



# Republika ng Pilipinas Lungsod Quezon

**BIDS AND AWARDS COMMITTEE FOR INFRASTRUCTURE & CONSULTANCY**

2<sup>nd</sup> Floor, Finance Building, Procurement Department, Quezon City Hall Complex, Elliptical Road, Quezon City



## **REQUEST FOR QUOTATION / PROPOSAL** **(Negotiated Procurement 53.9)**

The Quezon City Government through its Bids and Awards Committee – Infra and Consultancy undertake an Emergency Procurement for the **PROPOSED ELECTRICAL WIRING SYSTEM DUE TO ADDITIONAL LOADS AT EUGENIO LOPEZ JR. CENTER FOR MEDIA ARTS SENIOR HIGH SCHOOL** located at **BARANGAY SACRED HEART, DISTRICT 4, QUEZON CITY**, in accordance with **Section 53.2 of the Revised Implementing Rules and Regulations of Republic Act No. 9184**.

Name of Project : **PROPOSED ELECTRICAL WIRING SYSTEM DUE TO ADDITIONAL LOADS AT EUGENIO LOPEZ JR. CENTER FOR MEDIA ARTS SENIOR HIGH SCHOOL**

Approved Budget: **NINE HUNDRED FOURTEEN THOUSAND NINE HUNDRED TWENTY FOUR PESOS**  
for the Contract **AND 06/100 (Php914,924.06)**

Description : **Program of Work**  
I. General Requirements  
II. Electrical Works

Completion of the Works is required within **Sixty (60)** calendar days from receipt of Notice to Proceed.

Please see attached:  
Detailed Proposal Form  
Plan  
Technical Specification

Please quote your best offer for the project/s described below, subject to the Terms and Conditions provided. Submit your proposal/price quotation duly signed by you or your duly authorized representative not later than **14 September 2020** on or before **11:00am**, Philippine Standard Time, together with the following documents:

1. PhilGEPS Platinum Certificate
2. Business Registration (DTI & SEC)
3. Mayor's & Business Permit (2020)
4. Tax Clearance
5. PCAB License (Bidders with valid Philippine Contractors Accreditation Board (PCAB) Building-Small B)
6. Audited Financial Statements (2019)
7. Net Financial Contracting Capacity (NFCC)
8. Income/Business Tax Returns (2019)
9. Omnibus Sworn Statement prescribed by the Government Procurement Policy Board (GPPB) duly notarized with attached Secretary's Certificate (*If a partnership, corporation, cooperative, or joint venture*). The authorized representative as identified in the Omnibus Sworn Statement shall be the signatory in the proposal/price quotation form.

in a **SEALED LONG BROWN ENVELOPE** shall:

1. Contain the Name of Project of the contract to be quoted in capital letters;
2. Bear the name and address of the Contractor in capital letters;
3. Be addressed to the Procuring Entity's BAC.

Name of Project: **PROPOSED ELECTRICAL WIRING SYSTEM DUE TO ADDITIONAL LOADS AT EUGENIO LOPEZ JR. CENTER FOR MEDIA ARTS SENIOR HIGH SCHOOL**

**Quezon City Local Government  
BIDS AND AWARDS COMMITTEE (INFRA & CONSULTANCY)  
2/F Procurement Department, Finance Building  
Quezon City Hall Compound**

For any clarification you may contact us at 89884242 loc. 8505/8709.

**ATTY. MARK DALE DIAMOND P. PERRAL**  
Chairman, BAC Infra and Consultancy



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2<sup>nd</sup> Floor, Finance Building, Procurement Department, Quezon City Hall Complex, Elliptical Road, Quezon City



## **TERMS AND CONDITIONS**

1. Contractor shall **provide correct and accurate** information required in this form.
2. Price quotation/proposal must be valid for a period of thirty (30) calendar days from the date of submission.
3. Price quotation/proposal, to be denominated in Philippine Peso shall include all taxes, duties and/or levies payable.
4. Quotation/Proposal **exceeding the Approved Budget for the Contract (ABC) shall be rejected.**
5. Award of contract shall be made to the lowest quotation/proposal (for infra) which complies with the minimum technical specifications and other terms and conditions stated herein.
6. Any interlineations, erasures or overwriting shall be valid only if they are signed or initialed by the contractor or his/her duly authorized representative/s.
7. The Engineering Department shall have the right to inspect and monitor the construction projects
8. Non-submission of eligibility documents shall mean disqualification of Quotation/Proposal.
9. Liquidated damages equivalent to one tenth (1/10) of one percent (1%) of the cost of the unperformed portion for every day of delay, Engineering Department shall rescind the contract once the cumulative amount of liquidated damages reaches ten percent (10%) of the amount of the contract, without prejudice to other courses of action and remedies open to it.
10. Failure to follow these instructions will disqualify your entire quotation/proposal.

**ATTY. MARK DALE DIAMOND P. PERRAL**  
Chairman, BAC Infra and Consultancy



## PROGRAM OF WORK QC INFRA PROJECT

**PROJECT TITLE : PROPOSED ELECTRICAL WIRING SYSTEM DUE TO ADDITIONAL LOADS AT EUGENIO LOPEZ JR. CENTER FOR MEDIA ARTS SENIOR HIGH SCHOOL**

**LOCATION : BARANGAY SACRED HEART, DISTRICT 4, QUEZON CITY**

### SCOPE OF WORK:

1. General Requirements including temporary enclosure, temporary lighting and water facilities, billboard, scaffolding and construction
2. Electrical Works including installation of power supply for airconditioning and equipment units.
3. All necessary testing of materials and commissioning works must be performed as per standard procedure.

### DETAILED COST ESTIMATE

ITEM NO.	WORK DESCRIPTION & SCOPE OF WORKS	UNIT	QTY.		UNIT COST		TOTAL COST
<b>1</b>	<b>GENERAL REQUIREMENTS</b>						
	Temporary enclosure around the construction area	lm	32.00		<b>P</b>		<b>P</b>
	Temporary lighting and water facilities	days	60.00				
	Construction Health and Safety Equipment	unit	1.00				
	Billboard	pc	1.00				
	Scaffolding Rental	sq.m	72.00				
					<b>Direct Cost I</b>		<b>P</b>
<b>II</b>	<b>ELECTRICAL WORKS</b>						
<b>A</b>	<b>Roughing-ins</b>						
-	Conduits and raceway						
	3/4"0 x 3m IMC Pipe	pc	60.00		<b>P</b>		<b>P</b>
-	1 1/4"0 x 3m IMC Pipe	pc	20.00				
	Locknut & Bushing						
	3/4"0 x 3m IMC Locknut & Bushing	pc	20.00				
	1 1/4"0 x 3m IMC Locknut & Bushing	pc	10.00				
	Elbow						
	3M"0 IMC Elbow	pc	30.00				
	1 1/4"0 IMC Elbow	pc	10.00				
---	Coupling and Connectors						
	3/4"0 IMC Coupling	pc	60.00				
	1 1/4"0 IMC Coupling	pc	20.00				
	Boxes						
	G.I. Pull box 1000 mm x 600mm x 300mm in NEMA 3R	pc	2.00				
	PVC Amco Box	pc	1.00				
<b>B</b>	<b>Wires and Cables</b>						
	THHN/THWN Wire						
	3.5mm <sup>2</sup> THHN Wire(Green)	roll	3.00				
	5.5mm <sup>2</sup> THHN Wire(Red)	roll	3.00				
	5.5mm <sup>2</sup> THHN Wire(Black)	roll	3.00				
	8.0mm <sup>2</sup> THHN Wire	lm	15.00				
	30mm <sup>2</sup> THHN Wire	lm	30.00				
<b>C</b>	<b>Wiring Devices</b>						
	Special Purpose Outlet for 3D Printer	pc	1.00				
					<b>Material Cost I</b>		<b>P</b>
					<b>Labor Cost I</b>		
					<b>Direct Cost I</b>		<b>P</b>

