PHILIPPINE BIDDING DOCUMENTS

DEPARTMENT OF SOCIAL WELFARE AND DEVELOPMENT

FIELD OFFICE MIMAROPA

BIDDING DOCUMENTS FOR

ELECTRICAL UPGRADE OF THE 53 YEAR OLD DSWD MIMAROPA BUILDING

PROJECT ID NO. DSWD4B-2023-026

Sixth Edition
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Preface

These Philippine Bidding Documents (PBDs) for the procurement of Infrastructure Projects (hereinafter referred to also as the "Works") through Competitive Bidding have been prepared by the Government of the Philippines for use by all branches, agencies, departments, bureaus, offices, or instrumentalities of the government, including government-owned and/or -controlled corporations, government financial institutions, state universities and colleges, local government units, and autonomous regional government. The procedures and practices presented in this document have been developed through broad experience, and are for mandatory use in projects that are financed in whole or in part by the Government of the Philippines or any foreign government/foreign or international financing institution in accordance with the provisions of the 2016 revised Implementing Rules and Regulations (IRR) of Republic Act (RA) No. 9184.

The PBDs are intended as a model for admeasurements (unit prices or unit rates in a bill of quantities) types of contract, which are the most common in Works contracting.

The Bidding Documents shall clearly and adequately define, among others: (i) the objectives, scope, and expected outputs and/or results of the proposed contract; (ii) the eligibility requirements of Bidders; (iii) the expected contract duration; and (iv)the obligations, duties, and/or functions of the winning Bidder.

Care should be taken to check the relevance of the provisions of the PBDs against the requirements of the specific Works to be procured. If duplication of a subject is inevitable in other sections of the document prepared by the Procuring Entity, care must be exercised to avoid contradictions between clauses dealing with the same matter.

Moreover, each section is prepared with notes intended only as information for the Procuring Entity or the person drafting the Bidding Documents. They shall not be included in the final documents. The following general directions should be observed when using the documents:

a. All the documents listed in the Table of Contents are normally required for the procurement of Infrastructure Projects. However, they should be adapted as necessary to the circumstances of the particular Project.

b. Specific details, such as the "*name of the Procuring Entity*" and "*address for bid submission*," should be furnished in the Instructions to Bidders, Bid Data Sheet, and Special Conditions of Contract. The final documents should contain neither blank spaces nor options.

c. This Preface and the footnotes or notes in italics included in the Invitation to Bid, BDS, General Conditions of Contract, Special Conditions of Contract, Specifications, Drawings, and Bill of Quantities are not part of the text of the final document, although they contain instructions that the Procuring Entity should strictly follow.

d. The cover should be modified as required to identify the Bidding Documents as to the names of the Project, Contract, and Procuring Entity, in addition to date of issue.

e. Modifications for specific Procurement Project details should be provided in the Special Conditions of Contract as amendments to the Conditions of Contract. For easy completion, whenever reference has to be made to specific clauses in the Bid Data Sheet or Special Conditions of Contract, these terms shall be printed in bold typeface on Sections I (Instructions to Bidders) and III (General Conditions of Contract), respectively.

f. For guidelines on the use of Bidding Forms and the procurement of Foreign-Assisted Projects, these will be covered by a separate issuance of the Government Procurement Policy Board.

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Glossary of Terms, Abbreviations, and Acronyms

ABC – Approved Budget for the Contract.

ARCC – Allowable Range of Contract Cost.

BAC – Bids and Awards Committee.

Bid – A signed offer or proposal to undertake a contract submitted by a bidder in response to and in consonance with the requirements of the bidding documents. Also referred to as *Proposal* and *Tender*. (2016 revised IRR, Section 5[c])

Bidder – Refers to a contractor, manufacturer, supplier, distributor and/or consultant who submits a bid in response to the requirements of the Bidding Documents. (2016 revised IRR, Section 5[d])

Bidding Documents – The documents issued by the Procuring Entity as the bases for bids, furnishing all information necessary for a prospective bidder to prepare a bid for the Goods, Infrastructure Projects, and/or Consulting Services required by the Procuring Entity. (2016 revised IRR, Section 5[e])

BIR – Bureau of Internal Revenue.

BSP – Bangko Sentral ng Pilipinas.

CDA – Cooperative Development Authority.

Consulting Services – Refer to services for Infrastructure Projects and other types of projects or activities of the GOP requiring adequate external technical and professional expertise that are beyond the capability and/or capacity of the GOP to undertake such as, but not limited to: (i) advisory and review services; (ii) pre-investment or feasibility studies; (iii) design; (iv) construction supervision; (v) management and related services; and (vi) other technical services or special studies. (2016 revised IRR, Section 5[i])

Contract – Refers to the agreement entered into between the Procuring Entity and the Supplier or Manufacturer or Distributor or Service Provider for procurement of Goods and Services; Contractor for Procurement of Infrastructure Projects; or Consultant or Consulting Firm for Procurement of Consulting Services; as the case may be, as recorded in the Contract Form signed by the parties, including all attachments and appendices thereto and all documents incorporated by reference therein.

Contractor – is a natural or juridical entity whose proposal was accepted by the Procuring Entity and to whom the Contract to execute the Work was awarded. Contractor as used in these Bidding Documents may likewise refer to a supplier, distributor, manufacturer, or consultant.

CPI – Consumer Price Index.

DOLE – Department of Labor and Employment.

DTI – Department of Trade and Industry.

Foreign-funded Procurement or Foreign-Assisted Project – Refers to procurement whose funding source is from a foreign government, foreign or international financing institution as specified in the Treaty or International or Executive Agreement. (2016 revised IRR, Section 5[b]).

GFI – Government Financial Institution.

GOCC – Government-owned and/or –controlled corporation.

Goods – Refer to all items, supplies, materials and general support services, except Consulting Services and Infrastructure Projects, which may be needed in the transaction of public businesses or in the pursuit of any government undertaking, project or activity, whether in the nature of equipment, furniture, stationery, materials for construction, or personal property of any kind, including non-personal or contractual services such as the repair and maintenance of equipment and furniture, as well as trucking, hauling, janitorial, security, and related or analogous services, as well as procurement of materials and supplies provided by the Procuring Entity for such services. The term "related" or "analogous services" shall include, but is not limited to, lease or purchase of office space, media advertisements, health maintenance services, and other services essential to the operation of the Procuring Entity. (2016 revised IRR, Section 5[r])

GOP – Government of the Philippines.

Infrastructure Projects – Include the construction, improvement, rehabilitation, demolition, repair, restoration or maintenance of roads and bridges, railways, airports, seaports, communication facilities, civil works components of information technology projects, irrigation, flood control and drainage, water supply, sanitation, sewerage and solid waste management systems, shore protection, energy/power and electrification facilities, national buildings, school buildings, hospital buildings, and other related construction projects of the government. Also referred to as *civil works or works*. (2016 revised IRR, Section 5[u])

LGUs – Local Government Units.

NFCC – Net Financial Contracting Capacity.

NGA – National Government Agency.

PCAB – Philippine Contractors Accreditation Board.

PhilGEPS - Philippine Government Electronic Procurement System.

Procurement Project – refers to a specific or identified procurement covering goods, infrastructure project or consulting services. A Procurement Project shall be described, detailed, and scheduled in the Project Procurement Management Plan prepared by the agency which shall be consolidated in the procuring entity's Annual Procurement Plan. (GPPB Circular No. 06-2019 dated 17 July 2019)

PSA – Philippine Statistics Authority.

SEC – Securities and Exchange Commission.

SLCC – Single Largest Completed Contract.

UN – United Nations.

Section I. Invitation to Bid

INVITATION TO BID FOR THE ELECTRICAL UPGRADE OF 53 YEAR -OLD DSWD MIMAROPA MAIN BUILDING

PROJECT ID NO. DSWD4B-2023-027

1. The *Department of Social Welfare and Development Field Office MIMAROPA*, through the *authorized appropriations under the FY 2023 General Appropriations Act intends* to apply the sum of ***Twelve Million Seven Hundred Forty Two Thousand Pesos Only (Php12,742,000.00)*** being the ABC to payments under the contract for *Project, "Electrical Upgrade of 53 Year Main Building of DSWD MIMAROPA Region with Project ID No. DSWD4B-2023-027*. Bids received in excess of the ABC shall be automatically rejected at bid opening.

2. The DSWD Field Office MIMAROPA now invites bids for the above Procurement Project. Completion of the works is required **One Hundred Twenty (120) Calendar Days** upon receipt of Notice to Proceed. Bidders should have completed, within *five (5 years)* from the date of submission and receipt of bids, a contract similar to the Project. The description of an eligible bidder is contained in the Bidding Documents, particularly, in Section II (Instructions to Bidders).

3. Bidding will be conducted through open competitive bidding procedures using a non-discretionary "*pass/fail*" criterion as specified in the 2016 revised Implementing Rules and Regulations (IRR) of Republic Act (RA) No. 9184.

   a. Bidding is restricted to Filipino citizens/sole proprietorships, partnerships, or organizations with at least sixty percent (60%) interest or outstanding capital stock belonging to citizens of the Philippines, and to citizens or organizations of a country the laws or regulations of which grant similar rights or privileges to Filipino citizens, pursuant to RA No. 5183.

4. Prospective Bidders may obtain further information from *DSWD Field Office MIMAROPA Bids and Awards Committee Secretariat* and inspect the Bidding Documents at the address given below during office hours from 8:00 A.M to 5:00 P.M.

5. A complete set of Bidding Documents may be acquired by interested Bidders on **October 26, 2023- November 20, 2023** from the given address and website(s) below *and upon payment of the applicable nonrefundable fee for the Bidding Documents, pursuant to the latest Guidelines issued by the GPPB, in the amount of* Twenty Thousand Pesos Only (**Php 20,000.00)** .

6. It may also be downloaded free of charge from the website of the Philippine Government Electronic Procurement System (PHILGEPS) and the website of the Procuring Entity, provided that the bidders shall pay the applicable fee for the Bidding Documents not later than the submission of their bids.
Payment for the purchase of Bid Documents may be deposited thru electronic fund transfer or over-the-counter (OTC) transaction to:

Account Name: **DSWD IV-B MISCELLLANEOUS TRUST FUND**
Type Account: **Land Bank (Main –Cash Dept) Current Account**
Account Number: **3402-1021-51**

Proof of payment of bid documents i.e photos/ screenshots/printouts of electronic fund transfer receipts; actual OTC deposit receipts should be submitted with or before the submission of bid documents.

7. The *DSWD Field Office MIMAROPA* will hold a **Pre-Bid Conference on *November 6, 2023, Monday 1:30 P.M*** through video conferencing or webcasting *via google meet,* which shall be open to prospective bidders.

Interested bidders who would like to join the Pre-Bid Conference through video teleconferencing (google meet) may send at **procurement.fomimaropa@dswd.gov.ph** not later than **November 6, 2023** the following details so that the DSWD Field Office MIMAROPA BAC Secretariat may send the link and other instructions for the conduct of the video conference;

a. Name of Company;
b. Name of Authorized Representative/s;
c. Contact Number;
d. Email Address

8. Bids must be duly received by the BAC Secretariat through manual submission at the office address indicated below on or before ***November 20, 2023, Monday 1:00 P.M. at DSWD Field Office MIMAROPA, 1680 F.T Benitez cor Malvar Sts., Malate, Manila.*** **Late bids shall not be accepted.**

Should there happen a fortuitous event, the Pre-Bid Conference and Submission/Opening of Bids shall be automatically conducted on the next available working day, after the dates as above mentioned respectively for each of the afore-stated activities at the same time and place without need of further advertisement/posting.

9. All Bids must be accompanied by a bid security in any of the acceptable forms and in the amount stated in **ITB** Clause 14.

10. Bid opening shall be on ***November 20, 2023, Monday 1:30 P.M at DSWD Conference Room, 1680 F.T Benitez cor Malvar Sts, Malate, Manila and*/or via *Video***

Teleconferencing (VTC)thru google meet. Bids will be opened in the presence of the bidders' representatives who choose to attend the activity.

11. The Bidder by the act of submitting its bid shall have deemed to have inspected the site , determined the general characteristics of the contract works, and the condition for this Project, and examine all instructions, forms, terms, and project requirements in the bidding documents.

12. The DSWD Field Office MIMAROPA reserves the right to reject any and all bids, declare a failure of bidding, or not award the contract at any time prior to contract award in accordance with Sections 35.6 and 41 of the 2016 revised IRR of RA No. 9184, without thereby incurring any liability to the affected bidder or bidders.

13. For further information, please refer to:

Harvy B. Calabio
BAC Secretariat Head
DSWD FO MIMAROPA Bids and Awards Committee
DSWD FO MIMAROPA
1680 F.T Benitez cor Malvar Sts, Malate, Manila
Telephone Number: 5328-5111 Local 24052
Cellphone Number: +63998-474-6898
Email Address: ***procurement.fomimaropa@dswd.gov.ph***
Website: ***www.fo4b.dswd.gov.ph***

14. You may visit the following websites:
For downloading of Bidding Documents:
https://fo4b.dswd.gov.ph/opportunities/invitation-to-bid-notices/bid-2023/

October 24, 2023

(ORIGINAL SIGNED)

GENELIZA Q. GABILAN
BAC Chairperson

Section II. Instructions to Bidders

Notes on the Instructions to Bidders

This Section on the Instruction to Bidders (ITB) provides the information necessary for bidders to prepare responsive bids, in accordance with the requirements of the Procuring Entity. It also provides information on bid submission, eligibility check, opening and evaluation of bids, post-qualification, and on the award of contract.

1. Scope of Bid

The Procuring Entity, *Department of Social Welfare and Development MIMAROPA Region* Invites Bids for the *Electrical Upgrade of 53-Year Manin Building of DSWD MIMAROPA* with Project Identification Number *DSWD4B-2023-027*

The Procurement Project (referred to herein as "Project") is for the construction of Works, as described in Section VI (Specifications).

2. Funding Information

2.1. The GOP through the source of funding as indicated below for Fiscal Year 2023 in the amount of ***Twelve Million Seven Hundred Forty Two Thousand Pesos Only (Php 12,742,000.00).***

2.2. The source of funding is NGA , the General Appropriations Act:

3. Bidding Requirements

The Bidding for the Project shall be governed by all the provisions of RA No. 9184 and its 2016 revised IRR, including its Generic Procurement Manual and associated policies, rules and regulations as the primary source thereof, while the herein clauses shall serve as the secondary source thereof.

Any amendments made to the IRR and other GPPB issuances shall be applicable only to the ongoing posting, advertisement, or invitation to bid by the BAC through the issuance of a supplemental or bid bulletin.

The Bidder, by the act of submitting its Bid, shall be deemed to have inspected the site, determined the general characteristics of the contracted Works and the conditions for this Project, such as the location and the nature of the work; (b) climatic conditions; (c) transportation facilities; (c) nature and condition of the terrain, geological conditions at the site communication facilities, requirements, location and availability of construction aggregates and other materials, labor, water, electric power and access roads; and (d) other factors that may affect the cost, duration and execution or implementation of the contract, project, or work and examine all instructions, forms, terms, and project requirements in the Bidding Documents.

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

The Procuring Entity, as well as the Bidders and Contractors, shall observe the highest standard of ethics during the procurement and execution of the contract. They or through an agent shall not engage in corrupt, fraudulent, collusive, coercive, and obstructive practices defined under Annex "I" of the 2016 revised IRR of RA No. 9184 or other integrity violations in competing for the Project.

5. Eligible Bidders

5.1. Only Bids of Bidders found to be legally, technically, and financially capable will be evaluated.

5.2. The Bidder must have an experience of having completed a Single Largest Completed Contract (SLCC) that is similar to this Project, equivalent to at least fifty percent (50%) of the ABC adjusted, if necessary, by the Bidder to current prices using the PSA's CPI, except under conditions provided for in Section 23.4.2.4 of the 2016 revised IRR of RA No. 9184.

A contract is considered to be "similar" to the contract to be bid if it has the major categories of work stated in the **BDS**.

5.3. For Foreign-funded Procurement, the Procuring Entity and the foreign government/foreign or international financing institution may agree on another track record requirement, as specified in the Bidding Document prepared for this purpose.

5.4. The Bidders shall comply with the eligibility criteria under Section 23.4.2 of the 2016 IRR of RA No. 9184.

6. Origin of Associated Goods

There is no restriction on the origin of Goods other than those prohibited by a decision of the UN Security Council taken under Chapter VII of the Charter of the UN.

7. Subcontracts

7.1. The Procuring Entity has prescribed that Sub-contracting is not allowed

8. Pre-Bid Conference

The Procuring Entity will hold a pre-bid conference for this Project on the specified date and time and either through videoconferencing/webcasting} as indicated in paragraph 6 of the **IB.**

9. Clarification and Amendment of Bidding Documents

Prospective bidders may request for clarification on and/or interpretation of any part of the Bidding Documents. Such requests must be in writing and received by the Procuring Entity, either at its given address or through electronic mail indicated in the **IB**, at least ten (10) calendar days before the deadline set for the submission and receipt of Bids.

10. Documents Comprising the Bid: Eligibility and Technical Components

10.1. The first envelope shall contain the eligibility and technical documents of the Bid as specified in **Section IX. Checklist of Technical and Financial Documents**.

10.2. If the eligibility requirements or statements, the bids, and all other documents for submission to the BAC are in foreign language other than English, it must be accompanied by a translation in English, which shall be authenticated by the appropriate Philippine foreign service establishment, post, or the equivalent office having jurisdiction over the foreign bidder's affairs in the Philippines. For Contracting Parties to the Apostille Convention, only the translated documents shall be authenticated through an apostille pursuant to GPPB Resolution No. 13-2019 dated 23 May 2019. The English translation shall govern, for purposes of interpretation of the bid.

10.3. A valid PCAB License is required, and in case of joint ventures, a valid special PCAB License, and registration for the type and cost of the contract for this Project. Any additional type of Contractor license or permit shall be indicated in the **BDS**.

10.4. A List of Contractor's key personnel (e.g., Project Manager, Project Engineers, Materials Engineers, and Foremen) assigned to the contract to be bid, with their complete qualification and experience data shall be provided. These key personnel must meet the required minimum years of experience set in the **BDS**.

10.5. A List of Contractor's major equipment units, which are owned, leased, and/or under purchase agreements, supported by proof of ownership, certification of availability of equipment from the equipment lessor/vendor for the duration of the project, as the case may be, must meet the minimum requirements for the contract set in the **BDS**.

11. Documents Comprising the Bid: Financial Component

11.1. The second bid envelope shall contain the financial documents for the Bid as specified in **Section IX. Checklist of Technical and Financial Documents**.

11.2. Any bid exceeding the ABC indicated in paragraph 1 of the **IB** shall not be accepted.

11.3. For Foreign-funded procurement, a ceiling may be applied to bid prices provided the conditions are met under Section 31.2 of the 2016 revised IRR of RA No. 9184.

12. Alternative Bids

Bidders shall submit offers that comply with the requirements of the Bidding Documents, including the basic technical design as indicated in the drawings and specifications. Unless there is a value engineering clause in the **BDS**, alternative Bids shall not be accepted.

13. Bid Prices

All bid prices for the given scope of work in the Project as awarded shall be considered as fixed prices, and therefore not subject to price escalation during contract

implementation, except under extraordinary circumstances as determined by the NEDA and approved by the GPPB pursuant to the revised Guidelines for Contract Price Escalation guidelines.

14. Bid and Payment Currencies

14.1. Bid prices may be quoted in the local currency or tradeable currency accepted by the BSP at the discretion of the Bidder. However, for purposes of bid evaluation, Bids denominated in foreign currencies shall be converted to Philippine currency based on the exchange rate as published in the BSP reference rate bulletin on the day of the bid opening.

14.2. *Payment of the contract price shall be made in Philippine Peso:*

15. Bid Security

15.1. The Bidder shall submit a Bid Securing Declaration or any form of Bid Security in the amount indicated in the **BDS**, which shall be not less than the percentage of the ABC in accordance with the schedule in the **BDS**.

15.2. The Bid and bid security shall be valid until One Hundred Twenty Calendar Days (120) from the date of opening. Any bid not accompanied by an acceptable bid security shall be rejected by the Procuring Entity as non-responsive.

16. Sealing and Marking of Bids

Each Bidder shall submit three (3) copies of the first and second components of its Bid.

The Procuring Entity may request additional hard copies and/or electronic copies of the Bid. However, failure of the Bidders to comply with the said request shall not be a ground for disqualification.

If the Procuring Entity allows the submission of bids through online submission to the given website or any other electronic means, the Bidder shall submit an electronic copy of its Bid, which must be digitally signed. An electronic copy that cannot be opened or is corrupted shall be considered non-responsive and, thus, automatically disqualified.

17. Deadline for Submission of Bids

The Bidders shall submit on the specified date and time and either at its physical address or through online submission as indicated in paragraph 7 of the **IB.**

18. Opening and Preliminary Examination of Bids

18.1. The BAC shall open the Bids in public at the time, on the date, and at the place specified in paragraph 9 of the **IB**. The Bidders' representatives who are present shall sign a register evidencing their attendance. In case videoconferencing, webcasting or other similar technologies will be used, attendance of participants shall likewise be recorded by the BAC Secretariat.

In case the Bids cannot be opened as scheduled due to justifiable reasons, the rescheduling requirements under Section 29 of the 2016 revised IRR of RA No. 9184 shall prevail.

18.2. The preliminary examination of Bids shall be governed by Section 30 of the 2016 revised IRR of RA No. 9184.

19. Detailed Evaluation and Comparison of Bids

19.1. The Procuring Entity's BAC shall immediately conduct a detailed evaluation of all Bids rated "*passed*" using non-discretionary pass/fail criteria. The BAC shall consider the conditions in the evaluation of Bids under Section 32.2 of 2016 revised IRR of RA No. 9184.

19.2. If the Project allows partial bids, all Bids and combinations of Bids as indicated in the **BDS** shall be received by the same deadline and opened and evaluated simultaneously so as to determine the Bid or combination of Bids offering the lowest calculated cost to the Procuring Entity. Bid Security as required by **ITB** Clause 15 shall be submitted for each contract (lot) separately.

19.3. In all cases, the NFCC computation pursuant to Section 23.4.2.6 of the 2016 revised IRR of RA No. 9184 must be sufficient for the total of the ABCs for all the lots participated in by the prospective Bidder.

20. Post Qualification

Within a non-extendible period of five (5) calendar days from receipt by the Bidder of the notice from the BAC that it submitted the Lowest Calculated Bid, the Bidder shall submit its latest income and business tax returns filed and paid through the BIR Electronic Filing and Payment System (eFPS), and other appropriate licenses and permits required by law and stated in the **BDS**.

21. Signing of the Contract

The documents required in Section 37.2 of the 2016 revised IRR of RA No. 9184 shall form part of the Contract. Additional Contract documents are indicated in the **BDS**.

Section III. Bid Data Sheet

Notes on the Bid Data Sheet (BDS)

The Bid Data Sheet (BDS) consists of provisions that supplement, amend, or specify in detail, information, or requirements included in the ITB found in Section II, which are specific to each procurement.

This Section is intended to assist the Procuring Entity in providing the specific information in relation to corresponding clauses in the ITB and has to be prepared for each specific procurement.

The Procuring Entity should specify in the BDS information and requirements specific to the circumstances of the Procuring Entity, the processing of the procurement, and the bid evaluation criteria that will apply to the Bids. In preparing the BDS, the following aspects should be checked:

a. Information that specifies and complements provisions of the ITB must be incorporated.

b. Amendments and/or supplements, if any, to provisions of the ITB as necessitated by the circumstances of the specific procurement, must also be incorporated.

Bid Data Sheet

ITB Clause	
5.2	For this purpose, contracts similar to the Project refer to contracts which have the same major categories of work, which shall be: a. *Upgrading/ Improvement /Repair of Electrical System* b. *Completed within five(5) years from the date of submission . The amount of the SLCC must be equivalent to at least 50% of the ABC (Approved Budget for the Contract) , supported by the Contractors Performance Evaluation System Rating or a Certificate of Satisfactory Rating or Certificate of Satisfactory Completion and Acceptance of the Project issued by the owner of the previous completed project.*
7.1	*Subcontracting is not allowed*
10.3	*PCAB Classifications:* *Principal Classification: Specialty* *Category: C&D* *Registration Particulars:* *Kind of Project: SP- EE (Electrical Work)* *Respective Size Range (Minimum Requirement): Small B*
10.4	The key personnel must meet the required minimum years of experience set below:

Key Personnel	General Experience	Relevant Experience
Project Supervisor	3 years	3 years
Site/Project Engineer(Registered)		
Professional Electrical Engineer	3 years	3 years
Registered Electrical Engineer	2 years	2 years
Registered Master Electrician	2 years	2 years
Safety Officer	2 years	2 years

Respective resumes and photocopy of valid Professional Regulation Commission (PRC) license shall be submitted.

10.5 The minimum major equipment requirement is the following:

Equipment	Capacity	Number of Units
Digital Multi Tester	AC VOLTAGE RANGE - 0 - 600 VOLTS RESISTANCE - 0 - 200K ohms (with Sound Alarm) Current - 0 - 1000 Amps	1 unit

Supporting documents like proof of ownership, lease and/or purchase agreements shall be submitted . Submission of a certification of availability of

	equipment from the lessor for the duration of the Project is required.
12	*N/A*
15.1	The bid security shall be in the form of a **Bid Securing Declaration** or any of the following forms and amounts: a. The amount of not less than **Two Hundred Fifty Four Thousand Eight Hundred Forty Pesos Only (Php 254,840.00**) if bid security is in cash, cashier's/manager's check, bank draft/guarantee or irrevocable letter of credit; b. The amount of not less than **Six Hundred Thirty Seven Thousand One Hundred Pesos Only (Php 637,100.00)** if bid security is in Surety Bond.
16	Each bidder shall submit (one) 1 original and two (2) copies of the first and second components of the bid. Bid shall be enclosed in one sealed mother envelope/package as original, copy no 1 and copy no 2. Original Bid envelope should be sealed with two envelopes mark as "ORIGINAL –TECHNICAL COMPONENT and another envelope as "ORIGINAL- FINANCIAL COMPONENT" sealing them all in outer envelope marked as "ORIGINAL BID". Each copy of the first and second envelopes shall be similarly sealed duly marking the inner envelopes as "COPY NO __ - TECHNICAL COMPONENT and "COPY NO___ FINANCIAL COMPONENT and the outer envelope as "COPY NO. ___" respectively. **All bid should be originally signed and documents should have a clear copy, page number and with corresponding tabs/ear-tags.**
19.2	Partial bids are not allowed.
20	The following shall be submitted in addition to those specified under Section 20 of the GCC: ***Latest Income and Business Tax Returns, filed and paid through the Electronic Filing and Payments System (EFPS), consisting of the following:*** ***- Income Tax Return with proof of payment; and*** ***-VAT Returns (Form 2550M and 2550Q with proof of payment).***
21	The following documents shall be submitted by the winning bidder within ten (10) calendar days from receipt of the Notice of Award (NOA): 1. Construction Schedule and S-curve 2. Manpower Schedule 3. List of Manpower to be Deployed 4. Construction Methods 5. Equipment Utilization Schedule 6. PERT-CPM

Section IV. General Conditions of Contract

Notes on the General Conditions of Contract

The General Conditions of Contract (GCC) in this Section, read in conjunction with the Special Conditions of Contract in Section V and other documents listed therein, should be a complete document expressing all the rights and obligations of the parties.

Matters governing performance of the Contractor, payments under the contract, or matters affecting the risks, rights, and obligations of the parties under the contract are included in the GCC and Special Conditions of Contract.

Any complementary information, which may be needed, shall be introduced only through the Special Conditions of Contract.

1. Scope of Contract

This Contract shall include all such items, although not specifically mentioned, that can be reasonably inferred as being required for its completion as if such items were expressly mentioned herein. All the provisions of RA No. 9184 and its 2016 revised IRR, including the Generic Procurement Manual, and associated issuances, constitute the primary source for the terms and conditions of the Contract, and thus, applicable in contract implementation. Herein clauses shall serve as the secondary source for the terms and conditions of the Contract.

This is without prejudice to Sections 74.1 and 74.2 of the 2016 revised IRR of RA No. 9184 allowing the GPPB to amend the IRR, which shall be applied to all procurement activities, the advertisement, posting, or invitation of which were issued after the effectivity of the said amendment.

2. Sectional Completion of Works

If sectional completion is specified in the **Special Conditions of Contract (SCC)**, references in the Conditions of Contract to the Works, the Completion Date, and the Intended Completion Date shall apply to any Section of the Works (other than references to the Completion Date and Intended Completion Date for the whole of the Works).

3. Possession of Site

3.1 The Procuring Entity shall give possession of all or parts of the Site to the Contractor based on the schedule of delivery indicated in the **SCC,** which corresponds to the execution of the Works. If the Contractor suffers delay or incurs cost from failure on the part of the Procuring Entity to give possession in accordance with the terms of this clause, the Procuring Entity's Representative shall give the Contractor a Contract Time Extension and certify such sum as fair to cover the cost incurred, which sum shall be paid by Procuring Entity.

3.2 If possession of a portion is not given by the above date, the Procuring Entity will be deemed to have delayed the start of the relevant activities. The resulting adjustments in contract time to address such delay may be addressed through contract extension provided under Annex "E" of the 2016 revised IRR of RA No. 9184.

4. The Contractor's Obligations

The Contractor shall employ the key personnel named in the Schedule of Key Personnel indicating their designation, in accordance with **ITB** Clause 10.3 and specified in the **BDS**, to carry out the supervision of the Works.

The Procuring Entity will approve any proposed replacement of key personnel only if their relevant qualifications and abilities are equal to or better than those of the personnel listed in the Schedule.

5. Performance Security

5.1. Within ten (10) calendar days from receipt of the Notice of Award from the Procuring Entity but in no case later than the signing of the contract by both parties, the successful Bidder shall furnish the performance security in any of the forms prescribed in Section 39 of the 2016 revised IRR.

5.2. The Contractor, by entering into the Contract with the Procuring Entity, acknowledges the right of the Procuring Entity to institute action pursuant to RA No. 3688 against any subcontractor be they an individual, firm, partnership, corporation, or association supplying the Contractor with labor, materials and/or equipment for the performance of this Contract.

6. Site Investigation Reports

The Contractor, in preparing the Bid, shall rely on any Site Investigation Reports referred to in the **SCC** supplemented by any information obtained by the Contractor.

7. Warranty

7.1. In case the Contractor fails to undertake the repair works under Section 62.2.2 of the 2016 revised IRR, the Procuring Entity shall forfeit its performance security, subject its property(ies) to attachment or garnishment proceedings, and perpetually disqualify it from participating in any public bidding. All payables of the GOP in his favor shall be offset to recover the costs.

7.2. The warranty against Structural Defects/Failures, except that occasioned-on force majeure, shall cover the period from the date of issuance of the Certificate of Final Acceptance by the Procuring Entity. Specific duration of the warranty is found in the **SCC**.

8. Liability of the Contractor

Subject to additional provisions, if any, set forth in the **SCC**, the Contractor's liability under this Contract shall be as provided by the laws of the Republic of the Philippines.

If the Contractor is a joint venture, all partners to the joint venture shall be jointly and severally liable to the Procuring Entity.

9. Termination for Other Causes

Contract termination shall be initiated in case it is determined *prima facie* by the Procuring Entity that the Contractor has engaged, before, or during the implementation of the contract, in unlawful deeds and behaviors relative to contract acquisition and implementation, such as, but not limited to corrupt, fraudulent, collusive, coercive, and obstructive practices as stated in **ITB** Clause 4.

10. Dayworks

Subject to the guidelines on Variation Order in Annex "E" of the 2016 revised IRR of RA No. 9184, and if applicable as indicated in the **SCC**, the Dayworks rates in the Contractor's Bid shall be used for small additional amounts of work only when the Procuring Entity's Representative has given written instructions in advance for additional work to be paid for in that way.

11. Program of Work

11.1. The Contractor shall submit to the Procuring Entity's Representative for approval the said Program of Work showing the general methods, arrangements, order, and timing for all the activities in the Works. The submissions of the Program of Work are indicated in the **SCC.**

11.2. The Contractor shall submit to the Procuring Entity's Representative for approval an updated Program of Work at intervals no longer than the period stated in the **SCC.** If the Contractor does not submit an updated Program of Work within this period, the Procuring Entity's Representative may withhold the amount stated in the **SCC** from the next payment certificate and continue to withhold this amount until the next payment after the date on which the overdue Program of Work has been submitted.

12. Instructions, Inspections and Audits

The Contractor shall permit the GOP or the Procuring Entity to inspect the Contractor's accounts and records relating to the performance of the Contractor and to have them audited by auditors of the GOP or the Procuring Entity, as may be required.

13. Advance Payment

The Procuring Entity shall, upon a written request of the Contractor which shall be submitted as a Contract document, make an advance payment to the Contractor in an amount not exceeding fifteen percent (15%) of the total contract price, to be made in lump sum, or at the most two installments according to a schedule specified in the **SCC**, subject to the requirements in Annex "E" of the 2016 revised IRR of RA No. 9184.

14. Progress Payments

The Contractor may submit a request for payment for Work accomplished. Such requests for payment shall be verified and certified by the Procuring Entity's Representative/Project Engineer. Except as otherwise stipulated in the **SCC**, materials and equipment delivered on the site but not completely put in place shall not be included for payment.

15. Operating and Maintenance Manuals

15.1. If required, the Contractor will provide "as built" Drawings and/or operating and maintenance manuals as specified in the **SCC.**

15.2. If the Contractor does not provide the Drawings and/or manuals by the dates stated above, or they do not receive the Procuring Entity's Representative's approval, the Procuring Entity's Representative may withhold the amount stated in the **SCC** from payments due to the Contractor.

