.				
	(i) ½" dia	325	159.30	P.Rft	51,773
	(ii) 3/4" dia	120	199.83	P.Rft	23,980
	(iii) 1" dia Chapter # 04, Item # 2(i)(ii)&(iii), Page-211	155	272.35	P.Rft	42,214
7	Providing and fixing full way gun metal valves with wheels, threaded or flabged ends with rubber washing.(gate valve)				
	1-1/2" dia (standard pattern) Chapter # 06, Item # 4(B)(c), Page-215	2	1,614.60	Each	3,229
8	Supplying & fixing handle valve (china)				
	(ii). 1" dia Chapter # 06, Item # 5(c), Page-215	2	1,907.10	Each	3,814
9	Constructing manhole or inspection chamber for the required dia of circular sewer and 3'-6" (1067 mm) depth with walls of B.B in cement mortar 1:3 cement plastered 1:3 , ½" thick, inside of walls and 1" (25 mm) thick over benching and channel i/c fixing C.I. manhole cover with frame of clear opening 1½" x 1½" (457 x 457 mm) of 1.75 Cwt. (88.9 kg) embedded in plain C.C. 1:2:4 and fixing 1" (25 mm) dia M.S steps 6" (150 mm) wide projecting 4" (102 mm) from the face of wall at 12"				

	(305 mm) C/C duly painted etc. complete as per specification and drawing No. D.P/I of Public Health Circle Southern Zone. (a) 4" to 12" dia 2' x 2' x 3'-6" Chapter # 11, Item # 1(a), Page-148 **Note:** Deducted from the above cost at the rate of Rs. 4234 per foot depth, where depth of Manhole is less than 3'-6" or 1067mm)	10	55,584.18	Each	555,842
10	Suppying and fixing in position C.P Bib Cock 3/4" dia C.P bib cock, standard pattern Chapter # 06, Item # 2(c), Page-215	3	1,544.40	Each	4,633
11	Providing UPVC pipes specials and clamps etc. including fixing cutting and fittings complete with and including the cost of breaking through walls and roof making good etc. with pigment to match the colour of the building and testing with water to a pressure bead of 200 feet and handling.				
	i. UPVC Nikasi pipe 4" dia.	375	465.53	P.Rft	174,574
	ii. UPVC Nikasi pipe 3" dia.	204	836.36	P.Rft	170,617
	iii. UPVC Nikasi pipe 6" dia. Chapter # 04, Item # 2(iv)(v)&(vi), Page-211	480	950.38	P.Rft	456,182
12	(a). Supplying & fixing concealed stop cock of superior quality with C.P head ½ inch dia. Chapter # 06, Item # 12(a), Page-216	10	1,615	Each	16,146
				TOTAL "A"	**1,553,513**
			Add / Deduct	**% above / below**	
				TOTAL:	

RE-CONSTRUCTION OF OFFICE BLOCK
Civil, Electrical & Plumbing Works
BILL OF QUANTITIES
PLUMBING WORKS – Non -Schedule Items

S.No	Description	Qty	Rate (Rs)	Unit	Amount (Rs.)
	B - NON-SCHEDULE ITEMS				
1	Providing and Fixing a P.V.C trap with 4" dia inlet and 4" out let of the approved self clearing design with a P.V.C grating 6" x 6" with or without a vent arm including cost of making requisite number of holes in walls plinth and floor for pipe connection and making good cement concrete 1:2:4	3		Each	
2	Providing and fixing 6" x 2" or 6" x 3" floor trap of the approved self cleaning design, with a UPVC grating 6" x 6", with or without vent arm complete with and including making requiisite number of holes in walls, plinth and floor for pipe connections and making good in C.C. 1:2:4 etc.	3		Each	
3	Providing and fixing 6" x 4" P.V.C gully trap with 4" outlet complete 6" x 6" PVC cover with PVC frame.	3		Each	
4	Providing and fixing 24" x 24" beveled edge Mirror best quality Pak made fixed with 4 Nos clamp set and brass screw fixed to wood cleat	3		Each	
5	Providing & fixing a P.V.C clamps of the approved design to 4' dia pipe sockets including the cost of cutting and making good to wall or M.S bolts & nuts, 4" into wall including pipe distances extra painting to match the colour of the building.	60		Each	

6	Supply, fixing, testing and commissioning of clean out plug of 4 " dia along with specials, fittings, bends, sleeves, masking plates, traps, vent cowl, chiseling, making hole, excavation, backfilling making good where as required to operate as per specifications, drawings and instructions of Consultant.	6		Each	
	Total of non-schedule items		**Total**		

RE-CONSTRUCTION OF OFFICE BLOCK

Civil, Electrical & Plumbing Works

SUMMARY OF ELECTRICAL WORKS - SCHEDULE ITEMS				
SECTION	**DESCRIPTION**	**MATERIAL**	**LABOUR**	**TOTAL**
		AMOUNT (PKR)	**AMOUNT (PKR)**	**AMOUNT (PKR)**
SECTION-A	WIRING & WIRING ACCESSORIES	735,500	181,200	916,700
SECTION-B	WIRING DEVICES / RECEPTACLES	374,450	63,100	437,550
SECTION-C	LIGHTING FIXTURES	500,050	56,500	556,550
SECTION-D	DISTRIBUTION BOARDS AND CABLES	609,940	61,000	670,940
SECTION-E	CABLE RACEWAYS / CONTAINMENTS	157,500	25,000	182,500
SECTION-F	COMMUNICATION SYSTEM	1,128,125	229,250	1,357,375
SECTION-G	GROUNDING & BONDING	177,000	42,000	219,000
SECTION-H	TESTING REPORTS & AS BUILT DRAWINGS	0	70,000	70,000
TOTAL COST FO RELECTRICAL WORKS SCHEDULE ITEMS		**3,682,565**	**728,050**	**4,410,615**

ITEM #	DESCRIPTION	QTY	UNIT	MATERIAL		LABOUR		TOTAL
				RATE PKR	AMOUNT PKR	RATE PKR	AMOUNT PKR	AMOUNT PKR
SECTION - A WIRING / WIRING ACCESSORIES								
	Providing, installation, testing & commissioning of following items including all material, tools, labor & accessories required for completion of work as per specifications, details & drawings. Complete in all respects. Megger Test Report of all wiring shall be submitted by contractor to consultant.							
	SMALL WIRING FOR LIGHTS							
A1	***Circuit wiring from respective distribution board to switch board*** using following size of Stranded/Flexible, PVC Insulated wire in a in 25mm size of pvc conduits / channel/cable tray including all accessories as shown in the drawings.							
a	3 x 2.5 Sqmm PVC, Cu	9	Nos.	8,500	76,500	1,500	13,500	90,000
A2	***Wiring for light point from switch board to first light point*** using single core PVC insulated, Stranded Copper Conductor, color coded wires of 1.5 Sq.mm for phase, 2.5 Sqmm for common neutral and 1.5 Sqmm for common earth in 25mm size of pvc conduits / channel / cable tray including complete with all accessories as shown in the drawings.	43	Nos.	3,500	150,500	1,000	43,000	193,500
A3	***Wiring for light point to point*** using single core PVC insulated, Stranded Copper Conductor, color coded wires of 1.5 Sq.mm for phase, 2.5 Sqmm for common neutral and 1.5 Sqmm for common earth in appropriate size of pvc conduit / channel / cable tray complete with all accessories as shown in the drawings.	34	Nos.	2,500	85,000	800	27,200	112,200
	WIRING FOR GROUP CONTROL LIGHTS							

A4	***Circuit wiring for group control for Raw power & Emergency from respective distribution board to first point*** using following size of Stranded/Flexible, PVC Insulated wire in appropriate size of pvc conduit / channel / cable tray complete with all accessories as shown in the drawings.							
a	3 x 2.5 Sqmm PVC, Cu	2	Nos.	8,500	17,000	1,500	3,000	20,000
A5	***Same as above but for point to point*** using following Stranded/Flexible, PVC insulated copper wire in appropriate size of pvc conduit / channel including all accessories as shown in the drawings.							
a	3 x 2.5 Sqmm PVC, Cu	10	Nos.	3,000	30,000	1,000	10,000	40,000
	SMALL WIRING FOR POWER							
A6	***Circuit wiring from respective distribution board to 13A Multi Pin / 15A,3Pin Switch Socket unit*** (first outlet) for kitchen equipments & general using following Stranded/flexible Copper Conductor, color coded wire in 25 mm dia pvc conduit under floor. Complete with all accessories as shown in the drawings. Item include floor/wall cutting if required as per site conditions.							
a	3 x 2.5 Sqmm PVC, Cu	15	Nos.	8,500	127,500	1,500	22,500	150,000
A7	***Wiring for 13A Multi Pin / 15A 3-Pin Switch Socket units*** from outlet to outlet for kitchen equipments & generalusing following Stranded/Flexible Copper Conductor, color coded wires in 25 mm dia pvc conduit under floor. Complete with all accessories as shown in the drawings. Wiring on same workstation shall be counted as one. Item include floor/wall cutting if required as per site conditions.							
a	3 x 2.5 Sqmm PVC, Cu	38	Nos.	3,000	114,000	1,000	38,000	152,000
	WIRING FOR SIGNAGES							

A8	Wiring for Building's Signages on front and inteior from respective DB to junction box near signages, using using 3C, 2.5 Sqmm cu. PVC/PVC Cable in 25mm in specified size PVC conduit above false ceiling, surface on ceiling, embedded in floor. as required. Complete in all respect.	1	No.	5,000	5,000	1,000	1,000	6,000
	WIRING FOR COMRACK							
A9	Power wiring to Com. Rack from DB to 13A Flat Switch Socket units using following size of single core PVC stranded copper conductor, color coded wires in appropiate size of pvc conduit embedded in floor,concealed in wall as required. Complete in all respect as shown in the drawing.							
a	3C, 2.5 sqmm PVC	1	No.	5,000	5,000	1,000	1,000	6,000
	WIRING FOR FACP							
A10	***Wiring for Fire Alarm Control Panel from distribution board to FACP*** using 3C, 2.5 Sqmm FR Cable in in 25mm size of pvc conduits as shown in the design drawings. Complete with all accessories.	1	No.	5,000	5,000	1,000	1,000	6,000
	WIRING FOR AC UNITS							
A11	***Wiring for Air-Conditioning Units from respective DB to DP isolator switch near AC*** using following size of multicore PVC insulated stranded Copper Conductor, Complete in all respect.							
a	***Wiring for 1.0 Ton A/C Units (Wall Mounted)*** from distribution board to indoor condensing units using 3C, 4Sqmm PVC/PVC insulated copper cable in 25mm conduits / cable tray complete in all respect.	2	Nos.	10,000	20,000	2,000	4,000	24,000
b	***Wiring for 1.5 Ton A/C Units (Wall Mounted)*** from distribution board to indoor condensing units using 3C, 4Sqmm PVC/PVC insulated copper cable in 25mm conduits / cable tray complete in all respect.	4	Nos.	10,000	40,000	2,000	8,000	48,000

c	***Wiring for 2.0 Ton A/C Units (Wall Mounted)*** from distribution board to indoor condensing units using 3C, 4Sqmm PVC/PVC insulated copper cable in 25mm conduits / cable tray complete in all respect.	2	Nos.	10,000	20,000	2,000	4,000	24,000
	WIRING FOR HAND DRYER							
A12	***Wiring for Hand dryer From*** distribution board using 3C, 2.5 Sqmm PVC/PVC insulated cables partially in 25mm dia pvc conduit exposed on ceiling slab / concealed in wall and partially in cable tray. Complete in all respects.	3	Nos.	8,000	24,000	1,000	3,000	27,000
	WIRING FOR ELECTRIC HEATER							
A13	***Wiring for Electric Heater From*** distribution board using 3C, 4 Sqmm PVC/PVC insulated cables partially in 25mm dia pvc conduit exposed on ceiling slab / concealed in wall and partially in cable tray. Complete in all respects.	2	No.	8,000	16,000	1,000	2,000	18,000
TOTAL AMOUNT - SEC - A (PKR) (CARRIED FORWARD TO SUMMARY)				-	**735,500**	-	**181,200**	**916,700**
SECTION - B WIRING DEVICES / RECEPTACLES								
	Providing, installation and commissioning of following wiring devices / light control switches / power receptacles as per BS Standards including 16 SWG MS Powder Coated back boxes, flush with wall as shown in drawings and details.							
	LIGHT CONTROLLED SWITCHES							
B1	One Gang one way 10A Switch	3	No.	950	2,850	300	900	3,750
B2	Two Gang one way 10A Switch	7	Nos.	1,200	8,400	300	2,100	10,500
B3	Three Gang one way 10A Switch	7	Nos.	1,500	10,500	300	2,100	12,600
B4	Four Gang one way 10A Switch	3	Nos.	1,800	5,400	300	900	6,300
	UTILITY POWER RECEPTACLES / SOCKET OUTLETS							
B5	13A, Simplex multi-pin switch Socket Unit	24	Nos.	1,600	38,400	300	7,200	45,600
B6	15A, Round 3Pin Switch Socket Unit	3	No.	1,600	4,800	300	900	5,700
B7	20A, DP Switch Socket For AC	8	Nos.	2,200	17,600	500	4,000	21,600
B8	16A, DP Isolator Switch	3	Nos.	4,500	13,500	500	1,500	15,000
B9	32A, 3P Industrial Socket	6	Nos.	5,500	33,000	1,000	6,000	39,000
B10	Hand Dryer	2	Nos.	18,000	36,000	1,000	2,000	38,000

B11	Office Bell With Button	3	Nos.	3,000	9,000	1,000	3,000	12,000
	TECHNOLOGY BOX							
B12	4x13A MULTIPIN SWITCH SOCKET, 2 No DATA. & 1 No HDMI ***(including all sockets)***	11	Nos.	15,000	165,000	2,500	27,500	192,500
	FLOOR BOX							
B13	4x13A MULTIPIN SWITCH SOCKET, 2 No DATA. & 1 No HDMI ***(including all sockets)***	2	Nos.	15,000	30,000	2,500	5,000	35,000
TOTAL AMOUNT - SEC - B (PKR) (CARRIED FORWARD TO SUMMARY)				-	**374,450**	-	**63,100**	**437,550**
SECTION - C LIGHTING FIXTURES								
	Providing/ Supplying , Installation, testing and commissioning of the following lighting fixture including all accessories like electronic ballast, lamps, mounting arrangements etc. Complete in all respects. Mounting accessories shall be provided by contractor like screws, nuts, bolts, strings etc.							
C1	**CEILING DOWN LIGHT** Ceiling Down Light with 20W LED Light, As approved by architect.	45	Nos.	2,000	90,000	500	22,500	112,500
C2	**CEILING DOWN LIGHT** Ceiling Down Light with 12W LED Light, As approved by architect.	3	Nos.	1,350	4,050	500	1,500	5,550
C3	**LED LINEAR LIGHT** Led Linear Light fixture having 10W/ft (10'x2") (LxW) LED 4000K, As approved by architect.	1	No.	25,000	25,000	500	500	25,500
C4	**LED LINEAR LIGHT** Led Linear Light fixture having 10W/ft (4'x2") (LxW) LED 4000K, As approved by architect.	11	Nos.	8,500	93,500	500	5,500	99,000
C5	**LED STRIP LIGHT** Led Strip Light having 8W/mtr led lamp, As approved by architect.	100	Rmtr	750	75,000	50	5,000	80,000
C6	**EXHUAST FAN** Exhuast Fan, As approved by architect.	3	Nos.	6,500	19,500	1,000	3,000	22,500
C7	**SIGNAGE** Signage Light, As approved by architect.	1	No.	0	0	3,000	3,000	3,000