ITEM NO.	WORK DESCRIPTION & SCOPE OF WORKS	UNIT	QTY.		UNIT COST		TOTAL COST
<b>D</b>	<b>Installation of Panelboard</b>						
	Aircon and Equipment Panelboard	assy	1.00				
	Main: 100AT/25GAF,3P,230V,60Hz,MCCB in NEMA 1						
	Branches: 10 - 30AT/100AF, 2P, 60Hz, MCCB,230V						
	AEP CBTyp to 1-12	assy	12.00				
	Main: 1-30AT / 100AF, 230V, 2P, 60Hz, MCCB, 230v In						
	Main Circuit Breaker at MDP	assy	1.00				
	1-100AT/350AF,3P,230V,60Hz,MCCB						
<b>E</b>	<b>Hangers and Supports</b>						
	U-Boit 3/4 <sup>M</sup>	pc	168.00				
	U-Boit 1 1/4"	pc	26.00				
	1/4"0 x 1 1/2" Tox with Screw	box	336.00				
<b>F</b>	<b>Miscellaneous &amp; Consumables</b>						
	Concrete Drill Bit, 1/2" 0	pc	20.00				
	Electrical Tape	roll	30.00				
	Gi Tie Wire	kg	5.00				
	Hacksaw Biade	pc	10.00				
	Masking Tape	roll	5.00				
	Paint Brush 4"	pc	5.00				
	Pulling Lubricant	can	4.00				
	Red Oxide Paint (Metal Primer)	lit	1100				
	Rubber Tape	roll	15.00				
	Silver Gray QDE Paint	lit	15.00				
	Waste Cloth	kg	10.00				
					<b>Material Cost II</b>		<b>P</b>
					<b>Labor Cost II</b>		
					<b>Direct Cost II</b>		<b>P</b>

\_\_\_\_\_  
[Signature Over Printer Name]

\_\_\_\_\_  
[in the capacity of]

Duly authorized to sign Bid/Quote for and on behalf of \_\_\_\_\_



Name of Project: **PROPOSED ELECTRICAL WIRING SYSTEM DUE TO ADDITIONAL LOADS AT EUGENIO LOPEZ JR. CENTER FOR MEDIA ARTS SENIOR HIGH SCHOOL**

Location: **BARANGAY SACRED HEART, DISTRICT 4, QUEZON CITY**

ABC: **P914,924.06**

## SUMMARY

I	GENERAL REQUIREMENTS	P	
II	ELECTRICAL WORKS	P	
	TOTAL DIRECT COST	P	
	OCM		
	PROFIT		
	VAT		
	TOTAL ESTIMATED COST	P	

Amount in Words: \_\_\_\_\_

NAME OF COMPANY: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_  
[Signature Over Printer Name]

\_\_\_\_\_  
[in the capacity of]

Duly authorized to sign Bid/Quote for and on behalf of \_\_\_\_\_

Name of Project: **PROPOSED ELECTRICAL WIRING SYSTEM DUE TO ADDITIONAL LOADS AT EUGENIO LOPEZ JR. CENTER FOR MEDIA ARTS SENIOR HIGH SCHOOL**  
Location: **BARANGAY SACRED HEART, DISTRICT 4, QUEZON CITY**  
ABC: **P914,924.06**

**BREAKDOWN OF COST**

Item of Work (Description)		MATERIALS COST	LABOR COST	INDIRECT COST	AGGREGATE COST
I	GENERAL REQUIREMENTS				
II	ELECTRICAL WORKS				
	TOTAL				

Amount in Words: \_\_\_\_\_  
\_\_\_\_\_

NAME OF COMPANY: \_\_\_\_\_  
ADDRESS: \_\_\_\_\_

\_\_\_\_\_  
[Signature Over Printer Name] [in the capacity of]

Duly authorized to sign Bid/Quote for and on behalf of \_\_\_\_\_



Republika ng Pilipinas  
Lungsod ng Quezon  
**CITY ENGINEERING DEPARTMENT**  
5th , 6th, 7th Floor, QC Civic Center Building "B"  
Telephone Nos. 8988-4242 Local 8538



NAME OF PROJECT: **PROPOSED ELECTRICAL WIRING SYSTEM DUE TO ADDITIONAL LOADS AT EUGENIO LOPEZ, JR. CENTER FOR MEDIA ARTS SENIOR HIGH SCHOOL**

LOCATION: **BARANGAY SACRED HEART, DISTRICT 4, QUEZON CITY**

**TECHNICAL SPECIFICATIONS**

**PART 1 – GENERAL**

**1.1 GENERAL REQUIREMENTS**

These supplemental items consist of temporary lighting & water facilities, billboard, construction safety net and health. Personnel Protective Equipment (PPE) should be used by the construction personnel or manpower at all times.

**1.2 SITE WORKS**

This item consists of disposal of material that has been and replaced.

**1.3 REFERENCE**

The publications listed below form a part of his specification to the extent referenced. the publications are referred to in the text by the basic designation only.

**1.3.1 American Society for Testing and Materials (ASTM)**

ASTM A123/A123M	(2000) Zinc (Hot-dip Galvanized) Coatings On Iron and Steel Products
ASTM B1	(1995) Hard – Drawn Copper Wire
ASTM BB	(1999) Concentric-Lay-Stranded Copper Conductor, Hard, Medium – Hard or Soft

**1.3.2 National Electrical Manufacturers Association (NEMA)**

NEMA C80.3	(1994) Electrical Metallic Tubing – zinc Coated (EMT)
NEMA c57.12.28	(1999) Pad mounted equipment-Enclosure Integrity
NEMA TC 2	(1998) Electrical Polyvinyl Chloride (PVC) Tubing (EPT) and Conduit (EPC- 40)
NEMA TC3	(1999) PVC Fittings for Use with Rigid PVC Conduit ant Tubing
NEMA WD 1	(1999) General requirements for Wiring Devices



**1.3.3 National Fire Protection Association (NFPA)**

NFPA 70 (2002) National Electrical Code

**1.3.4 Underwriters Laboratories Inc. (UL)**

UL 1242 (1996; Mar 1998) Intermediate Metal Conduit

UL 467 (1993; Rev Apr 1999) Grounding & Bonding Equipment

UL 486A (1997; Rev Dec 1998) Wire Connection & Soldering Legs for Use with Copper Conductors

UL 486C (1997; Rev Aug 1998) Splicing Wire Connectors

UL 489 (1996; Rev thru Dec 1998) Molded-Case Circuit Breakers

UL 50 (1995; R 1999, Bul. 1999) Safety Enclosures for Electrical Equipment

UL510 (1994; R Apr 1998) Poly Vinyl Chloride Polyethylene & Rubber Insulating Tape

UL 514A (1996; Rev Dec 1999) Metallic Outlet Boxes

UL 797 (1993; R1997) Electrical Metallic Tubing

UL 83 (1998; R 1999, Bul. 1999 & 2000) Thermoplastic-Insulated Wires & Cables

UL 869A (1998) Service Equipment

**1.3.5 Institute of Integrated Electrical Engineer (IIEE)**

PEC (2017) Philippine Electrical Code

**1.3.6 Philippine National Standard (PNS)**

BS (2002) Bureau of Standard

**1.4 SUBMITTALS**

Submit the following:

**1.4.1 Shop Drawings**

Panelboards

**1.4.2 Product Data**

Receptacles

Circuit breakers

Switches

Enclosed Circuit breakers

### 1.4.3 Test Reports

Insulation Resistance & Continuity test  
Grounding system test  
Functionality Test

## 1.5 MAINTENANCE

### 1.5.1 Electrical Systems

Submit operation and maintenance manuals for electrical systems that provide basic data relating to the design, operation, and maintenance of the electrical distribution system for the building.

This shall include:

- a. Single line diagram of the “as-built” building electrical system.
- b. Manufacturers’ operating and maintenance manuals on active electrical equipment.

## PART 2 – PRODUCTS

### 2.1 MATERIALS AND EQUIPMENT

Materials, equipment, and devices shall, as a minimum, meet requirements of UL, where UL standards are established for those items, and requirements of NFPA 70 and PEC.

### 2.2 CONDUIT AND FITTINGS

Shall conform to the following:

#### 2.2.1 Rigid Nonmetallic Conduit

PVC Type EPC-40, in accordance with NEMA TC 2 and UL 651.

#### 2.2.2 Intermediate Metal Conduit (IMC)

UL 1242, zinc-coated steel only.

#### 2.2.3 Fittings for IMC threaded-type, Split couplings unacceptable.

#### 2.2.4 Fittings for Rigid Nonmetallic Conduit

NEMA TC 3.

### 2.3 WIRE AND CABLES

Wires and cables shall meet applicable requirements of NFPA 70, PEC and PNS and UL for type of insulation, jacket, and conductor specified or indicated. Wires and cables manufactured more than 12 months prior to date of delivery shall not be used.

- 2.3.1 Conductors, shall be stranded unless specifically indicated otherwise. Conductor sizes and ampacities show are based on copper, unless indicated otherwise. All conductors shall be copper

#### 2.3.1.1 Equipment Manufacturer Requirements

When manufacturer's equipment requires copper conductors at the terminations or requires copper conductors to be provided between components, of equipment, provide copper conductors or splices, splice boxes, and other work required to satisfy manufacturer's requirements.