Section V. Special Conditions of Contract

Notes on the Special Conditions of Contract

Similar to the BDS, the clauses in this Section are intended to assist the Procuring Entity in providing contract-specific information in relation to corresponding clauses in the GCC found in Section IV.

The Special Conditions of Contract (SCC) complement the GCC, specifying contractual requirements linked to the special circumstances of the Procuring Entity, the Procuring Entity's country, the sector, and the Works procured. In preparing this Section, the following aspects should be checked:

a. Information that complements provisions of the GCC must be incorporated.

b. Amendments and/or supplements to provisions of the GCC as necessitated by the circumstances of the specific purchase, must also be incorporated.

However, no special condition which defeats or negates the general intent and purpose of the provisions of the GCC should be incorporated herein.

Special Conditions of Contract

GCC Clause	
2	*The intended completion is One Hundred Twenty (120) Calendar Days upon receipt of Notice to Proceed*
4.1	*The Procuring Entity shall give possession of the Site to the contractor upon receipt of the Notice to Proceed.* *The Start Date should be five (5) calendar days upon the receipt of the Notice to Proceed.*
6	Site Investigation Reports
7.2	*The warranty against structural defects /failures is five (5) years*
10	No dayworks are applicable to the contract.
11.1	The Contractor shall submit the Program of Work to the Procuring Entity's Representative within *10 Ten Calendar* days of delivery of the Notice of Award.
11.2	The amount to be withheld for late submission of an updated Program of Work is Five Thousand Pesos Only (Php 5,000.00)
13	The amount of the advance payment is *shall not exceed 15% of the total contract price and schedule of payment.*
14	The payment for this project shall be made upon completion of the following activity/scope of works:

Payment Tranches	Output /Deliverables
1st Tranche: 15% payment of the total contract cost (Mobilization fee based on RA 9184)	Upon signing of the contract and submission of Performance Security indicated in the bid docs.
2nd Tranche: 50% of the total contract cost (subject for deduction of 10% Retention and half of 15% Mobilization Fee	Must be Fifty Percent (50%) of the project completion /physical accomplishment with the submission of Billing Statement , Progress/Accomplishment Report , Statement of Work Accomplished , Progress Photos and Narrative Report
3rd Tranche: 35% of the total contract cost (subject for deduction of 10% Retention and half of 15% Mobilization Fee)	Must be Eighty Five Percent (85%) of the project completion /physical accomplishment with the submission of Billing Statement , Progress/Accomplishment Report , Statement of Work Accomplished , Progress Photos and Narrative Report
Last Tranche: Final Billing 100% Accomplishments payment of the contract price (Subject for Deduction of 10% Retention)	Must be One Hundred Percent (100%) of the project completion /physical accomplishment with the submission of Billing Statement, Progress/Accomplishment Report, Statement of Work Accomplished,

		Progress Photos and Narrative Report. Must be two (2) months from the liability period and or from date of Final Acceptance and without damage /defect of installed items upon submission of Contractor's Warranty security which equivalent to the amount of retention money and issued by the private insurance company , notarized Certificate of Warranty, signed and approved punch list report
15.1	The date by which operating and maintenance manuals are required is *within thirty (30) calendar days from the date of completion* The date by which "as built" drawings are required is *within thirty (30) calendar days from the date of completion*.	
15.2	The amount to be withheld for failing to produce "as built" drawings and/or operating and maintenance manuals by the date required is Five Thousand Pesos Only (Php 5,000.00)	

Section VI. Specifications

PROPOSED PLAN

ELECTRICAL GENERAL NOTES

1. ALL ELECTRICAL WORKS HEREIN SHALL BE DONE IN ACCORDANCE WITH THE PROVISIONS OF THE LATEST EDITION OF THE PHILIPPINE ELECTRICAL CODE, APPLICABLE ORDINANCES, RULES AND REGULATIONS OF THE LOCAL GOVERNMENT AND REQUIREMENTS OF THE LOCAL POWER COMPANY.

2. ALL WIRING SHALL BE INSTALLED IN STANDARD CONDUITS RUN EMBEDDED IN CONCRETE AND HOLLOW BLOCK STRUCTURES, COLUMNS, WALLS, PARTITIONS, AND OR RUN CONCEALED BETWEEN DOUBLE WALL PARTITIONS AND INSIDE THE CEILING SPACES. WHERE THE USE OF THE CONCEALED CONDUIT WIRING IS IMPRACTICABLE, SURFACE METAL MOULDING MAYBE USED.

3. WHEREVER REQUIRED AND NECESSARY, PULL BOXES OR JUNCTION BOXES OF PROPER SIZES SHALL BE INSTALLED AT CONVENIENCE AND INCONSPICUOUS LOCATIONS.ALTHOUGH SUCH BOXES ARE NOT SHOWN ON THE PLAN NOR MENTIONED IN THE SPECIFICATIONS.

4. THE ELECTRICAL WORKS SHALL BE DONE UNDER THE DIRECT AND IMMEDIATE SUPERVISION OF A DULY LICENSED ELECTRICAL ENGINEER AND REGISTERED MASTER ELECTRICIAN.

PROPOSED PLAN

TECHNICAL MATERIALS SPECIFICATION

1. ALL ELECTRICAL DISTRIBUTION PANELS ENCLOSURE ASSEMBLY (POWER PANEL & LIGHTING PANEL) IN THIS PROPOSAL SHALL BE:
    a. NEMA 1
    b. RECESSED MOUNTED OR WALL MOUNTED
    c. POWER COATED FINISHED – WRINKLED GRAY
    d. G.I. SHEET GAUGE #16
    e. SHALL HAVE GROUNDING BUS

2. THE OUTDOOR ECB-MAIN ENCLOSURE ASSEMBLY FOR MERALCO NORMAL POWER IN THIS PROPOSAL SHALL BE:
    a. NEMA 3R
    b. SURFACE MOUNTED OR FLOOR MOUNTED
    c. POWER COATED FINISHED – WRINKLED GRAY
    d. G.I. SHEET GAUGE #16
    e. SHALL HAVE GROUNDING BUS

3. THE AUTOMATIC TRANSFER SWITCH & SWITCHBOARD LVSB ENCLOSURE ASSEMBLY IN THIS PROPOSAL SHALL BE:
    a. NEMA 12
    b. SURFACE MOUNTED OR FLOOR MOUNTED
    c. POWER COATED FINISHED – WRINKLED GRAY
    d. G.I. SHEET GAUGE #16
    e. SHALL HAVE GROUNDING BUS
    f. SHALL HAVE POWER METERS

4. ALL CIRCUIT BREAKERS IN THIS PROPOSAL SHALL BE:
    a. MOLDED CASE CIRCUIT BREAKER (MCCB)
    b. MINIMUM INTERRUPTING CAPACITY OF 10KAIC
    c. COMPLIED WITH IEC 60947-1 & IEC 60947-2 STANDARD
    d. CIRCUIT BREAKERS SHALL HAVE PUSH TO TRIP BUTTON
    e. CIRCUIT BREAKERS BELOW 500A CAPACITY SHALL HAVE THERMAL-MAGNETIC TRIPPING MECHANISM

f. CIRCUIT BREAKER THAT ARE ABOVE 500A SHALL HAVE THERMAL-MAGNETIC TRIPPING MECHANISM AND/OR TRIPPING UNIT THAT HAS CURRENT CHARACTERISTICS TRIPPING CURVE

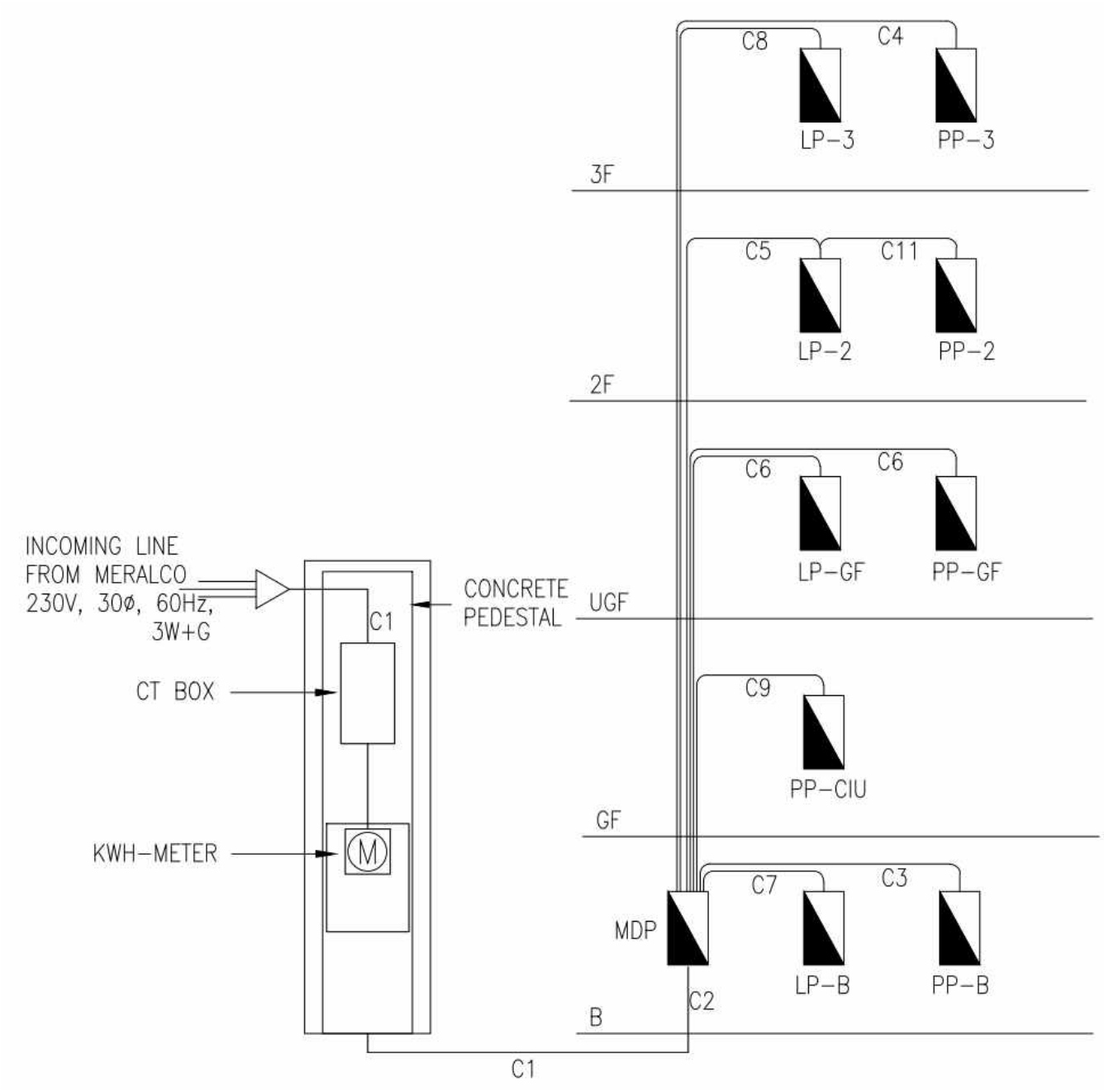
5. AUTOMATIC TRANSFER SWITCH CONTROL SHALL HAVE:
    a. CONTROL WIRING DIAGRAM
    b. INTELLIGENCE CIRCUIT CONTROL / MOTORIZED MECHANISM
    c. INDICATOR LIGHTS
    d. SELECTOR SWITCH / OPERATION SWITCH

6. CABLES IN THIS PROPOSAL SHALL BE:
    a. ANNEALED COPPER
    b. THHN / THWN -2, THERMOPLASTIC INSULATION
    c. COMPLIED WITH UL 83 STANDARD – CLEAR NYLON JACKET
    d. LEAD-FREE
    e. FLAME RETARDANT