C8	**CEILING FAN** AC /DC Celing Fans, As approved by architect.	12	Nos.	13,500	162,000	1,000	12,000	174,000
C9	**WALL BRACKET FAN** Wall Bracket Fan As approved by architect.	2	Nos.	6,500	13,000	1,000	2,000	15,000
C10	**LED MIRROR LIGHT** Led Mirror light having 10W led lamp, As approved by architect.	3	Nos.	6,000	18,000	500	1,500	19,500
TOTAL AMOUNT - SEC - C (PKR) (CARRIED FORWARD TO SUMMARY)				-	**500,050**	**-**	**56,500**	**556550**
SECTION - D DISTRIBUTION BOARDS & CABLES								
	Providing, Laying, Testing, Termination and Commissioning of following multi-core PVC insulated Copper / Aluminium Conductor Cables for main/sub-main power distribution system as shown in the layout plans in appropriate size of conduits. Work also includes necessary termination accessories like compression lugs, color coded sleeves, identification tags etc. Note : The quantities shown in the boq are estimated based on design drawings. Contractor has to take accurate measurements at site prior to procurement of material.							
D1	4C, 25 Sqmm Cu. PVC/PVC + ECC, 1x16 Sqmm PVC From METER to DB-Office	30	RM	7,239	217,170	300	9,000	226,170
D2	3C, 10 Sqmm Cu. PVC/PVC From MDB to DB-F	10	RM	2,777	27,770	200	2,000	29,770
	Supply, Installation, testing and commissioning of following distribution panels in accordance with the attached single line diagrams and layout plans. The panels shall be made according to the technical specifications attached.							
D3	DB-Office	1	No.	325,000	325,000	40,000	40,000	365,000
D4	80A TP Adj. MCCB Icu=18kA With Weather Proof Housing	1	No.	40,000	40,000	10,000	10,000	50,000
TOTAL AMOUNT - SEC - D (PKR) (CARRIED FORWARD TO SUMMARY)				-	**609,940**	**-**	**61,000**	**670,940**
SECTION- E CABLE RACEWAYS / CONTAINMENTS								

E1	**Supply and installation** of following sizes of PVC conduits / pipes including all installation acessories like bends, sockets, flexible conduits, partially above false ceiling and partially embedded in ground e.t.c , the works also complete with excavation and back filling of 1'-6" deep for laying of main / sub-main cables . Compete in all respects as shown in the drawing.							
a	20 mm dia PVC conduit	300	Rft.	125	37,500	25	7,500	45,000
b	25 mm dia PVC conduit	300	Rft.	150	45,000	25	7,500	52,500
c	32 mm dia PVC conduit	300	Rft.	175	52,500	25	7,500	60,000
d	50 mm dia PVC conduit	100	Rft.	225	22,500	25	2,500	25,000
	TOTAL AMOUNT - SEC - E (PKR) (CARRIED FORWARD TO SUMMARY)			-	**157,500**	**-**	**25,000**	**182,500**
	SECTION - F COMMUNICATION SYSTEMS							
	Supply , installation , testing and commissioning of following items for voice & data communication cabling system including all material , labor , tools , accessories etc. Complete in all respects. Item includes termination of all cables at respective outlets as shown in the drawings and instructed by client. ***Note : The quantities shown in the boq are estimated based on design drawings. Contractor has to take accurate measurements at site prior to procurement of material.***							
	HORIZONTAL DATA CABLING							
F1	**Category 6 , UTP Cables**, for data communication system at local workstations in 25mm dia PVC conduits under floor as shown in the layout plan and schematic diagrams. Work includes all terminations, management and tagging at both ends.	1400	Mtr	320	448,000	50	70,000	518,000
F2	**INFORMATION OUTLETS**							
a	**Workstation wall mounted Information outlet Duplex Face plate** with 2No. **CAT-6** RJ-45 socket for Data communication system including shuttered click-ins, labels, jacks etc. Complete in all respects with cable	13	Nos.	2,800	36,400	300	3,900	40,300

	identification tags.							
b	**Workstation wall mounted Information outlet Simplex Face plate** with 1No. **CAT-6** RJ-45 socket for Data communication system including shuttered click-ins, labels, jacks etc. Complete in all respects with cable identification tags.	7	Nos.	2,200	15,400	300	2,100	17,500
	PATCH PANELS & CABLE MANANGEMENT							
F3	**48 Port , 19 inch Patch Panel for data communication,** Straight, Flush Mount, 1 RU equipped with 48 x Cat-6 Unshielded RJ45 information outlet including labeling complete in all respect	1	No.	65,000	65,000	15,000	15,000	80,000
F4	**Front & Rear** Cable Management for above patch panels.	1	No.	15,000	15,000	5,000	5,000	20,000
	COMMUNICATION RACKS							
F5	**15 U, mounted communication rack**, Front door with glass cover, lock & key, and front blank panels for covering empty spaces, air flow ducts for effective cooling management inside the rack for switches. Item includes supply and installation of 8way rack mounted standard PDU.	1	No.	55,000	55,000	5,000	5,000	60,000
	PATCH CORDS							
F6	**Category-6 Factory Certified** tangle free RJ-45 to RJ-45 type patch / drop cords in required colors having following lengths for interconnection of switches and patch panels.							
a	1 meter long patch cords for data	40	Nos.	1,250	50,000	100	4,000	54,000
b	3 meter long drop cord for data	30	Nos.	1,500	45,000	100	3,000	48,000
	TELEPHONE JUNCTION BOX							
F7	**Telephone Junction Boxes (TJB)** for termination of incoming PTCL Cables having 10 pair tag block including surge protector, powder coated enclosure including interncal jumper wires and tagging.	1	No.	15,000	15,000	5,000	5,000	20,000
	Wi-Fi ROUTERS							
F8	**Supply and installation of Wi-Fi Routers** as shown in the drawings including all accessories.	3	Nos.	55,000	165,000	5,000	15,000	180,000

F9	4 Core Fiber Optic Cable from JB to Com Rack in appropriate size of pvc conduit including all accessories. ODF Box and with all Complete with termination and tagging at both ends.	1	Job	0	0	30,000	30,000	30,000
F10	**TV WIRING & OUTLET**							
a	TV Splitter (Tap) Unit with enclosure suitable for 1 incomings and 4 outgoing cables including all termination accessories.	1	No.	15,000	15,000	2,000	2,000	17,000
b	Wall Mounted 150x150x75 mm TV Pull box made with 16SWG sheet steel for Antina system.	4	Nos.	2,000	8,000	1,000	4,000	12,000
c	Supply and installation of AV cable from TV to junction box in appropriate size of PVC conduit including AV connectors at both ends.	185	Rmrtr.	285	52,725	50	9,250	61,975
F11	**HDMI CABLE**							
a	**HDMI CABLE** for Projectors	40	Rmrtr.	990	39,600	25	1,000	40,600
b	**HDMI Outlets**	4	Nos.	2,000	8,000	1,000	4,000	12,000
F12	**NETWORK SWITCH**							
a	POE Netwotk Switch 48 Port	1	No.	95,000	95,000	1,000	1,000	96,000
	TESTING & COMMISSIONING							
F13	Comprehensive Fluke Testing and commissioning Report of complete structured cabling system including written warranties from the Principal Manufacturer.	1	Job	0	0	50,000	50,000	50,000
TOTAL AMOUNT - SEC - F (PKR) (CARRIED FORWARD TO SUMMARY)				-	**1,128,125**	**-**	**229,250**	**1,357,375**
SECTION - G GROUNDING & BONDING								
	Providing , installation , testing and commissioning of following items for earthing & bonding system of complete data center including all material, boring, labor, tools, transportation, accessories etc. Complete in all respects including detailed test reports. Estimated earth stations are taken at this stage. Contractor has to check the soil resistivity at site and propose required stations to achieve earth resistance not more than one ohms. ***Must Use Bentonite Moisture high moisture retaining clay poweder.***							
	EARTH STATIONS							

G1	Providing , installation , testing and commissioning of earthing set which consist of one copper rod of size 20mm dia 3 meters long buried at 20 Feet below the ground level or until recieved water and 6" dia boring including G.I pipe and back filled chemical / lime powder wooden cool to enhance conductivity, Including all material, boring, labor, tools, transportation, accessories etc. Complete in all respects including detailed test reports. . Contractor has to check the soil resistivity at site and propose required stations to achieve earth resistance not more than one ohms.	2	Nos.	60,000	120,000	10,000	20,000	140,000
	EARTH TEST POINTS / CONNECTING POINTS							
G2	**Earth Test Point including Test Link** , 300 mm x 50 mm x 5 mm (4 Way) electroplated Copper bar , as shown in drawings. Bar shall be provided with holes (4 Way) suitable for installation of required earth leads. The test bar shall be enclosed in powder coated metal enclosure as approved by the client.	2	Nos.	15,000	30,000	5,000	10,000	40,000
	EARTH LEADS / CONDUCTORS							
G3	**Single Core PVC insulated**, 16 Sqmm Stranded Copper Conductor, green in color from earth pit to test point and from test point to connecting point / Panels in 32mm size of UPVC Conduit.	20	RM.	800	16,000	300	6,000	22,000
G4	**Single Core PVC insulated**, 1C, 10 Sqmm Solid Copper Conductor, green in color from earth connecting point to com rack and other electronic equipments.	20	RM.	550	11,000	300	6,000	17,000
TOTAL AMOUNT - SEC - G (PKR) (CARRIED FORWARD TO SUMMARY)				**-**	**177,000**	**-**	**42,000**	**219,000**
SECTION - H TESTING REPORTS & AS BUILT DRAWINGS								
H1	**Megger Testing** of all electrical wiring including detailed test report duly checked and attested by consultant and building management / representative.	1	Job.	0	0	35,000	35,000	35,000

H2	Preparation and submission of detailed shop drawings of complete electrical and allied works including dimensions, mounting heights, exact routes, single line diagrams etc. Item includes hard copies (3sets) in A3 size or ***advised by consultant***, and soft copies in CD for consultants/clients/building management. The shop drawings shall be submitted after verification of consultant.	1	Job.	0	0	35,000	35,000	35,000
H3	Allow for any other item required for completion of system not covered in BOQ or specifications / drawings in accordance with the same standards and brands shown and approved by consultant. All such items shall be covered in this item but complete description, item rates, quantity required and brands shall be mentioned separately and to be attached with the BOQ.	1	Job.	0	0	0	0	0
TOTAL AMOUNT - SEC -H (PKR) (CARRIED FORWARD TO SUMMARY)				-	**0**	**-**	**70,000**	**70,000**

RE-CONSTRUCTION OF OFFICE BLOCK

Civil, Electrical & Plumbing Works

DISMANTLING AND DEMOLITION WORKS

Sr.	Item description	Quantity	Unit	Rate	Amount
	SCHEDULE ITEMS				
1	Dismantling of cement concrete plain				
(a)	Cement concrete plain 1:4:8 Chapter # 2, Page-19, Item # 19(a)	1,046.34	P.Cft	68.12	71,276.45
(b)	Cement concrete plain 1:3:6 Chapter # 2, Page-20, Item # 19(b)	351.71	P.Cft	87.14	30,648.36
2	Brick work Chapter # 2, Page-19, Item # 13	2,992.48	P.Cft	59.41	177,783.31
3(a)	Removing Doors with chowket Chapter # 2, Page-21, Item # 33(a)	246.40	P.door	574.26	141,497.66
3(b)	Removing Windows and skylight with chowket Chapter # 2, Page-21, Item # 33(b)	228.80	P.window	465.31	106,462.93
4	Dismantling cement concrete reinforced separating reinforced cement from concrete cleaning and straightening the same. Chapter # 2, Page-20, Item # 20	3,498.82	P.Cft	229.72	803,747.80
	TOTAL AMOUNT				**1,331,417**

TENDER DRAWINGS

CADET COLLEGE PETARO

RE-CONSTRUCTION OF OFFICE BLOCK

CIVIL, ELECTRICAL & PLUMBING WORKS

TENDER DRAWING

ARCHITECTURAL,STRUCTURAL,PLUMBING & ELECTRICAL DRAWINGS

PREPARED BY:

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ARCHITECTURAL DRAWINGS

PREPARED BY:

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LIST OF ARCHITECTURAL DRAWINGS

S.NO.	DWG. NO.	DESCRIPTION
1	AR-00	LIST OF ARCHITECTURAL DRAWINGS
2	AR-01	GROUND FLOOR PLAN
3	AR-02	SECTION & ELEVATION

3rd Revision :	———	Date:	———
2nd Revision :	———	Date:	———
1st Revision :	———	Date:	———
ISSUED FOR :	TENDER DRAWING	Date:	09-02-2026

CLIENT:	CADET COLLEGE PETARO	DESCRIPTION : LIST OF ARCHITECTURAL DRAWING
JOB TITLE:	EXTENSION OF ADMINISTRATION BLOCK	

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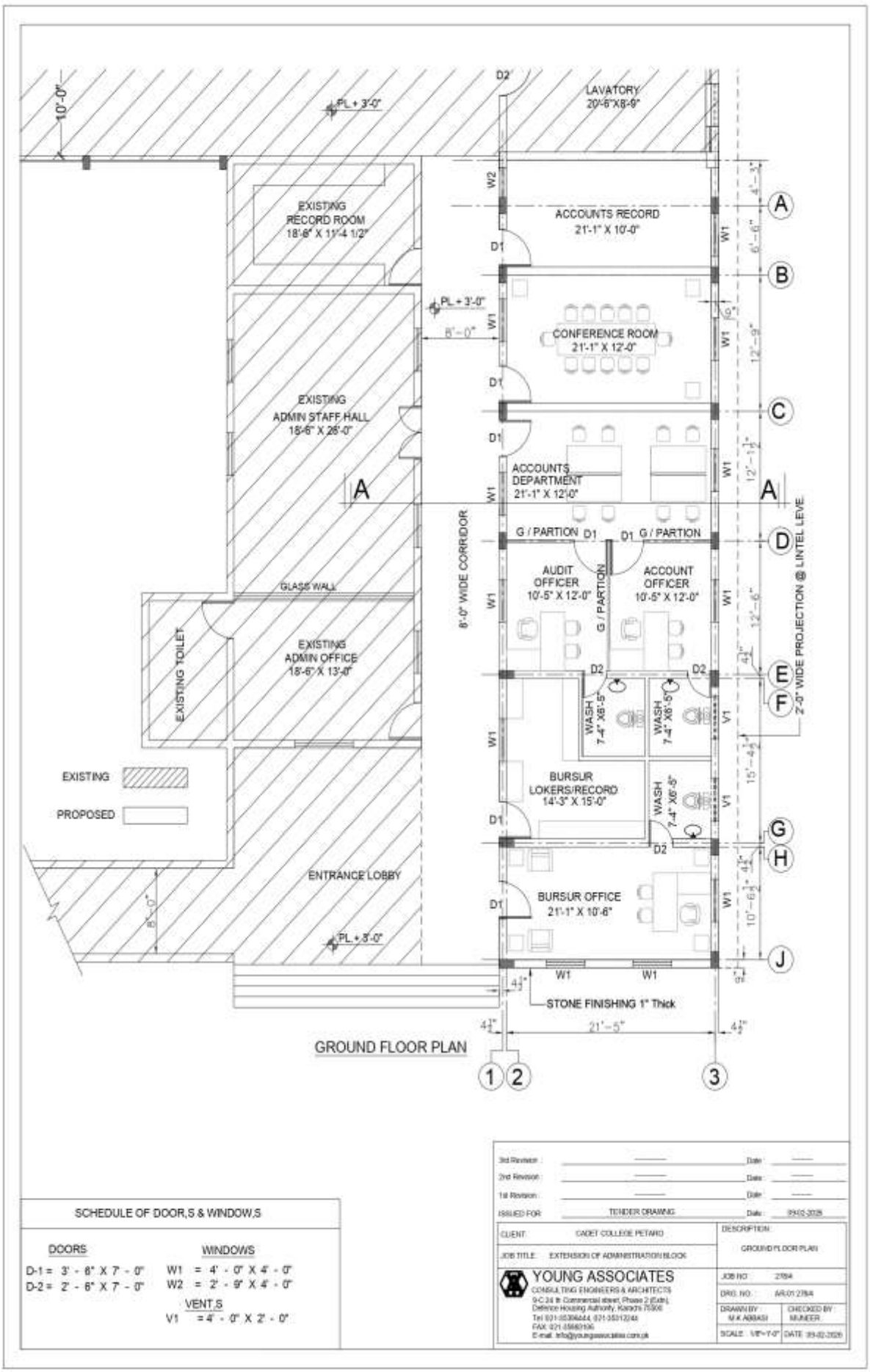
JOB NO :	276/4
DRG. NO. :	AR-80-276/4
DRAWN BY : M.K.ABBASI	CHECKED BY : MUNEER
SCALE :	DATE: 09-02-2026