#### 2.3.2 Color Coding

Provide for service, feeder, branch, control, and signalling circuit conductors. Color shall be green for grounding conductors Color of ungrounded conductors in different voltage systems shall be as follows;

- a. 240 volt, single phase: black and red

#### 2.3.3 Insulation

Unless specified or indicated otherwise or required by NFPA 70, PEC and PNS, power and lighting wires shall be 600-volt. Type THW or THHN conforming to UL 83 except that grounding wire may be type TW conforming to UL 83, Where lighting fixtures require 90-degree Centigrade (C) conductors, provide only conductors with 90-degree C insulation or better.

#### 2.3.4 Bonding Conductors

ASTM B1, Solid bare copper wire for sizes 8mm<sup>2</sup> and smaller diameter, ASTM B8, Class B, stranded bare copper wire for sizes 14mm<sup>2</sup> and larger diameter.

### 2.4 SPLICES AND TERMINATION COMPONENTS

UL 486A for wire connectors and UL 510 for Insulating tapes, Connectors for 5.5 mm<sup>2</sup> and smaller diameter wires shall be insulated, pressure-type in accordance with UL 486A or UL 486C (twist-on splicing connector). Provide solderless terminal lugs on stranded conductors.

### 2.5 PANELBOARDS

UL 67 and UL 50 having a short-circuit current rating of 10,000 amperes symmetrical minimum, Panelboards for use as service disconnecting means shall additionally conform to UL 869A, Panelboards shall be circuit breaker-equipped. Design shall be such that individual breakers can be removed without disturbing adjacent units or without loosening or removing supplemental insulation supplied as means of obtaining clearances as required by UL "Specific breaker placement" is required in panelboards to match the breaker placement indicated in the panelboard schedule on the drawings, Use of \*Subfeed Breakers\* is not acceptable unless specifically indicated otherwise, Main breaker shall be \*Separated\* mounted \*above\* branch breakers, Circuit breakers shall be bolt-on type, Where \*space only\* is indicated, make provisions for future installation of breakers. Panelboard locks shall be keyed same. Directories shall indicate load served by each circuit in panelboard, Directories shall also indicate source of service to panelboard (e.g. Panel PA served from Panel MDP), Type directories and mount in holder behind transparent protective covering. Panelboards shall be listed and labelled for their



intended use, Enclosure shall be galvanized steel gauge 14. Paint coating system shall comply with NEMA C57.12.28 for galvanized steel.

#### 2.5.1 Panelboard Buses

Support copper bus bars on bases independent of circuit breakers. Main buses and back pans shall be designed so that breakers may be changed without machining, drilling, or tapping. Provide separate ground bus identified as equipment grounding bus per UL 67 for connecting conducting bus per UL 67 form connecting grounding conductors, bond steel cabinet.

#### 2.5.2 Circuit Breakers

UL 489, thermal magnetic-type having a minimum short-circuit current rating equal to the short-circuit current rating of the panelboard in which the circuit breaker shall be mounted. Breaker terminals shall be UL listed as suitable for type of conductor provided. Series rated circuit breakers and plug-in circuit breakers without a self-contained bracket and not secured by a positive locking device requiring mechanical release for removal are unacceptable. Series rated circuit breakers and plug-in circuit breakers are unacceptable.

##### 2.5.2.1 Multipole Breakers

Provide common trip-type with single operating handle. Breaker design shall be such that overload in one pole automatically causes all poles to open. Maintain phase sequence throughout each panel so that three adjacent breaker poles are connected to Phases A,B, and C, respectively.

#### 2.6 ENCLOSED CIRCUIT BREAKERS

UL 489, Individual molded case circuit breakers with voltage and continuous current ratings, number of poles, overload trip setting, and short circuit current interrupting rating as indicated. Enclosure type as indicated.

#### 2.7 GROUNDING AND BONDING EQUIPMENT

UL 467, Ground rods shall be copper-clad steel, with minimum diameter of 20 mm and minimum length of 3050 mm.

### PART 3 – EXECUTION

#### 3.1 INSTALLATION

Electrical installations shall conform to requirements of NFPA 70 and PEC and to requirements specified herein.

### 3.1.1 Wiring Methods

Provide insulated conductors installed in IMC, and rigid non-metallic conduit except where specifically indicated or specified otherwise or required by NFPA 70 and PEC to be installed otherwise, provide insulated green equipment grounding conductor for circuit(S) installed in conduit and raceways. Minimum conduit size shall be 15mm nominal inside diameter for low voltage lighting and power circuits.

#### 3.1.1.2 Nonmetallic Conduit

##### a. Restrictions applicable to PVC Schedule 40

(1) Do not use in areas where subject to severe physical damage

(2) Do not use above grade

#### 3.1.1.3 Service Entrance Conduit, Underground

PVC, type-EPC 40, underground portion shall be encased in minimum of 75 mm of concrete and shall be installed minimum 460 mm below slab or grade.

### 3.1.2 Conduit Installation

Unless indicated otherwise, conceal conduit under floor slabs and within finished walls ceilings, and floors, install conduit parallel with or at right angles to ceilings, walls, and structural members where located above accessible ceilings and where conduit will be visible after completion of project.

#### 3.1.2.1 Conduit through Floor Slabs

Where conduits rise through floor slabs. Curved portion of bends shall not be visible above finished slab.

#### 3.1.2.2 Conduit Support

Support conduit by pipe straps, wall brackets, hangers, or ceiling trapeze. Fasten by concrete inserts or expansion bolts on concrete and by machine screws, welded threaded studs, or spring-tension clamps on steel work. Threaded C-Clamps may be used on IMC conduit only. Do not weld conduits of pipe straps to steel structures, Load applied to fasteners shall not exceed one-fourth proof test load. Fasteners attached to concrete ceiling shall be vibration resistant and shock-resistant. Holes cut to depth of more than 40 mm in reinforced concrete beams or to depth of more than 20 mm in concrete joints shall not cut main reinforcing bars. Fill unused holes. In partitions of light steel construction, use sheet metal screws. In suspended-ceiling construction, run conduit above ceiling. Do not support conduit by ceiling support system. Conduit and box systems shall be supported independently of both (a) tie wires supporting ceiling grid system, and (b) ceiling grid system into which ceiling panels are placed. Supporting

means shall not be shared between electrical raceways and mechanical piping or ducts. Installation shall be coordinated with above-ceiling mechanical systems to assure maximum accessibility to all systems. Spring-steel fasteners may be used for lighting branch circuit conduit supports in suspended ceilings in dry locations.

#### 3.1.2.3 Directional Changes in Conduit Runs

Make Changes in direction of runs with symmetrical bends or cast-metal fittings. Make field-made bends and offsets with hickey or conduit-bending machine. Do not install crushed or deformed conduits. Avoid trapped conduits. Prevent plaster, dirt, or trash from lodging in conduits, boxes, fittings, and equipment during construction. Free clogged conduits of obstructions.

#### 3.1.2.4 Pull Wire

Install pull wires in empty conduits, Pull wire shall be plastic having minimum 890-N tensile strength. Leave minimum 915 mm of slack at each end of pull wire.

#### 3.1.2.5 Conduit Installed in Concrete Floor Slabs

Locate so as not to adversely affect structural strength of slabs. Install conduit within middle one-third of concrete slab. Do not stack conduits. Space conduits horizontally not closer than three diameters, except at cabinet locations. Curved portions of bends shall not be visible above finish slab. Increase slab thickness as necessary to provide minimum 25 mm cover over conduit. Where embedded conduits cross building and/or expansion joints, provide suitable watertight expansion/deflection fittings and bonding jumpers. Expansion/deflection fittings shall allow horizontal and vertical movements of raceway. Conduit larger than 22 mm trade size shall be parallel with or at right angles to main reinforcement, when at right angles to reinforcement, conduit shall be close to one of supports of slab.

#### 3.1.2.6 Locknuts and Bushings

Fasten conduits to sheet metal boxes and cabinets with two locknuts where required by NFPA 70 and PEC where insulated bushings are used, and where bushings cannot be brought into firm contact with the box; otherwise, use at least minimum single locknut and bushing. Locknuts shall have sharp edges for digging into wall of metal enclosures. Install bushing on ends of conduits, and provide insulating type where required by NFPA 70 and PEC.

#### 3.1.3 Boxes, Outlets, and Supports

Provide boxes in wiring and raceway systems wherever required for pulling of wires, making connections, and mounting of devices or fixtures. Boxes for metallic raceways shall be cast-metal, except that nonmetallic boxes may be used with nonmetallic conduit system. Each box shall have volume required by NFPA 70 and PEC for number of conductors enclosed in box. Boxes for mounting lighting fixtures shall be minimum 100 mm square, or octagonal, except that smaller boxes may be installed as required by fixture configurations, as approved. Provide separate boxes for flush or recessed fixtures when required by fixture terminal operating temperature; fixtures shall be readily



removable for access to boxes unless ceiling access panels and provided, Support boxes and pendants for surface-mounted fixtures on suspended ceilings independently of ceiling supports, or make adequate provisions for distributing load over ceiling support members in an approved manner. Fasten boxes and supports with wood screws on wood. With bolts and expansion shields on concrete, with toggle bolts on hollow masonry units, and with machine screws or welded studs on steel.