Section VII. Drawings

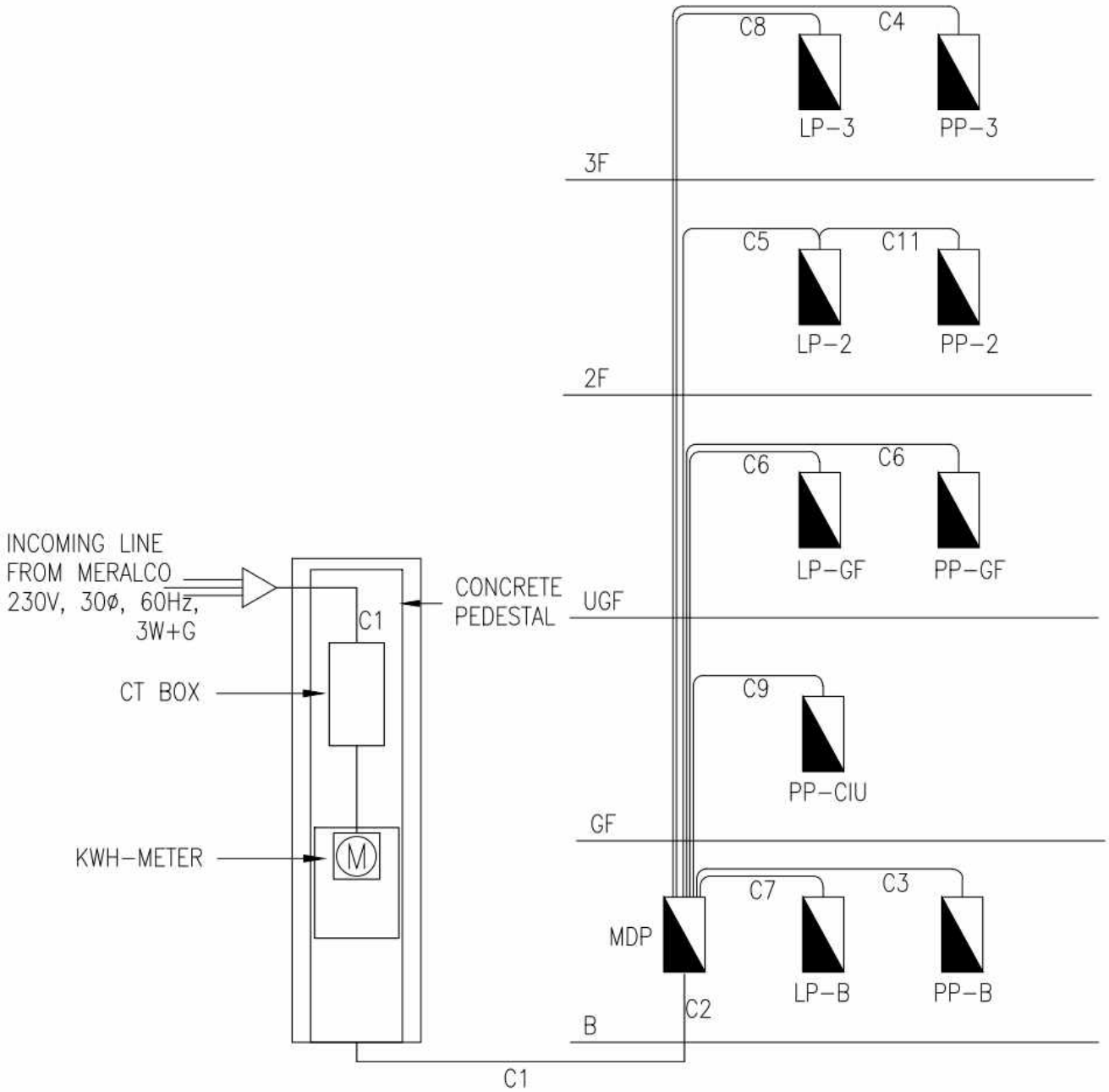
MAIN BUILDING AS-BUILT

RISER DIAGRAM

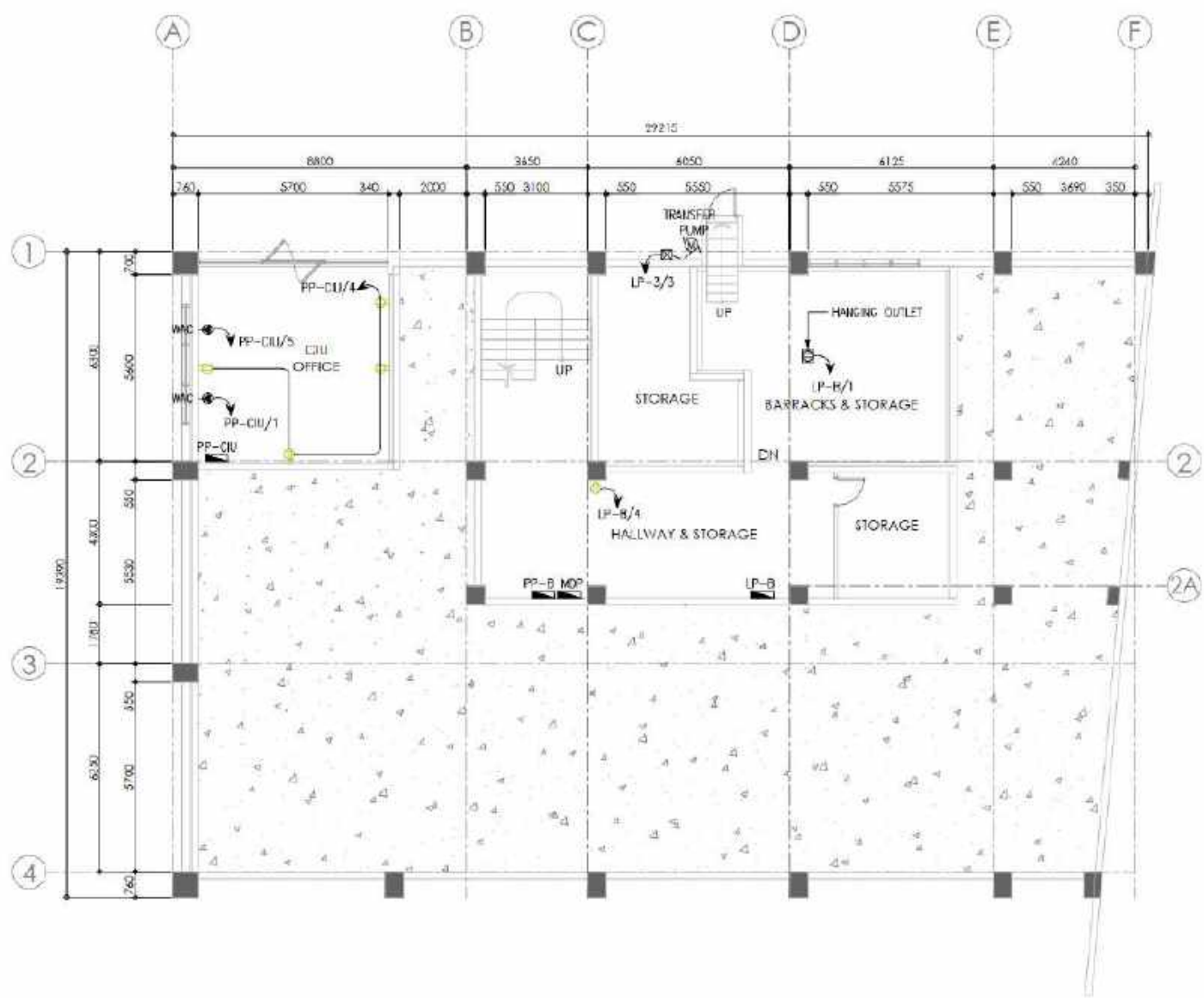


MAIN BUILDING AS-BUILT

RISER DIAGRAM



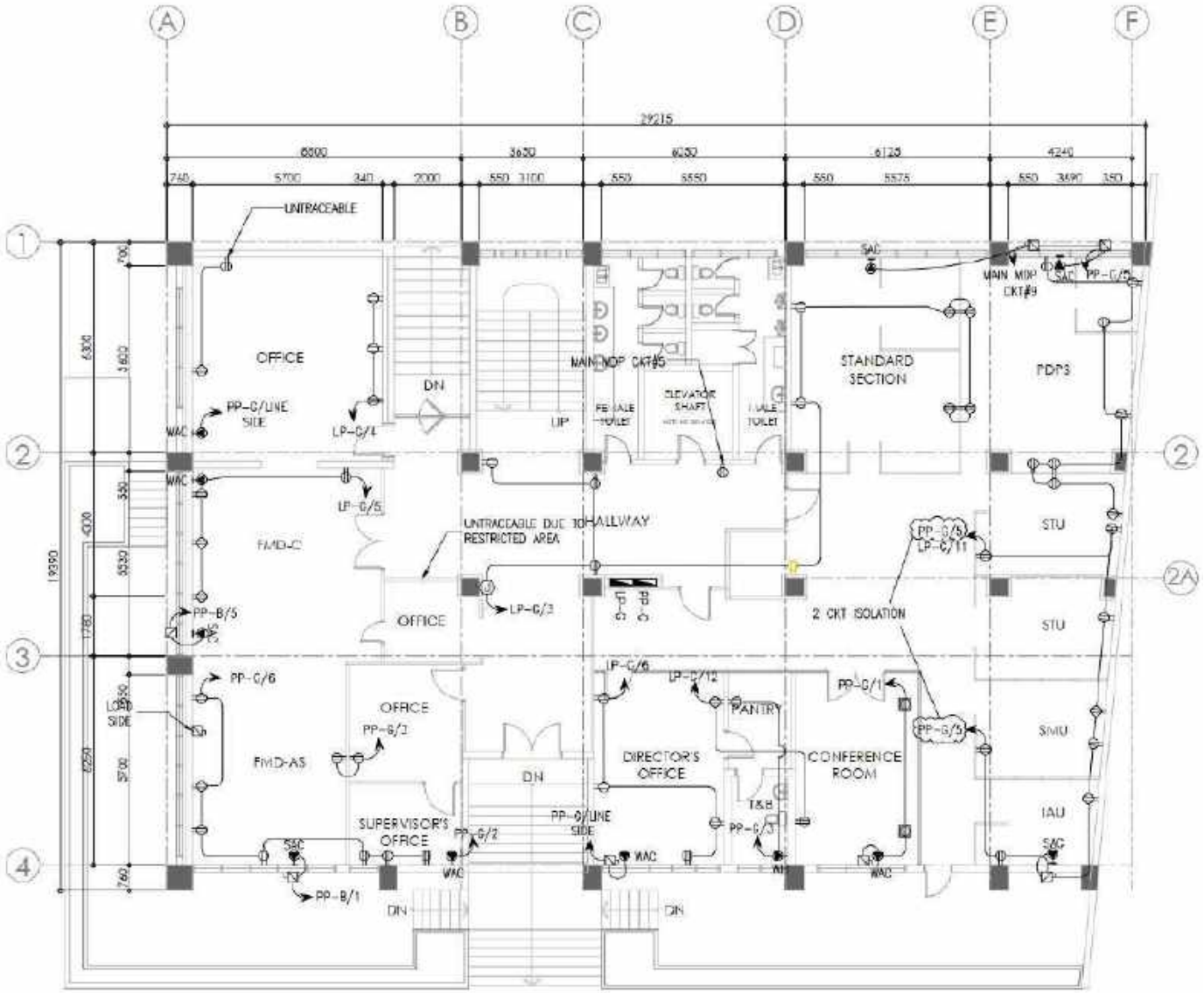
POWER LAYOUT



BASEMENT / GROUND FLOOR POWER LAYOUT

MAIN BUILDING AS-BUILT

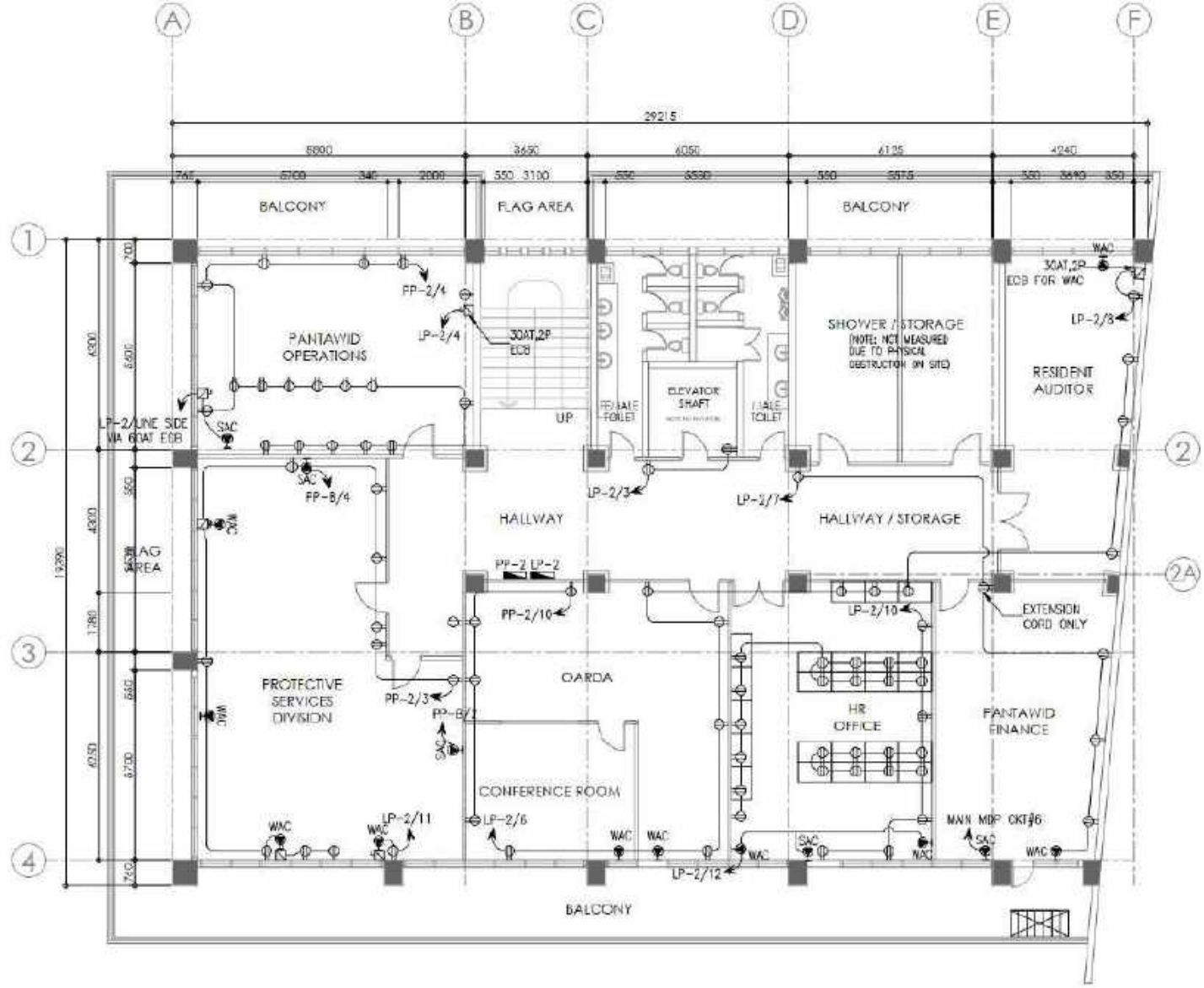
POWER LAYOUT



UPPER GROUND FLOOR POWER LAYOUT

MAIN BUILDING AS-BUILT

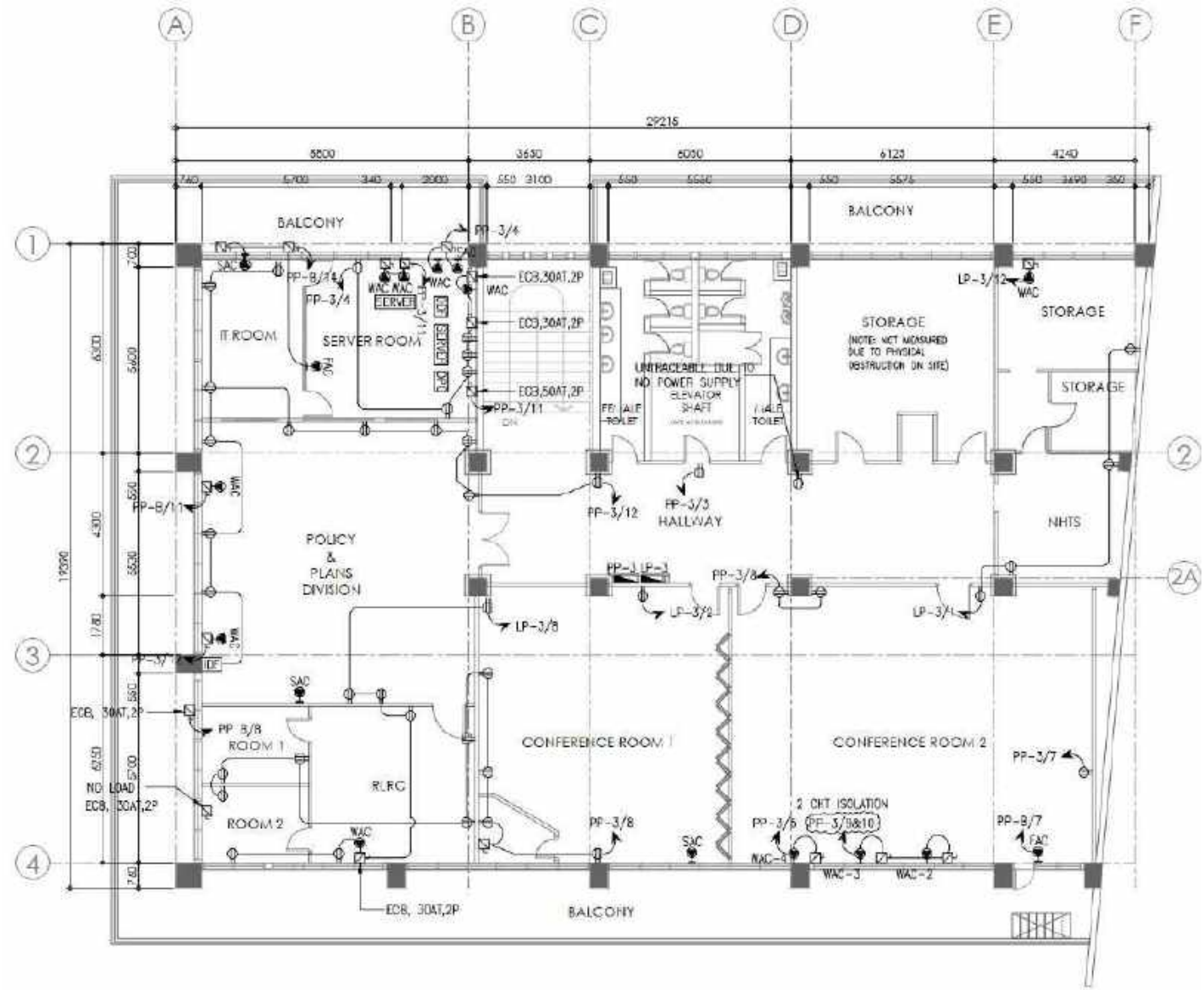
POWER LAYOUT



SECOND FLOOR POWER LAYOUT

MAIN BUILDING AS-BUILT

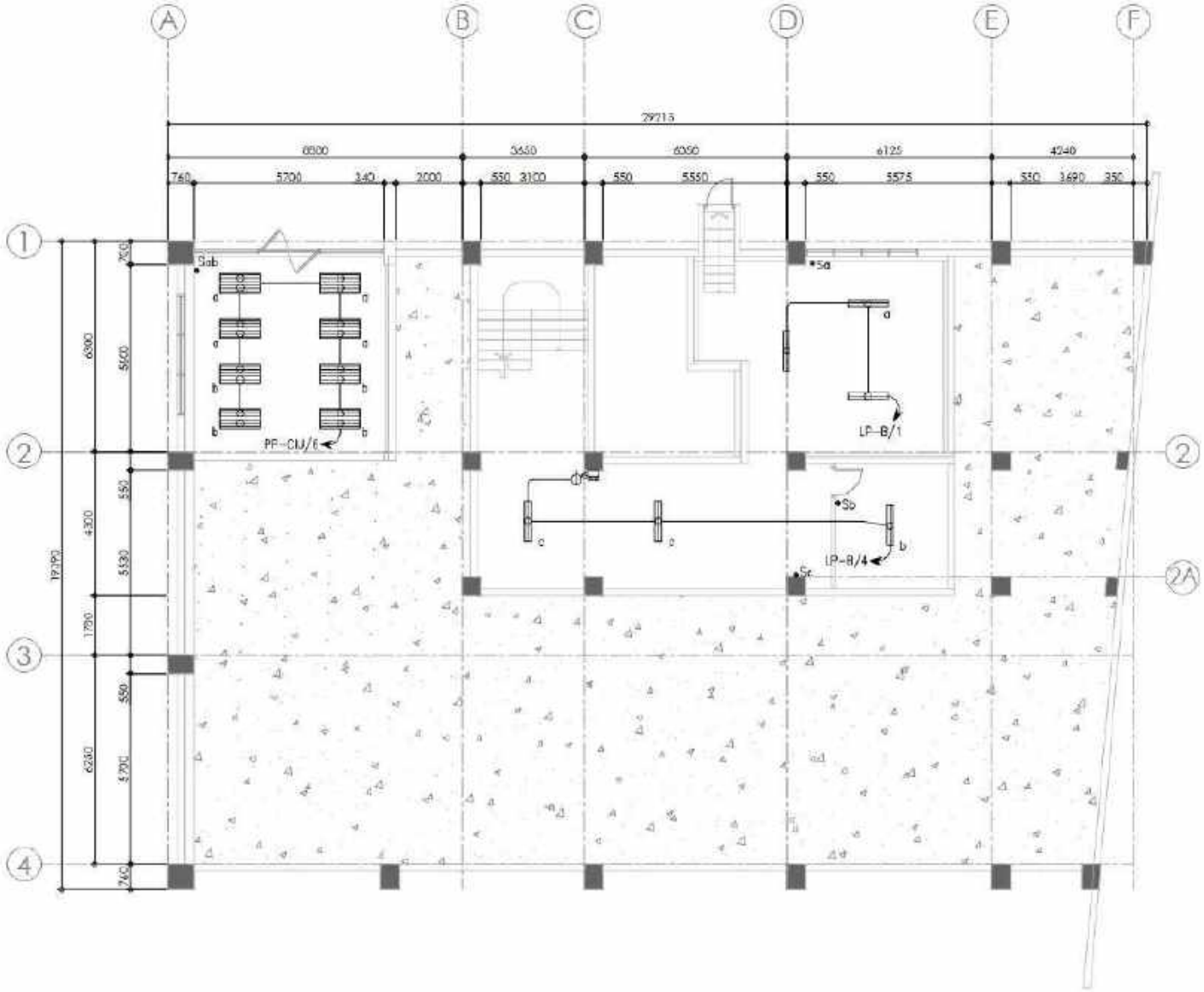
POWER LAYOUT



THIRD FLOOR POWER LAYOUT

MAIN BUILDING AS-BUILT

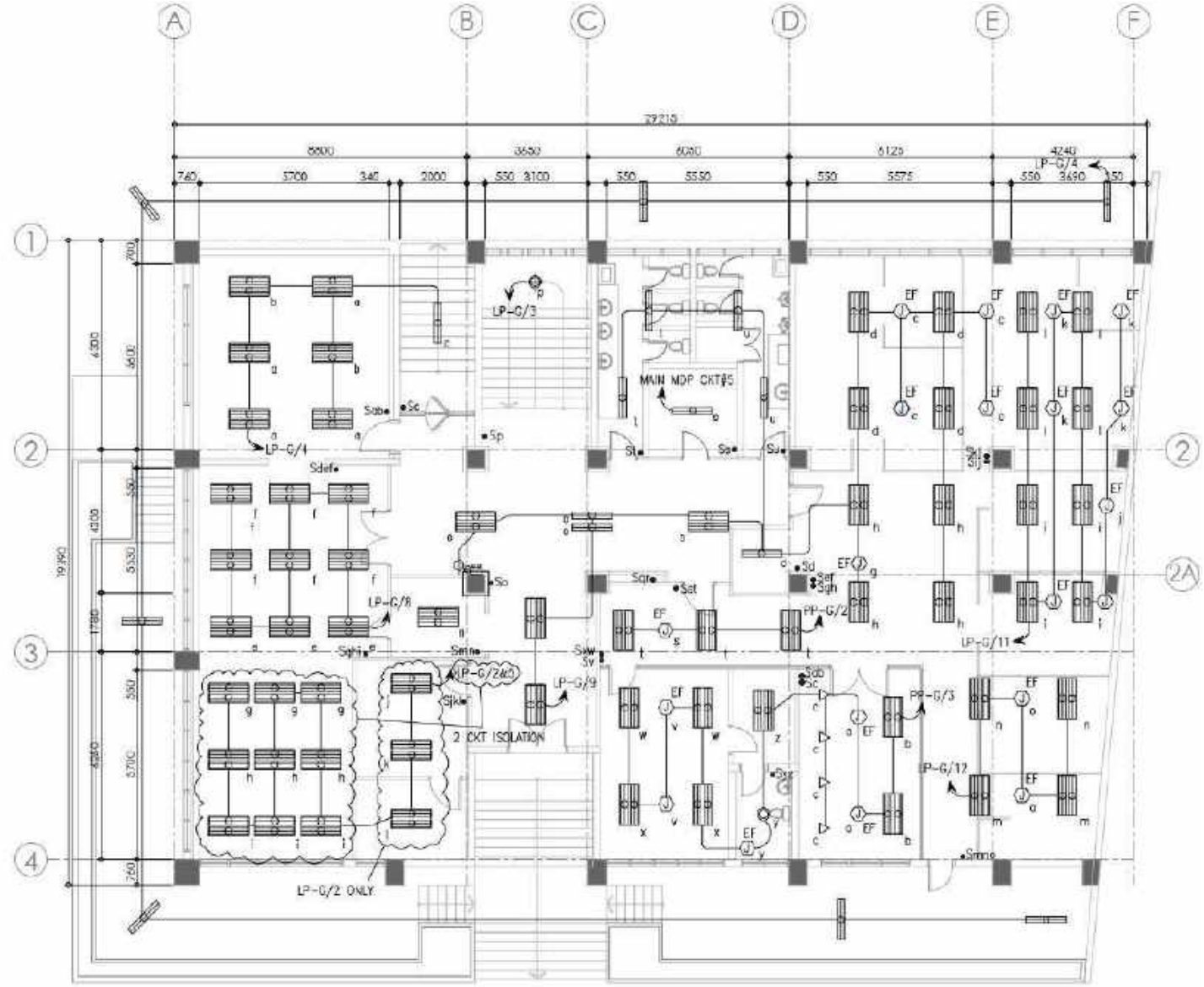
LIGHTING LAYOUT



BASEMENT / GROUND FLOOR LIGHTING LAYOUT

MAIN BUILDING AS-BUILT

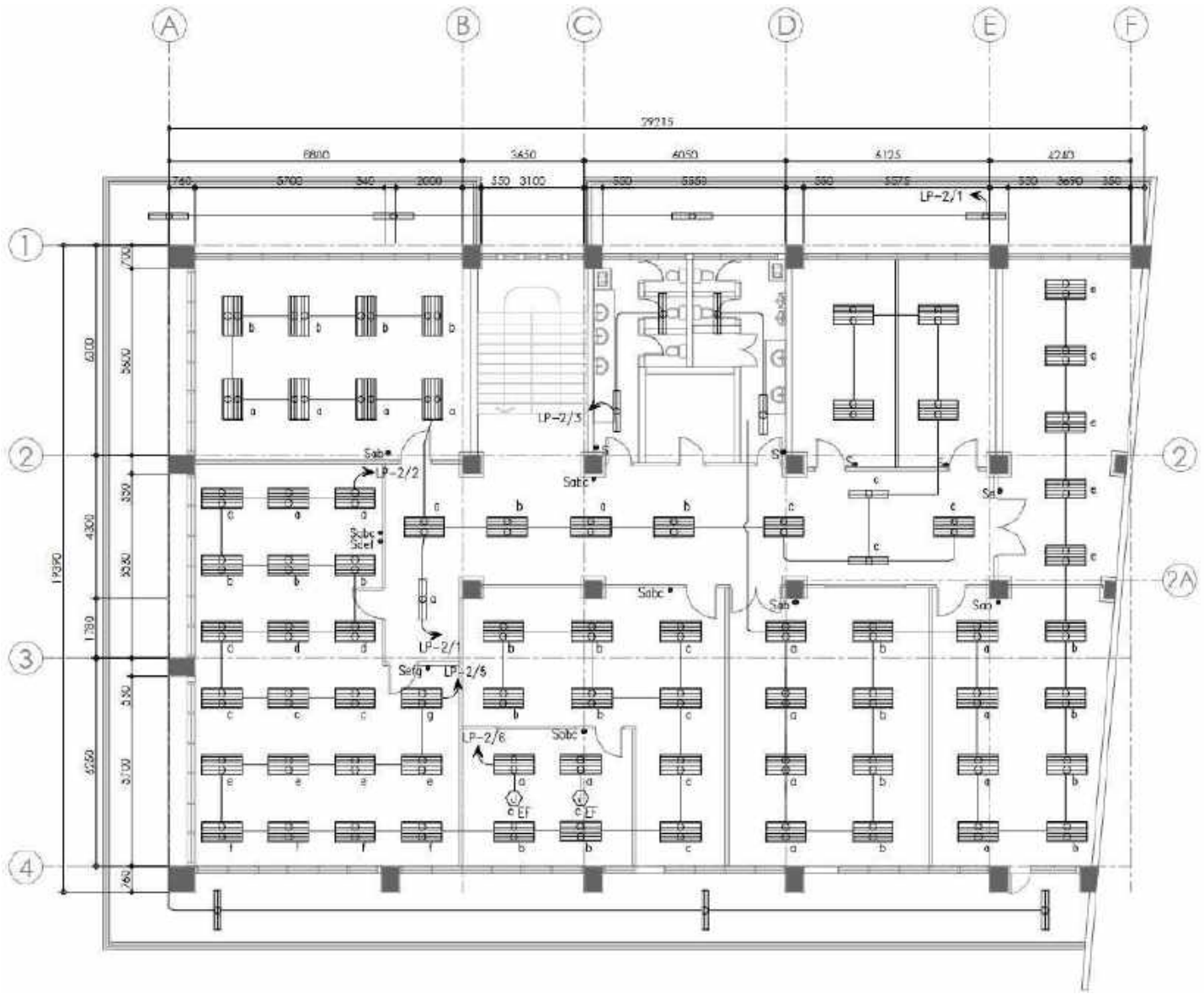
LIGHTING LAYOUT



UPPER GROUND FLOOR LIGHTING LAYOUT

MAIN BUILDING AS-BUILT

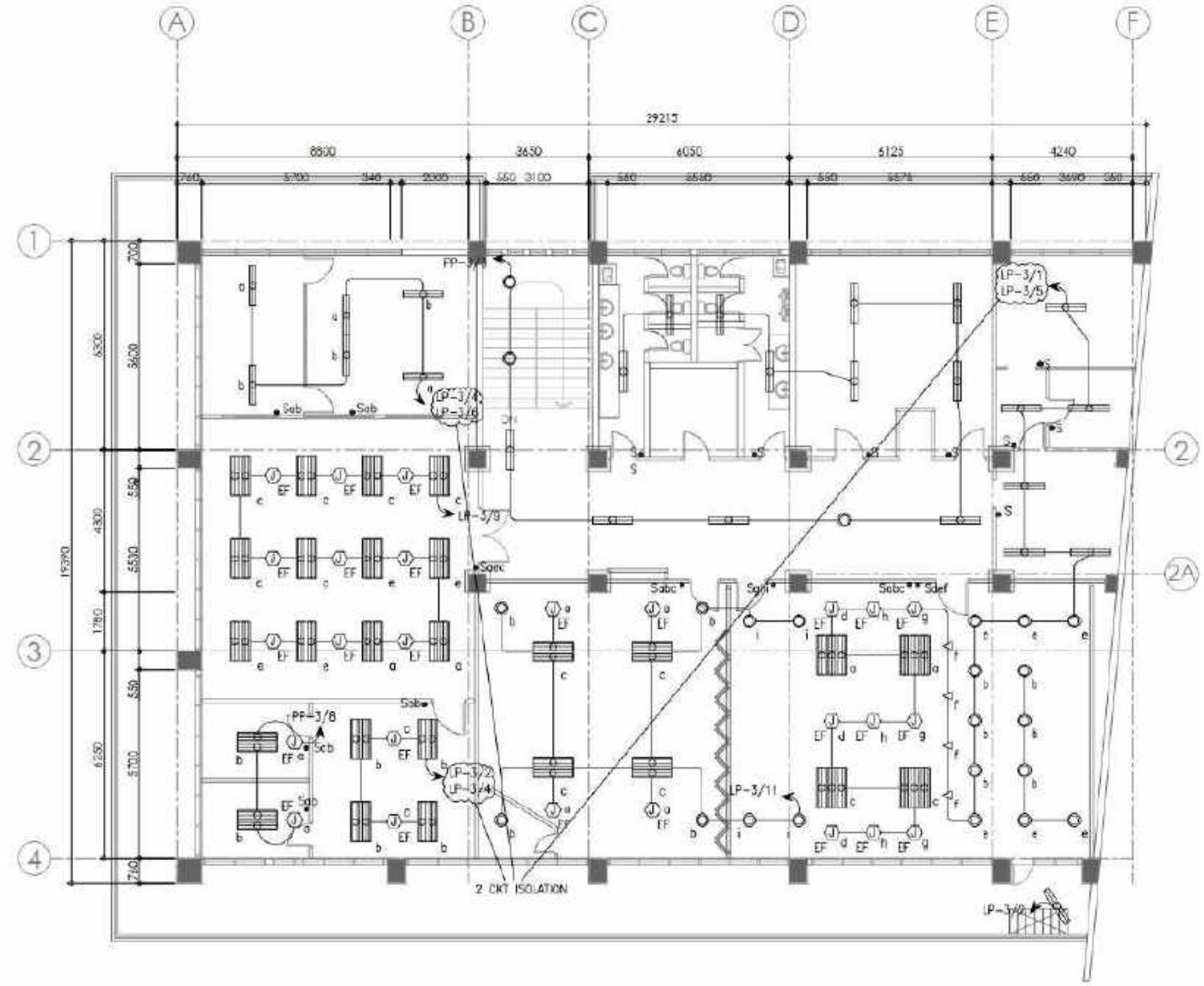
LIGHTING LAYOUT



SECOND FLOOR LIGHTING LAYOUT

MAIN BUILDING AS-BUILT

LIGHTING LAYOUT



THIRD FLOOR LIGHTING LAYOUT

MAIN BUILDING AS-BUILT

FEEDER SCHEDULE

CABLE FEEDER & CONDUIT RACEWAY SCHEDULE									
C#	SET(S)	# OF WIRES PER SET	MAIN FEEDER		GROUNDING		CONDUIT / RACEWAY		
C1	1	3	375mm^2	TW	MISSING		100mmø	IMC	C/T
C2	2	3	125mm^2	TW	MISSING		100mmø	IMC	C/T
C3	1	3	80mm^2	THHN/THWN	MISSING		50mmø	RPVC	C/T
C4	1	3	30mm^2	TW	5.5mm^2	TW	32mmø	RPVC	C/T
C5	1	3	30mm^2	TW	2.0mm SOL	TW	32mmø	RPVC	C/T
C6	1	3	30mm^2	TW	MISSING		32mmø	RPVC	C/T
C7	1	3	30mm^2	TW	MISSING		32mmø	IMC	C/T
C8	1	3	14mm^2	THHN/THWN	MISSING		25mmø	RPVC	C/T
C9	1	2	14mm^2	THHN/THWN	MISSING		25mmø	RPVC	C/T
C10	2	2	8.0mm^2	THHN/THWN	MISSING		20mmø	FPVC	C/T
C11	1	2	8.0mm^2	THHN/THWN	MISSING		20mmø	FPVC	C/T
C12	2	2	5.5mm^2	THHN/THWN	MISSING		15mmø	FPVC	C/T
C13	1	2	5.5mm^2	THHN/THWN	MISSING		15mmø	FPVC	C/T
C14	1	3	3.5mm^2	THHN/THWN	MISSING		15mmø	FPVC	C/T
C15	2	2	3.5mm^2	THHN/THWN	MISSING		15mmø	FPVC	C/T
C16	1	2	2.0mm SOL	DUPLEX TW	MISSING		15mmø	FPVC	C/T
C17	2	2	2.0mm SOL	THHN/THWN	MISSING		15mmø	FPVC	C/T
C18	1	2	2.0mm SOL	THHN/THWN	MISSING		15mmø	FPVC	C/T
C19	1	1	2.0mm SOL	THHN/THWN	MISSING		15mmø	FPVC	C/T

MAIN BUILDING AS-BUILT

LOAD SCHEDULE

DESIGNATION	MAIN MDP (EXISTING)	MOUNTING	SURFACE MOUNTED
SYSTEM	230 V 3 PHASE 3 WIRE NO GROUND	ENCLOSURE	NEMA-1
MIN. I.C.	10 KA	FEED	MERALCO 3-75KVA POLE MOUNTED DELTA TRANSFORMER BANK
LOCATION	BASEMENT	MAIN	300AT 450AF 3POLE MCCB

CKT NO.	LOAD DESCRIPTION	CONNECTED LOAD					BREAKER SIZE OVERCURRENT PROTECTION						FEEDER DETAILS	VD CALCULATION, %VD < 2% FOR MAIN BRANCHES				
		VA	CURRENT IN AMPERES											R CONSTANT	LENGTH (m)	FLC	VD	%VD
			3 PHASE	AB	CA	BC	BRAND	TYPE	AT	AF	KAIC	POLE						
	PANEL PP-B; FED THRU MAIN CB LINE SIDE	25339		72.70	10.80	26.67	G.E.	INDUSTRIAL MCCB	300	250	10	3	C3	30.8	2	63.51A	0.05V	0.02%
1	PANEL PP-3	33391		34.68	61.54	48.96	SQUARE D	INDUSTRIAL MCCB	300	250	18	3	C4	30.8	25	83.82A	2.15V	0.54%
2	PANEL PP-G & PANEL-CTU & GF-B-S-WACU	29907		45.66	52.05	30.51	SQUARE D	INDUSTRIAL MCCB	300	250	18	3	C6	30.8	12	73.57A	0.91V	0.38%
3	PANEL LP-G	17519		8.30	25.27	41.73	G.E.	PLUG-IN MCCB	100	100	10	3	C6	30.8	12	43.48A	0.54V	0.23%
4	SPACE																	
5	PANEL LP-2 & PANEL PP-2 & GF-ELEV LTG & C.D	47046	16.50	35.70	75.95	63.32	G.E.	PLUG-IN MCCB	100	100	10	3	C5	30.8	18	118.10A	2.18V	0.26%
6	2F PP-SACU	2062				8.52	WAIL	PLUG-IN MCCB	70	100	10	2		35.6	58	8.52A	2.32V	0.57%
7	PANEL LP-3	18055		37.56	43.59	17.00	G.E.	PLUG-IN MCCB	100	125	10	3	C8	30.8	25	45.53A	2.67V	1.16%
8	SPACE																	
9	PANEL LP-B	4347		8.40	1.80	8.20	G.E.	PLUG-IN MCCB	100	125	10	3	C7	30.8	8	10.91A	0.09V	0.04%
10	SPACE																	
	TOTAL	152816	16.50	151.50	265.20	239.14	G.E.	INDUSTRIAL MCCB	300	450	24	3	C2					

TOTAL VA = 152816 VA ESTIMATE DEMAND HOURS PER DAY = 18HRS AT 75% D.F. = 114612 VA

TOTAL CURRENT = 383.60 A DEMAND FACTOR = 18HRS / 24HRS = 75% AT 75% D.F. = 287.70 A

FEEDER = 383.60 A USED CODE C2 2.5CT 3 WIRE 125mm^2 TW CABLE MISSING GROUND IN 100mmφ IMC CONDUIT

BREAKER = 383.60 A USED 300AT 450AF 3POLE MCCB NOTE: MAIN BREAKER AT 95.90% LOADED

TRANSFORMER = 114.61 KVA USED 225 KVA (3-75KVA) POLE MOUNTED DELTA TRANSFORMER BANK FROM MERALCO

MAIN MDP (EXISTING)

DESIGNATION	PANEL PP-B (EXISTING)					MOUNTING	SURFACE MOUNTED								VOLTAGE DROP			CONSTANT	
SYSTEM	230 V	3 PHASE	3 WIRE	NO GROUND		ENCLOSURE	NEMA-1						VD	=	CONSTANT X LENGTH X INC		1φ =	35.6	
MIN. I.C.	10 KA					FEED	BASEMENT MAIN MDP CB LINE SIDE FED THRU								1000 X WIRE SIZE X SETS		3φ 3W =	30.8	
LOCATION	BASEMENT					MAIN	200AT	250AT	3POLE	MCCB			%VD	=	(VD / SUPPLY) X 100		3φ 4W =	17.8	
CKT NO.	LOAD DESCRIPTION	CONNECTED LOAD					BREAKER SIZE OVERCURRENT PROTECTION						FEEDER DETAILS	VD CALCULATION, %VD < 3% FOR BRANCHES				
		VA	CURRENT IN AMPERES											K CONSTANT	LENGTH (m)	I LC	VD	%VD
			3 PHASE	AB	CA	BC	BRAND	TYPE	AT	AF	KAIC	POLE						
1	3F-PMD-AS-SACU	2001		8.70			G.E.	BOLT-ON MCCB	30	100	10	2	C13	35.6	35	8.70A	1.46V	0.64%
2	3F-PSD-SACU	1106		5.20			G.E.	BOLT-ON MCCB	30	100	10	2	C12	35.6	32	5.20A	0.54V	0.23%
3	UNKNOWN CIRCUIT	391			1.70		G.E.	BOLT-ON MCCB	30	100	10	2	C13	35.6		1.70A	0.00V	0.00%
4	3F-PSD-SFP-SACU	2001			8.70		G.E.	BOLT-ON MCCB	40	100	10	2	C13	35.6	32	8.70A	1.80V	0.78%
5	3F-FMD-C-SACU	2047				8.90	G.E.	BOLT-ON MCCB	30	100	10	2	C13	35.6	16	8.90A	0.92V	0.40%
6	UNKNOWN CIRCUIT	230				1.00	G.E.	BOLT-ON MCCB	30	100	10	2	C13	35.6		1.00A	0.00V	0.00%
7	3F-CFRM2-FACU	5060		22.00			G.E.	BOLT-ON MCCB	30	100	10	2	C13	35.6	61	22.00A	8.69V	3.78%
8	3F-PFD-SACU	4232		18.40			G.E.	BOLT-ON MCCB	30	100	10	2	C13	35.6	46	18.40A	5.48V	2.38%
9	UNKNOWN CIRCUIT	0			0.00		G.E.	BOLT-ON MCCB	40	100	10	2	C13	35.6		0.00A	0.00V	0.00%
10	UNKNOWN CIRCUIT	92			0.40		G.E.	BOLT-ON MCCB	40	100	10	2	C13	35.6		0.40A	0.00V	0.00%
11	3F-PFD-WACU	3811				16.57	G.E.	BOLT-ON MCCB	60	100	10	2	C10	35.6	46	16.57A	1.70V	0.74%
12	UNKNOWN CIRCUIT	46				0.20	G.E.	BOLT-ON MCCB	60	100	10	2	C11	35.6		0.20A	0.00V	0.00%
13	UNKNOWN CIRCUIT	0		0.00			G.E.	BOLT-ON MCCB	40	100	10	2	C11	35.6		0.00A	0.00V	0.00%
14	3F-ITR M-SACU & 3F-SVRM-FACU	4232		18.40			G.E.	BOLT-ON MCCB	40	100	10	2	C11	35.6	56	18.40A	4.39V	1.99%
15	SPACE	0			0.00													
16	SPACE	0			0.00													
17	SPACE	0				0.00												
18	SPACE	0				0.00												
19	UNKNOWN CIRCUIT	0		0.00			G.E.	BOLT-ON MCCB	30	100	10	2	C11	35.6		0.00A	0.00V	0.00%
20	SPACE	0		0.00								2						
	TOTAL	25333	0.00	72.70	10.80	26.67	G.E.	INDUSTRIAL MCCB	200	250	10	3	K3					

TOTAL VA = 25333 VA

TOTAL CURRENT = (SUM OF COMPUTED LOAD + 25% OF THE LARGEST MOTOR FLA) / (230V * SQRT(3)) = 66.78 A

FEEDER = 66.78 A USED CODE C3 1 SET 3 WIRE 80mm^2 THHW/THWN CABLE MISSING GROUND 1X 50mm RPVC CONDUIT

BREAKER = 66.78 A USED 200AT 250AT 3POLE MCCB NOTE: NO GROUNDING BUS & CABLES; CKT#9, CKT#13 & CKT#19 NO LOAD DURING INSPECTION

VOLTAGE DROP FOR UNKNOWN CIRCUIT CANNOT BE COMPUTED

PANEL PP-B (EXISTING)

DESIGNATION	PANEL LP-B (EXISTING)					MOUNTING	SURFACE MOUNTED								VOLTAGE DROP			CONSTANT	
SYSTEM	230 V	3 PHASE	3 WIRE	NO GROUND		ENCLOSURE	NEMA-1						VD	=	CONSTANT X LENGTH X FLC		1ϕ =	35.6	
MIN. I.C.	10 KA					FEED	BASEMENT MAIN CKT#9								1000 X WIRE SIZE X SETS		3ϕ 3W =	30.8	
LOCATION	BASEMENT					MAIN	75AT	100AF	3 POLE	MCCB			NVD	=	(VD / SUPPLY) X 100		3ϕ 4W =	17.8	

CKT NO.	LOAD DESCRIPTION	CONNECTED LOAD					BREAKER SIZE OVERCURRENT PROTECTION						FEEDER DETAILS	VD CALCULATION, %VD < 3% FOR BRANCHES				
		VA	CURRENT IN AMPERES											R CONSTANT	LENGTH (m)	FLC	VD	%VD
			3 PHASE	AB	CA	BC	BRAND	TYPE	AT	AF	KAIC	POLE						
	SS - SACU	2001				8.70						2	C11	35.6	26	8.70A	1.01V	0.44%
1	LTG. & C.O. - BR & STR	1932		8.40			SQUARE D	BOLT-ON MCB	32	100	10	2	C13	35.6	18	8.40A	0.98V	0.43%
2	UNKNOWN CIRCUIT	0		0.00			SQUARE D	BOLT-ON MCB	32	100	10	2	C18	35.6		0.00A	0.00V	0.00%
3	SPACE	0			0.00													
4	LTG. & C.O. - HW & STR	414			1.80		SQUARE D	BOLT-ON MCB	32	100	10	2	C18	35.6	22	1.80A	0.40V	0.18%
5	UNKNOWN CIRCUIT	0				0.00	SQUARE D	BOLT-ON MCB	32	100	10	2	C18	35.6		0.00A	0.00V	0.00%
6	UNKNOWN CIRCUIT	0				0.00	SQUARE D	BOLT-ON MCB	20	100	10	2	C18	35.6		0.00A	0.00V	0.00%
	TOTAL	2346	0.00	8.40	1.80	0.00	SQUARE D	INDUSTRIAL MCCB	75	100	13	3	C7					

TOTAL VA = 2346 VA TOTAL VA+THE FED THRU = 4347 VA TOTAL CURRENT+THE FED THRU = 10.91 A

TOTAL CURRENT = 5.89 A

FEEDER = 5.89 A USED CODE C7 1 SET 3 WIRE 38mm^2 TW CABLE MISSING GROUND IN 32mmϕ IMC CONDUIT

BREAKER = 5.89 A USED 75AT 100AF 3POLE MCCB NOTE: NO GROUNDING BUS & CABLES; CKT#2, CKT#5, CKT#6 NO LOAD DURING INSPECTION

VOLTAGE DROP FOR UNKNOWN CIRCUIT CANNOT BE COMPUTED.

PANEL LP-B (EXISTING)

DESIGNATION	PANEL PP-G (EXISTING)					MOUNTING	RECESSED MOUNTED									VOLTAGE DROP			CONSTANT
SYSTEM	230 V	3 PHASE	3 WIRE	NO GROUND		ENCLOSURE	NEMA-1							VD	=	CONSTANT X LENGTH X FLC		3ϕ =	35.6
MIN. LC	10 KA					FEED	BASEMENT MAIN MDP CKT#2									1000 X WIRE SIZE X SETS		3ϕ 3W =	35.8
LOCATION	GROUND FLOOR-HALLWAY					MAIN	500AT	100AF	3POLE	MCCB			16KD	=		(VD / SUPPLY) X 100		3ϕ 4W =	17.8

CKT NO.	LOAD DESCRIPTION	CONNECTED LOAD					BREAKER SIZE OVERCURRENT PROTECTION						FEEDER DETAILS	VD CALCULATION, %VD < 3% FOR BRANCHES				
		VA	CURRENT IN AMPERES											K CONSTANT	LENGTH (m)	FLC	VD	%VD
			3 PHASE	AB	CA	BC	BRAND	TYPE	AT	AF	KAIC	POLE						
	PANEL DD; FED THRU PP-G LINE SIDE	5168		22.47A								2	C9	35.6	37	22.47A	2.01V	0.67%
	BS-WACU; FED THRU MAIN CB LINE SIDE	5520			24.00A							2	C11	35.6	31	24.00A	3.31V	1.44%
	DD-WACU; FED THRU MAIN CB LOAD SIDE	1265				5.50A						2	C16	35.6	18	5.50A	1.01V	0.44%
1	WACU & C.O. - CFRM	3165		13.75A			FUJI	PLUG-IN MCCB	30	100	10	2	C17	35.6	15	13.76A	1.61V	0.70%
2	LTG. - NEAR DD	2445		10.63A			FUJI	PLUG-IN MCCB	30	100	10	2	C18	35.6	18	10.63A	1.55V	0.95%
3	LTG. - CFRM & SYD-WACU	5686			24.72A		FUJI	PLUG-IN MCCB	30	100	10	2	C17	35.6	20	24.72A	2.51V	1.09%
4	UNKNOWN CIRCUIT	306			1.33A		MITSUBISHI	PLUG-IN MCCB	20	100	10	2	C18	35.6		1.33A	0.00V	0.00%
5	SS-PDPS-STU-SMU-IAU-CO.&PDPS-SACU&IAU-SACU	4492				19.53A	FUJI	PLUG-IN MCCB	30	100	10	2	C18	35.6	38	19.53A	7.55V	3.28%
6	FWD - C.O.	1260				5.48A	FUJI	PLUG-IN MCCB	30	100	10	2	C18	35.6	19	5.48A	2.17V	0.95%
	TOTAL	17954	0.00A	24.33A	26.05A	25.01A	SQUARE D	INDUSTRIAL MCCB	500	100	13	3	C5					

TOTAL VA = 17954 VA TOTAL VA+THE FED THRU = 29800 VA TOTAL CURRENT+THE FED THRU = 77.13 A

TOTAL CURRENT = (SUM OF COMPUTED LOAD + 25% OF THE LARGEST MOTOR FLA) / (230V * SQRT(3)) = 47.13 A

FEEDER = 47.13 A USED CODE C4 1 SET 3 WIRE 30mm^2 TW CABLE MISSING GROUND IN 32mm PRVC CONDUIT

BREAKER = 47.13 A USED 100AT 100AF 3POLE MCCB NOTE: FED THRU DOES NOT HAVE PROTECTION; NO GROUNDING BUS & CABLES

VOLTAGE DROP FOR UNKNOWN CIRCUIT CANNOT BE COMPUTED

PANEL PP-G (EXISTING)

DESIGNATION	PANEL PP-CIU (EXISTING)					MOUNTING	RECESSED MOUNTED								VOLTAGE DROP			CONSTANT	
SYSTEM	230 V	2 PHASE	2 WIRE	NO GROUND		ENCLOSURE	NEMA-1							VD	=	CONSTANT X LENGTH X FLC		1φ =	35.6
MIN. I.C.	10 KA					FEED	BASEMENT MAIN MDP (CTM)									1000 X WIRE SIZE X SETS		3φ 3W =	30.8
LOCATION	CIU OFFICE					MAIN	60AT	100AF	2POLE	MCCB				%VD	=	(VD / SUPPLY) X 100		3φ 4W =	17.8

CKT NO.	LOAD DESCRIPTION	CONNECTED LOAD					BREAKER SIZE OVERCURRENT PROTECTION						FEEDER DETAILS	VD CALCULATION, %VD < 3% FOR BRANCHES				
		VA	CURRENT IN AMPERES															
			3 PHASE	AB	CA	BC	BRAND	TYPE	AT	AF	KAIC	POLE		K CONSTANT	LENGTH (m)	FLC	VD	%VD
1	LEFT SIDE - WACU	1904		8.28A			FUJI	PLUG-IN MCCB	30	100	10	2	C18	35.6	3	8.28A	0.25V	0.11%
2	SPACE, USED FOR MAIN CB																	
3	UNKNOWN CIRCUIT	0		0.00A			FUJI	PLUG-IN MCCB	30	100	10	2	C18	35.6		0.00A	0.00V	0.00%
4	C.O.	720		3.13A			FUJI	PLUG-IN MCCB	20	100	10	2	C18	35.6	15	3.13A	0.51V	0.22%
5	RIGHT SIDE - WACU	1904		8.28A			FUJI	PLUG-IN MCCB	30	100	10	2	C18	35.6	6	8.28A	0.51V	0.22%
6	LTG.	639		2.78A			FUJI	PLUG-IN MCCB	30	100	10	2	C18	35.6	24	2.78A	0.68V	0.30%
TOTAL		5168	0.00A	22.47A	0.00A	0.00A	FUJI	PLUG-IN MCCB	60	100	13	2	CB					

TOTAL VA = 5168 VA

TOTAL CURRENT = (SUM OF COMPUTED LOAD + 25% OF THE LARGEST MOTOR FLA) / (230V * SQRT(3)) = 14.17 A

FEEDER = 14.17 A USED: 60DEG C 1 SET 2 WIRE 14mm^2 THHN/THWN CABLE MISSING GROUND IN 25mm ø RPVC CONDUIT

BREAKER = 14.17 A USED: 60AT 100AF 2POLE MCCB NOTE: NO GROUNDING BUS & CABLES; SEEN SPLICING OF 14mm2 CABLE POSSIBLY FEEDER FOR PANEL LP-8

VOLTAGE DROP FOR UNKNOWN CIRCUIT CANNOT BE COMPUTED

PANEL PP-CIU (EXISTING)