SCHEDULE OF DOOR,S & WINDOW,S

DOORS		WINDOWS	
D-1 =	3' - 6" X 7' - 0"	W1 =	4' - 0" X 4' - 0"
D-2 =	2' - 6" X 7' - 0"	W2 =	2' - 9" X 4' - 0"

VENT,S
V1 = 4' - 0" X 2' - 0"

3rd Revision		Date	
2nd Revision		Date	
1st Revision		Date	
ISSUED FOR	TENDER DRAWING	Date	09-02-2026
CLIENT	CADET COLLEGE PETARO	DESCRIPTION	GROUND FLOOR PLAN
JOB TITLE	EXTENSION OF ADMINISTRATION BLOCK		

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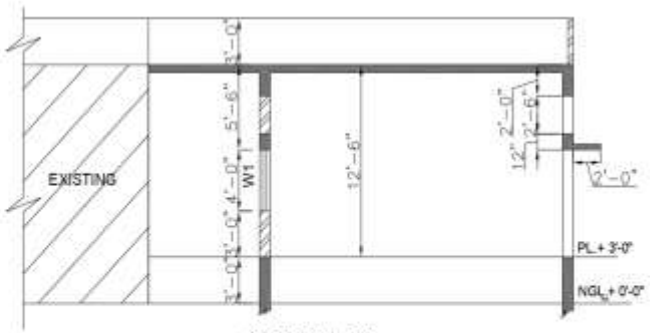
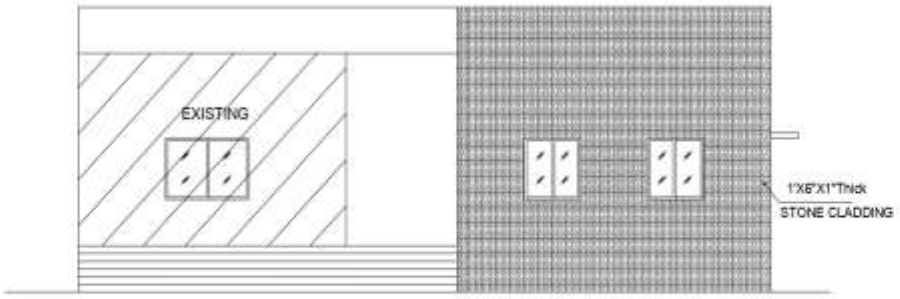
JOB NO	2764
DRG. NO.	AR-01-2764
DRAWN BY : M.K ABBASI	CHECKED BY : MUNEER
SCALE 1/8"=1'-0"	DATE 09-02-2026



SECTION B-B



ELEVATION

3rd Revision :	———	Date :	———
2nd Revision :	———	Date :	———
1st Revision :	———	Date :	———
ISSUED FOR	TENDER DRAWING	Date :	09-02-2026

CLIENT : CADET COLLEGE PETARO	DESCRIPTION : SECTION AND ELEVATION
JOB TITLE : EXTENSION OF ADMINISTRATION BLOCK	

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JOB NO : 2784	
DRG. NO : AR-02 2784	
DRAWN BY : M.K ABBASI	CHECKED BY : MUNEER
SCALE : 1/8"=1'-0"	DATE : 09-02-2026

STRUCTURAL DRAWINGS

PREPARED BY:

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GENERAL NOTES

1. REINFORCED CONCRETE DESIGN IS BASED ON BUILDING CODE REQUIREMENT FOR REINFORCED CONCRETE (ACI 318.02)
2. FOUNDATION DESIGN IS BASED UPON A SAFE SOIL BEARING CAPACITY OF 2.5 T / SQ.FT.
3. COORDINATE STRUCTURAL DRAWING'S WITH ARCHITECTURAL DRAWINGS IN CASE OF DISCREPANCY REFER TO ENGINEER IN CHARGE
4. ALL DIMENSIONS ARE IN FEET/INCHES.
5. DO NOT SCALE THE DRAWING, FOLLOW WRITTEN DIMENSIONS OR REFER TO CONSULTANT
6. THE CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS AND LEVELS BEFORE EXECUTION
7. ALL ERRORS AND OMISSIONS TO BE REFERED TO THE CONSULTANT / ENGINEER PRIOR TO EXECUTION OF WORK
8. PRIOR TO CASTING CONCRETE REFER TO ARCHITECTURAL, PLUMBING , ELECTRICAL AND HAVC DRAWINGS FOR EMBEDDED ITEMS.
9. ALL MATERIALS SHALL CONFIRM TO THE SPECIFICATIONS SHOWN ON THE DRAWINGS IN ABSENCE OF ANY SPECIFICATION ALL MATERIALS SHOULD CONFIRM TO RELEVANT ACI STANDARDS AND SHALL SUBJECT TO APPROVAL OF THE CONSULTANT.
10. CONCRETE CUBES SHALL BE AVAILABAL AT SITE AND SAMPLE FROM RANDOM BATCHES WILL BE TAKEN DURING CONCRETING TEST CUBES MOULDS
11. SLUMP CONE SHALL BE MADE AVAILBLE AT SITE BY THE CONTRACTOR AND RANDOM SAMPLES WILL BE CHECKED DURING CONCRETING.
12. THE WATER USED FOR CONCRETE MIXING AND CURING SHOULD BE OF POTABLE QUALITY AND WITHOUT ANY IMPURITIES. A SAMPLE SHOULD BE TESTED IN LABORATORY FOR SULPHATE AND CHLORIDE CONTENTS.
13. FINE AND COARSE AGGREGATES SHOULD BE FREE FROM CLAY, LOAMS OR ANY OTHER ORGANIC IMPURITIES. A TEST SHOULD BE CARRIED OUT BEFORE USE.
14. ATMOSPHERIC TEMPERATURE SHOULD BE BETWEEN 32 C TO 5 C, AT THE TIME OF CONCRETE POURING.
15. R.C.C.CONCRETE STRENGTHS (fc IN PSI) AT 28 DAYS FOR VARIOUS STRUCTURAL MEMBERS SHALL BE.
    FOUNDATION/ BEAMS/ SLAB (fc' = 3000 psi)
    COLUMNS (fc' = 4000 psi)
    LEAN CONCRETE (1 : 4 : 8)
16. ALL R.C.C.WORKS SHALL BE CONTINUOUSLY MOIST CURED FOR AT LEAST 14 DAYS OR CURED BY CURING COMPOUND.
17. FORM WORK SUPPORTING R.C.C. MEMBERS SHALL BE REMOVED AT LEAST AFTER 14 DAYS.
18. ALL R.C.C.WORKS SHALL BE INTERNALLY VIBRATED WITH ELECTRO MECHANICAL VIBRATOR.
19. MINIMUM CLEAR CONCRETE COVER TO REINFORCEMENT SHALL BE AS FOLLOWS.
    FOUNDATION..... 2"
    BEAMS ..... 3/4"
    COLUMNS/WALLS ..... 1 1/2"
    SLAB..... 3/4"
20. BEAMS AND SLABS SHOULD BE CASTED MONOLITHIC.
21. PRIOR TO PLACING CONCRETE ALL REINFORCEMENT SHALL BE FREE OF LOOSE RUST AND SCALE OR ANY FOREIGN MATERIALS.
22. SPLICE LENGTH SHALL BE 40 Ø BOTTOM BAR, 60 Ø TOP BAR, 48 Ø COLUMNS BAR,
23. ALL INTERNAL & EXTERNAL PLASTER ON R.C.C. MEMBERS TO BE OF RATIO 1:4 AND THICKNESS SHOULD NOT EXCEED 3/4".

3rd Revision		Date	
2nd Revision		Date	
1st Revision :		Date	
ISSUED FOR	TENDER DRAWING	Date	05-02-2026

CLIENT	CADET COLLEGE PETARO	DESCRIPTION	GROUND FLOOR PLAN
JOB TITLE	EXTENSION OF ADMINISTRATION BLOCK		

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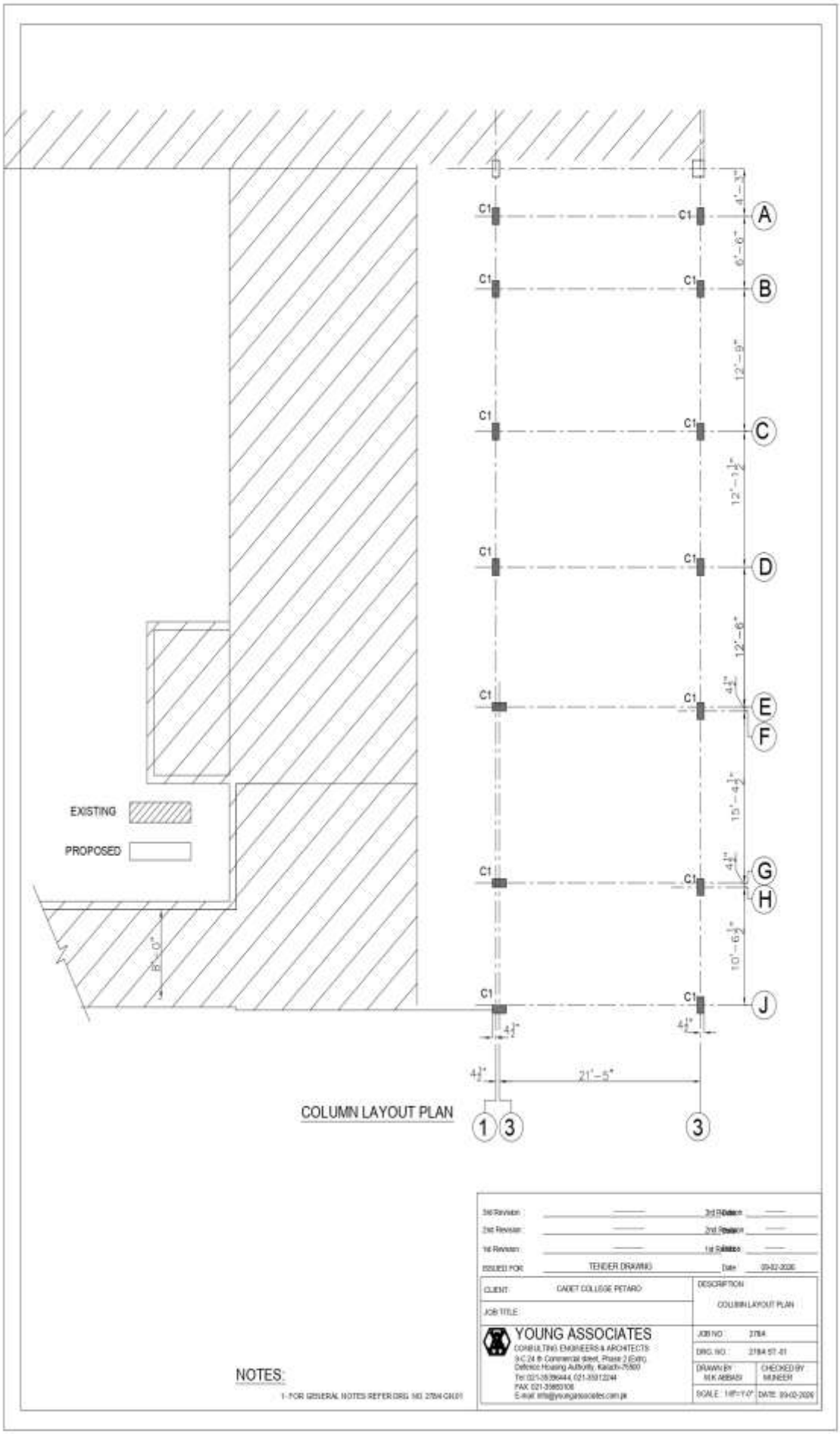
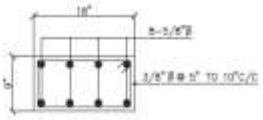
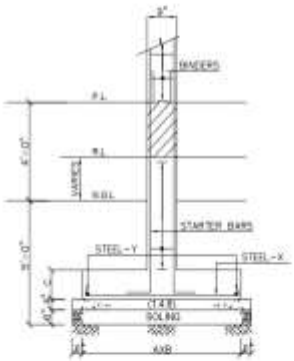
JOB NO	2784	
DRG. NO	GH-01 2784	
DRAWN BY : M.K.ABBASI	CHECKED BY : MUNEER	
SCALE : 1/8"=1'-0"	DATE : 09-02-2026	

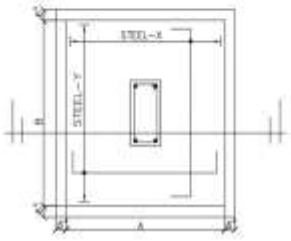

EXISTING
PROPOSED
C1
A
B
C
D
E
F
G
H
J
1
3
4'-3"
6'-6"
12'-9"
12'-1½"
12'-6"
4½"
15'-4½"
10'-6½"
21'-5"
8'-0"
COLUMN LAYOUT PLAN
NOTES:
1- FOR GENERAL NOTES REFER DRG. NO. 2784-GN-01
TENDER DRAWING
CADET COLLEGE PETARO
COLUMN LAYOUT PLAN
YOUNG ASSOCIATES
CONSULTING ENGINEERS & ARCHITECTS
JOB NO 2784
DRG. NO 2784-ST-01
DRAWN BY M.K.ABBASI
CHECKED BY MUNEER
SCALE 1/8"=1'-0"
DATE 03-02-2026