#### 3.1.4 Conductor Identification

Provide conductor identification within each enclosure where tap, splice, or termination is made. For conductor's 14mm<sup>2</sup> and smaller diameter, color coding shall be by factory applied, color-impregnated insulation. For conductors 22mm<sup>2</sup> and larger diameter, color coding shall be by plastic-coated, self-sticking markers, colored nylon cable ties and plates; or heat shrink-type sleeves.

#### 3.1.5 Splices

Make splices in accessible locations, make splices in conductors 5.5mm<sup>2</sup> and smaller diameter with insulated, pressure-type connector, Make splices in conductors 22mm<sup>2</sup> and larger diameter with solderless connector, and cover with insulation material equipment to conductor insulation.

Seal openings around electrical penetrations through fire resistance-rated walls, partitions, floor, or ceilings.

#### 3.1.6 Grounding and Bonding

In accordance with NFPA 70 and NEC. Ground exposed non-current-carrying metallic parts of electrical equipment, metallic raceway systems, grounding conductor in metallic and nonmetallic raceways, telephone system grounds. Make ground connection to driven ground rods on exterior of building. Interconnect all grounding media in or on the structure to provide a common ground potential.

##### 3.1.6.1 Resistance

Maximum resistance-to-ground of grounding system shall not exceeds 5 ohms, contact Engineer for further instructions.

##### 3.1.6.2 Equipment Connections

Provide power wiring for the connection of motors and control equipment under this section of the specification. Except as otherwise specifically noted or specified, automatic control wiring, control devices, and protective devices within the control circuitry are not included in the section of the specifications but shall be provided under the section specifying the associated equipment.

### 3.2 FIELD QUALITY CONTROL

Furnish test equipment and personnel and submit written copies of test result. Give the engineer five (5) working days' notice prior to each test.

3.2.1 Insulation Resistance and Continuity Test

Upon completion of wiring installations, test wiring rated 600 volt and less to verify that no short circuits or accidental grounds exist. Perform insulation resistance test on wiring 14 mm<sup>2</sup> and larger diameter using insulation resistance test instrument which applies voltage of approximately 500 volts on provide direct reading of resistance, Minimum resistance shall be 250,000 ohms. This shall be well documented as test forms supervised by a licensed electrical practitioner with valid Professional Regulation Commission ID. Attached in this test form is a certificate of calibration.

3.2.2 Grounding Resistance Test

Upon completion of main service entrance, test grounding system to ensure continuity, and that resistance to ground is not excessive. Test each ground rod for resistance to ground before making connections to rod; tie grounding system together and test for resistance to ground. Make resistance measurements in dry weather, not earlier that 48 hours after rainfall. Submit written results of each test to Engineer, and indicate location of rods as well as resistance and soil conditions at time measurements were made. Minimum resistance shall be 5 ohms. This shall be well documented as test forms supervised by a licensed electrical practitioner with valid Professional Regulation Commission ID. Attached in this test form is a certificate of calibration.

3.2.3 Functionality Test


This shall be performed after completion of installation of wiring devices and lighting fixture/s. Wiring devices shall provide appropriate voltage for its respective equipment or appliance as detailed in the schedule of loads. All Lighting Fixtures shall provide appropriate color temperature and illumination as required. The switch/es nomenclature shall be able to control the fixture/s as referred by the 'as-built' plan. This shall be well documented as test forms supervised by a licensed electrical practitioner with valid Professional Regulation Commission ID. Attached in this test form is a certificate of calibration.

PART 4 – CONCRETE WORKS

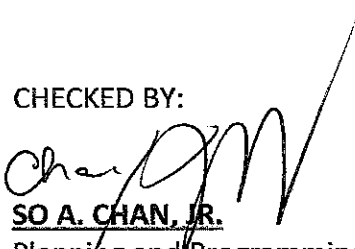
4.1 CONCRETE WORKS

Concrete works must be done using 2 bagger mixer with 3000psi or 4000psi with grade 40 or grade 60 reinforcing bars as specified in the plan and program of works.

PREPARED BY:

  
**STEPHANIE D. OVIEDO**  
Planning and Programming Division

CHECKED BY:

  
**SO A. CHAN, JR.**  
Planning and Programming Division

1. ALL WORKS SHALL BE DONE IN ACCORDANCE WITH THE PLANS PLANS AND SPECIFICATION
2. THE WORKS SHALL COMPLY WITH THE PROVISION OF THE LATEST EDITION OF THE PHILIPPINE ELECTRICAL CODE, LAWS, ORDINANCES, RULES AND REGULATIONS OF THE LOCALITY HAVING JURISDICTION OVER THE PROJECT REQUIREMENTS OF LOCAL POWER COMPANY.
3. ALL THE JOB SHALL BE EXECUTED IN THE MOST THOROUGH PROMPT AND WORKMAN-LIKE MANNER EMPLOYING STANDARD TOOLS, EQUIPMENT, METHOD AND GOOD ENGINEERING PRACTICES. THE JOB SHALL BE DONE COMPLETE IN ALL ASPECTS AS REQUIRED PER PLANS AND SPECIFICATIONS AND READY FOR OPERATIONS.
4. ALL MATERIALS TO BE USED SHALL BE OF THE BEST QUALITY , BRAND NEW AS SPECIFIED.
5. THE DRAWINGS AND SPECIFICATIONS ARE INTENDED TO PRESENT GENERAL LAYOUT AND BROAD OUTLINE/DESCRIPTION OF THE PROJECT BUT DO NOT NECESSARILY INDICATE/DESCRIBED ACTUAL LOCATIONS, LEVEL AND DISTANCES OF THE EQUIPMENT. THE CONTRACTOR IS HEREBY REQUIRED TO MAKE SUCH ADJUSTMENT AT THE JOBSITE AS LOCATION, DISTANCES AND LEVELS ARE GOVERNED BY ACTUAL FIELD CONDITIONS.
6. ANY DISCREPANCY BETWEEN THE PLANS AND SPECIFICATIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER FOR CLARIFICATION /DECISION.
7. ALL LIGHTING AND CONVENIENCE OUTLET CIRCUITS SHALL BE 3.5 SQ. MM. THW COPPER WIRE UNLESS OTHERWISE NOTED. MINIMUM SIZE OF WIRE SHALL BE 3.5 SQ. MM. COPPER WIRE
8. ALL DUPLEX RECEPTACLE OUTLETS SHALL BE GROUNDING TYPE WITH PARALLEL SLOTS FOR 230V.
9. UNLESS NOTED OTHERWISE IN THE DRAWING, WIRING DEVICES SHALL BE INSTALLED AS FOLLOWS.

























LIGHTING CONTROL - 1.40 M. ABOVE FLOOR FINISH  
OUTLET  
CONVENIENCE OUTLET - 0.30 M. ABOVE FLOOR FINISH  
OUTLET  
REFRIGERATOR OUTLET - 0.85 M. ABOVE  
CONVENIENCE OUTLET, ABOVE COUNTER - 0.15 M. ABOVE WORKING COUNTER  
SPECIAL PURPOSE OUTLET(ACU) - 0.15 M. ABOVE WORKING COUNTER  
SINGLE CONV. OUTLET(ACU) - 0.30 M. ABOVE WORKING COUNTER  
PANELBOARD - 1.82 M. ABOVE WORKING COUNTER  
TERMINAL BLOCK - 1.82 M. ABOVE WORKING COUNTER

10. BOXES, WIRE, GUTTERS, ENCLOSURE SHALL BE FABRICATED FROM STEEL WITH THICKNESS AS FOLLOWS:  
MAXIMUM WIDTH OF THE WIDEST

SURFACE STEEL	GA
UP TO INCLUDING 152.40mm	GA 16
OVER 152.40 mm BUT NOT OVER 457.30 mm	GA 14
OVER 457.30 mm BUT NOT OVER 762 mm	GA 12
OVER 762 mm	GA 10

11. REFER TO NOTES AND SPECIFICATION FOR MORE INFORMATION.

12. ALL WORKS SHALL BE UNDER DIRECT SUPERVISION OF A LICENSED ELECTRICAL PRACTITIONER AS PER RA 7070

	CIRCUIT LINE		CONVENIENCE DUPLEX OUTLET		SURFACE MOUNTED PINLIGHT,100 W, 230 VAC
	PANEL BOARD		SINGLE CONVENIENCE OUTLET, REFRIGERATOR		LED FL IN TROFFER FIXTURE, 18 W, 230 V
	TELEPHONE TERMINAL BLOCK		10 AMPS, 2P, 3-WIRE		LED FL IP65, 36 W, 230 V
	LIGHTING AND POWER PANEL		SPECIAL PURPOSE OUTLET (ACU)		JUNCTION BOX, FOR PROVISION OF ADD'L LUMINAIRES
	CIRCUIT HOMERUN		SINGLE CONVENIENCE OUTLET,(WEATHERPROOF)		Sx SINGLE GANG SWITCH, 15 A, 300 VAC
	CIRCUIT BREAKER, RATING AS INDICATED		SINGLE CONVENIENCE OUTLET, FOR ACU		Sxx TWO GANG SWITCH, 15 A, 300 VAC
	kWhr METER		TELEPHONE WALL MOUNTED OUTLET		Sxxx THREE GANG SWITCH, 15 A, 300 VAC
	GROUND		EXHAUST FAN (WALL MOUNTED), 150 W, 230 VAC		Sx(3W) THREE GANG SWITCH, 15 A, 300 VAC

## 2 LEGENDS AND SYMBOLS

SCALE: N.T.S.