DESIGNATION	PANEL LP-G (EXISTING)					MOUNTING	RECESSED MOUNTED								VOLTAGE DROP				CONSTANT
SYSTEM	230V	3 PHASE	3 WIRE	NO GROUND		ENCLOSURE	NEMA-1							VD	=	CONSTANT X LENGTH X FLC		1φ =	35.6
MIN. I.C.	10 KA					FEED	BASEMENT MAIN MDP CKTS									1000 X WIRE SIZE X SETS		3φ 3W =	30.8
LOCATION	GROUND FLOOR HALLWAY					MAIN	100AT	100AF	3POLE	MCCB				%VD	=	(VD / SUPPLY) X 100		3φ 4W =	17.8
CKT NO.	LOAD DESCRIPTION	CONNECTED LOAD					BREAKER SIZE OVERCURRENT PROTECTION							FEEDER DETAILS	VD CALCULATION, %VD < 2% FOR BRANCHES				
		VA	CURRENT IN AMPERES												K CONSTANT	LENGTH (m)	FLC	VD	%VD
			1 PHASE	A/B	CA	DC	BRAND	TYPE	AT	AF	KAIC	POLE							
1	UNKNOWN CIRCUIT	161		0.70A			FUJI	PLUG-IN MCCB	20	100	10	2	C18		35.6		0.70A	0.00V	0.00%
2	LTG. - FMD & SVD	828		3.60A			FUJI	PLUG-IN MCCB	30	100	10	2	C18		35.6	45	3.60A	1.60V	0.72%
3	LTG. - STAIRS, C.O. - HW & SS & PDPS	1819			7.91A		FUJI	PLUG-IN MCCB	20	100	10	2	C18		35.6	36	7.91A	2.50V	1.26%
4	LTG. & C.O. - FMD BS PLTG	1019			4.43A		FUJI	PLUG-IN MCCB	30	100	10	2	C18		35.6	122	4.43A	5.50V	2.30%
5	LTG. & C.O. - FMD	3165				13.50A	WH	PLUG-IN MCCB	30	100	10	2	C18		35.6	29	13.50A	3.96V	1.73%
6	C.O. - DD	720				3.13A	FUJI	PLUG-IN MCCB	30	100	10	2	C18		35.6	15	3.13A	0.48V	0.23%
7	UNKNOWN CIRCUIT	138		0.60A			FUJI	PLUG-IN MCCB	30	100	10	2	C18		35.6		0.60A	0.00V	0.00%
8	LTG. - FMD C	792		3.40A			FUJI	PLUG-IN MCCB	20	100	10	2	C18		35.6	33	3.40A	1.30V	0.59%
9	LTG. & CF - HW & MDF & FCR	2905			12.63A		FUJI	PLUG-IN MCCB	20	100	10	2	C18		35.6	44	12.63A	5.65V	2.46%
10	UNKNOWN CIRCUIT	69			0.30A		FUJI	PLUG-IN MCCB	20	100	10	2	C18		35.6		0.30A	0.00V	0.00%
11	SS-PDPS-STU-SMU-IAU-C.O.B.PDPS-SACU & IAU-SACU	4392				19.53A	FUJI	PLUG-IN MCCB	30	100	10	2	C18		35.6	38	19.53A	7.55V	3.28%
12	SMU & IAU - LTG	1261				5.57A	FUJI	PLUG-IN MCCB	30	100	10	2	C18		35.6	15	5.57A	0.85V	0.37%
	TOTAL	17319	0.00A	8.30A	25.27A	41.23A	SQUARE D	INDUSTRIAL MCCB	100	100	18	3	08						

TOTAL VA = 17319 VA

TOTAL CURRENT = (EQUIV OF COMPUTED LOAD + 15% OF THE LARGEST MOTOR FLA) / (230V * SQRT(3)) = 46.29 A

FEEDER = 46.29 A USED CODE CK 1 SET 3 WIRE 10mm^2 THW CABLE IN 32mm PVC CONDUIT

BREAKER = 46.29 A USED 100AT 100AF 3POLE MCCB

NOTE: NO GROUNDING BUS & CABLES

VOLTAGE DROP FOR UNKNOWN CIRCUIT CANNOT BE COMPUTED

PANEL LP-G (EXISTING)

DESIGNATION	PANEL PP2 (EXISTING)					MOUNTING	RECESSED MOUNTED								VOLTAGE DROP			CONSTANT
SYSTEM	230 V	3 PHASE	2 WIRE	NO GROUND		ENCLOSURE	NEMA 1							VD	=	CONSTANT X LENGTH X FLC	16 =	35.6
MIN. I.C.	10 kA					FEED FROM	PANEL LP 2 MAIN CB UNDISDEFED THRU									1000 X WIRE SIZE X SETS	3 φ 3W =	30.8
LOCATION	2 ND FLOOR HALLWAY					MAIN	100AT	100AF	3POLE	MCCB				%VD	=	(VD / SLTPLY) X 100	3 φ 4W =	17.8

CKT NO.	LOAD DESCRIPTION	CONNECTED LOAD					BREAKER SIZE OVERCURRENT PROTECTION						FEEDER DETAILS	VD CALCULATION, %VD < 5% FOR BRANCHES				
		VA	CURRENT IN AMPERES				BRAND	TYPE	AT	AF	IRNC	FCLL		K CONSTANT	LENGTH (m)	FLC	VD	%VD
			3 PHASE	AB	CA	BC												
1	SPARE	0		0.00A			SQUARE D	BOLT-ON MCB	30	100	10	2						
2	SPARE	0		0.00A			SQUARE D	BOLT-ON MCB	30	100	10	2						
3	PSD - C.O. & WACU 100	5450			23.69A		SQUARE D	BOLT-ON MCB	20	100	10	2	C18	35.6	48	23.69A	22.59V	9.83%
4	PO - C.O.	3059			13.30A		SQUARE D	BOLT-ON MCB	30	100	10	2	C18	35.6	41	13.30A	5.50V	2.41%
5	SPARE	0				0.00A	SQUARE D	BOLT-ON MCB	20	100	10	2						
6	SPARE	0				0.00A	SQUARE D	BOLT-ON MCB	30	100	10	2						
7	SPARE	0		0.00A			SQUARE D	BOLT-ON MCB	20	100	10	2						
8	SPARE	0		0.00A			SQUARE D	BOLT-ON MCB	30	100	10	2						
9	SPARE	0			0.00A		SQUARE D	BOLT-ON MCB	20	100	10	2						
10	UNKNOWN CIRCUIT	890			3.91A		SQUARE D	BOLT-ON MCB	20	100	10	2	C18	35.6		3.91A	0.00V	0.00%
11	SPARE	0				0.00A	SQUARE D	BOLT-ON MCB	20	100	10	2						
12	SPARE	0				0.00A	SQUARE D	BOLT-ON MCB	20	100	10	2						
	TOTAL	8989	0.00A	0.00A	40.89A	0.00A	SQUARE D	INDUSTRIAL MCCB	160	100	18	4	C18					

TOTAL VA = 8989 VA

TOTAL CURRENT = (SUM OF COMPUTED LOAD + 25% OF THE LARGEST MOTOR FLA) / (230V * SQRT(3)) = 26.59 A

FEEDER = 29.24 A USED COPPER 3 NO 2 WIRE 35mm^2 THWN/THHN CABLE MISSING GROUND IN 20mm φ TYPE CONDUIT

BREAKER = 26.38 A USED 100AT 100AF 3POLE MCCB NOTE WITH GROUNDING BUS, NO GROUNDING CABLE; USE 1 & 3 ONLY, UNDERSIZE MAIN CABLE, OVERLOAD CKT#3

VOLTAGE DROP FOR UNKNOWN CIRCUIT CANNOT BE COMPUTED

PANEL PP-2 (EXISTING)

DESIGNATION	PANEL LP-2 (EXISTING)					MOUNTING	RECESSED MOUNTED							VOLTAGE DROP			CONSTANT	
SYSTEM	230 V	3 PHASE	3 WIRE	WITH GROUND		ENCLOSURE	NEMA-1						VD	=	CONSTANT X LENGTH X FLC		1ϕ =	35.6
MIN. I.C.	10 KA					FEED FROM	BASEMENT MAIN MDP (XTNS)								1000 X WIRE SIZE X SETS		3ϕ 3W =	30.8
LOCATION	2ND FLOOR HALLWAY					MAIN	100AT	100AF	3POLE	MCCB			%VD	=	(VD / SUPPLY) X 100		3ϕ 4W =	17.8

CKT NO.	LOAD DESCRIPTION	CONNECTED LOAD					BREAKER SIZE OVERCURRENT PROTECTION						FEEDER DETAILS	VD CALCULATION, %VD < 3% FOR BRANCHES				
		VA	CURRENT IN AMPERES											K CONSTANT	LENGTH (m)	FLC	VD	%VD
			3 PHASE	AB	CA	BC	BRAND	TYPE	AT	AF	KAIC	POLE						
	PD - SACU	6575	16.50A				G.E.	BOLT-ON MCCB	60	100	10	3	C14	30.8	34	16.50A	4.04V	2.15%
	PANEL PP-2; FED THRU MAIN CB LINE SIDE	9389			40.82A		SQUARE D	INDUSTRIAL MCCB	100	100	15	2	C11	35.6	2	40.82A	0.36V	0.16%
1	HW-PD - LTG & PLTG	2231		9.70A			WM	PLUG-IN MCCB	30	100	10	2	C17	35.6	69	9.70A	2.40V	1.48%
2	PSD - LTG	805		3.50A			FUJI	PLUG-IN MCCB	30	100	10	2	C18	35.6	31	3.50A	1.09V	0.48%
3	HW - C.O. & HR-PD-RA-MCR-FCR-STR-PF - LTG	3035			13.20A		FUJI	PLUG-IN MCCB	30	100	10	2	C17	35.6	63	13.20A	4.23V	1.84%
4	UNKNOWN CIRCUIT	184			0.80A		FUJI	PLUG-IN MCCB	30	100	10	2	C18	35.6		0.80A	0.00V	0.00%
5	PSD-DAFDA - LTG	2599				11.30A	FUJI	PLUG-IN MCCB	30	100	10	2	C18	35.6	38	11.30A	4.37V	1.90%
6	PSD-DAFDA - C.O. & WACU (2X)	6249				27.17A	FUJI	PLUG-IN MCCB	30	100	10	2	C18	35.6	18	27.17A	4.97V	2.16%
7	HW-PF - C.O. & WACU	2806		12.20A			FUJI	PLUG-IN MCCB	30	100	10	2	C17	35.6	40	12.20A	2.48V	1.08%
8	RA - WACU	2369		10.30A			FUJI	PLUG-IN MCCB	30	100	10	2	C18	35.6	38	10.30A	4.09V	1.78%
9	UNKNOWN CIRCUIT	230			1.00A		FUJI	PLUG-IN MCCB	30	100	10	2	C17	35.6		1.00A	0.00V	0.00%
10	FR - C.O.	4860			21.13A		FUJI	PLUG-IN MCCB	30	100	10	2	C15	35.6	36	21.13A	3.87V	1.68%
11	PSD - WACU	1904				8.28A	FUJI	PLUG-IN MCCB	30	100	10	2	C18	35.6	22	8.28A	1.89V	0.81%
12	MR - WACU (2X) & SACU	3811				16.57A	G.E.	PLUG-IN MCCB	30	100	10	2	C13	35.6	30	16.57A	3.22V	1.40%
	TOTAL	31085	0.00A	35.70A	36.13A	63.32A	SQUARE D	INDUSTRIAL MCCB	100	100	10	3	C5					

TOTAL VA = 31085 VA TOTAL VA+THE FED THRU = 47946 VA TOTAL CURRENT+THE FED THRU = 122.02 A

TOTAL CURRENT = (SUM OF COMPUTED LOAD + 25% OF THE LARGEST MOTOR FLA) / (230V * SQRT(3)) = 81.95 A

FEEDER = 81.95 A USED 100 AT 3 SET 3 WIRE 30mm*2 THW CABLE 2mm SDL GROUND IN 32mmϕ RPVC CONDUIT

BREAKER = 81.95 A USED 100AT 100AF 3POLE MCCB NOTE: PANEL BODY GROUND ONLY, NO GROUNDING BUS; UNKNOWN FED THRU DOES NOT HAVE PROTECTION

VOLTAGE DROP FOR UNKNOWN CIRCUIT CANNOT BE COMPUTED

PANEL LP-2 (EXISTING)

DESIGNATION	PANEL PP-3 (EXISTING)					MOUNTING	RECESSED MOUNTED								VOLTAGE DROP			CONSTANT	
SYSTEM	230 V	3 PHASE	3 WIRE	WITH GROUND		ENCLOSURE	NEMA-1							VD	=	CONSTANT X LENGTH X FLC		3φ =	35.6
MIN. I.C.	10 KA					FEED FROM	BASEMENT MAIN MDP (CB#1)									1000 X WIRE SIZE X SETS		3φ 3W =	30.8
LOCATION	3RD FLOOR HALLWAY					MAIN	100AT	100AF	3POLE	MCCB				%VD	=	(VD / SUPPLY) X 100		3φ 4W =	17.8

CKT NO.	LOAD DESCRIPTION	CONNECTED LOAD					BREAKER SIZE OVERCURRENT PROTECTION						FEEDER DETAILS	VD CALCULATION, %VD < 3% FOR BRANCHES				
		VA	CURRENT IN AMPERES											K CONSTANT	LENGTH (m)	FLC	VD	%VD
			3 PHASE	AB	CA	BC	BRAND	TYPE	AT	AF	KAIC	#POLE						
	CFRM1 - FACU	3381		14.70A								2	C11	35.6	18	14.70A	1.18V	0.51%
1	SPARE	0		0.00A			FUJI	PLUG-IN MCCB	60	300	10	2						
2	UNKNOWN CIRCUIT	120		0.52A			FUJI	PLUG-IN MCCB	30	300	10	2	C18	35.6		0.52A	0.00V	0.00%
3	HW-STR - C.O. & LTG	3480			15.13A		FUJI	PLUG-IN MCCB	30	300	10	2	C18	35.6	38	15.13A	5.85V	2.54%
4	SVRM - C.O. & SACU	6764			29.41A		FUJI	PLUG-IN MCCB	30	300	10	2	C18	35.6	35	29.41A	10.47V	4.55%
5	CFRM2 - WACU	1909				8.30A	FUJI	PLUG-IN MCCB	30	300	10	2	C18	35.6	15	8.30A	2.11V	0.92%
6	UNKNOWN CIRCUIT	230				1.00A	FUJI	PLUG-IN MCCB	30	300	10	2	C18	35.6		1.00A	0.00V	0.00%
7	CFRM2 - C.O.	2086		9.07A			FUJI	PLUG-IN MCCB	30	300	10	2	C18	35.6	18	9.07A	2.68V	1.16%
8	CFRM1-RLRC - C.O. & LTG	2381		10.35A			FUJI	PLUG-IN MCCB	30	300	10	2	C18	35.6	33	10.35A	3.47V	1.51%
9	CFRM2 - WACU (2X) SAME AS CKT#10	1955			8.50A		FUJI	PLUG-IN MCCB	30	300	10	2	C18	35.6	15	8.50A	2.16V	0.94%
10	CFRM2 - WACU (2X) SAME AS CKT#10	1955			8.50A		FUJI	PLUG-IN MCCB	30	300	10	2	C18	35.6	15	8.50A	2.16V	0.94%
11	SVRM - WACU (2X)	5311				23.09A	FUJI	PLUG-IN MCCB	60	300	10	2	C18	35.6	35	23.09A	8.22V	3.57%
12	PP2 - WACU	3811				16.57A	FUJI	PLUG-IN MCCB	30	300	10	2	C18	35.6	30	16.57A	5.06V	2.20%
	TOTAL	30200	0.00A	19.98A	61.54A	48.96A	G.E.	BOLT-ON MCCB	100	300	10	3	C4					

TOTAL VA = 30200 VA TOTAL VA+THE FED THRU = 33392 VA TOTAL CURRENT+THE FED THRU = 88.06 A

TOTAL CURRENT = (SUM OF COMPUTED LOAD + 25% OF THE LARGEST MOTOR FLA) / (230V * SQRT(3)) = 79.58 A

FEEDER = 79.58 A USED CODE C4 1 SET 3 WIRE 30mm^2 TW CABLE 5.5mm^2 GROUND IN 38mm RPVC CONDUIT

BREAKER = 79.58 A USED 100AT 100AF 3POLE MCCB NOTE: PANEL BODY GROUND ONLY; NO GROUNDING BUS; UNKNOWN FED THRU DOES NOT HAVE PROTECTION

VOLTAGE DROP FOR UNKNOWN CIRCUIT CAN NOT BE COMPUTED

PANEL PP-3 (EXISTING)

DESIGNATION	PANEL LP3 (EXISTING)					MOUNTING	RECESSED MOUNTED								VOLTAGE DROP			CONSTANT	
SYSTEM	230 V	3 PHASE	3 WIRE	NO GROUND		ENCLOSURE	NEMA-1							VD	=	CONSTANT X LENGTH X FLC		3φ =	35.6
MIN I.C.	10 KA					FEED FROM	BASEMENT MAIN MDP CKT#7									1000 X WIRE SIZE X SETS		3φ 3W =	30.8
LOCATION	3RD FLOOR HALLWAY					MAIN	100AT	100AT	3POLE	MCCB				%VD	=	(VD / SUPPLY) X 100		3φ 4W =	17.8

CKT NO.	LOAD DESCRIPTION	CONNECTED LOAD					BREAKER SIZE OVERCURRENT PROTECTION						FEEDER DETAILS	VD CALCULATION %VD < 3% FOR BRANCHES				
		VA	CURRENT IN AMPERES											R CONSTANT	LENGTH (m)	FLC	VD	%VD
			3 PHASE	AB	CA	BC	BRAND	TYPE	AT	AF	KAIC	POLE						
1	CRRM2 NHTS - LTG & C.O. (SAME AS CKT #5)	3859			16.76A		FUJI	PLUG-IN MCCB	30	100	10	2	C10	35.6	43	16.76A	7.34V	3.19%
2	RLRC - LTG & EF; CRRM1 - C.O.; PLTG	786		3.20A			FUJI	PLUG-IN MCCB	30	100	10	2	C10	35.6	33	3.20A	1.07V	0.47%
3	GF-OUTDOOR-BOOSTER PUMP	3220			14.00A		FUJI	PLUG-IN MCCB	30	100	10	2	C10	35.6	34	14.00A	4.84V	2.11%
4	RLRC - LTG & C.O.; ITRM-SVRM - LTG	667			2.90A		FUJI	PLUG-IN MCCB	30	100	10	2	C10	35.6	46	2.90A	1.36V	0.59%
5	CRRM2 NHTS - LTG & C.O. (SAME AS CKT #1)	0					FUJI	PLUG-IN MCCB	30	100	10	2						
6	ITRM-SVRM - LTG	281				1.22A	FUJI	PLUG-IN MCCB	30	100	10	2	C10	35.6	35	1.22A	0.43V	0.19%
7	UNKNOWN CIRCUIT	92		0.40A			FUJI	PLUG-IN MCCB	30	100	10	2	C10	35.6		0.40A	0.00V	0.00%
8	RLRC - C.O. & WACU	3211		13.96A			FUJI	PLUG-IN MCCB	30	100	10	2	C10	35.6	33	13.96A	4.69V	2.04%
9	PPD - LTG	3659			15.91A		FUJI	PLUG-IN MCCB	30	100	10	2	C10	35.6	35	15.91A	5.66V	2.46%
10	SPACE	0			0.00A													
11	CRRM1&2 - LTG; CRRM2 - C.O.	1679				7.30A	FUJI	PLUG-IN MCCB	30	100	10	2	C10	35.6	24	7.30A	1.78V	0.77%
12	NHTS - WACU	1950				8.48A	KOTEK	PLUG-IN MCCB	30	100	10	2	C10	35.6	32	8.48A	2.76V	1.20%
TOTAL		19555	0.00A	17.56A	49.59A	17.00A	SQUARE D	INDUSTRIAL MCCB	100	100	10	3	C8					

TOTAL VA = 19555 VA

TOTAL CURRENT = (SUM OF COMPUTED LOAD + 25% OF THE LARGEST MOTOR FLA) / (230V * SQRT(3)) = 50.60 A

FEEDER = 50.60 A USED 100A CB 3 SET 4 WIRE 1/0mm² THHN/THWN CABLE MISSING GROUND IN 25mm² RPVC CONDUIT

BREAKER = 50.60 A USED 100AT 100AF 3POLE MCCB NOTE: UNDERSIZE MAIN CABLE; NO GROUNDING BUS & CABLES; VOLTAGE DROP FOR UNKNOWN CIRCUIT CANNOT BE COMPUTED

DETAILS AT PHASE A & CKTS AT PHASE C ONLY HAS 1 CABLE POSSIBLE ONLY ONE CKT.

PANEL LP-3 (EXISTING)

MAIN BUILDING AS-BUILT

VOLTAGE DROP CALCULATION

1.0 INTRODUCTION

THIS SECTION COVERS THE VOLTAGE DROP ANALYSIS FOR EXISTING DSWD-IV MIMAROPA MAIN BUILDING.

POWER SUPPLY FOR THE MAIN BUILDING IS 230V, 60HZ, 3 PHASE 3 WIRE.

2.0 OBJECTIVE

THE OBJECTIVE OF VOLTAGE DROP ANALYSIS IS TO COMPLY WITH APPLICABLE ELECTRICAL STANDARDS, TO HAVE AN EFFICIENT SYSTEM AND GOOD ELECTRICAL EQUIPMENT PERFORMANCE.

EXCESSIVE VOLTAGE DROP CAN CAUSE INCONSISTENT LIGHTING LEVELS, INCREASE CURRENT CONSUMPTION, INTERMITTENT OPERATION AND OVERHEATING OF ELECTRICAL EQUIPMENT, BLOWN FUSES OR BREAKER TRIPPINGS,

3.0 CALCULATIONS

VOLTAGE DROP – VOLTAGE DROP IS THE LOSS OF VOLTAGE CAUSED BY THE FLOW OF CURRENT THROUGH A RESSITANCE. IT IS THE DIFFERENCE BETWEEN THE VOLTAGE READING AT THE BEGINNING AND AT THE END OF A CABLE RUN. IN VOLTAGE DROP ANALYSIS, THE FARTHEST DISTANCE OR THE FARTHEST LOAD IS USED AS THE REFERENCE.

FORMULA:

VOLTAGE DROP = (CONSTANT x LENGTH x FULL LOAD CURRENT) / (1000 x

WIRE SIZE x NUMBER OF SETS)

%VOLTAGE DROP = (VOLTAGE DROP / SUPPLY VOLTAGE) x 100

CONSTANT: SINGLE PHASE = 35.6 ; THREE PHASE – THREE WIRE = 30.8 ; THREE PHASE – FOUR WIRE = 17.8

NOTE:

VOLTAGE DROP SHOULD BE LESS THAN 5% FROM THE MAIN SOURCE (2% FROM THE MAIN TO THE DISTRIBUTION AND 3% FROM THE DISTRIBUTION TO THE FARTHEST LOAD.

USING THE FORMULA

A. COMPUTE THE VOLTAGE DROP FROM MAIN MDP TO PANEL **PP-B** WITH CABLE CODE OF **C3**.

VOLTAGE DROP = (30.8 x 2m x 63.61A) / (1000 x 80mm2 x 1) = **0.049V**

%VOLTAGE DROP = (0.049V / 230V) x 100 = **0.021%**

B. COMPUTE THE VOLTAGE DROP FROM MAIN MDP TO PANEL **PP-3** WITH CABLE CODE OF **C4**.

VOLTAGE DROP = (30.8 x 25m x 83.82A) / (1000 x 30mm2 x 1) = **2.151V**

%VOLTAGE DROP = (2.151V / 230V) x 100 = **0.935%**

C. COMPUTE THE VOLTAGE DROP FROM MAIN MDP TO PANEL **PP-G, PP-CIU** WITH CABLE CODE OF **C6**.

VOLTAGE DROP = (30.8 x 12m x 73.57A) / (1000 x 30mm2 x 1) = **0.906V**

%VOLTAGE DROP = (2.151V / 230V) x 100 = **0.394%**

D. COMPUTE THE VOLTAGE DROP FROM MAIN MDP TO PANEL **LP-G** WITH CABLE CODE OF **C6**.

VOLTAGE DROP = (30.8 x 12m x 45.62A) / (1000 x 30mm2 x 1) = **0.562V**

%VOLTAGE DROP = (2.151V / 230V) x 100 = **0.244%**

E. COMPUTE THE VOLTAGE DROP FROM MAIN MDP TO PANEL **LP-2, PP-2** WITH CABLE CODE OF **C5**.

VOLTAGE DROP = (30.8 x 18m x 118.1A) / (1000 x 30mm2 x 1) = **2.182V**

%VOLTAGE DROP = (2.151V / 230V) x 100 = **0.949%**

NOTE: SINCE CIRCUIT BREAKER OF LP-2 IS ONLY 100A; THE 118.1A IS ALREADY **18%** OVERLOADING.

F. COMPUTE THE VOLTAGE DROP FROM MAIN MDP TO PANEL **LP-3** WITH CABLE CODE OF **C8**.

VOLTAGE DROP = (30.8 x 25m x 48.59A) / (1000 x 14mm2 x 1) = **2.672V**

%VOLTAGE DROP = (2.151V / 230V) x 100 = **1.162%**

G. COMPUTE THE VOLTAGE DROP FROM MAIN MDP TO PANEL **LP-B** WITH CABLE CODE OF **C7**.

VOLTAGE DROP = (30.8 x 8m x 10.91A) / (1000 x 30mm2 x 1) = **0.090V**

%VOLTAGE DROP = (2.151V / 230V) x 100 = **0.039%**

SINCE ALL VOLTAGE DROP FROM THE MAIN TO THE DISTRIBUTION IS LESS THAN 2%, WE CAN SELECT CIRCUITS FROM DISTRIBUTION PANEL WITH GREATER THAN 3% TO CHECK IF THE TOTAL VOLTAGE DROP IS STILL LESS THAN 5%.

A. COMPUTE THE VOLTAGE DROP **FROM PANEL PP-B TO LOAD 3F-CFRM2-FACU** WITH CABLE CODE OF **C13**.

VOLTAGE DROP = (35.6 x 61m x 22A) / (1000 x 5.5mm2 x 1) = **8.686V**

%VOLTAGE DROP = (0.049V / 230V) x 100 = **3.78%**

TOTAL VOLTAGE DROP = **0.021% + 3.78% = 3.801%** ; STILL LESS THAN 5%

B. COMPUTE THE VOLTAGE DROP **FROM PANEL PP-G TO SS-PDPS-STU-SMU-IAU-C.O.&PDPS-SACU&IAU-SACU**WITH CABLE CODE OF **C18**.

NOTE: 2.0mm SOL = 3.5mm2 STR = 12 AWG

VOLTAGE DROP = (35.6 x 38m x 19.53A) / (1000 x 3.5mm2 x 1) = **7.549V**

%VOLTAGE DROP = (0.049V / 230V) x 100 = **3.282%**

TOTAL VOLTAGE DROP = **0.394% + 3.282% = 3.676%** ; STILL LESS THAN 5%

C. COMPUTE THE VOLTAGE DROP **FROM PANEL PP-2 TO LOAD PSD – C.O. & WACU (3X)** WITH CABLE CODE OF **C18**.

NOTE: 2.0mm SOL = 3.5mm2 STR = 12 AWG

VOLTAGE DROP = (35.6 x 48m x 23.61A) / (1000 x 3.5mm2 x 1) = **11.527V**

%VOLTAGE DROP = (0.049V / 230V) x 100 = **5.012%**

TOTAL VOLTAGE DROP = **0.949% + 5.012% = 5.961%** ; **GREATER THAN 5%**

CONSIDER TO UPGRADE WIRE SIZE (FROM 2.0mm SOL TO 5.5mm2 STR) TO MINIMIZE VOLTAGE DROP

SAMPLE VOLTAGE DROP AFTER UPGRADE

VOLTAGE DROP = (35.6 x 48m x 23.61A) / (1000 x 5.5mm2 x 1) = **7.335V**

%VOLTAGE DROP = (0.049V / 230V) x 100 = **3.189%**

TOTAL VOLTAGE DROP = **0.949% + 3.189% = 4.138%** ; LESS THAN 5%

D. COMPUTE THE VOLTAGE DROP **FROM PANEL PP-3 TO LOAD SVRM – C.O. & SACU** WITH CABLE CODE OF **C18**.

NOTE: 2.0mm SOL = 3.5mm2 STR = 12 AWG

VOLTAGE DROP = (35.6 x 35m x 29.41A) / (1000 x 3.5mm2 x 1) = **10.470V**

%VOLTAGE DROP = (0.049V / 230V) x 100 = **4.552%**

TOTAL VOLTAGE DROP = **0.935% + 4.552% = 5.487%** ; **GREATER THAN 5%**

NOTE: SINCE CIRCUIT BREAKER OF CKT#4 IS ONLY 30A; THE 29.41A IS ALREADY AT **98%** LOADING.

CONSIDER TO UPGRADE WIRE SIZE & BREAKER SIZE.

E. COMPUTE THE VOLTAGE DROP **FROM PANEL LP-3 TO CFRM2-NHTS - LTG & C.O.** WITH CABLE CODE OF **C19**.

NOTE: 2.0mm SOL = 3.5mm2 STR = 12 AWG

CKT#1 & CKT#5 OF PANEL LP-3 IS THE SAME

VOLTAGE DROP = (35.6 x 43m x 16.78A) / (1000 x 3.5mm2 x 1) = **7.339V**

%VOLTAGE DROP = (0.049V / 230V) x 100 = **3.191%**

TOTAL VOLTAGE DROP = **1.162% + 3.191% = 4.353%** ; STILL LESS THAN 5%

MAIN BUILDING AS-BUILT

SHORT CIRCUIT ANALYSIS

1.0 INTRODUCTION

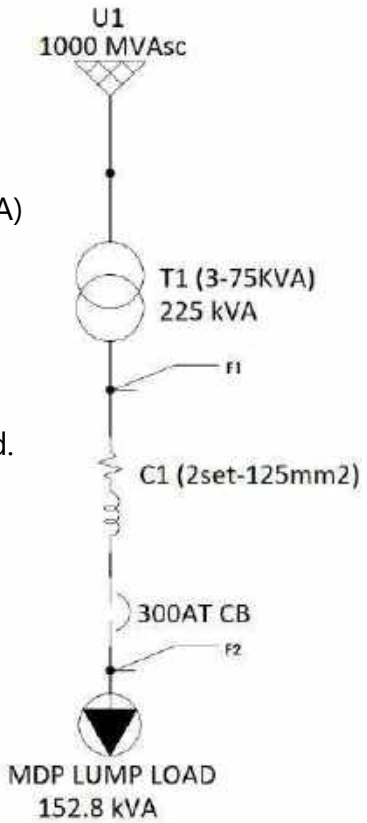
THIS SECTION COVERS THE SHORT CIRCUIT ANALYSIS FOR EXISTING DSWD-IV MIMAROPA MAIN BUILDING.

POWER SUPPLY FOR THE MAIN BUILDING IS 230V, 60HZ, 3 PHASE 3 WIRE.

2.0 OBJECTIVE

THE OBJECTIVE OF SHORT CIRCUIT ANALYSIS IS TO CONFIRM THE SHORT CIRCUIT RATING OF THE MAIN BREAKER.

3.0 CALCULATIONS



Let MVA Fault = 1000MVA (Meralco Manila Grid)

Let KVA Base = 1000KVA (Since Capacity is below 1000KVA)

Let approximate Length of MDP Cable = 20 meters

Let approximate Transformer Impedance %Z = 3%

Compute Short Circuit at Fault 1 & Fault 2 using Per-Unit Method.

1. Convert Values to PU

Compute Utility pu equivalent

pu Zu = MVA Base / MVA Fault

= 1/1000 = **0.001 pu**

Compute Transformer pu equivalent

pu Zt = (KVA Base / KVA Rating) x %Z

= (1000 / 225) x 0.03 = **0.1333 pu**

Compute MDP Cable pu equivalent

Rw = (Ω/km) x km = 0.1543 x 0.02 = 0.0031 Ω

pu Rw = (VA Base x R) / (V^2 x No. of Sets)

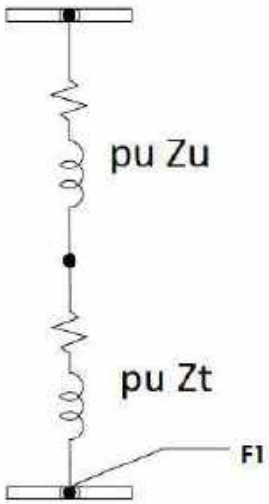
= (1000000 x 0.0031) / (230^2 x 2) = 0.0292 pu

Xw = (Ω/km) x km = 0.0881 x 0.02 = 0.0018 Ω

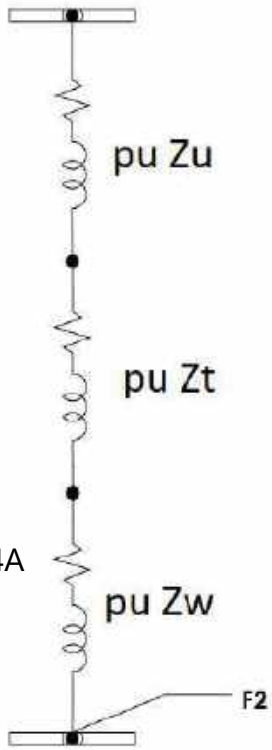
pu Xw = (VA Base x R) / (V^2 x No. of Sets)

= (1000000 x 0.0018) / (230^2 x 2) = 0.0167 pu

pu Zw = 0.0292 + j0.0167 = **0.0336**∟29.74° **pu**



2. If Short Circuit happens; the Equivalent Circuit can be drawn as



➔ Utility Fault - Short Circuit Calculation

Isc (Sym) = (VA Base) / (1.732 x V x pu Zu)

= 1000000 / 1.732 x 34500 x 0.001 = 16734.79A = **16.73KAIC**

Isc (Asym) = Isc (Sym) x MF = 16.73 x 1.25 = **20.91KAIC**

➔ Transformer Fault - Short Circuit Calculation

Isc (Sym) = TX Full Load / %Z = (225000/1.732*230) / 0.03 = 18826.64A

= **18.83KAIC**

Isc (Asym) = Isc (Sym) x MF = 18.83 x 1.25 = **23.54KAIC**

➔ Fault #1 - Short Circuit Calculation

pu Zc1 = pu Zu + pu Zt = 0.001 + 0.1333 = **0.1343 pu**

Isc (Sym) = (VA Base) / (1.732 x V x pu Zc1)

= 1000000 / 1.732 x 230 x 0.1343 = 18691.13A = **18.69KAIC**

Isc (Asym) = Isc (Sym) x MF = 18.69 x 1.25 = **23.36KAIC**

➔ Fault #2 - Short Circuit Calculation

pu Zc2 = pu Zu + pu Zt + pu Zw = 0.001 + 0.1333 + 0.0336 = **0.1679 pu**

Isc (Sym) = (VA Base) / (1.732 x V x pu Zc2)

= 1000000 / 1.732 x 230 x 0.1679 = 14951.11A = **14.95KAIC**

Isc (Asym) = Isc (Sym) x MF = 18.69 x 1.25 = **18.68KAIC**

Note : Main Breaker of MDP is 300AT 450AF 24KAIC

24KAIC Rating of Main MDP is greater than 18.68KAIC

FAULT POINTS	BASE VOLTAGE	COMBINED PU IMPEDANCE	SYMMETRICAL SHORT CIRCUIT CURRENT	MULTIPLYING FACTOR	ASYMMETRICAL SHORT CIRCUIT CURRENT
Utility	34.5kV	pu Zu = 0.001	16.73Kaic	1.25	20.91kAIC
Transformer	0.23kV	pu Zt = 0.1333	18.83kAIC	1.25	23.54kAIC
Fault #1	0.23kV	pu Zc1 = 0.1343	18.69kAIC	1.25	23.36kAIC
Fault #2	0.23kV	pu Zc2 = 0.1679	14.95kAIC	1.25	18.68kAIC

PROPOSED PLAN

ELECTRICAL GENERAL NOTES

- ALL ELECTRICAL WORKS HEREIN SHALL BE DONE IN ACCORDANCE WITH THE PROVISIONS OF THE LATEST EDITION OF THE PHILIPPINE ELECTRICAL CODE, APPLICABLE ORDINANCES, RULES AND REGULATIONS OF THE LOCAL GOVERNMENT AND REQUIREMENTS OF THE LOCAL POWER COMPANY.