TYP. SECTION OF COLUMN C-1



TYP.SECTION OF FOOTINGS



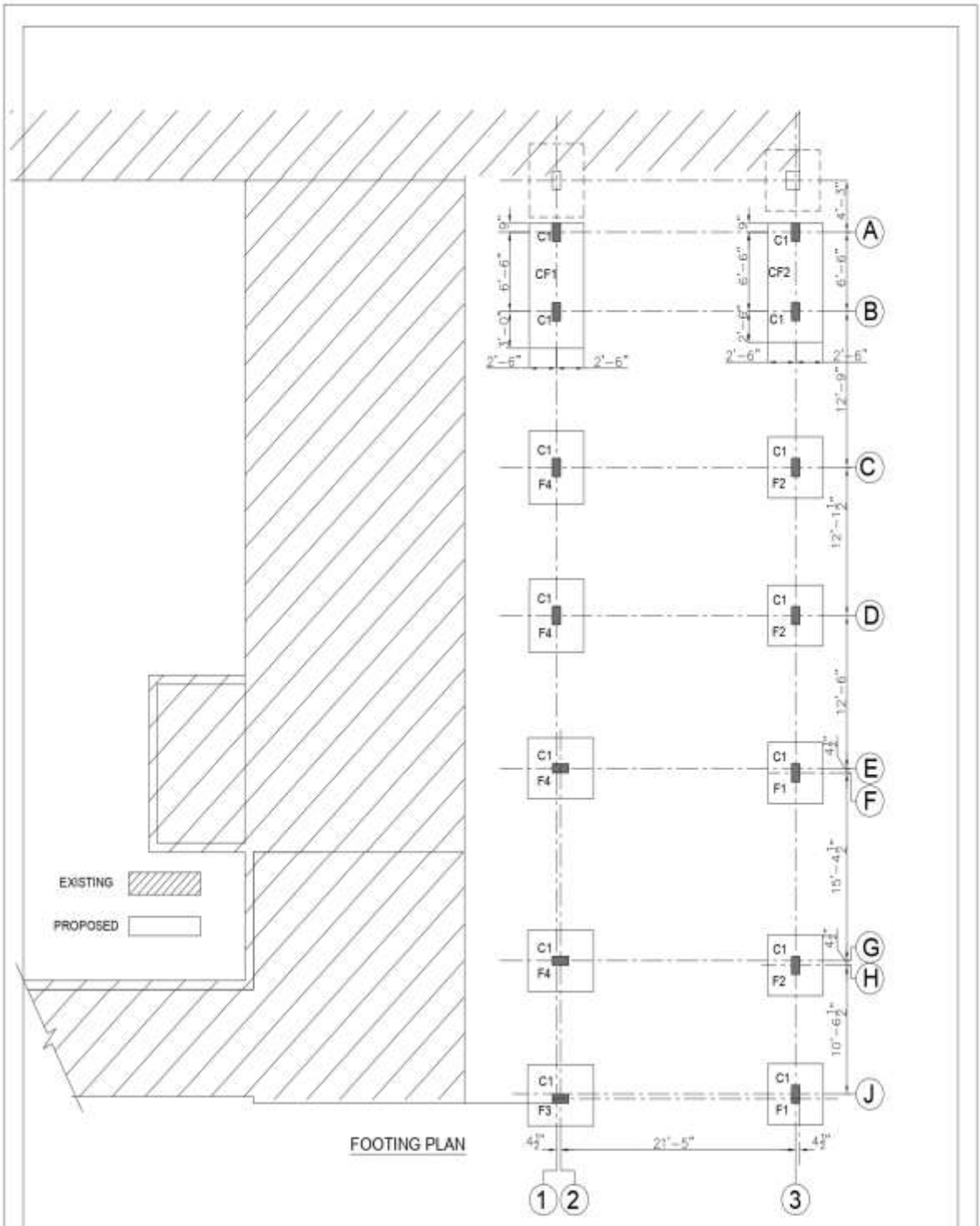
TYP.PLAN OF FOOTINGS

TYP.COLUMN ELEVATION

NOTES:

1- FOR GENERAL NOTES REFER DRG. NO. 2784 GN.01

3rd Revision :		Date :	
2nd Revision :		Date :	
1st Revision :		Date :	
ISSUED FOR	TENDER DRAWING	Date :	09-02-2026
CLIENT :	CADET COLLEGE PETARO	DESCRIPTION :	COLUMN SECTION & REINFORCEMENT DETAILS
JOB TITLE :	EXTENSION OF ADMINISTRATION BLOCK		
YOUNG ASSOCIATES CONSULTING ENGINEERS & ARCHITECTS 9-C 24 th Commercial street, Phase 2 (Extn), Defence Housing Authority, Karachi-75500 Tel: 021-35896444, 021-35312244 FAX: 021-35893108 E-mail: info@youngassociates.com.pk		JOB NO :	2784
		DRG. NO. :	2784 ST.02
		DRAWN BY : M.K.ABBASI	CHECKED BY : MUNEER
		SCALE : 1/8"=1'-0"	DATE : 09-02-2026



FOOTING PLAN

NOTES:

1- FOR GENERAL NOTES REFER DRG. NO. 2784 GN.01

SCHEDULE OF ISOLATED FOOTINGS

S.NO.	EXCAVATION SIZE	A	B	C	BOTTOM REINFORCEMANT	
					STEEL-X	STEEL-Y
F-1	6'-0" X 6'-0"	5'-0"	5'-0"	15"	1/2" @ 8"C/C	1/2" @ 8"C/C
F-2	6'-0" X 6'-0"	5'-0"	5'-0"	18"	1/2" @ 8"C/C	1/2" @ 8"C/C
F-3	7'-0" X 6'-0"	6'-0"	5'-0"	18"	1/2" @ 6"C/C	1/2" @ 6"C/C
F-4	7'-0" X 6'-0"	6'-0"	5'-0"	20"	1/2" @ 6"C/C	1/2" @ 8"C/C
CF-1	6'-0" X 11'-3"	5'-0"	10'-3"	20"	1/2" @ 6"C/C	1/2" @ 8"C/C
CF-2	6'-0" X 10'-9"	5'-0"	9'-9"	20"	1/2" @ 6"C/C	1/2" @ 8"C/C

3rd Revision :		Date:	
2nd Revision :		Date:	
1st Revision :		Date:	
ISSUED FOR	TENDER DRAWING	Date:	09-02-2026
CLIENT:	CADET COLLEGE PETARO	DESCRIPTION:	FOOTING PLAN & REINFORCEMENT DETAILS
JOB TITLE:	EXTENSION OF ADMINISTRATION BLOCK		

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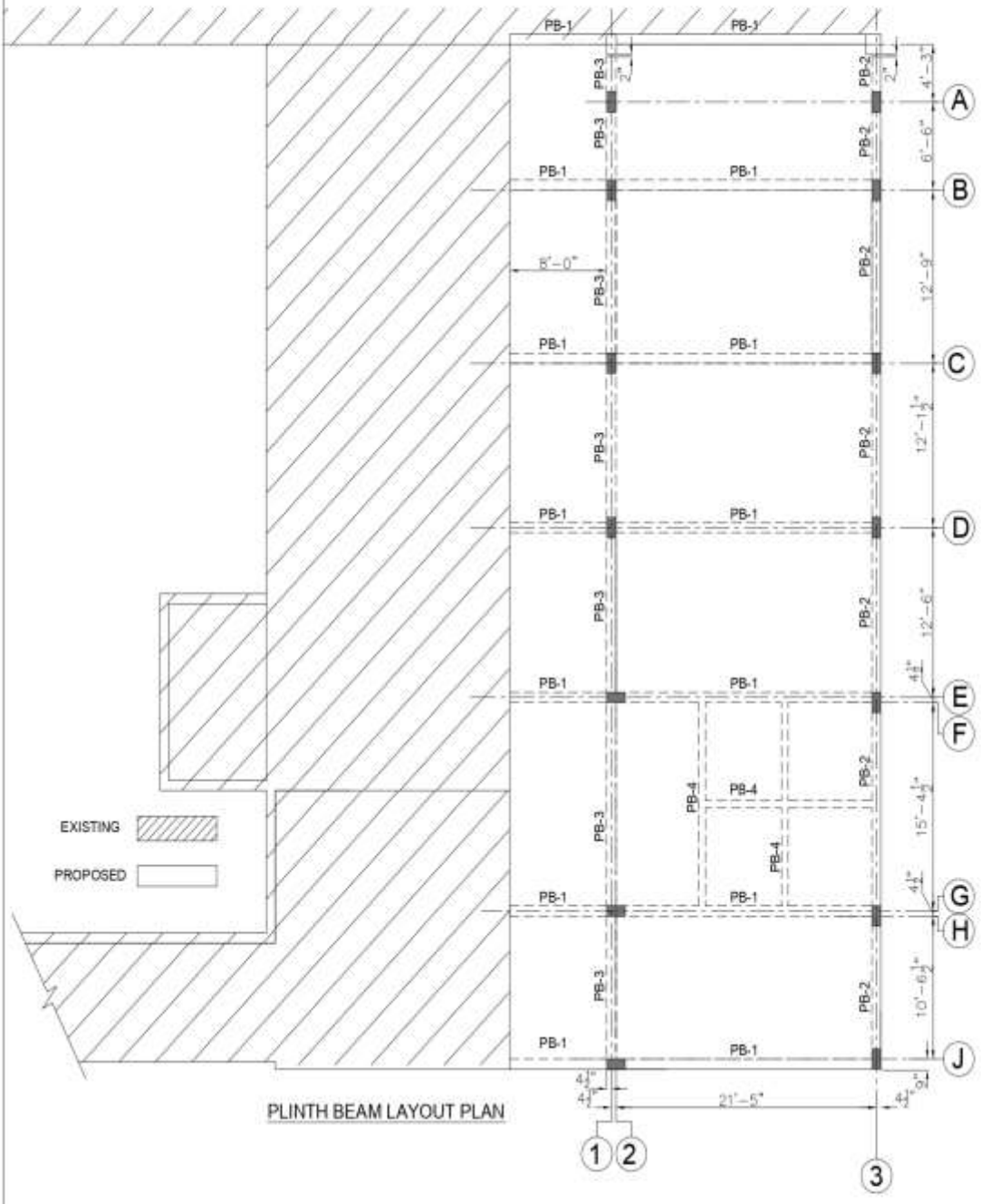
JOB NO.	2784
DRG. NO. :	2784 ST 03
DRAWN BY : M.K ABBASI	CHECKED BY : MUNEER
SCALE : 1/8"=1'-0"	DATE: 09-02-2026

SCHEDULE OF PLINTH

BEAMS NO.S	BEAMS SIZE B X H	TOP STEEL CONT.	BOTT. STEEL CONT.	EXTRA ON CONT. SUPPORT		EXTRA BOTTOM	MID BARS	RINGS @ L/H	RINGS @ CENTER
				L-SUPP.	R-SUPP.				
PB-1	9"X18"X24"	3-5/8"Ø	2-5/8"Ø	3-5/8"Ø	3-5/8"Ø	3-5/8"Ø	———	3/8"Ø @5"C/C	3/8"Ø @10"C/C
PB-2	9" X 24"	3-5/8"Ø	3-5/8"Ø	———	———	———	———	3/8"Ø @5"C/C	3/8"Ø @10"C/C
PB-3	9" X 24"	3-5/8"Ø	4-5/8"Ø	2-5/8"Ø	2-5/8"Ø	———	———	3/8"Ø @5"C/C	3/8"Ø @10"C/C
PB-4	6" X 24"	2-5/8"Ø	2-5/8"Ø	———	———	———	———	3/8"Ø @5"C/C	3/8"Ø @10"C/C



PLINTH BEAM LAYOUT PLAN

NOTES:

1- FOR GENERAL NOTES REFER DRG. NO. 2784 GN-01

3rd Revision :	———	Date:	———
2nd Revision :	———	Date:	———
1st Revision :	———	Date:	———
ISSUED FOR :	TENDER DRAWING	Date :	09-02-2026
CLIENT :	CADET COLLEGE PETARO	DESCRIPTION :	PLINTH BEAM PLAN & REINFORCEMENT DETAILS
JOB TITLE :	EXTENSION OF ADMINISTRATION BLOCK		

YOUNG ASSOCIATES
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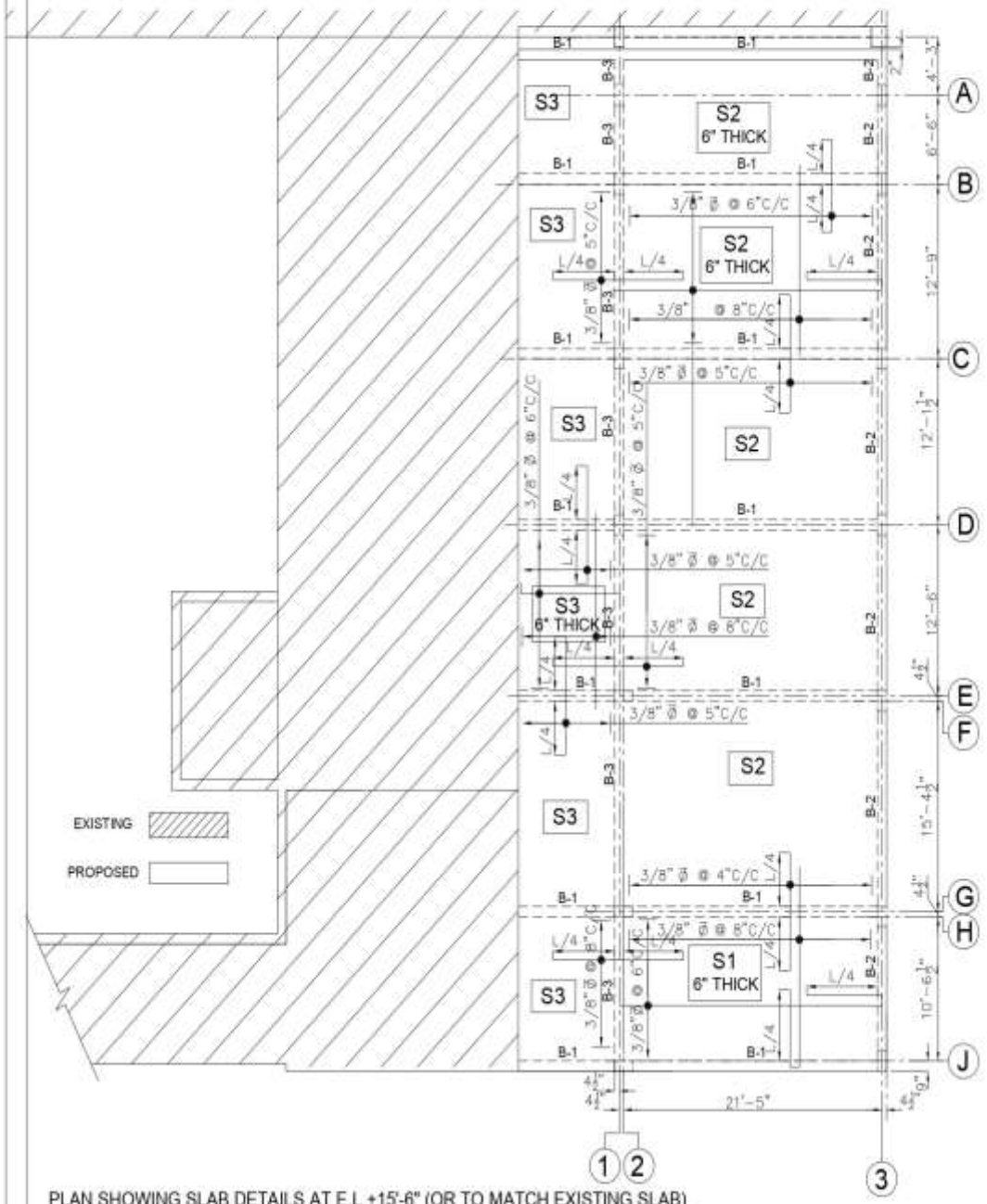
JOB NO :	2784
DRG. NO :	2784/ST- 04
DRAWN BY : M.N. ABBASI	CHECKED BY : MUNEER
SCALE : 1/8"=1'-0"	DATE: 09-02-2026