## 1 GENERAL SPECIFICATIONS

SCALE: N.T.S.

## 3 VICINITY MAP

SCALE: N.T.S.



Republika ng Pilipinas  
Lungsod ng Quezon  
CITY ENGINEERING DEPARTMENT

PROJECT TITLE:  
PROPOSED ELECTRICAL WIRING SYSTEM DUE TO  
ADDITIONAL LOADS AT EUGENIO LOPEZ, JR CENTER FOR  
MEDIA ARTS SENIOR HIGH SCHOOL  
LOCATION: BANGAY SACRED HEART, DISTRICT 4, QUEZON CITY

DRAWN BY: [Signature]  
DATE: [Blank]  
CHECKED BY: [Signature]  
REVISIONS: [Blank]

SUBMITTED BY: [Signature]  
ENGR. LEO S. DEL ROSARIO  
PLANNING & PROGRAMMING DIVISION

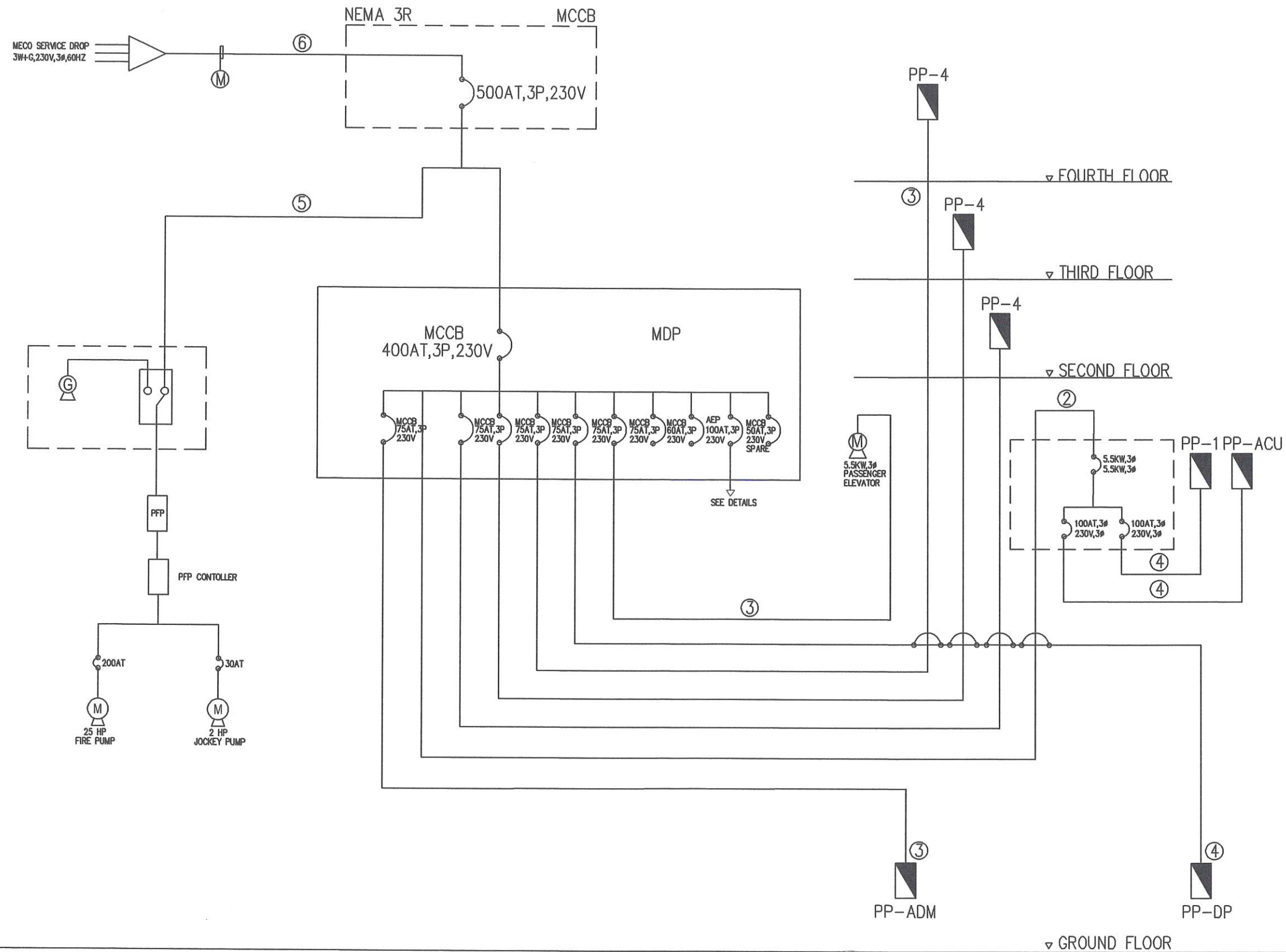
RECOMMENDING APPROVAL:  
ENGR. ISAGANI R. VERZOSA, JR.  
CITY ENGINEERING DEPARTMENT

APPROVED BY:  
HON. MA. JOSEFINA G. BELMONTE  
CITY MAYOR, QUEZON CITY

SHEET CONTENTS:  
GENERAL NOTES  
LEGENDS AND SYMBOLS  
VICINITY MAP

SHEET NO.  
EL-01





## 1 SINGLE LINE DIAGRAM

SCALE: N.T.S.



Republika ng Pilipinas  
Lungsod ng Quezon  
CITY ENGINEERING DEPARTMENT

PROJECT TITLE:  
PROPOSED ELECTRICAL WIRING SYSTEM DUE TO  
ADDITIONAL LOADS AT EUGENIO LOPEZ, JR CENTER FOR  
MEDIA ARTS SENIOR HIGH SCHOOL

LOCATION: BARANGAY SACRED HEART, DISTRICT 4, QUEZON CITY

DRAWN BY: RDC

DATE:

CHECKED BY: SAG

REVISION NO.:

SUBMITTED BY:

ENGR. LEO S. DEL ROSARIO  
PLANNING & PROGRAMMING DIVISION

RECOMMENDING APPROVAL:

ENGR. ISAGANI R. VERZOSA, JR.  
CITY ENGINEERING DEPARTMENT

APPROVED BY:

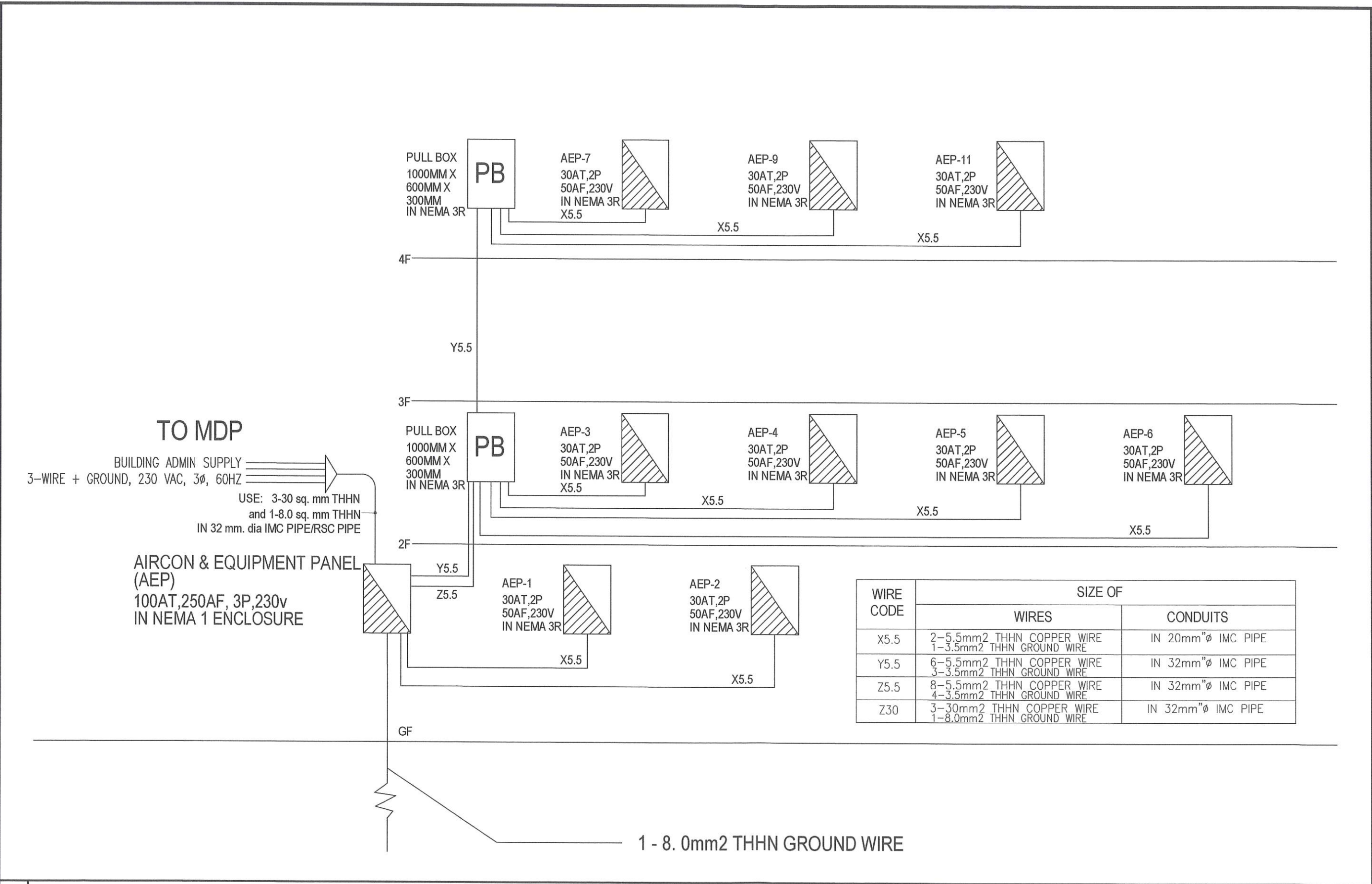
HON. MA. JOSEFINA G. BELMONTE  
CITY MAYOR, QUEZON CITY

SHEET CONTENTS:

SINGLE LINE DIAGRAM


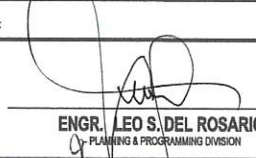


SHEET NO.

EL-02

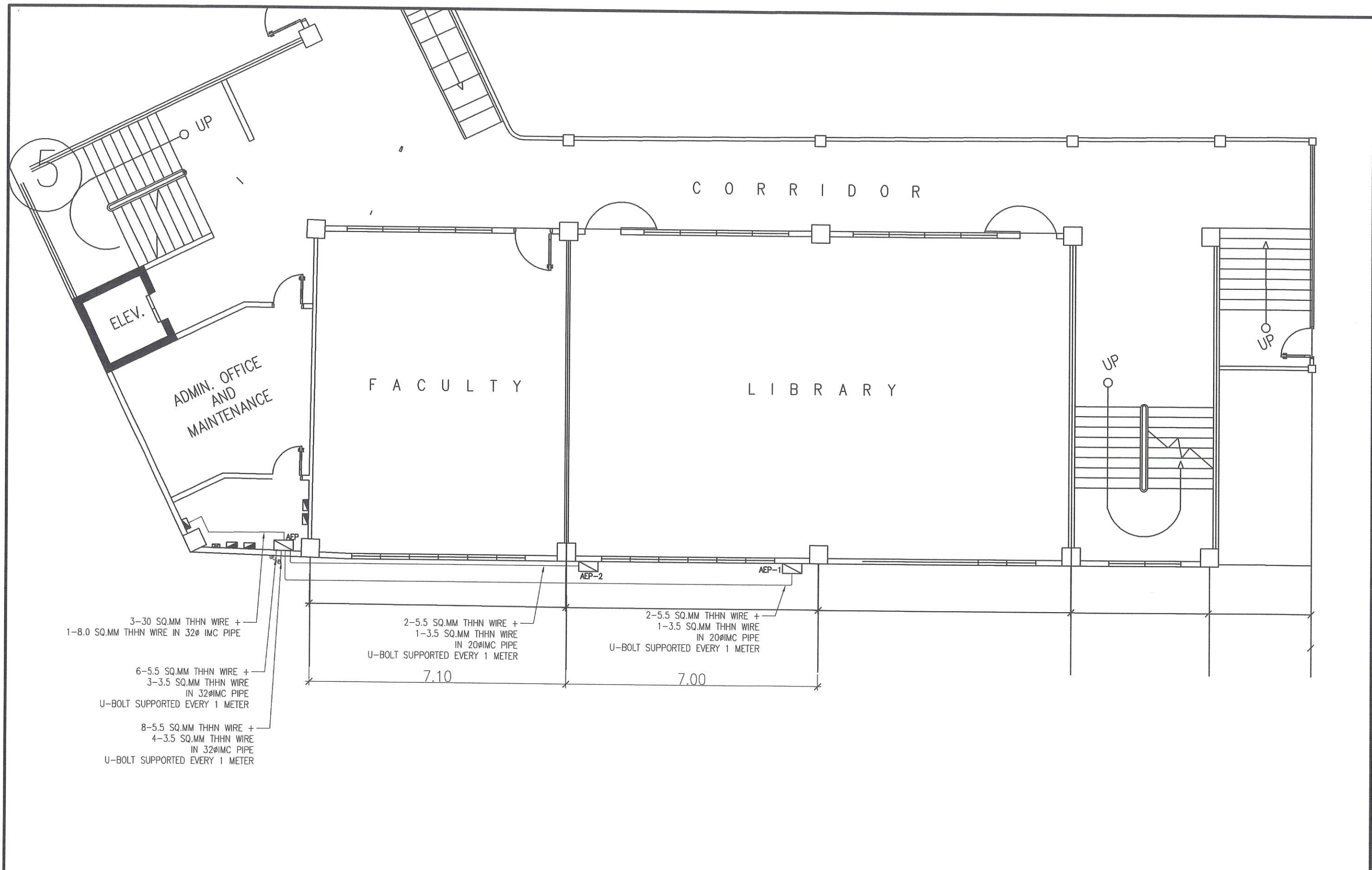


1 AEP SINGLE LINE DIAGRAM

SCALE: N.T.S.

	Republika ng Pilipinas Lungsod ng Quezon <b>CITY ENGINEERING DEPARTMENT</b>	PROJECT TITLE: PROPOSED ELECTRICAL WIRING SYSTEM DUE TO ADDITIONAL LOADS AT EUGENIO LOPEZ, JR CENTER FOR MEDIA ARTS SENIOR HIGH SCHOOL	DRAWN BY: KMD DATE: CHECKED BY: SAC REVISION NO.:	SUBMITTED BY:  ENGR. LEO S. DEL ROSARIO PLANNING & PROGRAMMING DIVISION	RECOMMENDING APPROVAL:  ENGR. ISAGANI R. VERZOSA, JR. CITY ENGINEERING DEPARTMENT	APPROVED BY:  HON. MA. JOSEFINA G. BELMONTE CITY MAYOR, QUEZON CITY	SHEET CONTENTS: AEP SINGLE LINE DIAGRAM	SHEET NO. <b>EL-03</b>
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# 1 GROUND FLOOR POWER LAYOUT

SCALE: 1:100 MTS



Republika ng Pilipinas  
Lungsod ng Quezon  
**CITY ENGINEERING DEPARTMENT**

PROJECT TITLE:  
**PROPOSED ELECTRICAL WIRING SYSTEM DUE TO  
ADDITIONAL LOADS AT EUGENIO LOPEZ, JR CENTER FOR  
MEDIA ARTS SENIOR HIGH SCHOOL**

LOCATION: BARANGAY SACRED HEART, DISTRICT 4, QUEZON CITY

DRAWN BY: NMD

DATE:

CHECKED BY: SAC

REVISION NO.:

SUBMITTED BY:

**ENGR. LEO S. DEL ROSARIO**  
OIC, PLANNING & PROGRAMMING DIVISION

RECOMMENDING APPROVAL:

**ENGR. ISAGANI R. VERZOSA, JR.**  
OIC, CIVIL ENGINEERING DEPARTMENT

APPROVED BY:

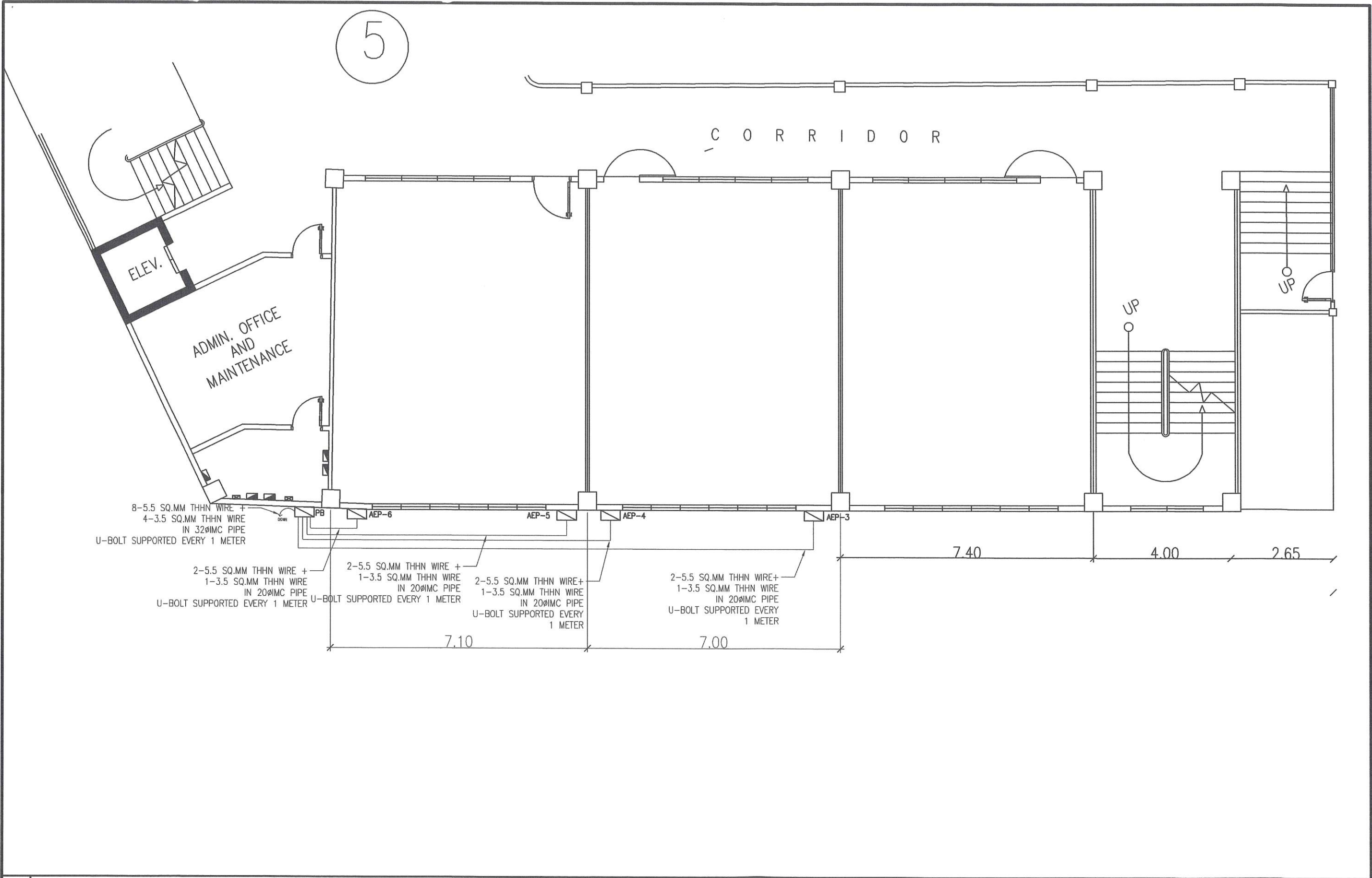
**HON. MA. JOSEFINA G. BELMONTE**  
CITY MAYOR, QUEZON CITY

SHEET CONTENTS:

GROUND FLOOR POWER LAYOUT

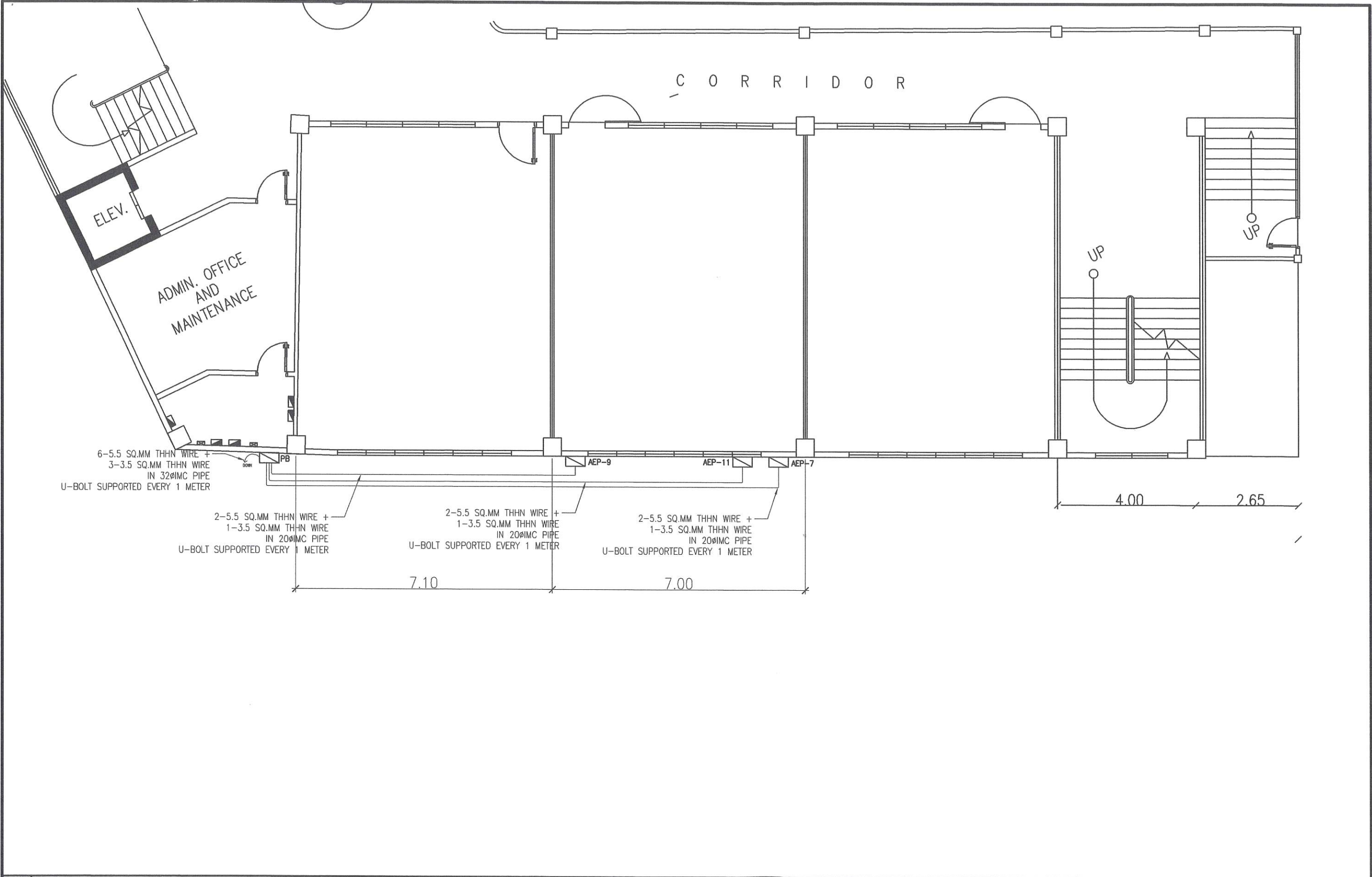
SHEET NO.