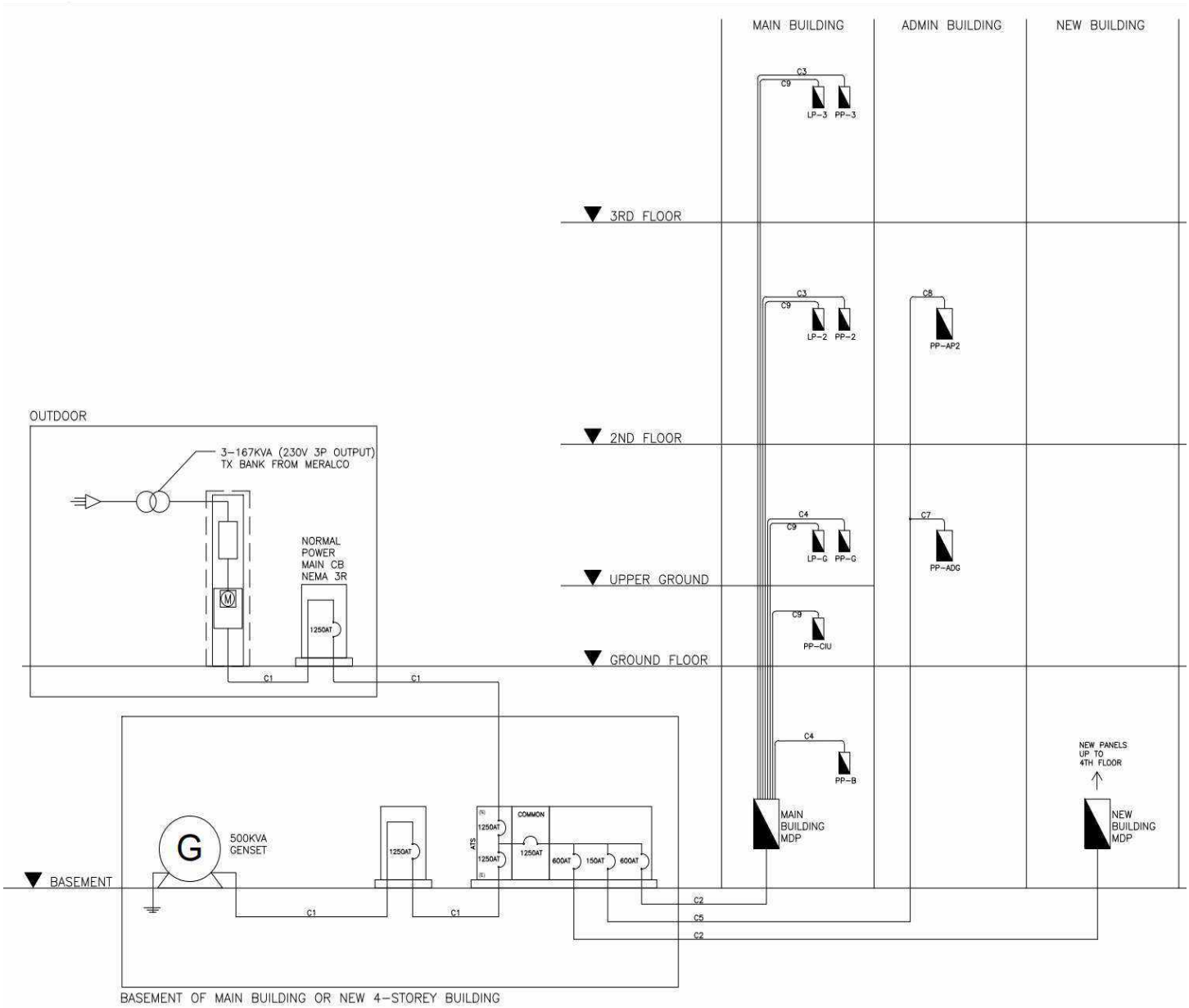
- ALL WIRING SHALL BE INSTALLED IN STANDARD CONDUITS RUN EMBEDDED IN CONCRETE AND HOLLOW BLOCK STRUCTURES, COLUMNS, WALLS, PARTITIONS, AND OR RUN CONCEALED BETWEEN DOUBLE WALL PARTITIONS AND INSIDE THE CEILING SPACES. WHERE THE USE OF THE CONCEALED CONDUIT WIRING IS IMPRACTICABLE, SURFACE METAL MOULDING MAYBE USED.

- WHEREVER REQUIRED AND NECESSARY, PULL BOXES OR JUNCTION BOXES OF PROPER SIZES SHALL BE INSTALLED AT CONVENIENCE AND INCONSPICUOUS LOCATIONS.ALTHOUGH SUCH BOXES ARE NOT SHOWN ON THE PLAN NOR MENTIONED IN THE SPECIFICATIONS.

- THE ELECTRICAL WORKS SHALL BE DONE UNDER THE DIRECT AND IMMEDIATE SUPERVISION OF A DULY LICENSED ELECTRICAL ENGINEER AND REGISTERED MASTER ELECTRICIAN.

