



# 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 INSTALLATION OF ELECTRICAL SYSTEM OF EMILIO JACINTO NATIONAL HIGH SCHOOL** located at **BARANGAY PASONG TAMO, DISTRICT 6, QUEZON CITY**, in accordance with **Section 53.2 of the Revised Implementing Rules and Regulations of Republic Act No. 9184**.

Name of Project : **PROPOSED INSTALLATION OF ELECTRICAL SYSTEM OF EMILIO JACINTO NATIONAL HIGH SCHOOL**

Approved Budget: **NINE HUNDRED FIFTY SEVEN THOUSAND THREE HUNDRED THIRTY TWO PESOS**  
for the Contract **AND 46/100 (Php957,332.46)**

Description : **Program of Work**  
I. General Requirements  
II. Installation of Electrical System  
III. Site Works  
IV. Concreting Works  
V. Insulation Resistance Testing

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 INSTALLATION OF ELECTRICAL SYSTEM OF EMILIO JACINTO NATIONAL 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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**BIDS AND AWARDS COMMITTEE FOR INFRASTRUCTURE & CONSULTANCY**

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 INSTALLATION OF ELECTRICAL SYSTEM OF EMILIO JACINTO NATIONAL HIGH SCHOOL**

**LOCATION : BARANGAY PASONG TAMO, DISTRICT 6, QUEZON CITY**

**SCOPE OF WORK:**

1. Wiring and installation of underground electrical feederline of DPWH Building
2. Excavation of Underground Feederline Wire
3. Certification of Insulation Resistance Test

### DETAILED COST ESTIMATE

ITEM NO.	WORK DESCRIPTION & SCOPE OF WORKS	UNIT	QTY.		UNIT COST		TOTAL COST
<b>A</b>	<b>GENERAL REQUIREMENTS</b>						
	Temporary lighting & water facilities	days	60	P		P	
	Steel Barricade with Caution tape (rental)	each	41				
	Billboard	pc	1				
	<b>Construction Safety and Health</b>						
	Safety Helmet	pcs	9				
	Safety Shoes	pcs	9				
	Safety Gloves	pcs	7				
	Vest	pcs	7				
	Face Mask	pcs	9				
	Harness	pcs	7				
	Goggles	pcs	7				
				<b>Direct Cost A</b>		<b>P</b>	
<b>B</b>	<b>INSTALLATION OF ELECTRICAL SYSTEM</b>						
<b>I</b>	<b>Roughing-ins</b>						
	63mm0 Entrance Cap Diecast (US)	pcs	2				
	63mm0x 10' IMC Pipe	pc	1				
	75mm0 x 10' IMC Pipe	pcs	20				
	75mm0 PVC Long Elbow	pcs	3				
	75mm0 PVC Adaptor	pcs	4				
	63mm0Locknut and Bushing	pairs	4				
	75mm0 Malleable Iron Clamp	mtrs	12				
	125mm0 Solderless Connector <b>w/</b> two Bolt	pcs	3				
	5/80 x 1/2"0 x 2 1/2@ Expansion Shield w/ lug screw	pairs	12				
	1/2"0 x 3/8"0 x 2" Expansion Shield w/lug screw	pairs	4				
	12" x 12" x 8" Fabricated Pulibox Ga.18	pc	1				
<b>II</b>	<b>WIRES &amp; CABLES</b>						
	125mm <sup>2</sup> THHN Wire	mtrs	315				
<b>III</b>	<b>PANEL BOARD</b>						
	Moulded Case Circuit Breaker 250 AT, 2P, 230V Enclosure Weather Proof Type w/ Ground Terminal in Nema 3R	set	1				
					Material Cost	P	
					Labor Cost		
					Direct Cost B	P	

ITEM NO.	WORK DESCRIPTION & SCOPE OF WORKS	UNIT	QTY.		UNIT COST		TOTAL COST
<b>IV</b>	<b>MISCELLANEOUS &amp; CONSUMABLES</b>						
	Rubber Tape	roll	1	P		P	
	Electrical Tape	roll	2				
	Pipe/Conduit Supports, Brackets and Other Accessories	unit	1				
<b>C</b>	<b>SITE WORKS</b>						
	Excavation	cum	6				
	Chipping and Disposal of Concrete	cum	20				
	Backfill	cum	6				
					Direct Cost C	P	
<b>D</b>	<b>CONCRETE WORKS</b>						
	Concrete Hollow Blocks (CHB) with Leveling Sand	sq.m	20				
					Materials Cost	P	
					Labor Cost		
					Direct Cost D	P	
<b>E</b>	<b>INSULATION OF RESISTANCE TESTING</b>						
	Certification of Insulation Resistance Test	lot	1				
					Direct Cost E	P	
<b>Total Direct Cost</b>						<b>P</b>	
<b>OCM</b>							
<b>Profit</b>							
<b>VAT</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 INSTALLATION OF ELECTRICAL SYSTEM OF EMILIO JACINTO NATIONAL HIGH SCHOOL**