**EL-04**



1   SECOND FLOOR POWER LAYOUT		SCALE: 1:100 MTS						
	Republika ng Pilipinas Lungsod ng Quezon <b>CITY ENGINEERING DEPARTMENT</b>	PROJECT TITLE:	DRAWN BY: NMD	SUBMITTED BY:	RECOMMENDING APPROVAL:	APPROVED BY:	SHEET CONTENTS :	SHEET NO.
		PROPOSED ELECTRICAL WIRING SYSTEM DUE TO ADDITIONAL LOADS AT EUGENIO LOPEZ, JR CENTER FOR MEDIA ARTS SENIOR HIGH SCHOOL.	DATE:				SECOND FLOOR POWER LAYOUT	<b>EL-05</b>
		CHECKED BY: SAC						
	LOCATION: BARANGAY SACRED HEART ,DISTRICT 4 , QUEZON CITY	REVISION NO:						





1		FOURTH FLOOR POWER LAYOUT					SCALE: 1:100 MTS		
	Republika ng Pilipinas Lungsod ng Quezon CITY ENGINEERING DEPARTMENT		PROJECT TITLE:	DRAWN BY: IMD	SUBMITTED BY:	RECOMMENDING APPROVAL:	APPROVED BY:	SHEET CONTENTS :	SHEET NO.
	PROPOSED ELECTRICAL WIRING SYSTEM DUE TO ADDITIONAL LOADS AT EUGENIO LOPEZ, JR CENTER FOR MEDIA ARTS SENIOR HIGH SCHOOL		DATE:					FOURTH FLOOR POWER LAYOUT	EL-06
	LOCATION: BARANGAY SACRED HEART ,DISTRICT 4 , QUEZON CITY		CHECKED BY: SAC						
			REVISION NO.:						
			ENGR. LEO S. DEL ROSARIO PLANNING & PROGRAMMING DIVISION		ENGR. ISAGANI R. VERZOSA, JR. CITY ENGINEERING DEPARTMENT		HON. MA. JOSEFINA G. BELMONTE CITY MAYOR, QUEZON CITY		

AEP-ADDITIONAL EQUIPMENT PANEL, 230V

CKT. NO.	LOAD DESCRIPTION	VOLTS	VA	AB	BC	CA	AT	AF	POLE	SIZE OF	
										WIRES	CONDUITS
1	1-2HP SPLIT TYPE ACCU	230	2760	12.0			30	50	2P	2-5.5mm2 THHN COPPER WIRE 1-3.5mm2 THHN GROUND WIRE	IN 25mmø IMC PIPE
2	1-2HP SPLIT TYPE ACCU	230	2760	12.0			30	50	2P	2-5.5mm2 THHN COPPER WIRE 1-3.5mm2 THHN GROUND WIRE	IN 25mmø IMC PIPE
3	1-2HP SPLIT TYPE ACCU	230	2760		12.0		30	50	2P	2-5.5mm2 THHN COPPER WIRE 1-3.5mm2 THHN GROUND WIRE	IN 25mmø IMC PIPE
4	1-2HP SPLIT TYPE ACCU	230	2760		12.0		30	50	2P	2-5.5mm2 THHN COPPER WIRE 1-3.5mm2 THHN GROUND WIRE	IN 25mmø IMC PIPE
5	1-2HP SPLIT TYPE ACCU	230	2760			12.0	30	50	2P	2-5.5mm2 THHN COPPER WIRE 1-3.5mm2 THHN GROUND WIRE	IN 25mmø IMC PIPE
6	1-2HP SPLIT TYPE ACCU	230	2760			12.0	30	50	2P	2-5.5mm2 THHN COPPER WIRE 1-3.5mm2 THHN GROUND WIRE	IN 25mmø IMC PIPE
7	1-2HP SPLIT TYPE ACCU	230	2760	12.0			30	50	2P	2-5.5mm2 THHN COPPER WIRE 1-3.5mm2 THHN GROUND WIRE	IN 25mmø IMC PIPE
8		230					-	-	2P		
9	1-2HP SPLIT TYPE ACCU	230	2760		12.0		30	50	2P	2-5.5mm2 THHN COPPER WIRE 1-3.5mm2 THHN GROUND WIRE	IN 25mmø IMC PIPE
10		230					-	-	2P		
11	1-1HP 3D PRINTER	230	1840			8.0	30	50	2P	2-5.5mm2 THHN COPPER WIRE 1-3.5mm2 THHN GROUND WIRE	IN 25mmø IMC PIPE
12	SPACE	230									
TOTAL			23,920	36.00	36.00	32.00					

COMPUTATION :

$IT = 1.732 \times [36 \text{ A} + (0.25 \times 12 \text{ A})]$

$= 67.55 \text{ AMPERES}$

OVER CURRENT PROTECTION:

USE : 100AT/250AF, 3P, 230V CIRCUIT BREAKER IN NEMA 1R

MAIN FEEDER :

USE : 3- 30.0 mm2 THHN & 1-8.0mm2 THN GROUND WIRE IN 32mmø IMC PIPE

EXISTING MDP-MAIN DISTRIBUTION PANEL, 230V (TAPPING POINT OF AEP)

CKT. NO.	LOAD DESCRIPTION	VOLTS	VA	AB	BC	CA	3Ø	AT	AF	POLE	SIZE OF	
											WIRES	CONDUITS
1	PP-ADM	230	21778.72				66.28	75	100	3P	3-22mm2 THHN COPPER WIRE 1-8.0mm2 THHN GROUND WIRE	IN 25mmø IMC PIPE
2	DP-1	230	56409.30				99.12	100	150	3P	3-30mm2 THHN COPPER WIRE 1-8.0mm2 THHN GROUND WIRE	IN 32mmø IMC PIPE
3	PP-2	230	17638.97				31.00	75	100	3P	3-22mm2 THHN COPPER WIRE 1-8.0mm2 THHN GROUND WIRE	IN 25mmø IMC PIPE
4	PP-3	230	17638.97				31.00	75	100	3P	3-22mm2 THHN COPPER WIRE 1-8.0mm2 THHN GROUND WIRE	IN 25mmø IMC PIPE
5	PP-4	230	17638.97				31.00	75	100	3P	3-22mm2 THHN COPPER WIRE 1-8.0mm2 THHN GROUND WIRE	IN 25mmø IMC PIPE
6	PP-DP	230	20541.61				36.10	60	100	3P	3-22mm2 THHN COPPER WIRE 1-8.0mm2 THHN GROUND WIRE	IN 25mmø IMC PIPE
7	PASSENGER ELEVATOR, 5.5kW, 3Ø	230	6055.07				10.64	50	100	3P	3-8.0mm2 THHN COPPER WIRE 1-8.0mm2 THHN GROUND WIRE	IN 25mmø IMC PIPE
8	SPARE	230	23,920.00	36.0	36.0	32.0		100	250	3P	3-30mm2 THHN COPPER WIRE 1-8.0mm2 THHN GROUND WIRE	IN 32mmø IMC PIPE
9	SPARE	230	-				-	-	-	-	-	-
10	SPARE	230	-				-	-	-	-	-	-
TOTAL			23,920	36.00	36.00	32.00	305.14					

COMPUTATION :

$IT = \{1.732 \times [36 \text{ A} + (0.25 \times 12 \text{ A})]\} + 305.14 \text{ AMPERES}$

$= 372.69 \text{ AMPERES}$

EXISTING OVER CURRENT PROTECTION:

USE : 400AT/250AF, 2P, 230V CIRCUIT BREAKER IN NEMA 1R

EXISTING MAIN FEEDER :

USE : 3- 250.0 mm2 THWN-2 & 1-38.0mm2 TW GROUND WIRE IN 50mmø IMC PIPE

TO MDP

3WIRE + 1 GROUND WIRE  
230 VAC, 3Ø, 60HZ

AEP

3-30.0mm2 THHN  
1-8.0mm2 THHN  
IN 32mm Ø IMC

100AT 3P, 230V

30A, 2P

30A, 2P

30A, 2P

30A, 2P

30A, 2P

30A, 2P

30A, 2P

30A, 2P

30A, 2P

30A, 2P

30A, 2P

30A, 2P

30A, 2P

30A, 2P

GROUNDING  
1-8.0mm2 THHN

1 SCHEDULE OF LOADS

SCALE: N.T.S.

2 PANELBOARD DETAILS



Republika ng Pilipinas  
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CITY ENGINEERING DEPARTMENT

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ADDITIONAL LOADS AT EUGENIO LOPEZ, JR CENTER FOR  
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LOCATION: BARANGAY SACRED HEART, DISTRICT 4, QUEZON CITY

DRAWN BY: JMD

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PLANNING & PROGRAMMING DIVISION

RECOMMENDING APPROVAL:

ENGR. ISABANI R. VERZOSA, JR.  
CITY ENGINEERING DEPARTMENT

APPROVED BY:

HON. MA. JOSEFINA G. BELMONTE  
CITY MAYOR, QUEZON CITY

SHEET CONTENTS:

SCHEDULE OF LOADS  
PANELBOARD DETAILS

SHEET NO.

EL-07