SCHEDULE OF ROOF BEAMS

BEAMS NO'S	BEAMS SIZE B X H	TOP STEEL CONT.	BOTT. STEEL CONT.	EXTRA ON CONT. SUPPORT		EXTRA BOTTOM	MID BARS	RINGS @ L/4	RINGS @ CENTER
				L-SUPP.	R-SUPP.				
B-1	8"X18"X24"	3-5/8"Ø	3-5/8"Ø	———	———	———	———	3/8"Ø @5"C/C	3/8"Ø @10"C/C
B-2	9" X 24"	3-5/8"Ø	4-5/8"Ø	2-5/8"Ø	2-5/8"Ø	———	———	3/8"Ø @5"C/C	3/8"Ø @10"C/C
B-3	6" X 24"	2-5/8"Ø	2-5/8"Ø	———	———	———	———	3/8"Ø @5"C/C	3/8"Ø @10"C/C



PLAN SHOWING SLAB DETAILS AT E.L +15'-6" (OR TO MATCH EXISTING SLAB)

NOTES:

1- FOR GENERAL NOTES REFER DRG. NO 2784 GN-01

3rd Revision	———	Date	———
2nd Revision	———	Date	———
1st Revision	———	Date	———
ISSUED FOR	TENDER DRAWING	Date	03-02-2026
CLIENT:	CADET COLLEGE PETARO	DESCRIPTION:	ROOF SLAB / FRAMING PLAN & REINFORCEMENT DETAILS
JOB TITLE:	EXTENSION OF ADMINISTRATION BLOCK		
YOUNG ASSOCIATES CONSULTING ENGINEERS & ARCHITECTS 9-C 24 th Commercial street, Phase 2 (Extn), Defence Housing Authority, Karachi-75500 Tel: 021-35398444, 021-35312244 FAX: 021-35883106 E-mail: info@youngassociates.com.pk		JOB NO:	2784
		DRG. NO:	2784 ST -05
		DRAWN BY: M.K ABBASI	CHECKED BY: M.REER
		SCALE: 1/8"=1'-0"	DATE: 03-02-2026

PLUMBING DRAWINGS

PREPARED BY:

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LIST OF PLUMBING DRAWINGS

S.NO.	DWG. NO.	DESCRIPTION
1	WS-00	LIST OF PLUMBING DRAWINGS
2	WS-01	WATER SUPPLY SYSTEM
3	WS-02	WATER SUPPLY SYSTEM
4	DS-01	DRAIN SYSTEM PLAN

3rd Revision : ..... Date : .....
2nd Revision : ..... Date : .....
1st Revision : ..... Date : .....
ISSUED FOR : TENDER DRAWING Date : 09-02-2026

CLIENT : CADET COLLEGE PETARO
JOB TITLE : EXTENSION OF ADMINISTRATION BLOCK
DESCRIPTION : LIST OF PLUMBING DRAWING

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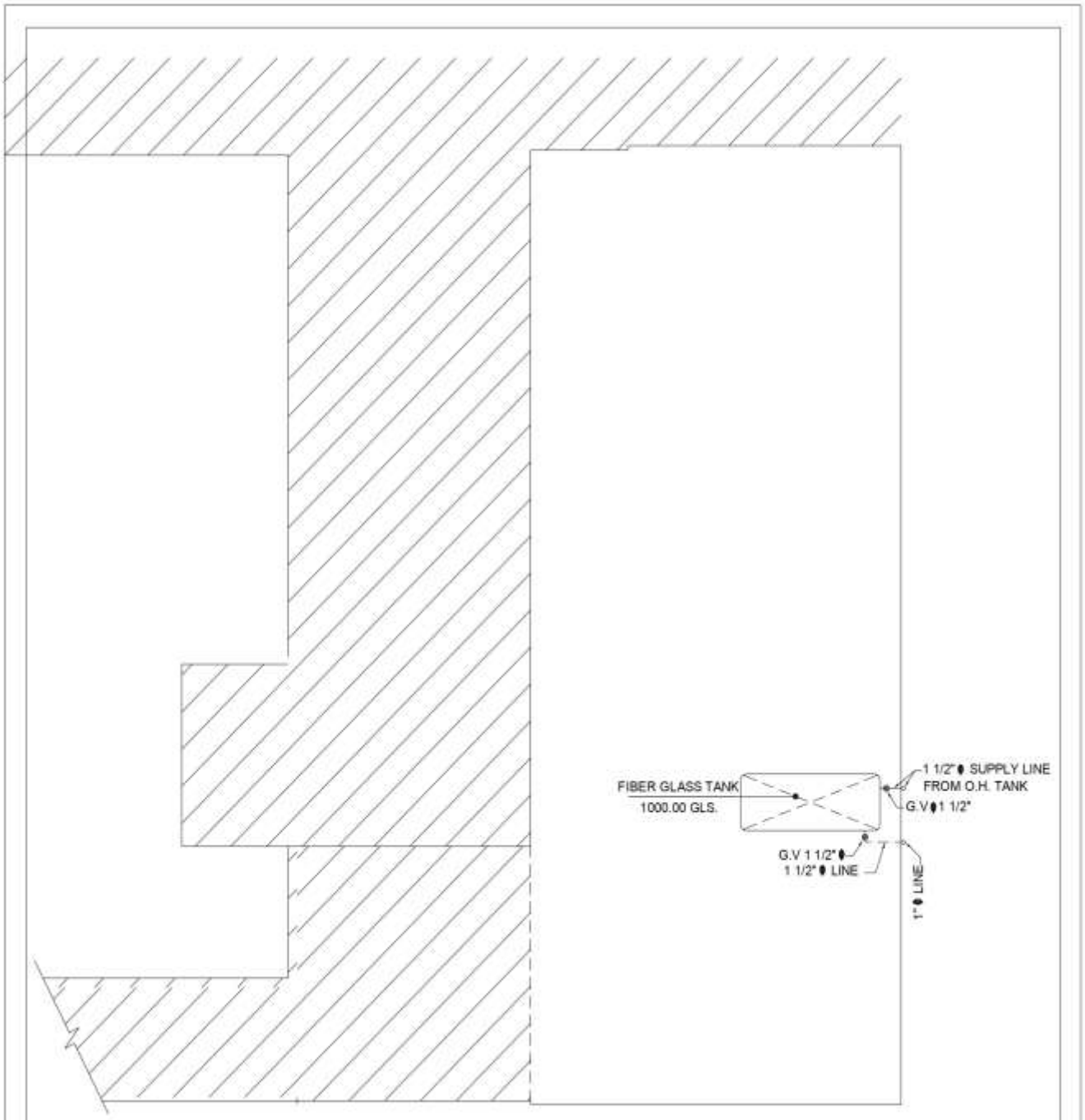
JOB NO : 278/4
DRG. NO. : SW-00 278/4
DRAWN BY : M.K ABBASI
CHECKED BY : MUNEER
SCALE: 1/8"=1'-0" DATE:09-02-2026



ROOF PLAN

	LEGEND	SYMBOLE
1	11/2"ϕ PIPE U P.V.C W / LINE	
2	1"ϕ PIPE U P.V.C W / LINE	
3	3/4"ϕ PIPE U P.V.C W / LINE	
4	1/2"ϕ PIPE U P.V.C W / LINE	
5	GATE VALVE	
6	B/B COCK	B.C
7	EUROPEAN	
8	WASH BASIN	W.B

3rd Revision :	----------	Date :	----------
2nd Revision :	----------	Date :	----------
1st Revision :	----------	Date :	----------
ISSUED FOR	TENDER DRAWING	Date :	09-02-2026

CLIENT: CADET COLLEGE PETARO	DESCRIPTION : WATER SUPPLY SYSTEM PLAN
JOB TITLE : EXTENSION OF ADMINISTRATION BLOCK	

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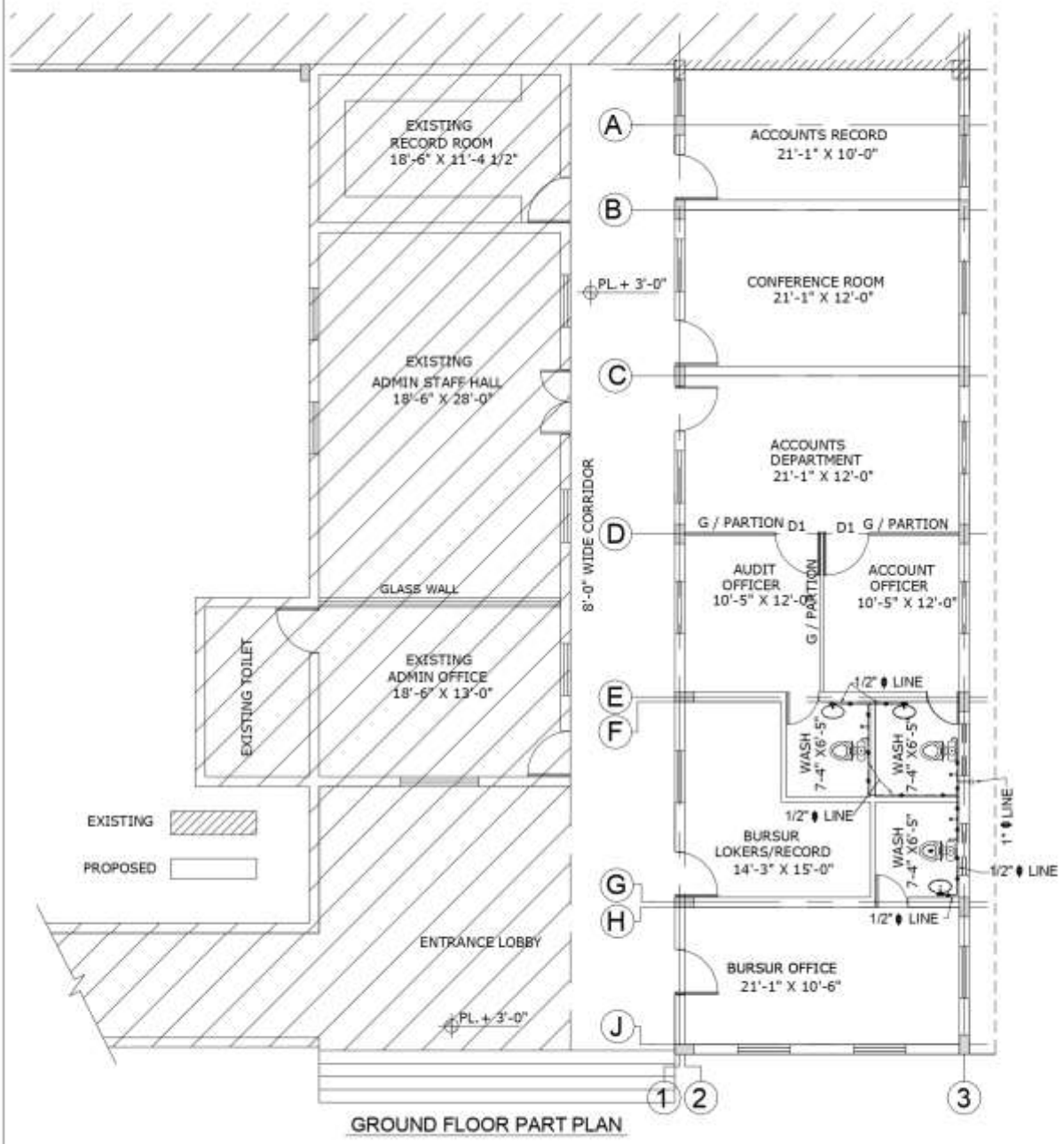
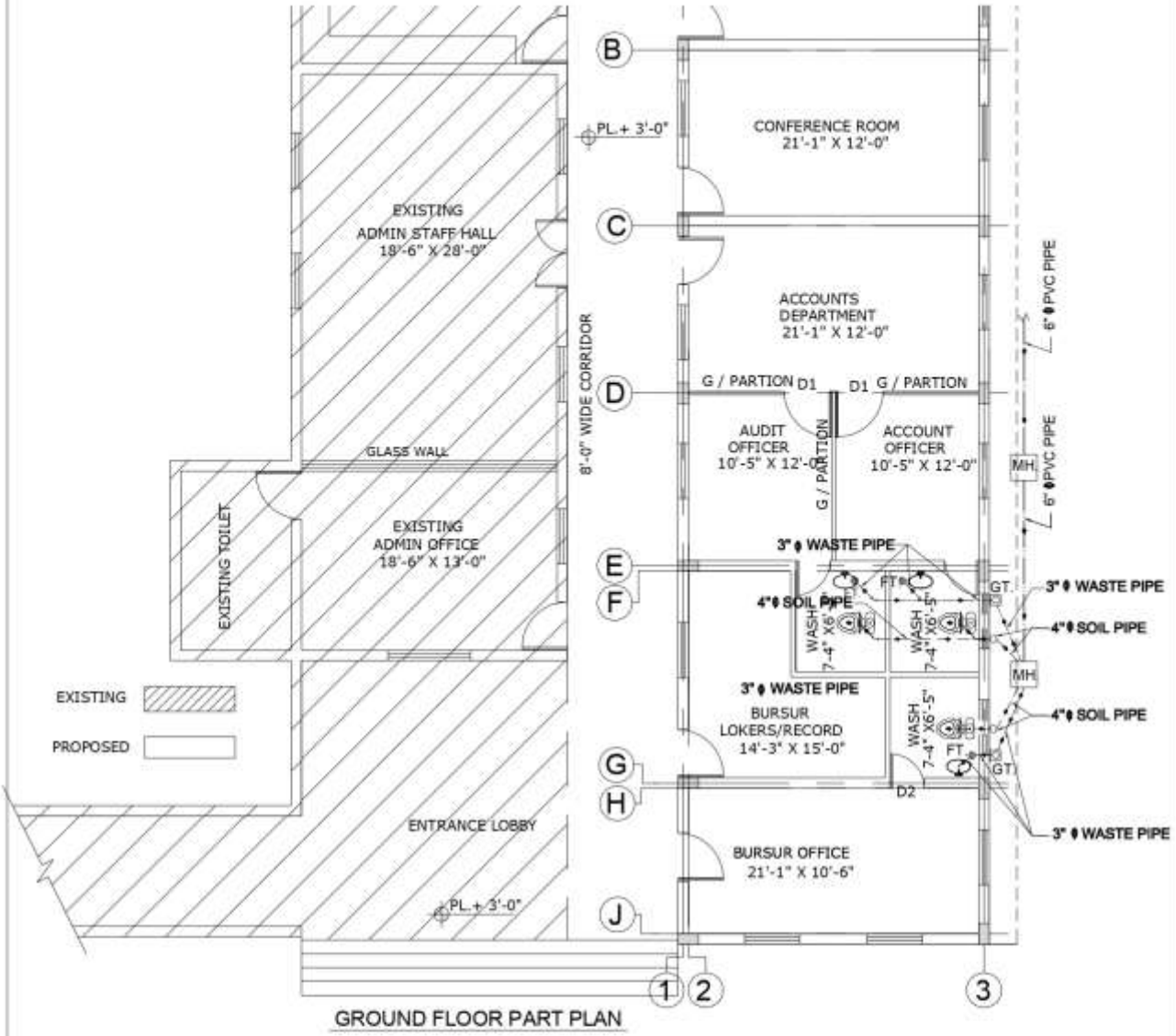
JOB NO :	278/4
DRG. NO. :	WS-01 278/4
DRAWN BY : M.K ABBASI	CHECKED BY : MUNEER
SCALE:1/8"=1'-0"	DATE:09-02-2026