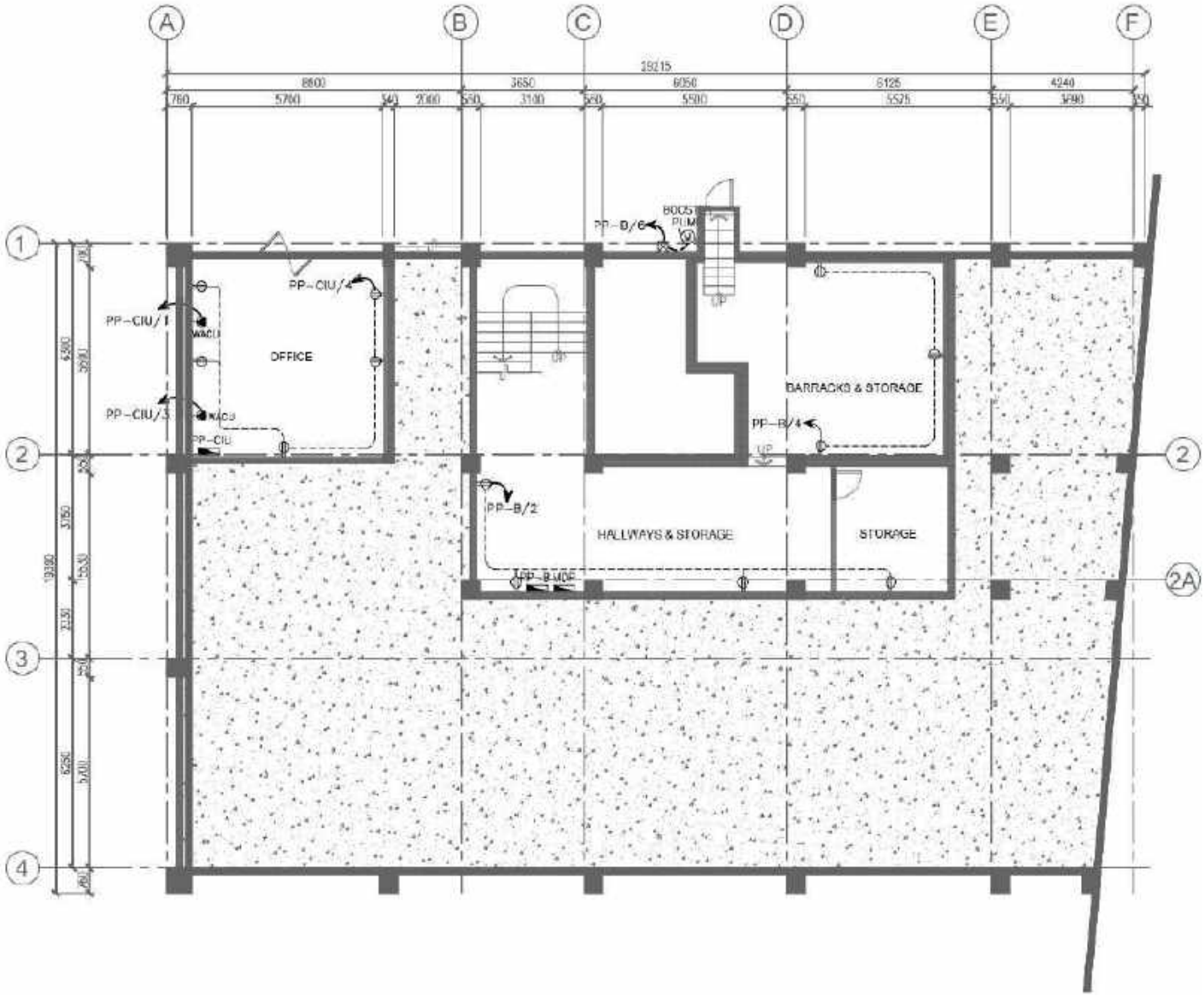
PROPOSED PLAN

RISER DIAGRAM



PROPOSED PLAN

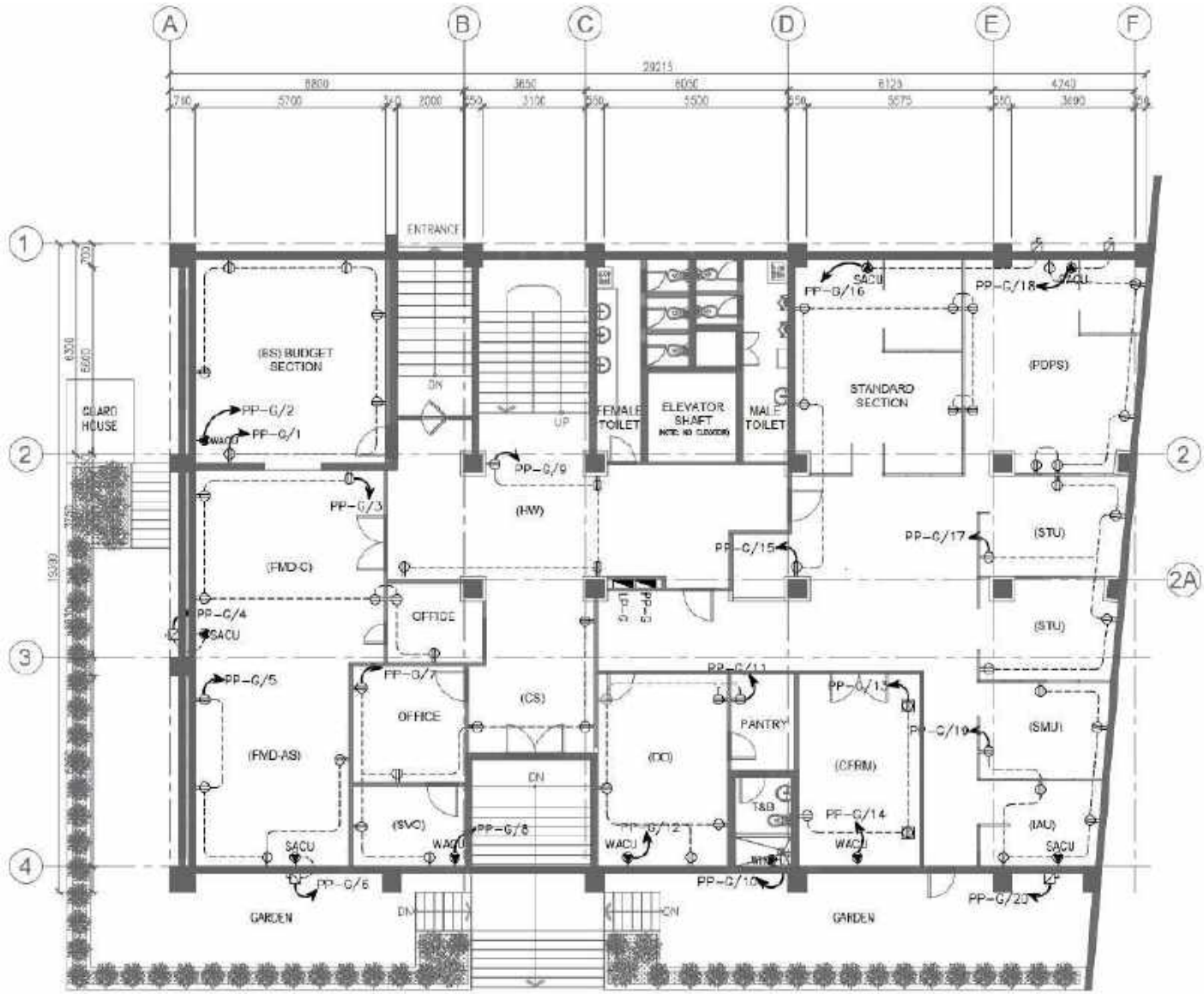
POWER LAYOUT



BASEMENT / GROUND FLOOR POWER LAYOUT

PROPOSED PLAN

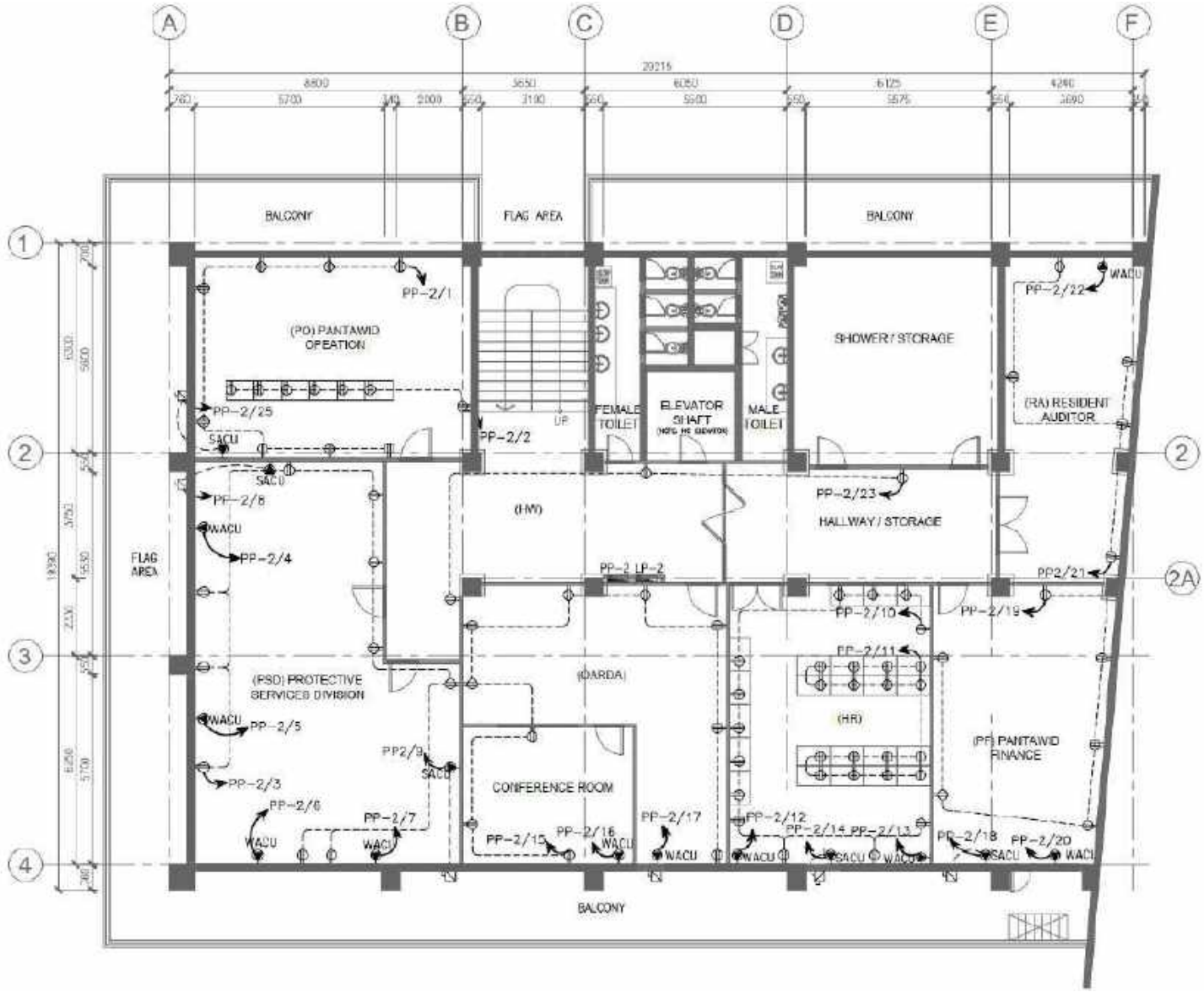
POWER LAYOUT



UPPER GROUND FLOOR POWER LAYOUT

PROPOSED PLAN

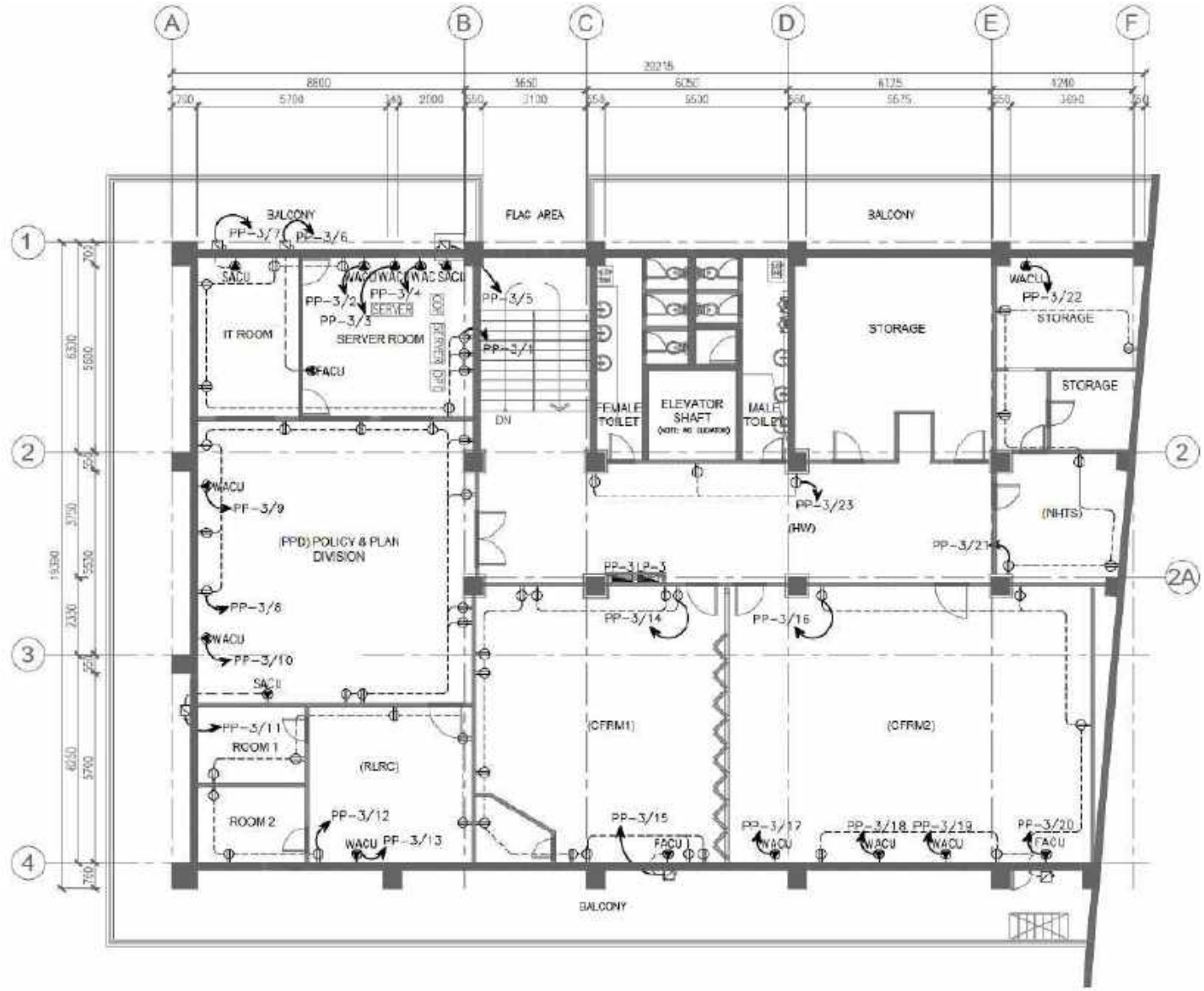
POWER LAYOUT



SECOND FLOOR POWER LAYOUT

PROPOSED PLAN

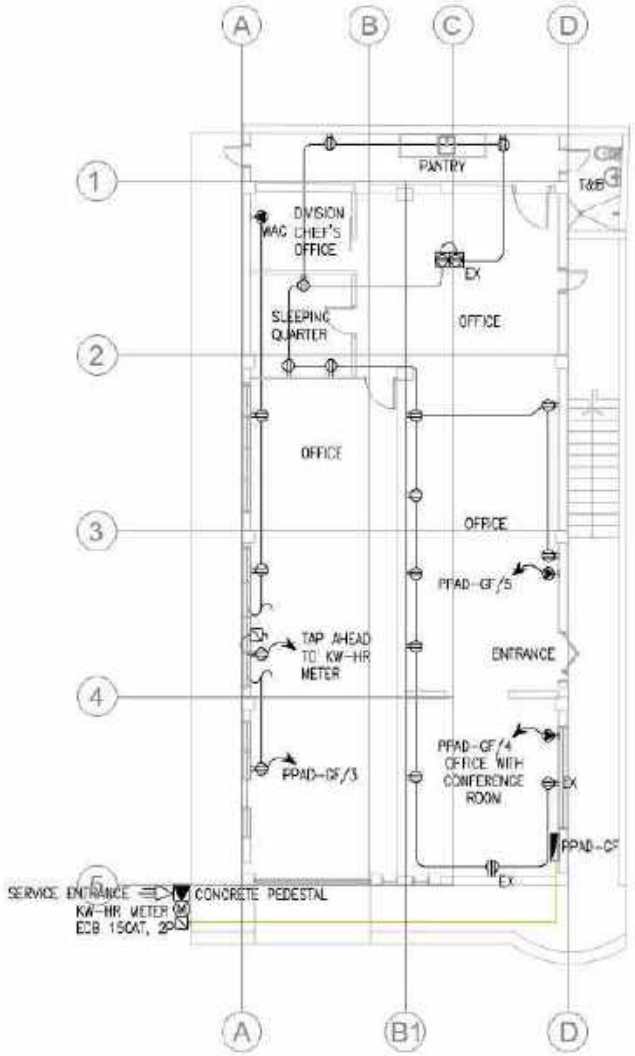
POWER LAYOUT



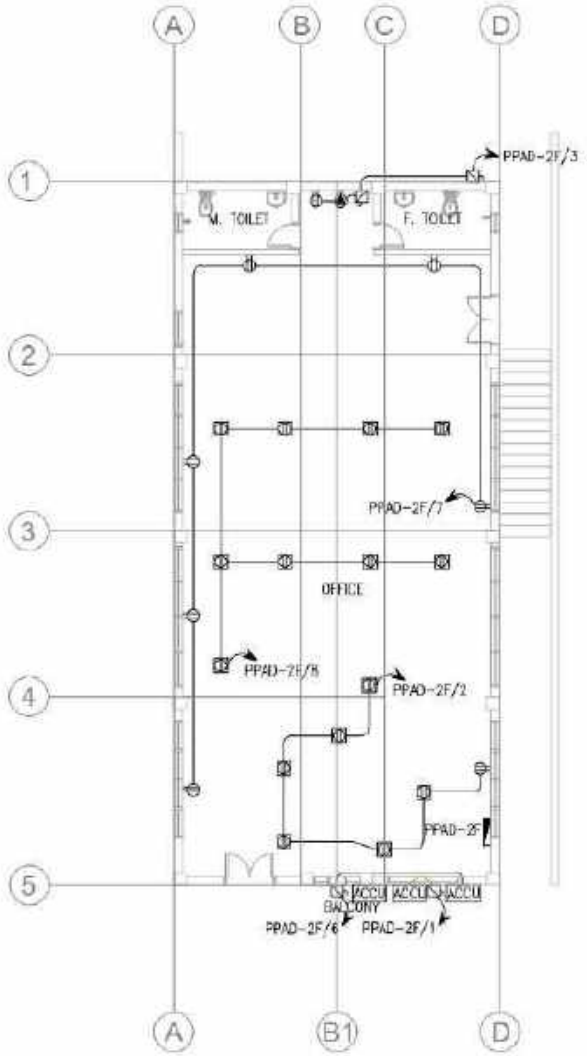
THIRD FLOOR POWER LAYOUT

PROPOSED PLAN

POWER LAYOUT – ADMIN BUILDING



ADMIN BUILDING - GROUND FLOOR

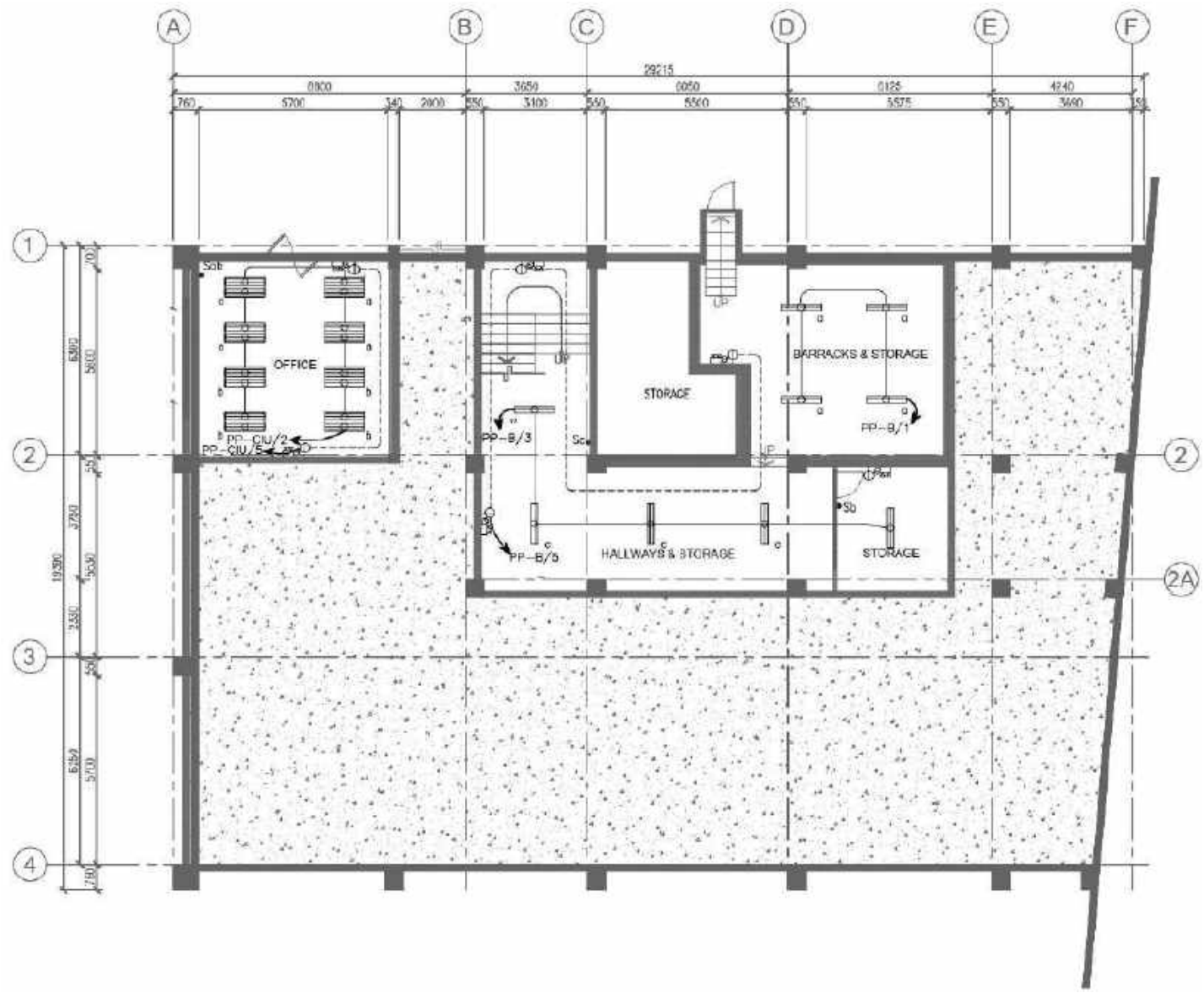


ADMIN BUILDING - SECOND FLOOR

ADMIN BUILDING POWER LAYOUT

PROPOSED PLAN

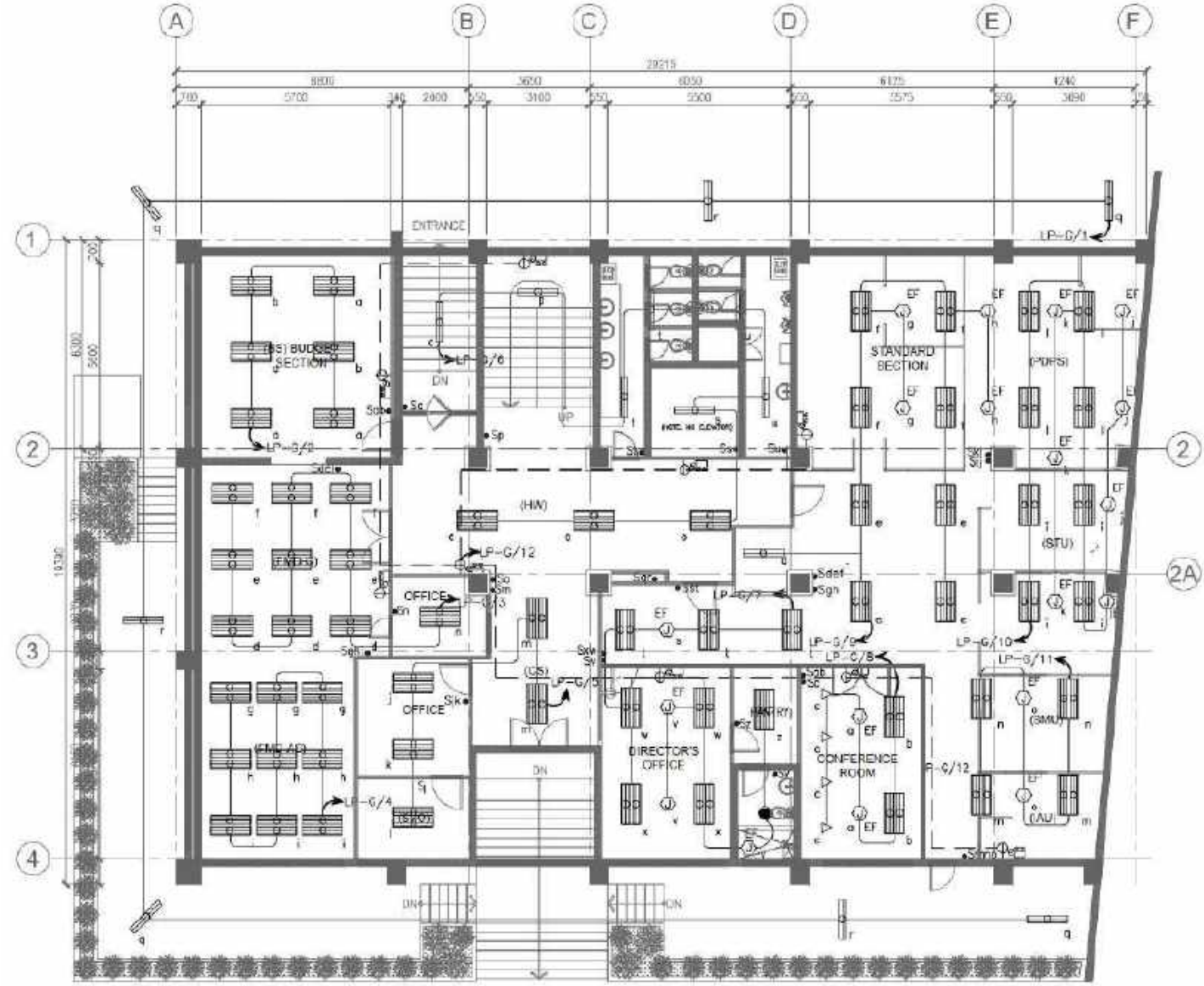
LIGHTING LAYOUT



BASEMENT / GROUND FLOOR LIGHTING LAYOUT

PROPOSED PLAN

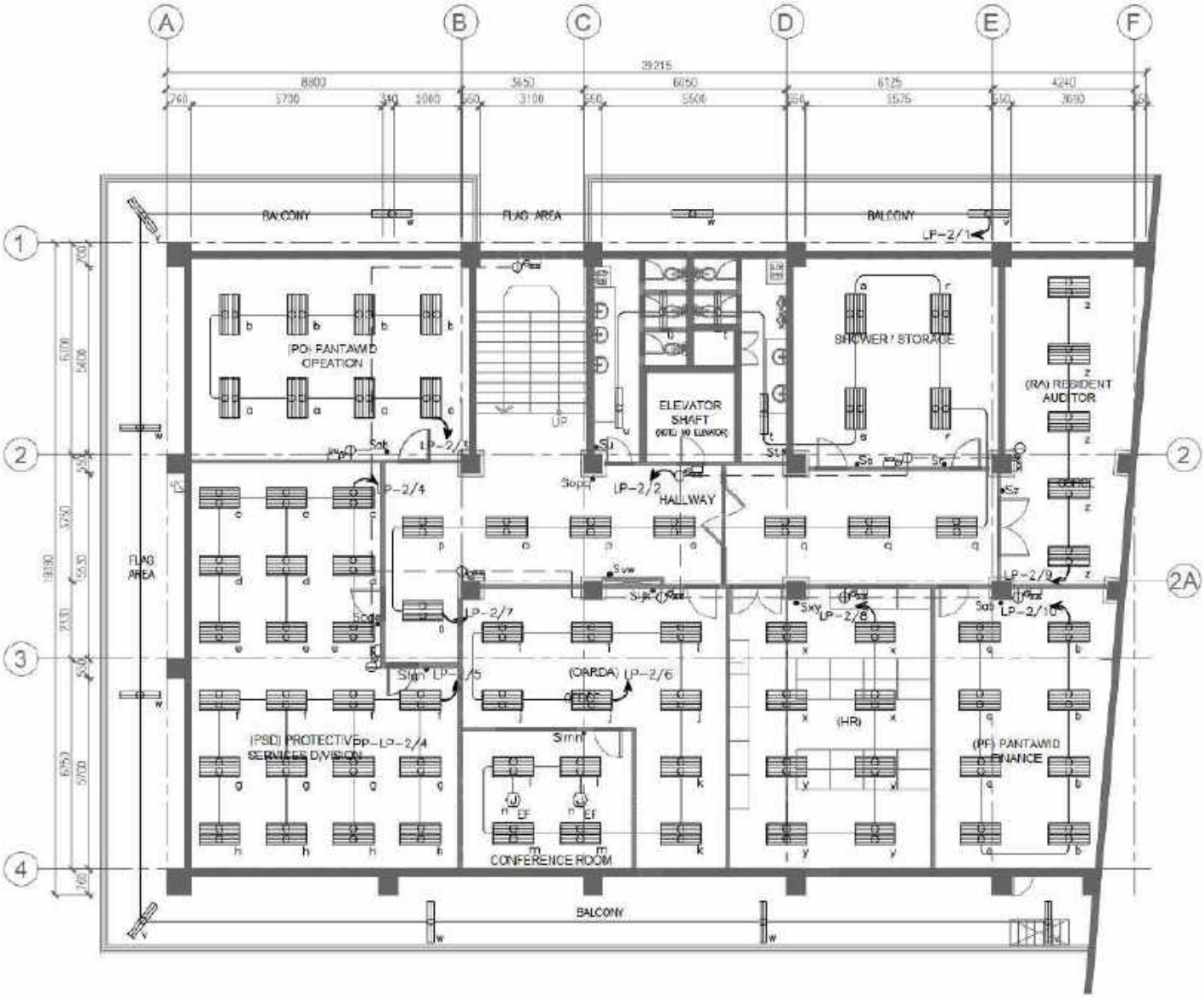
LIGHTING LAYOUT



UPPER GROUND FLOOR LIGHTING LAYOUT

PROPOSED PLAN

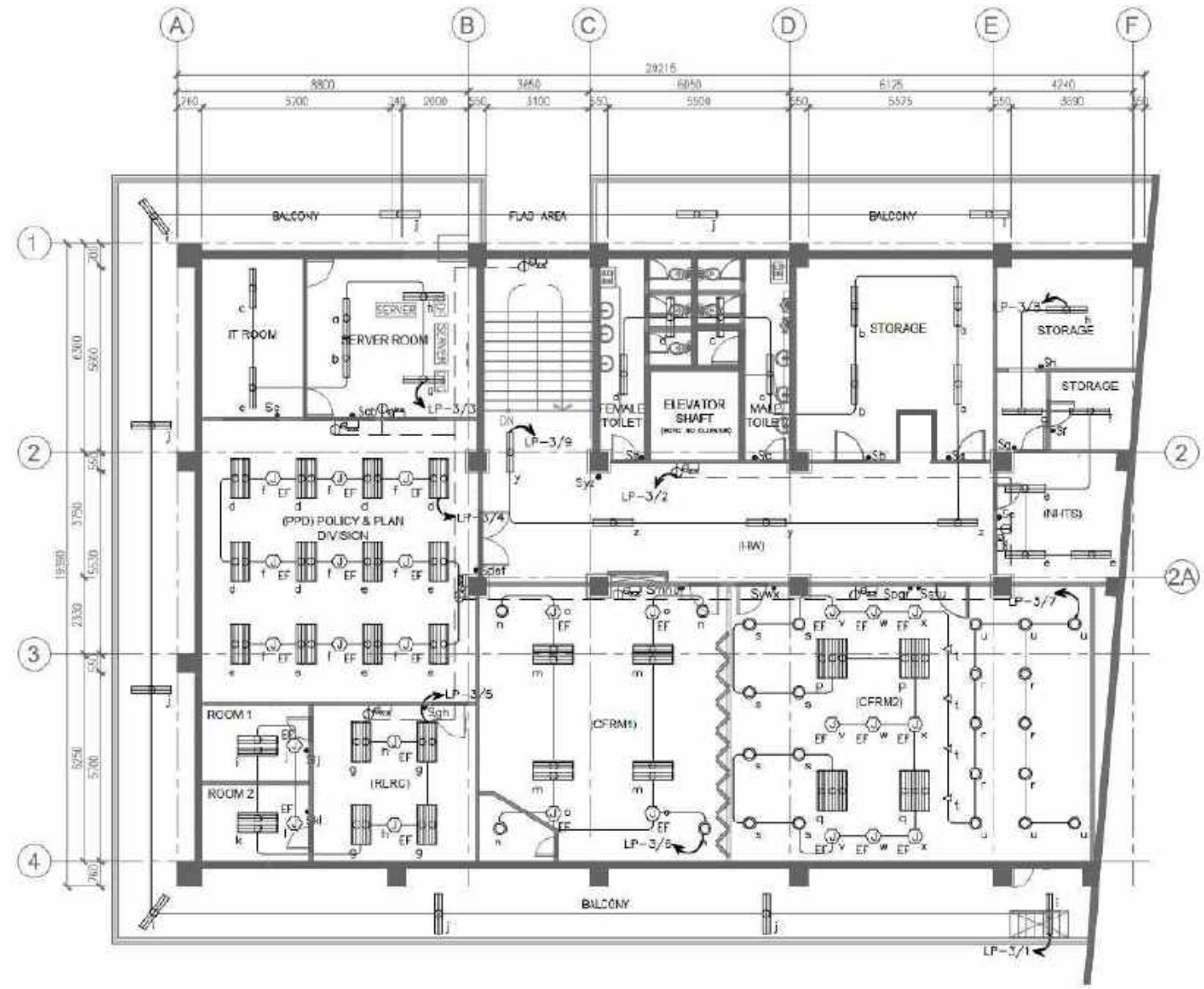
LIGHTING LAYOUT



SECOND FLOOR LIGHTING LAYOUT

PROPOSED PLAN

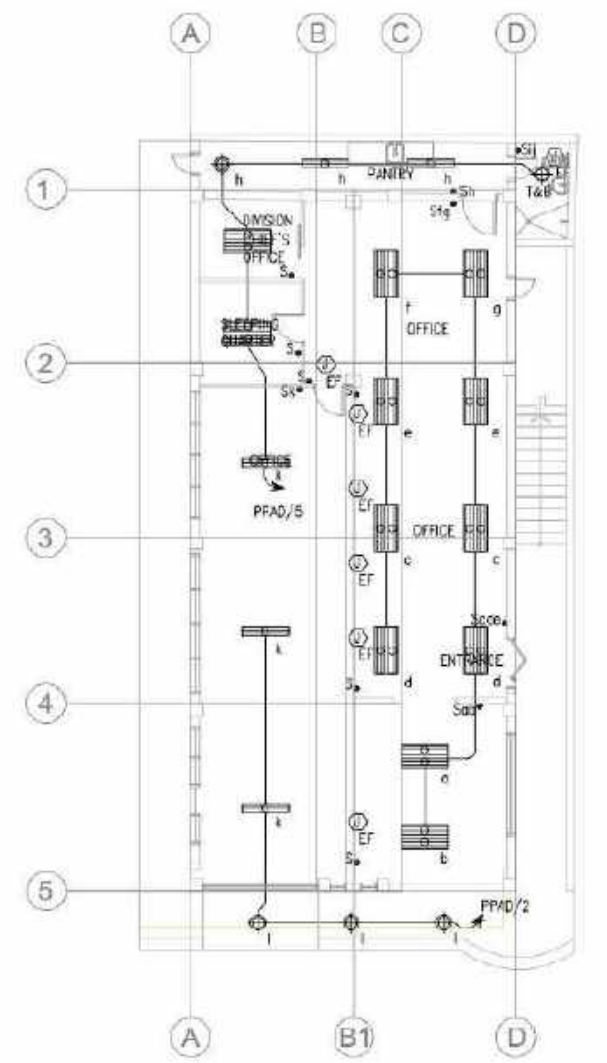
LIGHTING LAYOUT



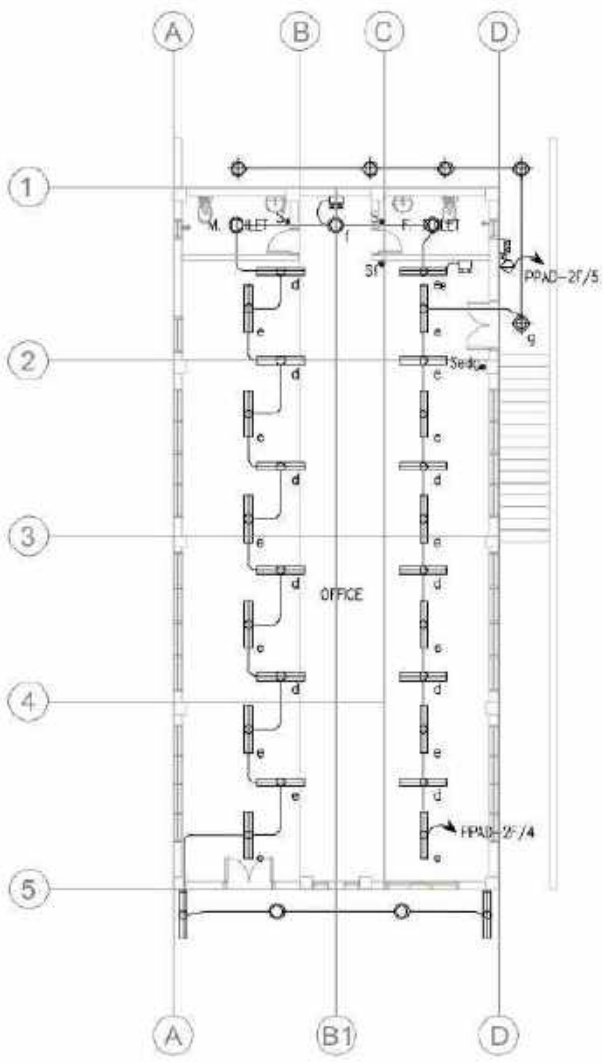
THIRD FLOOR LIGHTING LAYOUT

PROPOSED PLAN

LIGHTING LAYOUT - ADMIN



ADMIN BUILDING - GROUND FLOOR



ADMIN BUILDING - SECOND FLOOR

ADMIN BUILDING LIGHTING LAYOUT

PROPOSED PLAN

FEEDER SCHEDULE

CABLE FEEDER & CONDUIT RACEWAY SCHEDULE									
C#	SET(S)	# OF WIRES PER SET	MAIN FEEDER		GROUNDING		CONDUIT / RACEWAY		
C1	4	3	250mm^2	THHN/THWN	125mm^2	THHN/THWN	100mmø	IMC	C/T
C2	2	3	250mm^2	THHN/THWN	60mm^2	THHN/THWN	100mmø	IMC	C/T
C3	1	3	125mm^2	THHN/THWN	30mm^2	THHN/THWN	75mmø	IMC	C/T
C4	1	3	60mm^2	THHN/THWN	14mm^2	THHN/THWN	50mmø	IMC	C/T
C5	1	2	60mm^2	THHN/THWN	8mm^2	THHN/THWN	50mmø	IMC	C/T
C6	1	3	30mm^2	THHN/THWN	8.0mm^2	THHN/THWN	32mmø	IMC	C/T
C7	1	2	30mm^2	THHN/THWN	8.0mm^2	THHN/THWN	32mmø	IMC	C/T
C8	1	2	22mm^2	THHN/THWN	8.0mm^2	THHN/THWN	32mmø	IMC	C/T
C9	1	3	14mm^2	THHN/THWN	5.5mm^2	THHN/THWN	25mmø	IMC	C/T
C10	1	2	8.0mm^2	THHN/THWN	3.5mm^2	THHN/THWN	20mmø	IMC	C/T
C11	1	3	5.5mm^2	THHN/THWN	2.0mm^2	THHN/THWN	15mmø	IMC	C/T
C12	1	2	5.5mm^2	THHN/THWN	2.0mm^2	THHN/THWN	15mmø	IMC	C/T
C13	2	2	3.5mm^2	THHN/THWN	2.0mm^2	THHN/THWN	15mmø	IMC	C/T
C14	1	2	3.5mm^2	THHN/THWN	2.0mm^2	THHN/THWN	15mmø	IMC	C/T
C15	3	2	3.5mm^2	THHN/THWN	2.0mm^2	THHN/THWN	15mmø	IMC	C/T
C16	1	2	2.0mm^2	THHN/THWN	2.0mm^2	THHN/THWN	15mmø	IMC	C/T

PROPOSED PLAN

LOAD SCHEDULE

DESIGNATION	SWITCHBOARD LVSB (PROPOSED)							MOUNTING	FLOOR MOUNTED									VOLTAGE DROP			CONSTANT
SYSTEM	230 V	3 PHASE	3 WIRE+GND					ENCLOSURE	NEMA-1							VD	=	CONSTANT X LENGTH X FLC		1ϕ =	35.6
MIN. I.C	35 KA							FEED	MERALCO 3-167KVA POLE MOUNTED DELTA TRANSFORMER BANK									1000 X WIRE SIZE X SETS		3ϕ 3W =	30.8
LOCATION	BASEMENT							MAIN	1250AT	1250AF	3POLE	MCCB				%VD	=	(VD / SUPPLY) X 100		3ϕ 4W =	27.8

CKT NO.	LOAD DESCRIPTION	CONNECTED LOAD					BREAKER SIZE OVERCURRENT PROTECTION						FEEDER DETAILS	VD CALCULATION, %VD < 2% FOR MAIN BRANCHES				
		VA	CURRENT IN AMPERES											K CONSTANT	LENGTH (m)	FLC	VD	%VD
			3 PHASE	AB	CA	BC	BRAND	TYPE	AT	AF	KAIC	POLE						
1	MAIN BUILDING MDP	247587	175.24	141.93	282.10	248.14	S.E.	INDUSTRIAL MCCB	600	630	50	3	C2	30.8	20	621.01A	0.77V	0.33%
2	FUTURE 4 STOREY BUILDING MDP	250000	627.55				S.E.	INDUSTRIAL MCCB	600	630	50	3						
3	ADMIN BUILDING PP-AD1G & PP-AD2	36150		157.17			S.E.	INDUSTRIAL MCCB	150	250	25	2	C5	35.6	20	157.17A	1.87V	0.81%
	TOTAL	533536	802.80	399.00	282.10	248.14	S.E.	ACB D.O.	1250	1250	100	3	C1					

TOTAL VA = 533536 VA ESTIMATE DEMAND HOURS PER DAY = 18HRS 75% D.F. = 400152 VA

TOTAL CURRENT = 1330.29 A DEMAND FACTOR = 18HRS / 24HRS = 75% 75% D.F. = 1000.47 A

FEEDER = 1000.47 A USE CTDF C1 4 SET 3 WIRE 250mm^2 THHN/THWN CABLE 125mm^2 GROUND IN 100mm IMC CONDUIT

BREAKER = 1000.47 A USE 1250AT 1250AF 3 POLE MCCB

TRANSFORMER SIZE = 400.15 KVA USE 501 KVA (3 - 167KVA) POLE MOUNTED DELTA TRANSFORMER BANK FROM MERALCO

SWITCHBOARD LVSB (PROPOSED)

DESIGNATION	MAIN BUILDING MDP (PROPOSED)						MOUNTING	SURFACE MOUNTED								VOLTAGE DROP			CONSTANT
SYSTEM	230 V	3 PHASE	3 WIRE+GND				ENCLOSURE	NEMA-1							VD	=	CONSTANT X LENGTH X FLC	1φ =	35.6
MIN. I.C	10 KA						FEED	MERALCO 3-PUMA POLE MOUNTED DELTA TRANSFORMER BANK									1000 X WIRE SIZE X SETS	3φ 3W =	30.8
LOCATION	BASEMENT						MAIN	60DAT	630AF	3POLE	MCCB				%VD	=	(VD / SUPPLY) X 100	3φ 4W =	17.8

CKT NO.	LOAD DESCRIPTION	CONNECTED LOAD					BREAKER SIZE OVERCURRENT PROTECTION						FEEDER DETAILS	VD CALCULATION, %VD < 2% FOR MAIN BRANCHES				
		VA	CURRENT IN AMPERES											K CONSTANT	LENGTH (m)	FLC	VD	%VD
			3 PHASE	AB	CA	BC	BRAND	TYPE	AT	AF	KAIC	POLE						
1	PANEL PP-3	58797		85.30	68.95	86.55	S.E.	INDUSTRIAL MCCB	225	250	25	3	C3	30.8	25	177.49A	0.45V	0.34%
2	PANEL PP-2	55989	24.01	57.48	87.68	86.58	S.E.	INDUSTRIAL MCCB	225	250	25	3	C3	30.8	18	140.50A	0.62V	0.37%
3	PANEL PP-6	44415		62.20	72.94	58.07	S.E.	INDUSTRIAL MCCB	150	250	25	3	C4	30.8	12	111.50A	0.40V	0.30%
4	PANEL PP-8	27976	60.87	6.86	5.57	3.88	S.E.	INDUSTRIAL MCCB	125	250	25	3	C4	30.8	3	70.21A	0.18V	0.08%
5	PANEL O U	6949		8.14	13.17	6.73	S.E.	INDUSTRIAL MCCB	60	100	25	3	C9	30.8	12	16.19A	0.43V	0.19%
6	PANEL LP-3	22072	30.32	10.56	15.03	18.26	S.E.	INDUSTRIAL MCCB	60	100	25	3	C9	30.8	25	55.42A	3.06V	1.33%
7	PANEL LP-2	21179	30.32	7.88	10.45	21.65	S.E.	INDUSTRIAL MCCB	60	100	25	3	C9	30.8	18	53.17A	2.13V	0.92%
8	PANEL LP-6	18533	31.32	8.43	13.16	6.80	S.E.	INDUSTRIAL MCCB	60	100	25	3	C9	30.8	12	46.52A	1.23V	0.53%
	TOTAL	247387	175.24	241.83	282.10	248.11	S.E.	INDUSTRIAL MCCB	600	630	50	3	C2					

TOTAL VA	=	247387 VA		ESTIMATE DEMAND HOURS PER DAY	=	18HRS		75%	D.F.	=	185540 VA								
TOTAL CURRENT	=	630.99 A		DEMAND FACTOR	=	18HRS / 24HRS	=	75%		75%	D.F.	=	466.75 A						
FEEDER	=	630.99 A	USE	600E C2	2 SET	1 WIRE	250mm^2	THWN/THWN CABLE	60mm^2		GROUND	IN	100mm2	IMC	CONDUIT				
BREAKER	=	620.99 A	USE	600AT	630AF	3POLE	MCCB		NOTE:	MAIN BREAKER AT			77.62%	LOADED					

MAIN BUILDING MDP (PROPOSED)

DESIGNATION	PANEL PP-B (PROPOSED)					MOUNTING	SURFACE MOUNTED								VOLTAGE DROP			CONSTANT	
SYSTEM	230 V	3 PHASE	3 WIRE+GND			ENCLOSURE	NEMA-1							VD	=	CONSTANT X LENGTH X FLC		1φ =	35.6
MIN. I.C.	10 KA					FEED	BASEMENT MAIN MDP CKT#4									1000 X WIRE SIZE X SETS		3φ 3W =	30.8
LOCATION	BASEMENT					MAIN	125AT	250AF	3POLE	MCCB				%VD	=	(VD / SUPPLY) X 100		3φ 4W =	17.8

CKT NO.	LOAD DESCRIPTION	CONNECTED LOAD					BREAKER SIZE OVERCURRENT PROTECTION						FEEDER DETAILS	VD CALCULATION, %VD < 8% FOR BRANCHES				
		VA	CURRENT IN AMPERES											R CONSTANT	LENGTH (m)	FLC	VD	%VD
			3 PHASE	AB	CA	BC	BRAND	TYPE	AT	AF	KAIC	POLE						
1	4 x 1-40VA LTG (BR & STR)	151		0.20			G.E.	BOLT-ON MCCB	20	100	10	2	C14	35.6	58	0.20A	0.13V	0.05%
2	4 x 2-160VA C.O. (HW & STR ROOM)	1440		6.26			G.E.	BOLT-ON MCCB	30	100	10	2	C14	35.6	22	6.26A	1.49V	0.61%
3	5 x 1-40VA LTG (HW & STR ROOM)	200			0.87		G.E.	BOLT-ON MCCB	20	100	10	2	C14	35.6	22	0.87A	0.19V	0.08%
4	3 x 2-180VA C.O. (BR & STR)	1081			4.70		G.E.	BOLT-ON MCCB	30	100	10	2	C14	35.6	18	4.70A	0.86V	0.37%
5	4 X 24W ELTG	97				0.42	G.E.	BOLT-ON MCCB	20	100	10	2	C14	35.6	44	0.42A	0.19V	0.08%
6	2 HP - BOOSTER PUMP	750				3.26	G.E.	BOLT-ON MCCB	30	100	10	2	C14	35.6	20	3.26A	0.66V	0.29%
7	SPARE FOR 25HP FIRE PUMP	18650	46.82				S.E.	INDUSTRIAL MCCB	75	100	25	3						
8	SPARE FOR 7.5HP JOCKEY PUMP	5600	14.08				S.E.	INDUSTRIAL MCCB	40	100	25	3						
	TOTAL	27376	60.87	6.26	5.57	3.68	S.E.	INDUSTRIAL MCCB	125	250	25	3	C4					

TOTAL VA = 27376 VA

TOTAL CURRENT = (SUM OF COMPUTED LOAD + 25% OF THE LARGEST MOTOR FLA) / (230V * SQRT(3)) = 81.93 A

FEEDER = 81.93 A USE CODE C4 1 SET 3 WIRE 60mm^2 THHN/THWN CABLE 14.0mm^2 GROUND IN 50mmø IMC CONDUIT

BREAKER = 81.93 A USE 125AT 250AF 3POLE MCCB

PANEL PP-B (PROPOSED)

DESIGNATION	PANEL PP-CIU (PROPOSED)						MOUNTING	RECESSED MOUNTED							VOLTAGE DROP			CONSTANT	
SYSTEM	230 V	3 PHASE	3 WIRE+GND				ENCLOSURE	NEMA-1						VD	=	CONSTANT X LENGTH X FLC	1φ =	35.6	
MIN. I.C.	10 KA						FEED	BASEMENT MAIN MDP CKTHS								2000 X WIRE SIZE X SETS	3φ 3W =	30.8	
LOCATION	CIU OFFICE						MAIN	50AT	100AF	3POLE	MCCB			%VD	=	(VD / SUPPLY) X 100	3φ 4W =	17.8	
CKT NO.	LOAD DESCRIPTION	CONNECTED LOAD					BREAKER SIZE OVERCURRENT PROTECTION							FEEDER DETAILS	VD CALCULATION, %VD < 3% FOR BRANCHES				
		VA	CURRENT IN AMPERES												F CONSTANT	LENGTH (m)	FLC	VD	%VD
			3 PHASE	AB	CA	BC	BRAND	TYPE	AT	AF	KAIC	POLE							
1	1.5HP WACU	1232		5.35A			G.E.	BOLT-ON MCCB	40	100	10	2	C12	35.6	3	5.35A	0.10V	0.05%	
2	8 x 2-40WA LTG	642		2.79A			G.E.	BOLT-ON MCCB	20	100	10	2	C14	35.6	24	2.79A	0.68V	0.30%	
3	1.5HP WACU	1232			5.35A		G.E.	BOLT-ON MCCB	40	100	10	2	C12	35.6	6	5.35A	0.21V	0.09%	
4	5 x 2-180WA C.O.	1799			7.82A		G.E.	BOLT-ON MCCB	30	100	10	2	C14	35.6	16	7.82A	1.27V	0.55%	
5	2 x 24WA ELTG	48				0.21A	G.E.	BOLT-ON MCCB	20	100	10	2	C14	35.6	17	0.21A	0.04V	0.02%	
6	2P SPARE	1500				6.52A	G.E.	BOLT-ON MCCB	30	100	10	2							
TOTAL		6449	0.00A	8.14A	13.17A	6.73A	S.E.	INDUSTRIAL MCCB	60	100	25	3	C9						

TOTAL VA = 6449 VA

TOTAL CURRENT = (SUM OF COMPUTED LOAD + 25% OF THE LARGEST MOTOR FLA) / (230V * SQRT(3)) = 36.96 A

FEEDER = 36.96 A USE CODE C9 1 SET 3 WIRE 14mm^2 THHN/THWN CABLE 5.5mm^2 GROUND IN 25mm MC CONDUIT

BREAKER = 36.96 A USE 60AT 100AF 3POLE MCCB

PANEL PP-CIU (PROPOSED)

DESIGNATION	PANEL LP-G (PROPOSED)					MOUNTING	RECESSED MOUNTED								VOLTAGE DROP				CONSTANT
SYSTEM	230 V	3 PHASE	3 WIRE+GND			ENCLOSURE	NEMA-1							VD	=	CONSTANT X LENGTH X FLC		1φ =	35.6
MIN. I.C.	10 KA					FEED	BASEMENT MAIN MDP (CT48)									1000 X WIRE SIZE X %FT		3φ 3W =	30.8
LOCATION	GROUND FLOOR HALLWAY					MAIN	60AT	100AF	3POLE	MCCB				%VD	=	(VD / SUPPLY) X 100		3φ 4W =	17.8

CKT NO.	LOAD DESCRIPTION	CONNECTED LOAD					BREAKER SIZE OVERCURRENT PROTECTION						FEEDER DETAILS	VD CALCULATION, %VD = 3% FOR BRANCHES				
		VA	CURRENT IN AMPERES											R CONSTANT	LENGTH (m)	FLC	VD	%VD
			3 PHASE	AB	CA	BC	BRAND	TYPE	AT	AF	KAIC	POLE						
1	7 x 1-40VA PLTS	281		1.22A			G.E.	BOLT-ON MCCB	20	100	10	2	C14	35.6	122	1.22A	1.51V	0.66%
2	6 x 2-40VA LTG (SS)	481		2.09A			G.E.	BOLT-ON MCCB	20	100	10	2	C14	35.6	30	2.09A	0.67V	0.28%
3	10 x 2-40VA LTG (FMD-C)	800			3.48A		G.E.	BOLT-ON MCCB	20	100	10	2	C14	35.6	39	3.48A	1.38V	0.58%
4	9 x 2-40VA LTG (FMD-RS)	720			3.13A		G.E.	BOLT-ON MCCB	20	100	10	2	C14	35.6	45	3.13A	1.42V	0.62%
5	5 x 2-40VA LTG (CS & SVU)	400				1.74A	G.E.	BOLT-ON MCCB	20	100	10	2	C14	35.6	23	1.74A	0.35V	0.17%
6	3 x 2-40VA LTG, 7 x 1-40VA (HW, MCR, FCR, STAIR)	520				2.26A	G.E.	BOLT-ON MCCB	20	100	10	2	C14	35.6	27	2.26A	0.62V	0.27%
7	8 x 2-40VA LTG ; 4-30VA EF; 1-40VA PL (DO)	400		1.48A			G.E.	BOLT-ON MCCB	20	100	10	2	C14	35.6	31	1.48A	0.81V	0.35%
8	2 x 2-40VA LTG ; 2-30VA EF; 4-40VA PL (CTRM)	382		1.66A			G.E.	BOLT-ON MCCB	20	100	10	2	C14	35.6	23	1.66A	0.35V	0.17%
9	8 x 2-40VA LTG ; 2-30VA EF (SS)	702			3.05A		G.E.	BOLT-ON MCCB	20	100	10	2	C14	35.6	27	3.05A	0.84V	0.36%
10	8 x 2-40VA LTG ; 7-30VA EF (PDPS & STU)	851			3.70A		G.E.	BOLT-ON MCCB	20	100	10	2	C14	35.6	40	3.70A	1.51V	0.65%
11	4 x 2-40VA LTG ; 2-30VA EF (SWU & IAU)	382				1.66A	G.E.	BOLT-ON MCCB	20	100	10	2	C14	35.6	28	1.66A	0.47V	0.21%
12	6 - 24VA ELTG	216				0.94A	G.E.	BOLT-ON MCCB	20	100	10	2	C14	35.6	122	0.94A	1.17V	0.51%
13	3P SPARE	3000	7.53A				G.E.	BOLT-ON MCCB	30	100	10	3						
14	3P SPARE	3000	7.53A				G.E.	BOLT-ON MCCB	30	100	10	3						
15	3P SPARE	3000	7.53A				G.E.	BOLT-ON MCCB	30	100	10	3						
16	3P SPARE	3000	7.53A				G.E.	BOLT-ON MCCB	30	100	10	3						
TOTAL		15533	30.12A	8.45A	13.38A	8.69A	S.E.	INDUSTRIAL MCCB	60	100	25	3	C9					

TOTAL VA = 15533 VA

TOTAL CURRENT = 46.52 A

FEEDER = 46.52 A USE CODE C9 1 SET 3 WIRE (4mm^2) THHN/THWN CABLE 5.5mm^2 GROUND IN 25mm PVC CONDUIT

BREAKER = 46.52 A USE 60AT 100AF 3POLE MCCB

PANEL LP-G (PROPOSED)

DESIGNATION	PANEL PP-G (PROPOSED)						MOUNTING	RECESSED MOUNTED									VOLTAGE DROP				CONSTANT	
SYSTEM	230 V	3 PHASE	3 WIRE+GRD				ENCLOSURE	NEMA-1								VD	=	CONSTANT X LENGTH X FLC			36 =	35.9
MIN. I.C	10 KA						FEED	BASEMENT MAIN MDP CKTS3										1000 X WIRE SIZE IC SETS			36 3W =	26.4
LOCATION	GROUND FLOOR HALLWAY						MAIN	150AT	250AT	3POLE	MCCB					NVD	=	NVD / SUPPLY X 100			36 4W =	17.8