GROUND FLOOR PART PLAN

	LEGEND	SYMBOLE
1	11/2"ϕ PIPE U.P.V.C.W / LINE	
2	1"ϕ PIPE U.P.V.C.W / LINE	
3	3/4"ϕ PIPE U.P.V.C.W / LINE	
4	1/2"ϕ PIPE U.P.V.C.W / LINE	
5	GATE VALVE	
6	BIB COCK	B.C
7	EUROPEAN	
8	WASH BASIN	W.B

3rd Revision :		Date :	
2nd Revision :		Date :	
1st Revision :		Date :	
ISSUED FOR	TENDER DRAWING	Date :	09-02-2026
CLIENT:	CADET COLLEGE PETARO	DESCRIPTION :	WATER SUPPLY SYSTEM PLAN
JOB TITLE :	EXTENSION OF ADMINISTRATION BLOCK		
YOUNG ASSOCIATES CONSULTING ENGINEERS & ARCHITECTS 9-C 24 th Commercial street, Phase 2 (Extn), Defence Housing Authority, Karachi-75500 Tel :021-35395444, 021-35312244 FAX: 021-35863106 E-mail: info@youngassociates.com.pk		JOB NO :	278/4
		DRG. NO. :	WS-02 278/4
		DRAWN BY : M.K ABBASI	CHECKED BY : MUNEER
		SCALE:1/8"= 1'-0"	DATE:09-02-2026



GROUND FLOOR PART PLAN

GENERAL NOTE,S FOR WATER AND SEWERAGE

1) ALL PIPES TO BE TESTED BEFORE COVERING.
2) ALL MANHOLES SHALL BE OF SIZES 16"X16" INTERNAL AND THEIR INVERT LEVELS ARE RELATED TO FINISHED FLOOR LEVELS OF INDIVIDUAL HOUSE.
3) ALL C.I MANHOLES COVERS SHALL BE OF 18"X18" AND LAID FLUSH WITH ADJOINING SURFACES OF FLOOR.
4) ALL GALLY TRAPS SHALL BE OF P.V.C WITH C.I COVERS
5) ALL FLOOR TRAPS SHALL BE OF P.V.C WITH P.V.C GRATING OF 6"X6"
6) FOR ARCHITECTURAL GENERAL NOTES REFER DRG.
7) ALL INTERNAL WATER LINES MUST BE U.P.V.C OF REQUIRED SIZES

	LEGEND	SYMBOLE
1	6"ϕ PIPE P.V.C SEWER LINE	
2	4"ϕ PIPE P.V.C SEWER LINE	
3	3"ϕ PIPE P.V.C SEWER LINE	
4	EUROPEAN	
5	WASH BASIN	W.B
6	WATER CLOSET	W.C
7	MAN HOLE	MH.
8	GULLY TRAP	GT.
9	FLOOR TRAP	FT.

3rd Revision :		Date :	
2nd Revision :		Date :	
1st Revision :		Date :	
ISSUED FOR	TENDER DRAWING	Date :	09-02-2026
CLIENT:	CADET COLLEGE PETARO	DESCRIPTION :	DRAIN SYSTEM PLAN
JOB TITLE :	EXTENSION OF ADMINISTRATION BLOCK		

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JOB NO :	278/4
DRG. NO. :	DS-01 278/4
DRAWN BY : M.K ABBASI	CHECKED BY : MUNEER
SCALE:1/8"=1'-0"	DATE:09-02-2026

ELECTRICAL DRAWINGS

PREPARED BY:

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LIGHTING

SYMBOL	DESCRIPTION	MOUNTING HEIGHT
	DOWN LIGHT WITH 20W LED LIGHT AS APPROVED BY ARCHITECT	CEILING SURFACE / AS PER SITE
	MIRROR LIGHT POINT WITH 10W LED LIGHT AS APPROVED BY ARCHITECT	AS PER SITE
	CEILING FAN, AS APPROVED BY ARCHITECT	AS PER SITE
	EXHAUST WALL MOUNTED FAN, AS APPROVED BY ARCHITECT	AS PER SITE

SWITCHES & SOCKETS & COMMUNICATION

SYMBOL	DESCRIPTION	MOUNTING HEIGHT
	10A-1-WAY GANG TYPE SWITCH / DIMMER SWITCH	SWITCH BOTTOM AT 3'-0" AFFL
	13A MULTI PIN SWITCH SOCKET OUTLET	AT 1'-0" AFFL / AT 3'-0" AFFL / AFS / AT 7'-0" AFFL
	13A 3-PIN ROUND SWITCH SOCKET OUTLET	0'-9" A.F.F.L
	6-PIN 63A INDUSTRIAL SOCKET UNITS ON RAW POWER WITH CONNECTING PLUG	AT 1'-0" AFFL / AS PER SITE
	WIFI ROUTER	7'-0" A.F.F.L
	63A DOUBLE POLE SWITCH FOR AC	AT 7'-0" AFFL
	RJ-45 DATA OUTLET SIMPLEX / DUPLEX	AT 1'-0" AFFL / AT 3'-0" AFFL / AFS / AT 7'-0" AFFL
	RJ-45 TELEPHONE OUTLET	AT 1'-0" AFFL
	TV OUTLET FOR LED TV	0'-9" A.F.F.L
	DP / 4P ISOLATOR	AS PER SITE
	HDMI SOCKET	AS PER SITE
	2NO. 13A INTERNATIONAL SWITCH SOCKET (N/A/E, 2ND. 13A FLAT PIN) DUPLEX SWITCH SOCKET , 2ND. RJ-45 DUPLEX DATA OUTLET	PROVIDED IN FLOOR
	TECHNOLOGY DESK HAVING 2no 13A FLAT PIN DUPLEX , 2no 13A MULTIPIN & 1NO. VDICE AND 2 NO. DATA OUTLETS	AS PER FURNITURE
	HAND DRYER	WALL MOUNTED
	1NO. DUPLEX 13A SCHUKO SOCKET	AS PER FURNITURE

CCTV SYSTEMS

SYMBOL	DESCRIPTION	MOUNTING HEIGHT
	INDOOR CCTV IP DOME CAMERA	CEILING SURFACE
	WEATHER PROOF WALL BRACKET / BOX IP CAMERA	WALL MOUNTED

POWER DISTRIBUTION SYSTEM

SYMBOL	DESCRIPTION	MOUNTING HEIGHT
	DISTRIBUTION BOARD	DB TOP AT 1800MM AFFL
	CIRCUIT BREAKERS	INSIDE DB
	INDICATION LIGHTS	INSIDE DB
	VOLT METER	INSIDE DB
	DIGITAL SMLT METER	INSIDE DB
	COMMUNICATION RACK	BOTTOM AT 7'-0" A.F.F.L

RACEWAYS AND CABLES

SYMBOL	DESCRIPTION	MOUNTING HEIGHT
	CONDUIT RUNNING AT CEILING SLAB	AT CEILING SLAB
	CONDUIT RUNNING UNDER FLOOR & FLUSH WALL	UNDER FLOOR / FLUSH WALL
CCTV	CONDUIT RUNNING AT CEILING SLAB FOR CCTV SIGNAL WIRING	AT CEILING SLAB
SP	CONDUIT RUNNING AT CEILING SLAB FOR SPEAKER WIRING	AT CEILING SLAB
FA	CONDUIT RUNNING AT CEILING SLAB FOR FIRE ALARM WIRING	AT CEILING SLAB

TEXT

SYMBOL	DESCRIPTION
R1, Y1, B1	INDICATES LIGHTING CIRCUIT NUMBERS ON RED / YELLOW / BLUE PHASES
R1, Y1, B1	INDICATES POWER CIRCUIT NUMBERS ON RED / YELLOW / BLUE PHASES
S1,S2,S3.....	INDICATES SWITCH NO. S1,S2,S3 ETC.
2S-R1	INDICATES 2 NO. SWITCHES AND CIRCUIT NO. R1
UP/DN	CONDUIT UP / DOWN
T1,T2,T3.....	INDICATES TELEPHONE OUTLET NUMBERS
D1,D2,D3.....	INDICATES DATA OUTLET NUMBERS

GENERAL NOTES

1. ALL WIRING OF LIGHTING AND POWER SHALL BE WITH SINGLE CORE PVC INSULATED WIRES FOR SINGLE PHASE CIRCUIT. THE VOLTAGE GRADE OF WIRE SHALL BE 450/750V, WHERE AS FOR THREE PHASE CIRCUIT IT WILL BE 600/1000 VOLTS.
2. CIRCUIT WIRING SHALL BE WITH THE FOLLOWING SIZE OF WIRES UNLESS OTHERWISE INDICATED.
   a) DB TO SWITCH BOARD / SW TO SW——— 2x2.5 Sq.mm + ECC 1x2.5 Sq.mm
   b) SWITCH BOARD TO LIGHT POINT———— 1x1.5 Sq.mm + COMMON ECC 1x1.5 Sq.mm AND COMMON NEUTRAL 1x1.5 Sq.mm FOR ALL LIGHTS FIXTURE ON ONE CIRCUIT.
   c) 13A 3-PIN SWITCH SOCKET UNIT ——— 2x2.5 Sq.mm + ECC 1x2.5 Sq.mm
   d) 15A 3-PIN SWITCH SOCKET UNIT ——— 2x2.5 Sq.mm + ECC 1x2.5 Sq.mm
   e) SPLIT AIR-CONDITIONING UNIT (1.5/2 Tons)—— 2x4 Sq.mm + ECC 1x4 Sq.mm
   f) SPLIT AIR-CONDITIONING UNIT (1 Ton) ——— 2x4 Sq.mm + ECC 1x4 Sq.mm
3. CONDUIT UNDER FLOOR SHALL HAVE A MINIMUM DEPTH OF 50mm MEASURED FROM FINISH FLOOR LEVEL TO TOP OF CONDUIT.
4. MINIMUM SIZE OF CONDUIT SHALL BE 25mm Ø, UNLESS OTHERWISE INDICATED.
5. AVOID USING 4 WAY JUNCTION BOX AT EACH LOCATION. FOR TWO WAY CONNECTIVITY USE A 2 WAY JUNCTION BOX ALSO ADHESIVE SOLUTION TO BE USED FOR FIXING OF JUNCTION BOX.
6. USE PVC PLUGS/STOPPERS AT OPEN ENDS OF JUNCTION BOXES/PVC CONDUITS TO AVOID INGRESS OF CONCRETE.
7. CONTRACTOR SHALL PROVIDE THE REQUIRED CONDUIT SIZE WHERE EVER NOT INDICATED FOR THE EASE OF PULLING OF CABLES.
8. THE ELECTRICAL RESISTANCE OF ECC TOGETHER WITH EARTH LEAD AND ELECTRODE SHALL NOT EXCEED ONE OHM. THE CONTRACTOR SHALL OBTAIN INSTRUCTIONS FROM CONSULTANT FOR ANY RECTIFICATION.
9. FOR GROUP SWITCHING AND WHERE SWITCH BOXES CONTAIN MORE THAN ONE PHASE, APPROVED BARRIER SWITCH BOXES SHALL BE USED WITH A LABEL SHOWING THAT (380-400V) EXISTS IN THAT BOX.
10. BACK BOXES FOR SWITCHES, SOCKETS AND TELEPHONE ETC. SHALL BE MADE WITH 16SWG SHEET STEEL, POWER COATED.
11. WIRE AS ECC SHALL BE GREEN OR GREEN / YELLOW IN COLOR.
12. EARTHING RESISTANCE SHOULD BE LESS THAN ONE OHMS CONTRACTOR HAS TO INCREASE EARTHING MANHOLES WITH EARTH RODS TO REACH TO ONE OHM.
13. RUNNING LENGTHS SHOWN IN B.O.Q ARE NOT EXACT, CONTRACTOR SHOULD TAKE MEASUREMENTS BEFORE PURCHASING THE MATERIAL.
14. CONDUIT AND CABLES TO BE LAID UNDER FLOOR SHALL BE IN COORDINATION WITH OTHERS SERVICES.
15. EXACT LOCATION OF SWITCHES ,SOCKETS AND MIRROR LIGHTS TO BE GIVEN BY THE ARCHITECT.
16. CONDUIT AND CABLES TO BE LAID UNDER FLOOR SHALL BE IN COORDINATION WITH OTHER SERVICES.
17. SHOP DRAWING TO BE SUBMITTED BY THE CONTRACTOR TO CONSULTANT FOR APPROVAL BEFORE COMMENCEMENT OF WORK.
18. CONTRACTOR TO BE COORDINATED TO ALL OTHER TRADE DRAWINGS.
19. EXACT LOCATION OF LIGHT FIXTURES TO BE GIVEN BY THE ARCHITECT.
20. THE MAIN HOLES TO BE PROPERLY SEALED VIA A SEALENT/WATER MASKING TAPE TO AVOID INGRESS OF SLURRY IN THE JUNCTION BOX.
21. ALL OPENINGS, SLEEVE AND SHAFTS BETWEEN FLOORS USED FOR POWER & LOW CURRENT, CABLES SHALL BE CLOSED BY FIRE RESISTANT MATERIAL TO THE APPROVAL OF AUTHORITIES / ENGINEER.
22. THE CONTRACTOR SHALL SUBMIT ALL SHOP DRAWING AND MATERIAL SUBMITTAL THE ENGINEER FOR APPROVAL.
23. EACH PANEL BOARD SHOULD BE IDENTIFIED WITH ENGRAVED NAME PLATE AS PER ENGINEER APPROVAL.
24. CIRCUITS FROM DIFFERENT DB's WILL NOT BE INSTALLED IN COMMON CONDUIT AND TRUNKING.
25. ALL DIMENSIONS SHOWN ARE FOR GUIDANCE & FROM FINISHED FLOOR/WALL MAKE NECESSARY DIMENSIONAL ALLOWANCES.
26. ALL WORKS SHALL COMPLY WITH ALL APPLICABLE LOCAL, STATE AND HEALTH CODES.
27. THE CONTRACTOR IS RESPONSIBLE FOR BALANCING THE LOAD AT EVERY DB, SMDB, MCC & MD EQUALLY ON ALL 3 PHASES LOADS CAN VARY A MAXIMUM ± 10% OF WITH REFERENCE TO OTHER PHASES.
28. DRAWINGS ARE SCALEABLE DIMENSIONS ARE PROVIDED FOR GUIDANCE ONLY.
29. ANY VARIATIONS ON THE SITE AND/OR DUE TO SITE CONDITIONS MUST BE BROUGHT IN THE NOTICE OF CONSULTANTS BEFORE PROCEEDING WITH WORK.

REV NO	DESCRIPTION	DATE

TENDER DRAWING

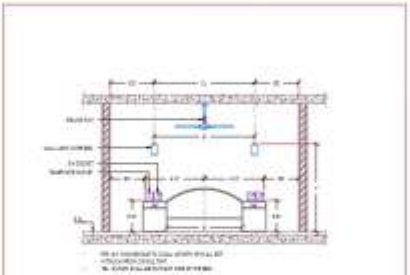
MB ASSOCIATES

CCP NEW OFFICE BLOCK

YOUNG ASSOCIATES

LEGEND & GENERAL NOTES

EL-00-01



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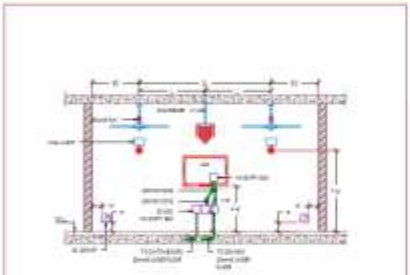

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03

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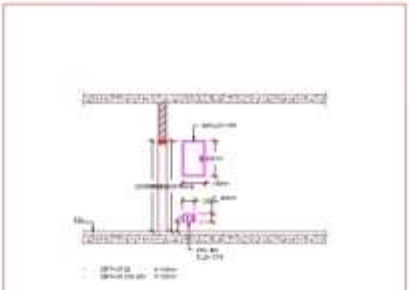

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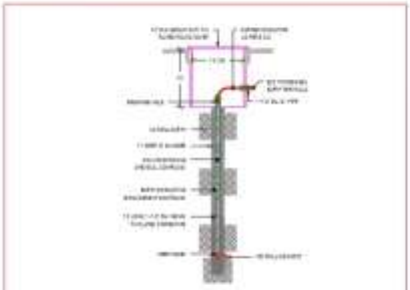

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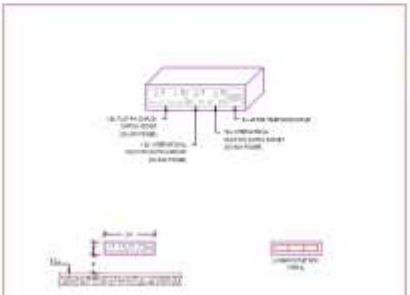

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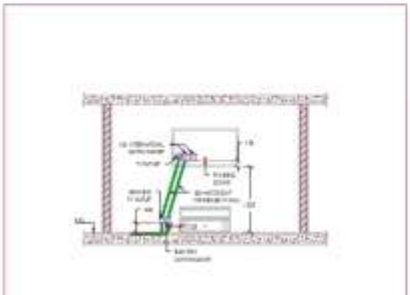

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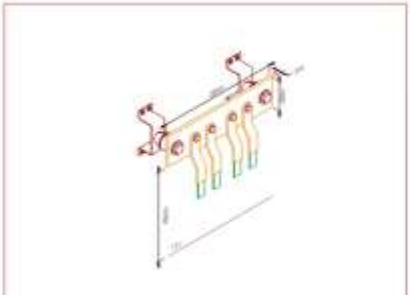


39

KEY PLAN

NOTES

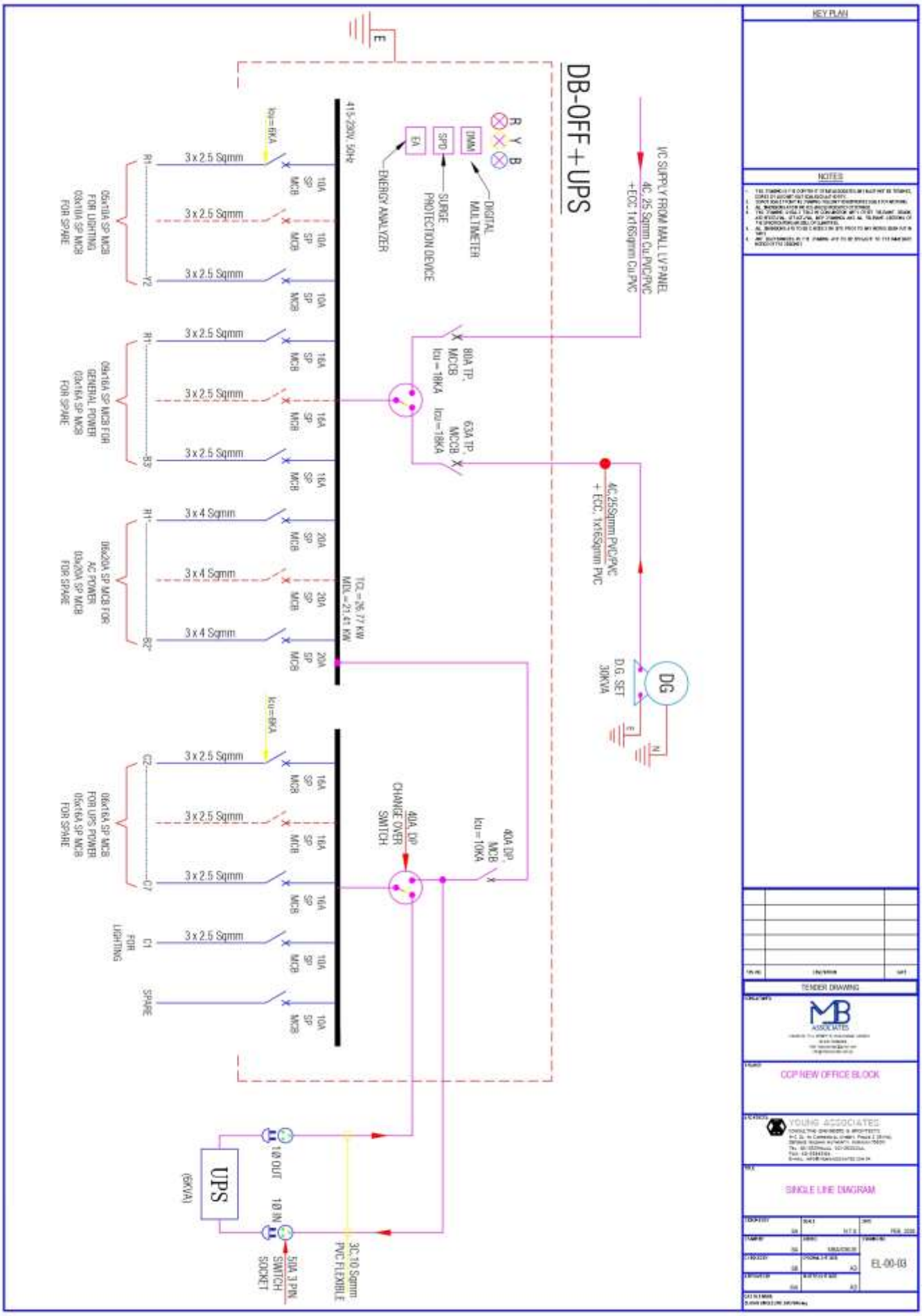
TENDER DRAWING

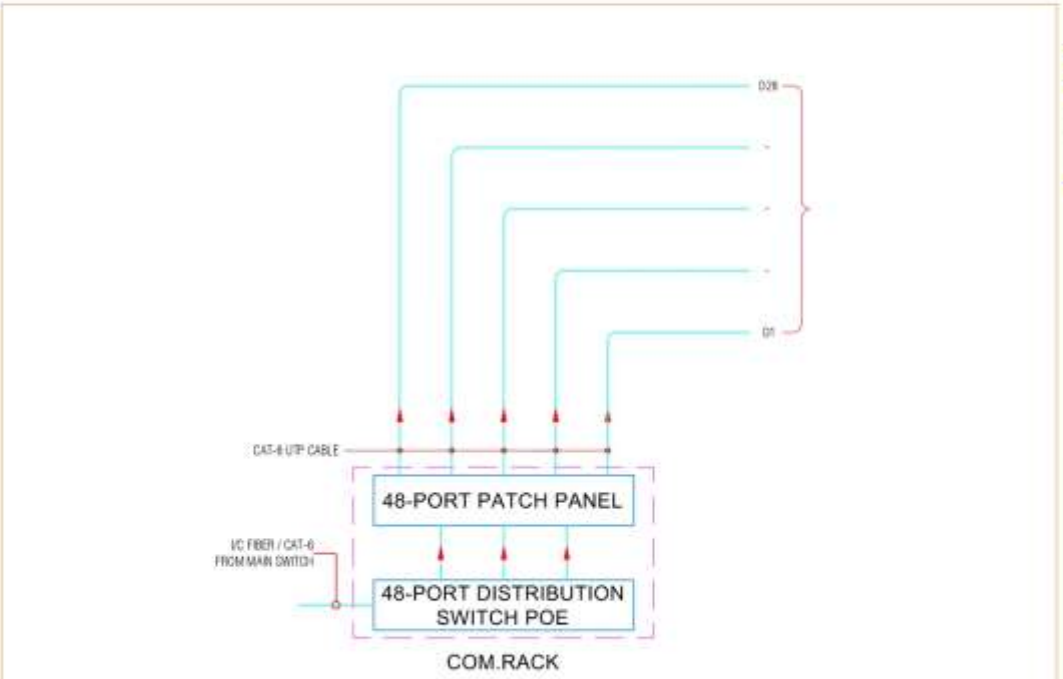
CCP NEW OFFICE BLOCK

YOUNG ASSOCIATES

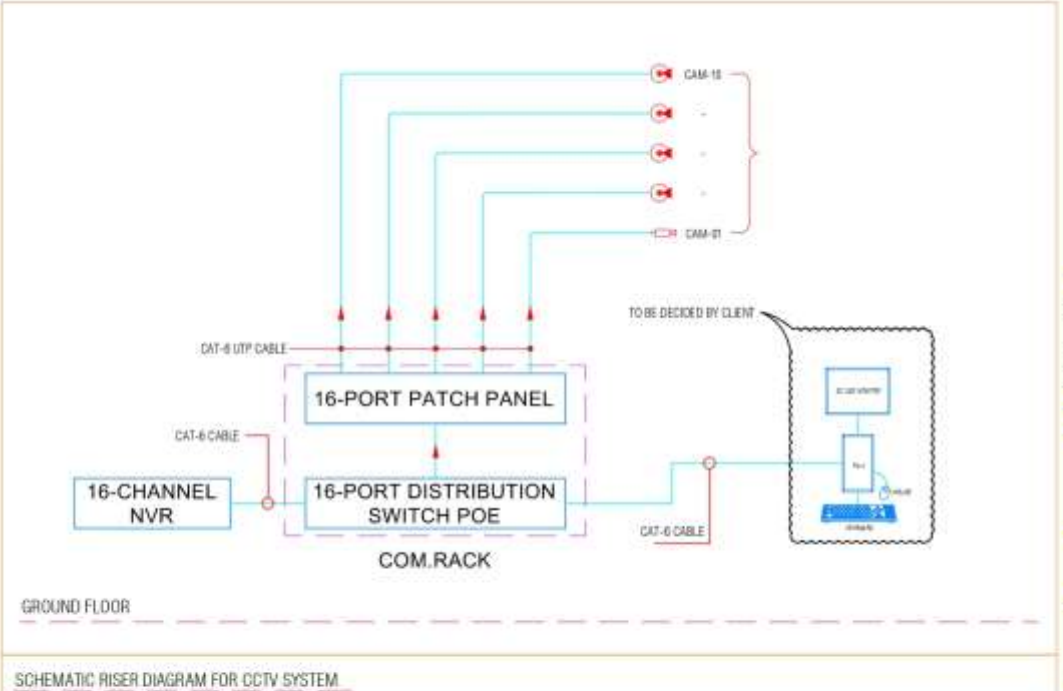
MISCELLANEOUS DETAILS

EL-00-02


DB-OFF+UPS
415-230V, 50Hz
I/C SUPPLY FROM MAIN LV PANEL
4C, 25 Sqmm Cu PVC/PVC
+ ECC 1x16sqmm Cu PVC
R Y B
EA
SPD
DNAM
ENERGY ANALYZER
SURGE PROTECTION DEVICE
DIGITAL MULTIMETER
800A TP, MCCB Icu = 18KA
630A TP, MCCB Icu = 18KA
4C, 25Sqmm PVC/PVC + ECC, 1x16Sqmm PVC
DG
D.G. SET 30KVA
TCL = 26.77 KW
MDL = 21.41 KW
3 x 2.5 Sqmm
3 x 4 Sqmm
10A SP MCB
16A SP MCB
20A SP MCB
05x10A SP MCB FOR LIGHTING
03x10A SP MCB FOR SPARE
09x16A SP MCB FOR GENERAL POWER
02x16A SP MCB FOR SPARE
06x20A SP MCB FOR AC POWER
03x20A SP MCB FOR SPARE
06x16A SP MCB FOR UPS POWER
05x16A SP MCB FOR SPARE
40A DP CHANGE OVER SWITCH
40A DP MCB Icu = 10KA
FOR LIGHTING
SPARE
UPS
(6KVA)
I/P IN
O/P OUT
50A 3 PIN SOCKET
3C,10 Sqmm PVC FLEXIBLE
KEY PLAN
NOTES
TENDER DRAWING
MB ASSOCIATES
CCP NEW OFFICE BLOCK
YOUNG ASSOCIATES
SINGLE LINE DIAGRAM
EL-00-03