CKT NO.	LOAD DESCRIPTION	CONNECTED LOAD					BREAKER SIZE (OVERCURRENT PROTECTION)							FEEDER DETAILS	VD CALCULATION, NVD = 3% FOR BRANCHES				
		VA	CURRENT IN AMPERES												K CONSTANT	LENGTH (m)	FLC	VD	%VD
			3 PHASE	AB	CA	BC	BRAND	TYPE	AT	AF	IC/AIC	POLE							
1	6 x 2-180VA C.O. (BS)	2160		3.39A			G.E.	BOLT-ON MCCB	30	100	10	2	C24	35.6	28	9.39A	2.63V	1.14%
2	2.5HP WACU (BS)	2052		8.92A			G.E.	BOLT-ON MCCB	40	100	10	2	C32	35.6	29	8.92A	3.44V	0.63%
3	6 x 2-180VA C.O. (FMD-C)	2160			9.39A		G.E.	BOLT-ON MCCB	30	100	10	2	C24	35.6	33	9.39A	3.15V	1.37%
4	2.5HP SACU (FMD-C)	2052			8.92A		G.E.	BOLT-ON MCCB	40	100	10	2	C32	35.6	41	8.92A	3.21V	0.53%
5	4 x 2-180VA C.O. (FMD-AS)	1080				6.26A	G.E.	BOLT-ON MCCB	40	100	10	2	C24	35.6	32	6.26A	2.04V	0.88%
6	2.5HP SACU (FMD-AS)	2052				8.92A	G.E.	BOLT-ON MCCB	40	100	10	2	C32	35.6	25	8.92A	1.44V	0.63%
7	7 x 2-180VA C.O. (CS & SVD)	2521		10.96A			G.E.	BOLT-ON MCCB	30	100	10	2	C24	35.6	35	10.96A	2.70V	1.16%
8	0.75HP WACU (SVD)	616		2.68A			G.E.	BOLT-ON MCCB	40	100	10	2	C32	35.6	16	2.68A	0.28V	0.12%
9	4 x 2-180VA C.O. (HW)	1440			6.26A		G.E.	BOLT-ON MCCB	30	100	10	2	C24	35.6	36	6.26A	1.02V	0.44%
10	4.5KW WATER HEATER (DD)	4201			10.22A		G.E.	BOLT-ON MCCB	40	100	10	2	C32	35.6	18	10.22A	2.20V	0.95%
11	6 x 2-180VA C.O. (DD)	2160				9.39A	G.E.	BOLT-ON MCCB	30	100	10	2	C24	35.6	25	9.39A	2.30V	1.00%
12	3HP WACU (DD)	1682				7.34A	G.E.	BOLT-ON MCCB	40	100	10	2	C32	35.6	58	7.34A	0.80V	0.35%
13	3 x 2-180VA C.O. (CRM)	1080		4.70A			G.E.	BOLT-ON MCCB	30	100	10	2	C24	35.6	28	4.70A	1.34V	0.58%
14	2HP WACU (CRM)	1682		7.34A			G.E.	BOLT-ON MCCB	40	100	10	2	C32	35.6	22	7.34A	1.62V	0.44%
15	7 x 2-180VA C.O. (SS)	2521			10.96A		G.E.	BOLT-ON MCCB	30	100	10	2	C24	35.6	34	10.96A	3.79V	1.65%
16	5HP SACU (SS)	4103			17.84A		G.E.	BOLT-ON MCCB	40	100	10	2	C32	35.6	23	17.84A	2.66V	1.15%
17	10 x 2-180VA C.O. (FDPS & STU)	3602				15.65A	G.E.	BOLT-ON MCCB	30	100	10	2	C24	35.6	32	15.65A	5.10V	2.22%
18	3HP SACU (FDPS)	2461				10.70A	G.E.	BOLT-ON MCCB	40	100	10	2	C32	35.6	37	10.70A	2.22V	0.96%
19	6 x 2-180VA C.O. (MU & WU)	2160		3.39A			G.E.	BOLT-ON MCCB	30	100	10	2	C24	35.6	30	9.39A	2.07V	1.25%
20	2.5HP SACU (MU)	2052		8.92A			G.E.	BOLT-ON MCCB	40	100	10	2	C32	35.6	30	8.92A	1.93V	0.75%
	TOTAL	44410	0.00A	62.38A	72.94A	58.07A	G.E.	INDUSTRIAL MCCB	150	250	25	3	C4					

TOTAL VA = 44410 VA

TOTAL CURRENT = (SUM OF COMPUTED LOAD + 25% OF THE LARGEST MOTOR FLA) / (230V * SQRT(3)) = 112.78 A

FEEDER = 112.78 A USE 1000 CM 3 SET 4 WIRE 60mm^2 THHN/THWN CABLE 1.5mm^2 GROUND IN 50mm EMC CONDUIT

BREAKER = 112.78 A USE 150AT 250AF 3POLE MCCB

PANEL PP-G (PROPOSED)

DESIGNATION	PANEL LP-2 (PROPOSED)					MOUNTING	RECESSED MOUNTED							VOLTAGE DROP				CONSTANT	
SYSTEM	230 V	3 PHASE	3 WIRE GND			ENCLOSURE	NEMA-1						VD	=	CONSTANT K LENGTH X FLC			1ϕ =	35.6
MIN. I.C.	10 kA					FEED FROM	BASEMENT MAIN MDP OKMP								1000 K WIRE SIZE X SETS			3ϕ 3W =	30.8
LOCATION	2ND FLOOR HALLWAY					MAIN	60AT	100AF	3POLE	MCCB			3ϕ4W	=	(VD / SUPPLY) X 100			3ϕ 4W =	17.8
CKT NO.	LOAD DESCRIPTION	CONNECTED LOAD					BREAKER SIZE OVERCURRENT PROTECTION						FEEDER DETAILS	VD CALCULATION, IN VD < 3% FOR BRANCHES					
		VA	CURRENT IN AMPERES											K CONSTANT	LENGTH (m)	FLC	VD	%VD
			3 PHASE	AB	CA	BC	BRAND	TYPE	AT	AF	KAIC	POLE							
1	10 x 1-40VA PLUG	400		1.74A			G.E.	BOLT-ON MCCB	20	100	10	2	C14	35.6	79	1.74A	1.40V	0.61%
2	10 x 2-40VA LTG	240		1.04A			G.E.	BOLT-ON MCCB	20	100	10	2	C14	35.6	62	1.04A	0.66V	0.29%
3	8 x 2-40VA LTG (FO)	640			2.78A		G.E.	BOLT-ON MCCB	20	100	10	2	C14	35.6	40	2.78A	1.19V	0.48%
4	9 x 2-40VA LTG (PSD)	720			3.13A		G.E.	BOLT-ON MCCB	20	100	10	2	C14	35.6	42	3.13A	1.34V	0.58%
5	12 x 2-40VA LTG (PSD)	960				4.17A	G.E.	BOLT-ON MCCB	20	100	10	2	C14	35.6	51	4.17A	2.12V	0.94%
6	12 x 2-40VA LTG (OAHDAR); 2-36VA EF	1000				4.43A	G.E.	BOLT-ON MCCB	20	100	10	2	C14	35.6	41	4.43A	1.85V	0.80%
7	12 x 2-40VA LTG; 5 x 1-40VA LTG (HW, STRUMCR,PCR)	1160		5.04A			G.E.	BOLT-ON MCCB	20	100	10	2	C14	35.6	33	5.04A	2.00V	0.81%
8	8 x 2-40VA LTG (HR)	640		2.78A			G.E.	BOLT-ON MCCB	20	100	10	2	C14	35.6	22	2.78A	0.62V	0.27%
9	5 x 2-40VA LTG (RA)	400			1.74A		G.E.	BOLT-ON MCCB	20	100	10	2	C14	35.6	39	1.74A	0.69V	0.30%
10	8 x 2-40VA LTG (PF)	640			2.78A		G.E.	BOLT-ON MCCB	30	100	10	2	C14	35.6	22	2.78A	0.62V	0.27%
11	2P SPARE	1500				6.52A	G.E.	BOLT-ON MCCB	30	100	10	2						
12	2P SPARE	1500				6.52A	G.E.	BOLT-ON MCCB	30	100	10	2						
13	3P SPARE	3900	7.58A				G.E.	BOLT-ON MCCB	30	100	10	3						
14	3P SPARE	3900	7.58A				G.E.	BOLT-ON MCCB	30	100	10	3						
15	3P SPARE	3900	7.58A				G.E.	BOLT-ON MCCB	30	100	10	3						
16	3P SPARE	3900	7.58A				G.E.	BOLT-ON MCCB	30	100	10	3						
	TOTAL	21179	30.13A	7.83A	10.43A	21.65A	G.E.	INDUSTRIAL MCCB	60	100	25	3	C9					

TOTAL VA = 21179 VA

TOTAL CURRENT = 33.16 A

FEEDER = 33.16 A USE COPPER 1.5HT 2 WIRE 16mm^2 THHN/THWN CABLE 6mm^2 GROUND IN 25mm IMC CONDUIT

BREAKER = 33.16 A USE 60AT 100AF 3POLE MCCB

PANEL LP-2 (PROPOSED)

DESIGNATION	PANEL PP2 (PROPOSED)					MOUNTING	RECESSED MOUNTED								VOLTAGE DROP			CONSTANT	
SYSTEM	230 V	1 PHASE	3 WIRE + GND			ENCLOSURE	NEMA-1						VD	=	CONSTANT X LENGTH X FLC			1ø =	35.6
MIN. I.C.	10 KA					FEED FROM	BASEMENT MAIN MDP CKT#2								1000 X WIRE SIZE X SETS			3ø 3W =	30.8
LOCATION	2ND FLOOR HALLWAY					MAIN	225AT	250AF	3POLE	MCCB			%VD	=	(VD / SUPPLY) X 100			3ø 4W =	17.8

CKT NO.	LOAD DESCRIPTION	VA	CONNECTED LOAD CURRENT IN AMPERES				BREAKER SIZE-OVERCURRENT PROTECTION						FEEDER DETAILS	VD CALCULATION, %VD < 3% FOR BRANCHES				
			3 PHASE	AB	CA	BC	BRAND	TYPE	AT	AF	IEMC	POLE		K CONSTANT	LENGTH (m)	FLC	VD	%VD
1	8 x 2-180VA C.D. (PO)	2880		12.52A			G.E.	BOLT-ON MCCB	30	100	10	2	C14	35.6	40	12.52A	5.99V	2.21%
2	7 x 2-180VA C.D. (PO)	2519		10.95A			G.E.	BOLT-ON MCCB	30	100	10	2	C14	35.6	40	10.95A	4.40V	1.94%
3	10 x 2-180VA (PSD)	3600			15.65A		G.E.	BOLT-ON MCCB	30	100	10	2	C14	35.6	42	15.65A	6.80V	2.91%
4	1HP WACU (PSD)	821			3.57A		G.E.	BOLT-ON MCCB	40	100	10	2	C12	35.6	23	3.57A	0.58V	0.23%
5	1HP WACU (PSD)	821				3.57A	G.E.	BOLT-ON MCCB	40	100	10	2	C12	35.6	35	3.57A	0.88V	0.25%
6	1HP WACU (PSD)	821				3.57A	G.E.	BOLT-ON MCCB	40	100	10	2	C12	35.6	54	3.57A	0.79V	0.34%
7	1HP WACU (PSD)	821		3.57A			G.E.	BOLT-ON MCCB	40	100	10	2	C12	35.6	32	3.57A	0.74V	0.32%
8	1HP SACU (PSD)	821		3.57A			G.E.	BOLT-ON MCCB	40	100	10	2	C12	35.6	23	3.57A	0.53V	0.23%
9	1HP SACU (PSD)	821			3.57A		G.E.	BOLT-ON MCCB	40	100	10	2	C12	35.6	32	3.57A	0.74V	0.32%
10	15 x 2-180VA (HR)	4680			20.35A		G.E.	BOLT-ON MCCB	30	100	10	2	C14	35.6	32	20.35A	6.62V	2.88%
11	16 x 2-180VA (HR)	5760				25.04A	G.E.	BOLT-ON MCCB	30	100	10	2	C14	35.6	22	25.04A	5.80V	2.44%
12	1HP WACU (HR)	821				3.57A	G.E.	BOLT-ON MCCB	40	100	10	2	C12	35.6	22	3.57A	0.51V	0.22%
13	1HP WACU (HR)	821		3.57A			G.E.	BOLT-ON MCCB	40	100	10	2	C12	35.6	30	3.57A	0.60V	0.30%
14	1.5HP SACU (HR)	1231		5.35A			G.E.	BOLT-ON MCCB	40	100	10	2	C12	35.6	44	5.35A	1.32V	0.66%
15	10 x 2-180VA (OARDA)	3600			15.65A		G.E.	BOLT-ON MCCB	30	100	10	2	C14	35.6	18	15.65A	2.82V	1.25%
16	2HP WACU (OARDA)	1643			7.14A		G.E.	BOLT-ON MCCB	40	100	10	2	C12	35.6	34	7.14A	1.11V	0.48%
17	3HP WACU (OARDA)	2461				10.70A	G.E.	BOLT-ON MCCB	40	100	10	2	C12	35.6	31	10.70A	1.45V	0.63%
18	2.5HP SACU (PF)	2053				8.92A	G.E.	BOLT-ON MCCB	40	100	10	2	C12	35.6	29	8.92A	1.67V	0.73%
19	6 x 2-180VA (PF)	2160		9.39A			G.E.	BOLT-ON MCCB	30	100	10	2	C14	35.6	34	9.39A	3.25V	1.41%
20	1HP WACU (PF)	821		3.57A			G.E.	BOLT-ON MCCB	40	100	10	2	C12	35.6	29	3.57A	0.67V	0.29%
21	5 x 2-180VA (RA)	1800			7.83A		G.E.	BOLT-ON MCCB	30	100	10	2	C14	35.6	40	7.83A	3.18V	1.38%
22	2.5HP WACU (RA)	2053			8.92A		G.E.	BOLT-ON MCCB	40	100	10	2	C12	35.6	30	8.92A	1.85V	0.80%
23	3 x 2-180VA (HW)	1080				4.70A	G.E.	BOLT-ON MCCB	30	100	10	2	C14	35.6	17	4.70A	0.81V	0.35%
24	2P SPARE	1500				6.52A	G.E.	BOLT-ON MCCB	30	100	10	2						
25	8HP SACU (PO)	6565	16.48A				G.E.	BOLT-ON MCCB	40	100	10	3	C11	30.8	23	16.48A	2.12V	0.92%
26	3P SPARE	3000	7.53A				G.E.	BOLT-ON MCCB	30	100	10	2						
	TOTAL	55469	24.01A	50.49A	42.68A	66.98A	G.E.	INDUSTRIAL MCCB	225	250	35	3	C3					

TOTAL VA = 55469 VA

TOTAL CURRENT = (SUM OF COMPUTED LOAD + 25% OF THE LARGEST MOTOR FLA) / (230V * SQRT(3)) = 142.07 A

FEEDER = 142.07 A USE CODE C3 3 SET 3 WIRE 120mm^2 THHN/THWN CABLE 30mm^2 GROUND IN 75mm IMC CONDUIT

BREAKER = 142.07 A USE 225AT 250AF 3POLE MCCB

PANEL PP-2 (PROPOSED)

DESIGNATION	PANEL LP3 (PROPOSED)						MOUNTING	RECESSED MOUNTED									VOLTAGE DROP			CONSTANT	
SYSTEM	230 V	3 PHASE	3 WIRE+GND				ENCLOSURE	NEMA-1							VD	=	CONSTANT X LENGTH X FLC			1ϕ =	35.6
MIN. I.C.	10 KA						FEED FROM	BASEMENT MAIN MDP (CCTN)									1000 X WIRE SIZE X SETS			3ϕ 3W =	30.8
LOCATION	3RD FLOOR HALLWAY						MAIN	60AT	100AF	3POLE	MCCB				%VD	=	(NO / SUPPLY) X 100			3ϕ 4W =	17.8

CCT NO.	LOAD DESCRIPTION	CONNECTED LOAD					BREAKER SIZE OVERCURRENT PROTECTION						FEEDER DETAILS	VD CALCULATION, %VD < 3% FOR BRANCHES				
		VA	CURRENT IN AMPERES											K CONSTANT	LENGTH (m)	FLC	VD	%VD
			3 PHASE	AB	CA	BC	BRAND	TYPE	AT	AF	KAIC	POLE						
1	10 x 1-40VA FLTG	400		1.74A			G.E.	BOLT-ON MCCB	20	100	10	2	C14	35.6	70	1.74A	1.48V	0.61%
2	10 x 24VA ELTG	239		1.04A			G.E.	BOLT-ON MCCB	20	100	10	2	C14	35.6	75	1.04A	0.79V	0.34%
3	6 x 1-40VA LTG (TRM, SURM)	239			1.04A		G.E.	BOLT-ON MCCB	20	100	10	2	C14	35.6	40	1.04A	0.42V	0.18%
4	12 x 2-40VA LTG; 9 x 10VA EF (PPD)	1231			5.35A		G.E.	BOLT-ON MCCB	20	100	10	2	C14	35.6	48	5.35A	2.50V	1.09%
5	6 x 2-40VA LTG; 4 x 10VA EF (RLFC)	600				2.61A	G.E.	BOLT-ON MCCB	20	100	10	2	C14	35.6	48	2.61A	1.04V	0.45%
6	4x2-40VA LTG; 4x40VA EF; 4x40VA PIN LTG (CFRM1)	600				2.61A	G.E.	BOLT-ON MCCB	20	100	10	2	C14	35.6	33	2.61A	0.88V	0.38%
7	4x3-40VA LTG; 5x30VA EF; 20W40VA PIN LTG (CFRM2)	1550		6.74A			G.E.	BOLT-ON MCCB	20	100	10	2	C14	35.6	67	6.74A	4.59V	2.00%
8	6 x 1-40VA LTG (N-HTS)	239		1.04A			G.E.	BOLT-ON MCCB	20	100	10	2	C14	35.6	25	1.04A	0.26V	0.11%
9	12 x 2-40VA LTG (HW, STR, MCR, FCR)	480			2.09A		G.E.	BOLT-ON MCCB	20	100	10	2	C14	35.6	56	2.09A	1.19V	0.52%
10	2P SPARE	1500			6.52A		G.E.	BOLT-ON MCCB	30	100	10	2						
11	2P SPARE	1500				6.52A	G.E.	BOLT-ON MCCB	30	100	10	2						
12	2P SPARE	1500				6.52A	G.E.	BOLT-ON MCCB	30	100	10	2						
13	3P SPARE	3000	7.53A				G.E.	BOLT-ON MCCB	30	100	10	3						
14	3P SPARE	3000	7.53A				G.E.	BOLT-ON MCCB	30	100	10	3						
15	3P SPARE	3000	7.53A				G.E.	BOLT-ON MCCB	30	100	10	3						
16	3P SPARE	3000	7.53A				G.E.	BOLT-ON MCCB	30	100	10	3						
TOTAL		22077	30.12A	10.56A	16.00A	18.26A	S.E.	INDUSTRIAL MCCB	60	100	35	3	C9					

TOTAL VA = 22077 VA

TOTAL CURRENT = 55.42 A

FEEDER = 55.42 A USE CODE C9 1 SET 3 WIRE 14mm^2 THHN/THWN CABLE 6mm^2 GROUND IN 25mm ∅ IMC CONDUIT

BREAKER = 55.42 A USE 60AT 100AF 3POLE MCCB

PANEL LP-3 (PROPOSED)

DESIGNATION	PANEL PP-3 (PROPOSED)					MOUNTING	RECESSED MOUNTED									VOLTAGE DROP				CONSTANT	
SYSTEM	230 V	3 PHASE	3 WIRE+GND			ENCLOSURE	NEMA-1								VD	=	CONSTANT X LENGTH X FLC			1ϕ =	35.6
MIN. I.C.	10 KA					FEED FROM	BASEMENT MAIN MDP OCTB1										1000 X WIRE SIZE X SETS			3ϕ TW =	36.8
LOCATION	3RD FLOOR HALLWAY					MAIN	225AT	250AF	3POLE	MCCB					NVD	=	(VD / SUPPLY) X 100			3ϕ 4W =	17.8

CKT NO.	LOAD DESCRIPTION	CONNECTED LOAD					BREAKER SIZE OVERCURRENT PROTECTION						FEEDER DETAILS	VD CALCULATION, NVD < 3% FOR BRANCHES				
		VA	CURRENT IN AMPERES											K CONSTANT	LENGTH (m)	FLC	VD	NVD
			3 PHASE	AB	CA	BC	BRAND	TYPE	AT	AF	KAIC	POLE						
1	8 x 2-180VA (ETRM & SVRM)	2880		12.52A			G.E.	BOLT-ON MCCB	30	100	10	2	C14	35.6	36	12.52A	4.58V	1.99%
2	2.5HP WACU (SVRM)	2052		8.92A			G.E.	BOLT-ON MCCB	40	100	10	2	C12	35.6	25	8.92A	1.44V	0.63%
3	2.5HP WACU (SVRM)	2052			8.92A		G.E.	BOLT-ON MCCB	40	100	10	2	C12	35.6	25	8.92A	1.44V	0.63%
4	2.5HP WACU (SVRM)	2052			8.92A		G.E.	BOLT-ON MCCB	40	100	10	2	C12	35.6	25	8.92A	1.44V	0.63%
5	2.5HP WACU (SVRM)	2052				8.92A	G.E.	BOLT-ON MCCB	40	100	10	2	C12	35.6	32	8.92A	1.85V	0.80%
6	5HP FACU (SVRM)	4108				17.84A	G.E.	BOLT-ON MCCB	40	100	10	2	C12	35.6	25	17.84A	2.88V	1.26%
7	2HP SACU (ITRM)	1642		7.14A			G.E.	BOLT-ON MCCB	40	100	10	2	C12	35.6	31	7.14A	1.42V	0.62%
8	12 x 2-180VA (PPD)	4320		18.78A			G.E.	BOLT-ON MCCB	30	100	10	2	C14	35.6	35	18.78A	6.69V	2.91%
9	1HP WACU (PPD)	821			3.57A		G.E.	BOLT-ON MCCB	40	100	10	2	C12	35.6	23	3.57A	0.52V	0.23%
10	1HP WACU (PPD)	821			3.57A		G.E.	BOLT-ON MCCB	40	100	10	2	C12	35.6	21	3.57A	0.49V	0.21%
11	2.5HP SACU (PPD)	2052				8.92A	G.E.	BOLT-ON MCCB	40	100	10	2	C12	35.6	31	8.92A	1.31V	0.57%
12	8 x 2-180VA (BURC)	2880				12.52A	G.E.	BOLT-ON MCCB	30	100	10	2	C14	35.6	36	12.52A	4.58V	1.99%
13	2HP WACU (BURC)	1642		7.14A			G.E.	BOLT-ON MCCB	40	100	10	2	C12	35.6	31	7.14A	0.97V	0.42%
14	6 x 2-180VA (CFRM1)	2160		9.39A			G.E.	BOLT-ON MCCB	30	100	10	2	C14	35.6	31	9.39A	2.56V	1.11%
15	5HP FACU (CFRM1)	4108			17.84A		G.E.	BOLT-ON MCCB	40	100	10	2	C12	35.6	17	17.84A	1.96V	0.85%
16	5 x 2-180VA (CFRM2)	1800			7.83A		G.E.	BOLT-ON MCCB	30	100	10	2	C14	35.6	36	7.83A	2.92V	1.25%
17	1HP WACU (CFRM2)	821				3.57A	G.E.	BOLT-ON MCCB	40	100	10	2	C12	35.6	24	3.57A	0.55V	0.24%
18	1HP WACU (CFRM2)	821				3.57A	G.E.	BOLT-ON MCCB	40	100	10	2	C12	35.6	24	3.57A	0.55V	0.24%
19	1HP WACU (CFRM2)	821		3.57A			G.E.	BOLT-ON MCCB	40	100	10	2	C12	35.6	24	3.57A	0.55V	0.24%
20	5HP FACU (CFRM2)	4108		17.84A			G.E.	BOLT-ON MCCB	40	100	10	2	C12	35.6	30	17.84A	3.40V	1.51%
21	5 x 2-180VA (NHTS)	2160			9.39A		G.E.	BOLT-ON MCCB	30	100	10	2	C14	35.6	29	9.39A	2.77V	1.20%
22	2.5HP WACU (NHTS)	2052			8.92A		G.E.	BOLT-ON MCCB	40	100	10	2	C12	35.6	29	8.92A	1.67V	0.73%
23	3 x 2-180VA (RW)	1080				4.70A	G.E.	BOLT-ON MCCB	30	100	10	2	C14	35.6	12	4.70A	0.57V	0.25%
24	2P SPARE	1500				6.52A	G.E.	BOLT-ON MCCB	30	100	10	2						
	TOTAL	50787	0.00A	85.30A	85.55A	85.55A	S.E.	INDUSTRIAL MCCB	225	250	25	3	C3					

TOTAL VA = 50787 VA

TOTAL CURRENT = (SUM OF COMPUTED LOAD + 25% OF THE LARGEST MOTOR FLA) / (230V * SQRT(3)) = 130.06 A

FEEDER = 130.06 A USE CODE C3 1 SET 3 WIRE 125mm2 THHN/THWN CABLE 30.0mm^2 Z GROUND W 75mmø IMC CONDUIT

BREAKER = 130.06 A USE 225AT 250AF 3POLE MCCB

PANEL PP-3 (PROPOSED)

DESIGNATION	PANEL PP-ADG (EXISTING)					MOUNTING	RECESSED MOUNTED								VOLTAGE DROP			CONSTANT	
SYSTEM	230 V	1 PHASE	3 WIRE+GND			ENCLOSURE	NEMA-1							VD	=	CONSTANT K LENGTH X FLC		1φ =	35.6
MIN. I.C.	10 KA					FEED FROM	BASEMENT MAIN MDP (ETW)									1000 X WIRE SIZE X SETS		3φ 3W =	30.8
LOCATION	GROUND FLOOR OFFICE / CONFERENCE ROOM					MAIN	100AT	100AF	2POLE	MCCB				%VD	=	(VD / SUPPLY) X 100		3φ 4W =	17.8

CKT NO.	LOAD DESCRIPTION	CONNECTED LOAD					BREAKER SIZE OVERCURRENT PROTECTION						FEEDER DETAILS	VD CALCULATION, %VD < 3% FOR BRANCHES				
		VA	CURRENT IN AMPERES											K CONSTANT	LENGTH (m)	FLC	VD	%VD
			3 PHASE	RA	CA	BC	BRAND	TYPE	AT	AF	KAIC	POLE						
	FED THRU - PANEL PP-AD2	19707		85.68A			METASOL	INDUSTRIAL MCCB	100	100	35	2						
1	2P SPARE	1500		6.52A			METASOL	BOLT-ON MCCB	30	100	10	2						
2	LTG - STORAGE & FRONT PERIMETER	200		0.87A			METASOL	BOLT-ON MCCB	15	100	10	2	C14	35.6	14	0.87A	0.12V	0.05%
3	C.O. & WACU - OFFICE & STORAGE	3491		15.18A			METASOL	BOLT-ON MCCB	20	100	10	2	C14	35.6	32	15.18A	4.94V	2.15%
4	CONFERENCE ROOM - WACU	2051		8.92A			METASOL	BOLT-ON MCCB	15	100	10	2	C14	35.6	6	8.92A	0.54V	0.24%
5	LTG, C.O., WACU - GROUND FLOOR	9200		40.00A			ROYU	BOLT-ON MCCB	60	100	10	2	C10	35.6	38	40.00A	6.76V	2.94%
6	UNKNOWN CIRCUIT	0		0.00A			METASOL	BOLT-ON MCCB	20	100	10	2	C14	35.6	33	0.00A	0.00V	0.00%
	TOTAL	16443	0.00A	71.49A	0.00A	0.00A	METASOL	INDUSTRIAL MCCB	100	100	35	2	C7					

TOTAL VA = 16443 VA

TOTAL CURRENT = (SUM OF COMPUTED LOAD + 25% OF THE LARGEST MOTOR FLA) / (230V * SQRT(3)) = 81.49 A

FEEDER	=	81.49 A	USE	CODE C2	1 SET	2 WIRE	80mm^2	THHN/THWN CABLE	8mm^2	GROUND	IN	32mm	IMC CONDUIT
BREAKER	=	81.49 A	USE	100AT	100AF	3POLE	MCCB						

TOTAL VA+THE FED THRU			=	36150 VA		ESTIMATE DEMAND HOURS PER DAY	=	18 HRS		75%	D.F.	=	27112 VA
TOTAL CURRENT+THE FED THRU			=	157.17 A		DEMAND FACTOR	= 18HRS / 24HRS =	75%		75%	D.F.	=	117.88 A
FEEDER	=	157.17 A	USE	CODE C2	1 SET	2 WIRE	80mm^2	THHN/THWN CABLE	8mm^2	GROUND	IN	50mm	IMC CONDUIT
BREAKER	=	157.17 A	USE	150AT	250AF	3POLE	MCCB						

ADMIN BUILDING PANEL PP-ADG (EXISTING)

DESIGNATION	PANEL PP-AD-2 (EXISTING)						MOUNTING	RECESSED MOUNTED								VOLTAGE DROP			CONSTANT
SYSTEM	230 V	3 PHASE	3 WIRE+GND				ENCLOSURE	NEMA-1						VD	=	CONSTANT X LENGTH X FLC		1ϕ =	35.6
MIN. I.C.	10 KA						FEED FROM	BASEMENT MAIN MDP (X1&7								1000 X WIRE SIZE X SETS		3ϕ 3W =	30.8
LOCATION	2ND FLOOR OFFICE						MAIN	100AT	100AF	2POLE	MCCB			%VD	=	(VD / SUPPLY) X 100		3ϕ 4W =	17.8

CKT NO.	LOAD DESCRIPTION	CONNECTED LOAD					BREAKER SIZE OVERCURRENT PROTECTION						FEEDER DETAILS	VD CALCULATION, %VD < 3% FOR BRANCHES				
		VA	CURRENT IN AMPERES											K CONSTANT	LENGTH (m)	FLC	VD	%VD
			3 PHASE	AB	CA	BC	BRAND	TYPE	AI	AF	KAIC	POLE						
1	SACU	2052		8.92A			METASOL	BOLT-ON MCCB	30	100	10	3	C13	35.6	5	8.92A	0.23V	0.96%
2	C.O. - OFFICE	2520		10.96A			METASOL	BOLT-ON MCCB	15	100	10	2	C12	35.6	13	10.96A	0.92V	0.40%
3	C.O. & SACU - OFFICE	2412		10.49A			METASOL	BOLT-ON MCCB	30	100	10	2	C10	35.6	32	10.49A	2.49V	0.05%
4	LTG - OFFICE	1955		8.50A			METASOL	BOLT-ON MCCB	15	100	10	2	C16	35.6	18	8.50A	2.42V	1.05%
5	ELTG - OUTDOOR STAIR	46		0.20A			METASOL	BOLT-ON MCCB	20	100	10	2	C10	35.6	22	0.20A	0.02V	0.01%
6	2 - SACU	5305		23.05A			G.E.	BOLT-ON MCCB	50	100	10	2	C15	35.6	9	23.05A	0.75V	0.31%
7	C.O. - OFFICE	2150		9.35A			METASOL	BOLT-ON MCCB	20	100	10	2	C13	35.6	27	9.35A	2.29V	0.56%
8	C.O. - OFFICE	3238		14.08A			G.E.	BOLT-ON MCCB	20	100	10	2	C14	35.6	47	14.08A	6.73V	2.93%
	TOTAL	19707	0.00A	85.68A	0.00A	0.00A	METASOL	INDUSTRIAL MCCB	100	100	35	2	CB					

TOTAL VA = 19707 VA

TOTAL CURRENT = (SUM OF COMPUTED LOAD + 25% OF THE LARGEST MOTOR FLA) / (230V * SQRT(3)) = 88.30 A

FEEDER = 88.30 A USE COPPER CB 1 SET 2 WIRE 22mm^2 THHN/THWN CABLE 8mm^2 GROUND IN 32mmø PVC CONDUIT

BREAKER = 88.30 A USE 100AT 100AF 2POLE MCCB

ADMIN BUILDING PANEL PP-AD2 (EXISTING)

Section VIII. Bill of Quantities

PROGRAM OF WORKS

Name of Project:	**ELECTRICAL UPGRADE OF 53-YEAR-OLD MAIN BUILDING (SERVICE ENTRANCE AND MAIN BUILDING)**	Locatic	**Benitez Street corner General Malvar Street Malate Manila**
Total Project Cost:	**PHP -**	Project Duration:	**120 Calendar Days**
Source of Fund:	**RGASS AND PROGRAM FUNDS**	Mode of Procurement:	**PUBIC BIDDING**

Item No.	Item Description	QTY	Unit	Unit Cost	Amount
1	Removal of Existing Lightings at 3rd Floor Installation of New Panel LP-3 at 3rd Floor Installation of New Lightings at 3rd Floor Piping & Wiring Installation from LP-3 to Branches	1	lot		
2	Removal of Existing Outlets at 3rd Floor Installation of New Panel PP-3 at 3rd Floor Installation of New Outlets at 3rd Floor Installation of Aircon Outlets / ECBs at 3rd Floor Piping & Wiring Installation from PP-3 to Branches	1	lot		
3	Removal of Existing Lightings at 2nd Floor Installation of New Panel LP-2 at 2nd Floor Installation of New Lightings at 2nd Floor Piping & Wiring Installation from LP-2 to Branches	1	lot		
4	Removal of Existing Outlets at 2nd Floor Installation of New Panel PP-2 at 2nd Floor Installation of New Outlets at 2nd Floor Installation of Aircon Outlets / ECBs at 2nd Floor Piping & Wiring Installation from PP-2 to Branches	1	lot		
5	Removal of Existing Lightings at 1st Floor Installation of New Panel LP-G at 1st Floor Installation of New Lightings at 1st Floor Piping & Wiring Installation from LP-G to Branches	1	lot		
6	Removal of Existing Outlets at 1st Floor Installation of New Panel PP-G at 1st Floor Installation of New Outlets at 1st Floor Installation of Aircon Outlets / ECBs at 1st Floor Piping & Wiring Installation from PP-G to Branches	1	lot		
7	Removal of Existing Lightings & Outlets at Gnd Floor Installation of New Panel PP-CIU at Gnd Floor Installation of New Lighitngs & Outlets at Gnd Floor Installation of Aircon Outlets / ECBs at Gnd Floor Piping & Wiring Installation from PP-CIU to Branches	1	lot		
8	Removal of Existing Lightings & Outlets at Basement Installation of New Panel PP-B at Basement Installation of New Lighitngs & Outlets at Basement Installation of ECBs at Basement Piping & Wiring Installation from PP-B to Branches	1	lot		
9	Removal of Existing Old Distribution Panels Removal of Old Main Distribution Panel Installation of New Main Distribution Panel Piping & Wiring Installation from MDP to DPs	1	lot		
10	Installation of New Switchboard LVSB Piping & Wiring Installation from LVSB to MDP Piping & Wiring Installation from LVSB to Admin Bldg	1	lot		
11	Installation of Meralco (Normal Supply) ECB Piping & Wiring Installation from Meralco ECB to LVSB	1	lot		
	Mobilization / Demobilization Cost	1	lot		
	Labor Cost	1	lot		

A	Total Direct Cost (Material, Labor and Equipment)	₱ -
B	Overhead, Contingencies & Miscellaneous Expenses	₱ -
C	Contractor's Profit	₱ -
D	Value Added Tax	₱ -
	TOTAL PROJECT COST	**₱ -**