SCHEMATIC RISER DIAGRAM FOR DATA



SCHEMATIC RISER DIAGRAM FOR CCTV SYSTEM

KEY PLAN

NOTES

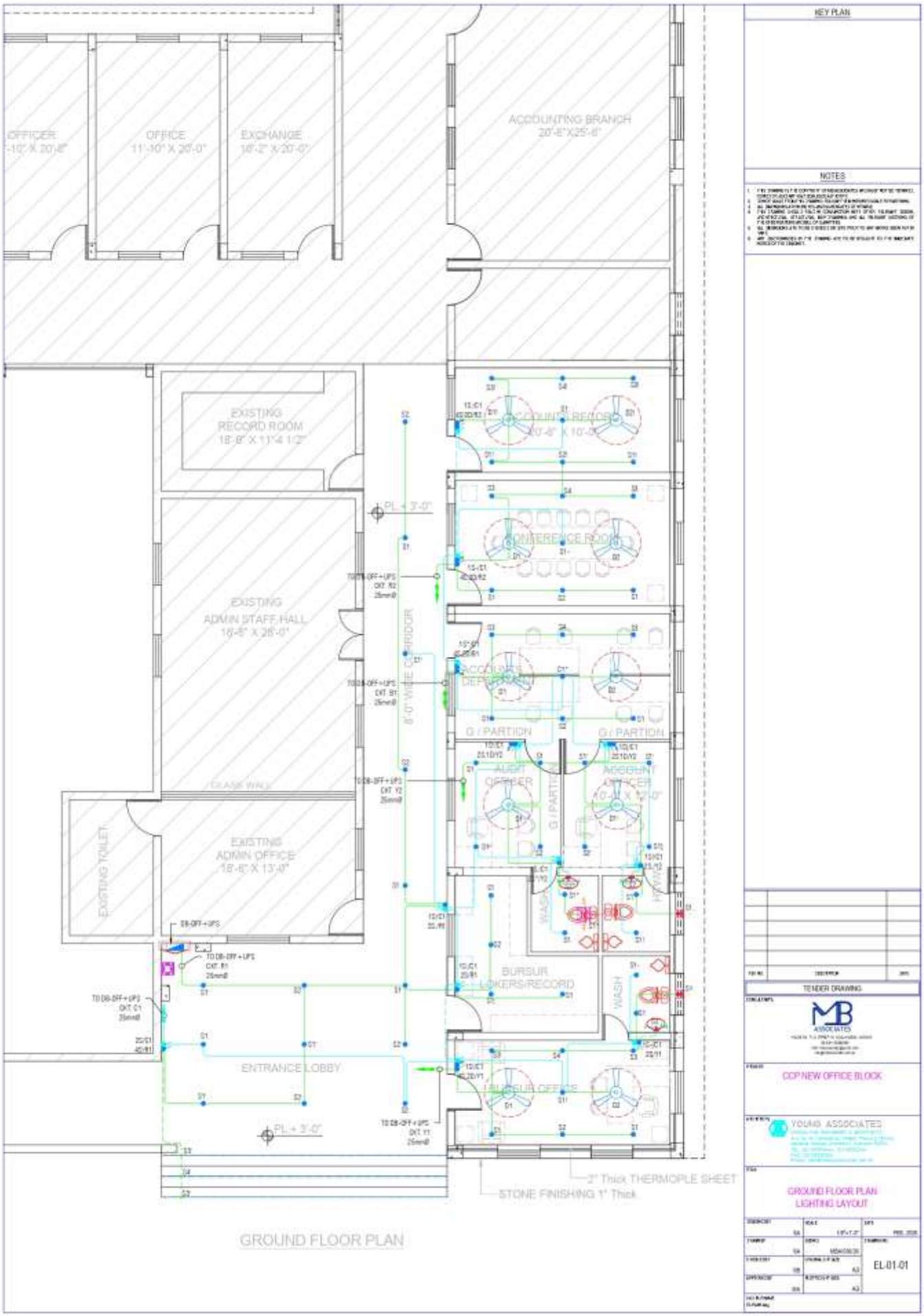
TENDER DRAWING

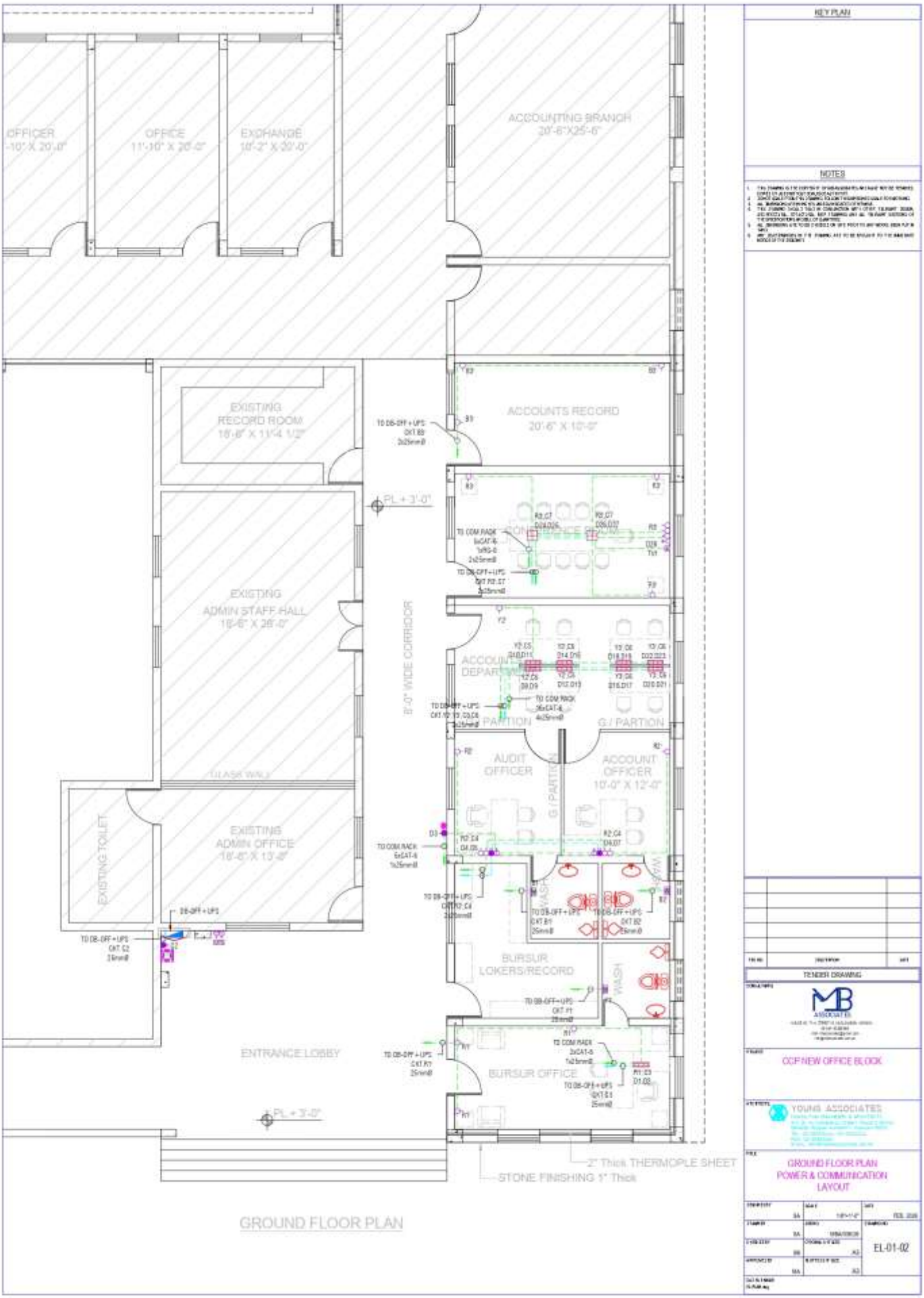
CCP NEW OFFICE BLOCK

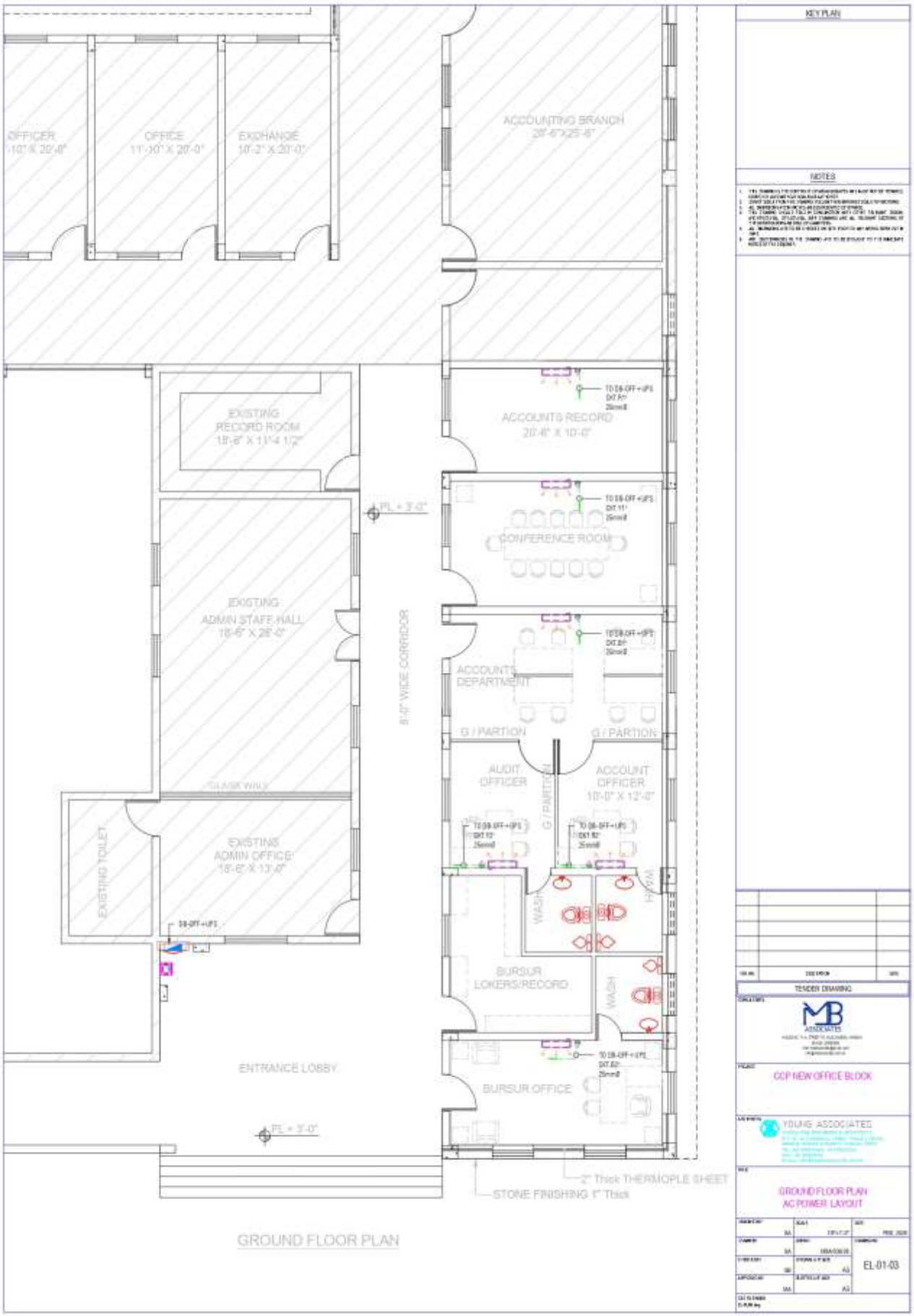
YOUNG ASSOCIATES

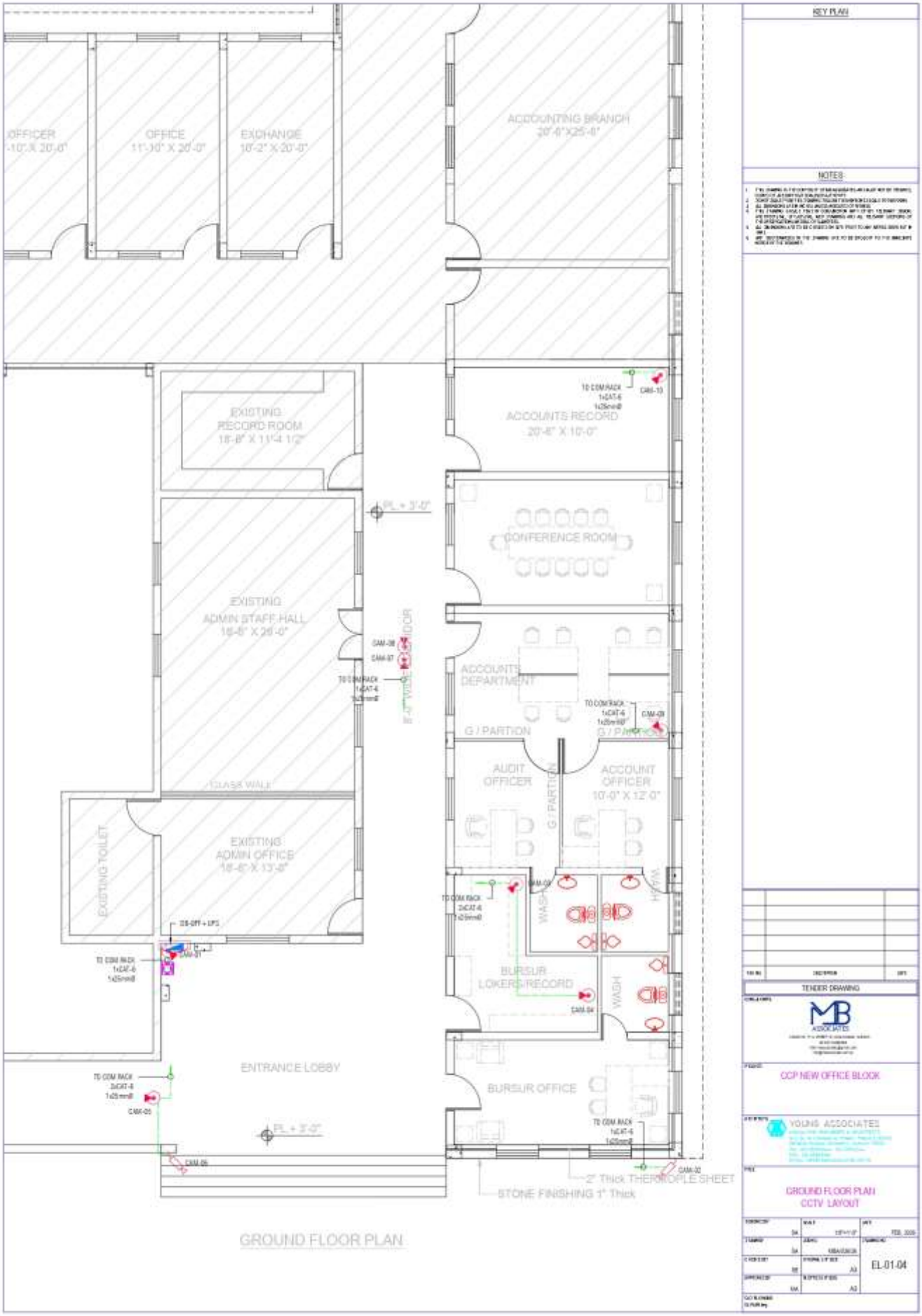
SCHEMATIC DIAGRAMS

EL-00-04


KEY PLAN
NOTES
OFFICE
OFFICE
EXCHANGE
ACCOUNTING BRANCH
EXISTING RECORD ROOM
EXISTING ADMIN STAFF HALL
EXISTING ADMIN OFFICE
EXISTING TOILET
GRADE WALL
8'-0" WIDE CORRIDOR
CONFERENCE ROOM
G / PARTITION
AUDIT OFFICER
ASSISTANT AUDITOR
BURSUR LOKERS/RECORD
WASH
ENTRANCE LOBBY
PL + 3'-0"
3" Thick THERMOPLE SHEET
STONE FINISHING 1" Thick
GROUND FLOOR PLAN
TENDER DRAWING
CCP NEW OFFICE BLOCK
YOUNG ASSOCIATES
GROUND FLOOR PLAN
LIGHTING LAYOUT
EL-01-01


KEY PLAN
NOTES
OFFICER
OFFICE
EXCHANGE
ACCOUNTING BRANCH
EXISTING RECORD ROOM
ACCOUNTS RECORD
EXISTING ADMIN STAFF HALL
8'-0" WIDE CORRIDOR
G.I PARTION
AUDIT OFFICER
ACCOUNT OFFICER
EXISTING ADMIN OFFICE
EXISTING TOILET
GLASS WALL
BURSUR LOKERS/RECORD
BURSUR OFFICE
ENTRANCE LOBBY
PL + 3'-0"
2" Thick THERMOPLE SHEET
STONE FINISHING 1" Thick
GROUND FLOOR PLAN
TENDER DRAWING
CCP NEW OFFICE BLOCK
YOUNG ASSOCIATES
GROUND FLOOR PLAN
POWER & COMMUNICATION
LAYOUT
EL-01-02


KEY PLAN
NOTES
OFFICER
OFFICE
EXCHANGE
ACCOUNTING BRANCH
EXISTING RECORD ROOM
ACCOUNTS RECORD
CONFERENCE ROOM
EXISTING ADMIN STAFF HALL
8'-0" WIDE CORRIDOR
ACCOUNTS DEPARTMENT
G / PARTION
AUDIT OFFICER
ACCOUNT OFFICER
EXISTING TOILET
EXISTING ADMIN OFFICE
BURSUR LOKERS/RECORD
WASH
ENTRANCE LOBBY
BURSUR OFFICE
FL + 3'-0"
2" Thick THERMOPLE SHEET
STONE FINISHING 1" Thick
GROUND FLOOR PLAN
TENDER DRAWING
MB ASSOCIATES
CCP NEW OFFICE BLOCK
YOUNG ASSOCIATES
GROUND FLOOR PLAN
AC POWER LAYOUT
EL-01-03


KEY PLAN
NOTES
OFFICER
OFFICE
EXCHANGE
ACCOUNTING BRANCH
EXISTING RECORD ROOM
ACCOUNTS RECORD
CONFERENCE ROOM
EXISTING ADMIN STAFF HALL
ACCOUNTS DEPARTMENT
AUDIT OFFICER
ACCOUNT OFFICER
EXISTING ADMIN OFFICE
EXISTING TOILET
BURSUR LOKERS RECORD
BURSUR OFFICE
ENTRANCE LOBBY
STONE FINISHING 1" Thick
GROUND FLOOR PLAN
TENDER DRAWING
CCP NEW OFFICE BLOCK
YOUNS ASSOCIATES
GROUND FLOOR PLAN
CCTV LAYOUT
EL-01-04