Submitted by:

Name: _____

Legal Capacity: _____

Signature: _____

Duly authorized to sign the Bid for and behalf of: _____

Date: _____

BILL OF QUANTITIES

Name of Project:	EMERGENCY ELECTRICAL UPGRADE OF 53-YEAR-OLD MAIN BUILDING (SERVICE ENTRANCE AND MAIN BUILDING)		1680 F. T Benitez Street corner General Malvar Street Malate Manila		
Total Project Cost:	Php12,742,000.00	Project Duration:	120		Calendar Days

Item No.		Item Description	Quantity	Unit	Material Cost	Amount
1	ELECTRICAL WORKS					
	1.1	**Panel PP-B**			-	
		Panel PP-B 18Ways Enclosure	1.00	set(s)		
		20AT 100AF 2P MCCB	3.00	pc(s)		
		30AT 100AF 2P MCCB	4.00	pc(s)		
		40AT 100AF 3P MCCB	1.00	pc(s)		
		50AT 100AF 3P MCCB	1.00	pc(s)		
		100AT 100AF 3P MCCB (Main)	1.00	pc(s)		
		Lighting Fixtures & Exhaust Fans				
		1 x 40W T8 Louver Housing Recessed Troffer Light	9.00	pc(s)		
		24W 2 Heads Wall Mount Emergency Light	4.00	pc(s)		
		Outlet & Switches				
		2 Gang Universal Outlet with Cover	7.00	pc(s)		
		1 Gang Universal Outlet with Cover	4.00	pc(s)		
		1 Gang Switch with Cover	3.00	pc(s)		
		Conduits & Fittings & Junction Box				
		Octagonal Junction Box with Cover	9.00	pc(s)		
		Rectangular Utility Box	14.00	pc(s)		
		Nema 3R Enclosure w/ 30AT 100AF 2P MCCB	1.00	pc(s)		
		1/2" IMC / PVC Pipe	48.00	pc(s)		
		1/2" IMC / PVC Elbow	12.00	pc(s)		
		1/2" IMC / PVC Connectors/Bushings/Coupling	120.00	pc(s)		
		1/2" IMC / PVC Clamps or U-Bolts	96.00	pc(s)		
		Cables and Lugs				
		2.0 mm2 THHN Cable Green	1.00	roll(s)		
		2.0 mm2 Cable Lugs	1.00	pk(s)		
		3.5 mm2 THHN Cable Black	2.00	roll(s)		
		3.5 mm Cable Lugs	2.00	pk(s)		

	1.2	**Panel PP-CIU**			-	
		Panel PP-CIU 12Ways Enclosure	1.00	set(s)		
		20AT 2P 100AF MCCB	2.00	pc(s)		
		30AT 2P 100AF MCCB	2.00	pc(s)		
		40AT 2P 100AF MCCB	4.00	pc(s)		
		60AT 100AF 3P MCCB (Main)	1.00	pc(s)		
		Lighting Fixtures & Exhaust Fans				
		2 x 40W T8 Louver Housing Recessed Troffer Light	8.00	pc(s)		
		24W 2 Heads Wall Mount Emergency Light	2.00	pc(s)		
		Outlet & Switches				
		2 Gang Universal Outlet with Cover	5.00	pc(s)		
		1 Gang Universal Outlet with Cover	4.00	pc(s)		
		2 Gang Switch with Cover	3.00	pc(s)		
		WACU 2P 30AT Circuit Breaker w/ Plug	2.00	pc(s)		
		Conduits & Fittings & Junction Box				
		Octagonal Junction Box with Cover	8.00	pc(s)		
		Rectangular Utility Box	11.00	pc(s)		
		1/2" IMC / PVC Pipe	22.00	pc(s)		
		1/2" IMC / PVC Elbow	6.00	pc(s)		
		1/2" IMC / PVC Connectors/Bushings/Coupling	57.00	pc(s)		
		1/2" IMC / PVC Clamps or U-Bolts	44.00	pc(s)		
		Cables & Lugs				
		2.0 mm2 THHN Cable Green	1.00	roll(s)		
		2.0 mm2 Cable Lugs	1.00	pk(s)		
		3.5 mm2 THHN Cable Black	1.00	roll(s)		
		3.5 mm2 Cable Lugs	1.00	pk(s)		
		5.5 mm2 THHN Cable Black	1.00	roll(s)		
		5.5 mm2 Cable Lugs	1.00	pk(s)		
	1.3	**Panel LP-G**			-	
		Panel LP-G 36Ways Enclosure	1.00	set(s)		
		20AT 2P 100AF MCCB	12.00	pc(s)		
		30AT 3P 100AF MCCB	4.00	pc(s)		
		60AT 100AF 3P MCCB (Main)	1.00	pc(s)		
		Lighting Fixtures & Exhaust Fans				
		1 x 40W T8 Louver Housing Recessed Troffer Light	19.00	pc(s)		
		2 x 40W T8 Louver Housing Recessed Troffer Light	63.00	pc(s)		
		24W 2 Heads Wall Mount Emergency Light	9.00	pc(s)		
		1 x 40W Recessed Down Light	1.00	pc(s)		
		30W Exhaust Fan	17.00	pc(s)		
		Outlet & Switches				
		1 Gang Universal Outlet with Cover	9.00	pc(s)		
		1 Gang Switch with Cover	13.00	pc(s)		
		2 Gang Switch with Cover	7.00	pc(s)		

		3 Gang Switch with Cover	5.00	pc(s)		
		Conduits & Fittings & Junction Box				
		Octagonal Junction Box with Cover	99.00	pc(s)		
		Rectangular Utility Box	34.00	pc(s)		
		1/2" IMC / PVC Pipe	183.00	pc(s)		
		1/2" IMC / PVC Elbow	54.00	pc(s)		
		1/2" IMC / PVC Connectors/Bushings/Coupling	473.00	pc(s)		
		1/2" IMC / PVC Clamps or U-Bolts	366.00	pc(s)		
		Cables & Lugs				
		2.0 mm2 THHN Cable Green	4.00	roll(s)		
		2.0 mm2 Cable Lugs	4.00	pk(s)		
		3.5 mm2 THHN Cable Black	8.00	roll(s)		
		3.5 mm2 Cable Lugs	8.00	pk(s)		
	1.4	**Panel PP-G**			-	
		Panel PP-G 40Ways Enclosure	1.00	set(s)		
		30AT 2P 100AF MCCB	10.00	pc(s)		
		40AT 2P 100AF MCCB	10.00	pc(s)		
		150AT 250AF 3P MCCB (Main)	1.00	pc(s)		
		Outlet & Switches				
		2 Gang Universal Outlet with Cover	59.00	pc(s)		
		1 Gang Universal Outlet with Cover	10.00	pc(s)		
		Nema 3R Enclosure w/ 30AT 100AF 2P MCCB	5.00	pc(s)		
		WACU 2P 30AT Circuit Breaker w/ Plug	5.00	pc(s)		
		Conduits & Fittings & Junction Box				
		Rectangular Utility Box	79.00	pc(s)		
		1/2" IMC / PVC Pipe	164.00	pc(s)		
		1/2" IMC / PVC Elbow	69.00	pc(s)		
		1/2" IMC / PVC Connectors/Bushings/Coupling	450.00	pc(s)		
		1/2" IMC / PVC Clamps or U-Bolts	328.00	pc(s)		
		Cables & Lugs				
		2.0 mm2 THHN Cable Green	4.00	roll(s)		
		2.0 mm2 Cable Lugs	4.00	pk(s)		
		3.5 mm2 THHN Cable Black	5.00	roll(s)		
		3.5 mm2 Cable Lugs	5.00	pk(s)		
		5.5 mm2 THHN Cable Black	4.00	roll(s)		
		5.5 mm2 Cable Lugs	4.00	pk(s)		
	1.5	**Panel LP-2**			-	
		Panel LP-2 36Ways Enclosure	1.00	set(s)		
		20AT 2P 100AF MCCB	9.00	pc(s)		
		30AT 2P 100AF MCCB	3.00	pc(s)		
		30AT 3P 100AF MCCB	4.00	pc(s)		

		60AT 100AF 3P MCCB (Main)	1.00	pc(s)		
		Lighting Fixtures & Exhaust Fans				
		1 x 40W T8 Louver Housing Recessed Troffer Light	15.00	pc(s)		
		2 x 40W T8 Louver Housing Recessed Troffer Light	71.00	pc(s)		
		24W 2 Heads Wall Mount Emergency Light	10.00	pc(s)		
		30W Exhaust Fan	2.00	pc(s)		
		Outlet & Switches				
		1 Gang Universal Outlet with Cover	10.00	pc(s)		
		1 Gang Switch with Cover	7.00	pc(s)		
		2 Gang Switch with Cover	3.00	pc(s)		
		3 Gang Switch with Cover	5.00	pc(s)		
		Conduits & Fittings & Junction Box				
		Octagonal Junction Box with Cover	86.00	pc(s)		
		Rectangular Utility Box	25.00	pc(s)		
		1/2" IMC / PVC Pipe	146.00	pc(s)		
		1/2" IMC / PVC Elbow	62.00	pc(s)		
		1/2" IMC / PVC Connectors/Bushings/Coupling	415.00	pc(s)		
		1/2" IMC / PVC Clamps or U-Bolts	292.00	pc(s)		
		Cables & Lugs				
		2.0 mm2 THHN Cable Green	3.00	roll(s)		
		2.0 mm2 Cable Lugs	3.00	pk(s)		
		3.5 mm2 THHN Cable Black	6.00	roll(s)		
		3.5 mm2 Cable Lugs	6.00	pk(s)		
1.6		**Panel PP-2**			-	
		Panel PP-2 54Ways Enclosure	1.00	set(s)		
		30AT 2P 100AF MCCB	9.00	pc(s)		
		40AT 2P 100AF MCCB	19.00	pc(s)		
		30AT 3P 100AF MCCB	1.00	pc(s)		
		40AT 3P 100AF MCCB	2.00	pc(s)		
		225AT 250AF 3P MCCB (Main)	1.00			
		Outlet & Switches				
		2 Gang Universal Outlet with Cover	80.00	pc(s)		
		2 Gang Universal Outlet with Cover	10.00	pc(s)		
		Nema 3R Enclosure w/ 30AT 100AF 2P MCCB	5.00	pc(s)		
		WACU 2P 30AT Circuit Breaker w/ Plug	10.00	pc(s)		
		Conduits & Fittings & Junction Box				
		Rectangular Utility Box	90.00	pc(s)		
		1/2" IMC / PVC Pipe	236.00	pc(s)		
		1/2" IMC / PVC Elbow	116.00	pc(s)		
		1/2" IMC / PVC Connectors/Bushings/Coupling	704.00	pc(s)		
		1/2" IMC / PVC Clamps or U-Bolts	472.00	pc(s)		
		Cables & Lugs				

		2.0 mm2 THHN Cable Green	5.00	roll(s)		
		2.0 mm2 Cable Lugs	5.00	pk(s)		
		3.5 mm2 THHN Cable Black	5.00	roll(s)		
		3.5 mm2 Cable Lugs	5.00	pk(s)		
		5.5 mm2 THHN Cable Black	6.00	roll(s)		
		5.5 mm2 Cable Lugs	6.00	pk(s)		
	1.7	**Panel LP-3**			-	
		Panel LP-3 36Ways Enclosure	1.00	set(s)		
		20AT 2P 100AF MCCB	9.00	pc(s)		
		30AT 2P 100AF MCCB	3.00	pc(s)		
		30AT 3P 100AF MCCB	4.00	pc(s)		
		60AT 100AF 3P MCCB (Main)	1.00	pc(s)		
		Lighting Fixtures & Exhaust Fans				
		1 x 40W T8 Louver Housing Recessed Troffer Light	58.00	pc(s)		
		2 x 40W T8 Louver Housing Recessed Troffer Light	24.00	pc(s)		
		3 x 40W T8 Louver Housing Recessed Troffer Light	4.00	pc(s)		
		24W 2 Heads Wall Mount Emergency Light	10.00	pc(s)		
		1 x 40W Recessed Down Light	28.00	pc(s)		
		30W Exhaust Fan	26.00	pc(s)		
		Outlet & Switches				
		1 Gang Universal Outlet with Cover	10.00	pc(s)		
		1 Gang Switch with Cover	10.00	pc(s)		
		2 Gang Switch with Cover	4.00	pc(s)		
		3 Gang Switch with Cover	4.00	pc(s)		
		Conduits & Fittings & Junction Box				
		Octagonal Junction Box with Cover	112.00	pc(s)		
		Rectangular Utility Box	28.00	pc(s)		
		1/2" IMC / PVC Pipe	154.00	pc(s)		
		1/2" IMC / PVC Elbow	46.00	pc(s)		
		1/2" IMC / PVC Connectors/Bushings/Coupling	399.00	pc(s)		
		1/2" IMC / PVC Clamps or U-Bolts	308.00	pc(s)		
		Cables & Lugs				
		2.0 mm2 THHN Cable Green	3.00	roll(s)		
		2.0 mm2 Cable Lugs	3.00	pk(s)		
		3.5 mm2 THHN Cable Black	6.00	roll(s)		
		3.5 mm2 Cable Lugs	6.00	pk(s)		
	1.8	**Panel PP-3**			-	
		Panel PP-3 48Ways Enclosure	1.00	set(s)		
		30AT 2P 100AF MCCB	8.00	pc(s)		
		40AT 2P 100AF MCCB	16.00	pc(s)		
		225AT 250AF 3P MCCB (Main)	1.00	pc(s)		
		Outlet & Switches				
		2 Gang Universal Outlet with Cover	55.00	pc(s)		

		1 Gang Universal Outlet with Cover	9.00	pc(s)		
		Nema 3R Enclosure w/ 30AT 100AF 2P MCCB	6.00	pc(s)		
		WACU 2P 30AT Circuit Breaker w/ Plug	10.00	pc(s)		
		Conduits & Fittings & Junction Box				
		Rectangular Utility Box	70.00	pc(s)		
		1/2" IMC / PVC Pipe	204.00	pc(s)		
		1/2" IMC / PVC Elbow	114.00	pc(s)		
		1/2" IMC / PVC Connectors/Bushings/Coupling	636.00	pc(s)		
		1/2" IMC / PVC Clamps or U-Bolts	408.00	pc(s)		
		Cables & Lugs				
		2.0 mm2 THHN Cable Green	4.00	roll(s)		
		2.0 mm2 Cable Lugs	4.00	pk(s)		
		3.5 mm2 THHN Cable Black	4.00	roll(s)		
		3.5 mm2 Cable Lugs	4.00	pk(s)		
		5.5 mm2 THHN Cable Black	5.00	roll(s)		
		5.5 mm2 Cable Lugs	5.00	pk(s)		
	1.9	**Panel Main Building MDP**			-	
		Panel Main Building MDP 24Ways Enclosure	1.00	set(s)		
		100AT 100AF 3P MCCB (PP-B)	1.00	pc(s)		
		60AT 100AF 3P MCCB (PP-CIU)	1.00	pc(s)		
		60AT 100AF 3P MCCB (LP-G)	1.00	pc(s)		
		150AT 250AF 3P MCCB (PP-G)	1.00	pc(s)		
		60AT 100AF 3P MCCB (LP-2)	1.00	pc(s)		
		225AT 250AF 3P MCCB (PP-2)	1.00	pc(s)		
		60AT 100AF 3P MCCB (LP-3)	1.00	pc(s)		
		225AT 250AF 3P MCCB (PP-3)	1.00	pc(s)		
		Conduits & Fittings & Pullbox				
		1" IMC Pipe	25.00	pc(s)		
		1" IMC Elbow	16.00	pc(s)		
		1" IMC Connectors/Bushings/Coupling	25.00	pc(s)		
		1" IMC Clamps or U-Bolts	60.00	pc(s)		
		2" IMC Pipe	14.00	pc(s)		
		2" IMC Elbow	8.00	pc(s)		
		2" IMC Connectors/Bushings/Coupling	14.00	pc(s)		
		2" IMC Clamps or U-Bolts	35.00	pc(s)		
		3" IMC Pipe	15.00	pc(s)		
		3" IMC Elbow	8.00	pc(s)		
		3" IMC Connectors/Bushings/Coupling	30.00	pc(s)		
		3" IMC Clamps or U-Bolts	38.00	pc(s)		
		Pullbox	1.00	lot(s)		
		Cables & Lugs				
		5.5 mm2 THHN Cable Green	2.00	roll(s)		
		5.5 mm2 Cable Lugs	10.00	pk(s)		

		14 mm2 THHN Cable Red	1.00	roll(s)		
		14 mm2 THHN Cable Yellow	1.00	pk(s)		
		14 mm2 THHN Cable Blue	1.00	roll(s)		
		14 mm2 THHN Cable Green	20.00	pk(s)		
		14 mm2 Cable Lugs	35.00	roll(s)		
		30 mm2 THHN Cable Green	50.00	pk(s)		
		30 mm2 Cable Lugs	4.00	roll(s)		
		60 mm2 THHN Cable Red	20.00	pk(s)		
		60 mm2 THHN Cable Yellow	20.00	roll(s)		
		60 mm2 THHN Cable Blue	20.00	pk(s)		
		60 mm2 THHN Cable Green	20.00	roll(s)		
		60 mm2 Cable Lugs	15.00	pk(s)		
		125 mm2 THHN Cable Red	50.00	roll(s)		
		125 mm2 THHN Cable Yellow	50.00	pk(s)		
		125 mm2 THHN Cable Blue	50.00	roll(s)		
		125 mm2 THHN Cable Green	20.00	pk(s)		
		125 mm2 Cable Lugs	14.00	roll(s)		
	1.1	**Switchboard LVSB**			-	
		Switchboard LVSB Enclosure	1.00	set(s)		
		600AT 630AF 3P MCCB (Main)	1.00	pc(s)		
		150AT 250AF 2P MCCB (PP-ADG & AD2)	1.00	pc(s)		
		1250AT 1250AF 3P MCCB (ATS)	2.00	pc(s)		
		1250AT 1250AF 3P MCCB (Common)	1.00	pc(s)		
		Energy Monitoring				
		Schneider Electric PM2220 Power Meter	5.00	pc(s)		
		Current Transformer 1250A/5A	12.00	pc(s)		
		Current Transformer 600A/5A	6.00	pc(s)		
		Current Transformer 150A/5A	2.00	pc(s)		
		6A 3P Schneider Control MCB	6.00	pc(s)		
		6A 2P Schneider Control MCB	8.00	pc(s)		
		Conduits & Fittings for Main Building MDP				
		4" IMC / PVC Pipe	20.00	pc(s)		
		4" IMC / PVC Elbow	8.00	pc(s)		
		4" IMC / PVC Connectors/Bushings/Coupling	20.00	pc(s)		
		4" IMC / PVC Clamps or U-Bolts	40.00	pc(s)		
		Cables & Lugs for Main Building MDP				
		250 mm2 THHN Cable Red	120.00	mt(s)		
		250 mm2 THHN Cable Yellow	120.00	mt(s)		
		250 mm2 THHN Cable Blue	120.00	mt(s)		
		250 mm2 Cable Lugs	12.00	pc(s)		
		Conduits & Fittings for Admin Building				
		2" IMC Pipe	7.00	pc(s)		
		2" IMC Elbow	3.00	pc(s)		
		2" IMC Connectors/Bushings/Coupling	7.00	pc(s)		

		2" IMC Clamps or U-Bolts	14.00	pc(s)		
		Pullbox	1.00	pc(s)		
		Cables & Lugs for Admin Building				
		60 mm2 THHN Cable Black	20.00	mt(s)		
		60 mm2 Cable Lugs	15.00	pc(s)		
		30 mm2 THHN Cable Black	10.00	mt(s)		
		30 mm2 Cable Lugs	2.00	pc(s)		
		14 mm2 THHN Cable Green	20.00	mt(s)		
		14 mm2 Cable Lugs	35.00	pc(s)		
		MERALCO MAIN ECB			-	
		Main Circuit Breaker Enclosure	1.00	set(s)		
		1250AT 1250AF 3P MCCB	1.00	set(s)		
		Conduits & Fittings				
		4" IMC / PVC Pipe	20.00	pc(s)		
		4" IMC / PVC Elbow	8.00	pc(s)		
		4" IMC / PVC Connectors/Bushings/Coupling	20.00	pc(s)		
		4" IMC / PVC Clamps or U-Bolts	40.00	pc(s)		
		4" Service Entrance Cap	4.00	pc(s)		
		Cables & Lugs for Meralco Main ECB				
		250 mm2 THHN Cable Red	240.00	mt(s)		
		250 mm2 THHN Cable Yellow	240.00	mt(s)		
		250 mm2 THHN Cable Blue	240.00	mt(s)		
		250 mm2 Cable Lugs	24.00	mt(s)		
SUB - TOTAL (ELECTRICAL WORKS)						
2						
	2.1	Mobilization / Demobilization	1	lot(s)		
SUB - TOTAL (Mobilization)						
3						
	3.1	Labor Cost	30	%	₱ -	
SUB - TOTAL (Labor Cost)						

A	Total Direct Cost (Material, Labor and Equipment)		
B	"Overhead, Contingencies & Miscellaneous Expenses		
C	Contractor's Profit		
D	Value Added Tax		₱ -
TOTAL PROJECT COST		₱ -	

Submitted by:

Name: _____

Legal Capacity: _____

Signature: _____

Duly authorized to sign the Bid for and behalf of: _____

Date: _____

Bid Form for the Procurement of Infrastructure Projects

[shall be submitted with the Bid]

BID FORM

Date : _____
Project Identification No. : _____

To: [name and address of Procuring Entity]

Having examined the Philippine Bidding Documents (PBDs) including the Supplemental or Bid Bulletin Numbers *[insert numbers],* the receipt of which is hereby duly acknowledged, we, the undersigned, declare that:

a. We have no reservation to the PBDs, including the Supplemental or Bid Bulletins, for the Procurement Project: *[insert name of contract];*

b. We offer to execute the Works for this Contract in accordance with the PBDs;

c. The total price of our Bid in words and figures, excluding any discounts offered below is: *[insert information]*;

d. The discounts offered and the methodology for their application are: *[insert information]*;

e. The total bid price includes the cost of all taxes, such as, but not limited to: *[specify the applicable taxes, e.g. (i) value added tax (VAT), (ii) income tax, (iii) local taxes, and (iv) other fiscal levies and duties],* which are itemized herein and reflected in the detailed estimates,

f. Our Bid shall be valid within the a period stated in the PBDs, and it shall remain binding upon us at any time before the expiration of that period;

g. If our Bid is accepted, we commit to obtain a Performance Security in the amount of *[insert percentage amount]* percent of the Contract Price for the due performance of the Contract, or a Performance Securing Declaration in lieu of the the allowable forms of Performance Security, subject to the terms and conditions of issued GPPB guidelines[1] for this purpose;

h. We are not participating, as Bidders, in more than one Bid in this bidding process, other than alternative offers in accordance with the Bidding Documents;

i. We understand that this Bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal Contract is prepared and executed; and

j. We understand that you are not bound to accept the Lowest Calculated Bid or any other Bid that you may receive.

k. We likewise certify/confirm that the undersigned, is the duly authorized representative of

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[1] currently based on GPPB Resolution No. 09-2020

the bidder, and granted full power and authority to do, execute and perform any and all acts necessary to participate, submit the bid, and to sign and execute the ensuing contract for the [Name of Project] of the [Name of the Procuring Entity*].*

l. We acknowledge that failure to sign each and every page of this Bid Form, including the Bill of Quantities, shall be a ground for the rejection of our bid.

Name: _____

Legal Capacity: _____

Signature: _____

Duly authorized to sign the Bid for and behalf of: _____

Date: _____

Omnibus Sworn Statement (Revised)

[shall be submitted with the Bid]

REPUBLIC OF THE PHILIPPINES)
CITY/MUNICIPALITY OF _____) S.S.

AFFIDAVIT

I, [Name of Affiant], of legal age, [Civil Status], [Nationality], and residing at [Address of Affiant], after having been duly sworn in accordance with law, do hereby depose and state that:

1. *[Select one, delete the other:]*

   [If a sole proprietorship:] I am the sole proprietor or authorized representative of [Name of Bidder] with office address at [address of Bidder];

   [If a partnership, corporation, cooperative, or joint venture:] I am the duly authorized and designated representative of [Name of Bidder] with office address at [address of Bidder];

2. *[Select one, delete the other:]*

   [If a sole proprietorship:] As the owner and sole proprietor, or authorized representative of [Name of Bidder], I have full power and authority to do, execute and perform any and all acts necessary to participate, submit the bid, and to sign and execute the ensuing contract for [Name of the Project] of the [Name of the Procuring Entity], as shown in the attached duly notarized Special Power of Attorney;

   [If a partnership, corporation, cooperative, or joint venture:] I am granted full power and authority to do, execute and perform any and all acts necessary to participate, submit the bid, and to sign and execute the ensuing contract for [Name of the Project] of the [Name of the Procuring Entity], as shown in the attached [state title of attached document showing proof of authorization (e.g., duly notarized Secretary's Certificate, Board/Partnership Resolution, or Special Power of Attorney, whichever is applicable;)];

3. [Name of Bidder] is not "blacklisted" or barred from bidding by the Government of the Philippines or any of its agencies, offices, corporations, or Local Government Units, foreign government/foreign or international financing institution whose blacklisting rules have been recognized by the Government Procurement Policy Board, **by itself or by relation, membership, association, affiliation, or controlling interest with another blacklisted person or entity as defined and provided for in the Uniform Guidelines on Blacklisting;**

4. Each of the documents submitted in satisfaction of the bidding requirements is an authentic copy of the original, complete, and all statements and information provided therein are true and correct;

5. [Name of Bidder] is authorizing the Head of the Procuring Entity or its duly authorized representative(s) to verify all the documents submitted;

6. *[Select one, delete the rest:]*

[If a sole proprietorship:] The owner or sole proprietor is not related to the Head of the Procuring Entity, members of the Bids and Awards Committee (BAC), the Technical Working Group, and the BAC Secretariat, the head of the Project Management Office or the end-user unit, and the project consultants by consanguinity or affinity up to the third civil degree;

[If a partnership or cooperative:] None of the officers and members of *[Name of Bidder]* is related to the Head of the Procuring Entity, members of the Bids and Awards Committee (BAC), the Technical Working Group, and the BAC Secretariat, the head of the Project Management Office or the end-user unit, and the project consultants by consanguinity or affinity up to the third civil degree;

[If a corporation or joint venture:] None of the officers, directors, and controlling stockholders of *[Name of Bidder]* is related to the Head of the Procuring Entity, members of the Bids and Awards Committee (BAC), the Technical Working Group, and the BAC Secretariat, the head of the Project Management Office or the end-user unit, and the project consultants by consanguinity or affinity up to the third civil degree;

7. *[Name of Bidder]* complies with existing labor laws and standards; and

8. *[Name of Bidder]* is aware of and has undertaken the responsibilities as a Bidder in compliance with the Philippine Bidding Documents, which includes:

   a. Carefully examining all of the Bidding Documents;
   b. Acknowledging all conditions, local or otherwise, affecting the implementation of the Contract;
   c. Making an estimate of the facilities available and needed for the contract to be bid, if any; and
   d. Inquiring or securing Supplemental/Bid Bulletin(s) issued for the *[Name of the Project]*.

9. *[Name of Bidder]* did not give or pay directly or indirectly, any commission, amount, fee, or any form of consideration, pecuniary or otherwise, to any person or official, personnel or representative of the government in relation to any procurement project or activity.

10. **In case advance payment was made or given, failure to perform or deliver any of the obligations and undertakings in the contract shall be sufficient grounds to constitute criminal liability for Swindling (Estafa) or the commission of fraud with unfaithfulness or abuse of confidence through misappropriating or converting any payment received by a person or entity under an obligation involving the duty to deliver certain goods or services, to the prejudice of the public and the government of the Philippines pursuant to Article 315 of Act No. 3815 s. 1930, as amended, or the Revised Penal Code.**

IN WITNESS WHEREOF, I have hereunto set my hand this __ day of ___, 20__ at _____, Philippines.

[Insert NAME OF BIDDER OR ITS AUTHORIZED REPRESENTATIVE]
[Insert signatory's legal capacity]
Affiant

[Jurat]

[Format shall be based on the latest Rules on Notarial Practice

Bid Securing Declaration Form

[shall be submitted with the Bid if bidder opts to provide this form of bid security]

REPUBLIC OF THE PHILIPPINES)
CITY OF _____) S.S.

BID SECURING DECLARATION
Project Identification No.: *[Insert number]*

To: *[Insert name and address of the Procuring Entity]*

I/We, the undersigned, declare that:

1. I/We understand that, according to your conditions, bids must be supported by a Bid Security, which may be in the form of a Bid Securing Declaration.

2. I/We accept that: (a) I/we will be automatically disqualified from bidding for any procurement contract with any procuring entity for a period of two (2) years upon receipt of your Blacklisting Order; and, (b) I/we will pay the applicable fine provided under Section 6 of the Guidelines on the Use of Bid Securing Declaration, within fifteen (15) days from receipt of the written demand by the procuring entity for the commission of acts resulting to the enforcement of the bid securing declaration under Sections 23.1(b), 34.2, 40.1 and 69.1, except 69.1(f),of the IRR of RA No. 9184; without prejudice to other legal action the government may undertake.

3. I/We understand that this Bid Securing Declaration shall cease to be valid on the following circumstances:

   a. Upon expiration of the bid validity period, or any extension thereof pursuant to your request;
   b. I am/we are declared ineligible or post-disqualified upon receipt of your notice to such effect, and (i) I/we failed to timely file a request for reconsideration or (ii) I/we filed a waiver to avail of said right; and
   c. I am/we are declared the bidder with the Lowest Calculated Responsive Bid, and I/we have furnished the performance security and signed the Contract.

IN WITNESS WHEREOF, I/We have hereunto set my/our hand/s this ____ day of *[month] [year]* at *[place of execution]*.

[Insert NAME OF BIDDER OR ITS AUTHORIZED REPRESENTATIVE]
[Insert signatory's legal capacity]
Affiant

[Jurat]
[Format shall be based on the latest Rules on Notarial Practice]

Section IX. Checklist of Technical and Financial Documents

Checklist of Technical and Financial Documents

I. TECHNICAL COMPONENT ENVELOPE

Class "A" Documents

Legal Documents

☐ (a) Valid PhilGEPS Registration Certificate (Platinum Membership) (all pages);
And

☐ (b) Registration certificate from Securities and Exchange Commission (SEC), Department of Trade and Industry (DTI) for sole proprietorship, or Cooperative Development Authority (CDA) for cooperatives or its equivalent document;
And

☐ (c) Mayor's or Business permit issued by the city or municipality where the principal place of business of the prospective bidder is located, or the equivalent document for Exclusive Economic Zones or Areas;
And

☐ (e) Tax clearance per E.O. No. 398, s. 2005, as finally reviewed and approved by the Bureau of Internal Revenue (BIR).

Technical Documents

☐ (f) Statement of the prospective bidder of all its ongoing government and private contracts, including contracts awarded but not yet started, if any, whether similar or not similar in nature and complexity to the contract to be bid (**Please attach the supporting documents); and**

☐ (g) Statement of the bidder's Single Largest Completed Contract (SLCC) similar to the contract to be bid, except under conditions provided under the rules **(Please attached copy of contract/Purchase Order and Certificate of Completion and Acceptance)**; **and**

☐ (h) Philippine Contractors Accreditation Board (PCAB) License;
or
Special PCAB License in case of Joint Ventures;
and registration for the type and cost of the contract to be bid; **and**

☐ (i) Original copy of Bid Security. If in the form of a Surety Bond, submit also a certification issued by the Insurance Commission;
or
Original copy of Notarized Bid Securing Declaration; **and**

(j) Project Requirements, which shall include the following:

☐ a. Organizational chart for the contract to be bid;

☐ b. List of contractor's key personnel (*e.g.*, Project Manager, Project Engineers, Materials Engineers, and Foremen), to be assigned to the contract to be bid, with their complete qualification and experience data;

☐ c. List of contractor's major equipment units, which are owned, leased, and/or under purchase agreements, supported by proof of ownership or certification of availability of equipment from the equipment lessor/vendor for the duration of the project, as the case may be

d. Certificate of Site Inspection **and**

☐ (k) Original duly signed Omnibus Sworn Statement (OSS);
and if applicable, Original Notarized Secretary's Certificate in case of a corporation, partnership, or cooperative; or Original Special Power of Attorney of all members of the joint venture giving full power and authority to its officer to sign the OSS and do acts to represent the Bidder.

Financial Documents

☐ (l) The prospective bidder's audited financial statements, showing, among others, the prospective bidder's total and current assets and liabilities, stamped "received" by the BIR or its duly accredited and authorized institutions, for the preceding calendar year which should not be earlier than two (2) years from the date of bid submission; **and**

☐ (m) The prospective bidder's computation of Net Financial Contracting Capacity (NFCC).

Class "B" Documents

☐ (n) If applicable, duly signed joint venture agreement (JVA) in accordance with RA No. 4566 and its IRR in case the joint venture is already in existence;
or
duly notarized statements from all the potential joint venture partners stating that they will enter into and abide by the provisions of the JVA in the instance that the bid is successful.

II. FINANCIAL COMPONENT ENVELOPE

☐ (o) Original of duly signed and accomplished Financial Bid Form; **and**

Other documentary requirements under RA No. 9184

☐ (p) Original of duly signed Bid Prices in the Bill of Quantities; **and**

☐ (q) Duly accomplished Detailed Estimates Form, including a summary shee indicating the unit prices of construction materials, labor rates, and equipmen rentals used in coming up with the Bid; **and**

☐ (r) Cash Flow by Quarter.

Republic of the Philippines

gppb

Government Procurement Policy Board