Location: **BARANGAY PASONG TAMO, DISTRICT 6, QUEZON CITY**

ABC: **P957,332.46**

## SUMMARY

A	GENERAL REQUIREMENT	P	
B	INSTALLATION OF ELECTRICAL SYSTEM		
C	SITE WORKS		
D	CONCRETING WORKS		
E	INSULATION RESISTANCE TESTING		
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 INSTALLATION OF ELECTRICAL SYSTEM OF EMILIO JACINTO NATIONAL HIGH SCHOOL**

Location: **BARANGAY PASONG TAMO, DISTRICT 6, QUEZON CITY**  
ABC: **P957,332.46**

**BREAKDOWN OF COST**

Item of Work (Description)		MATERIALS COST	LABOR COST	INDIRECT COST	AGGREGATE COST
A	GENERAL REQUIREMENT				
B	INSTALLATION OF ELECTRICAL SYSTEM				
C	SITE WORKS				
D	CONCRETING WORKS				
E	INSULATION RESISTANCE TESTING				
	<b>TOTAL</b>				

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 INSTALLATION OF ELECTRICAL SYSTEM OF EMILIO JACINTO NATIONAL HIGH SCHOOL**

LOCATION: **BARANGAY PASONG TAMO, DISTRICT 6, QUEZON CITY**

**TECHNICAL SPECIFICATIONS**

**PART 1 – GENERAL**

**1.1 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.

**1.1.1 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

**1.1.2 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

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

NFPA 70 (2002) National Electrical Code

**1.1.4 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

*Signature*

- |         |  |
|---------|--|
| 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   |
- 1.1.5 Institute of Integrated Electrical Engineer (IIEE)
- |     |                                   |
|-----|-----------------------------------|
| PEC | (2002) Philippine Electrical Code |
|-----|-----------------------------------|
- 1.1.6 Philippine National Standard (PNS)
- |    |                           |
|----|---------------------------|
| BS | (2002) Bureau of Standard |
|----|---------------------------|

### 1.3 SUBMITTALS

Submit the following:

#### 1.3.1 Shop Drawings

Panelboards

#### 1.3.2 Product Data

Receptacles

Circuit breakers

Switches

Enclosed Circuit breakers

#### 1.3.3 Test Reports

600-volt wiring test

Grounding system test





## **1.4 MAINTENANCE**

### **1.4.1 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 shown 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
- b. 240 volt, 3 phase: red and blue

### 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 are 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 equivalent 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 exceed 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.

#### 3.2.1 600-Volt Wiring Test

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 instrument which applies voltage of approximately 500 volts or provide direct reading of resistance, Minimum resistance shall be 250,000 ohms.



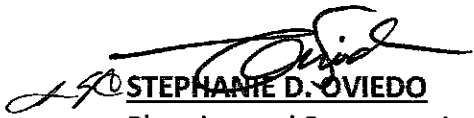
### 3.2.2 Grounding System Test

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 than 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.

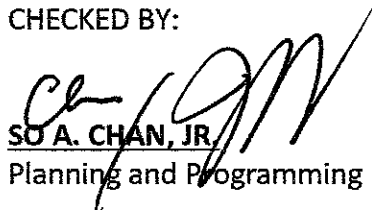
### 4.0 Concrete Works

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

PREPARED BY:

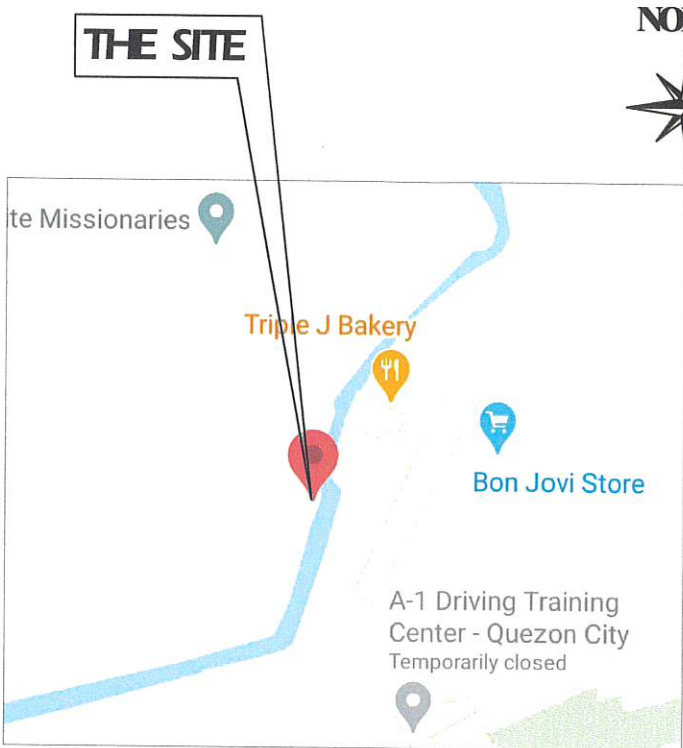
  
STEPHANIE D. OVIEDO  
Planning and Programming Division

CHECKED BY:

  
SO A. CHAN, JR.  
Planning and Programming Division

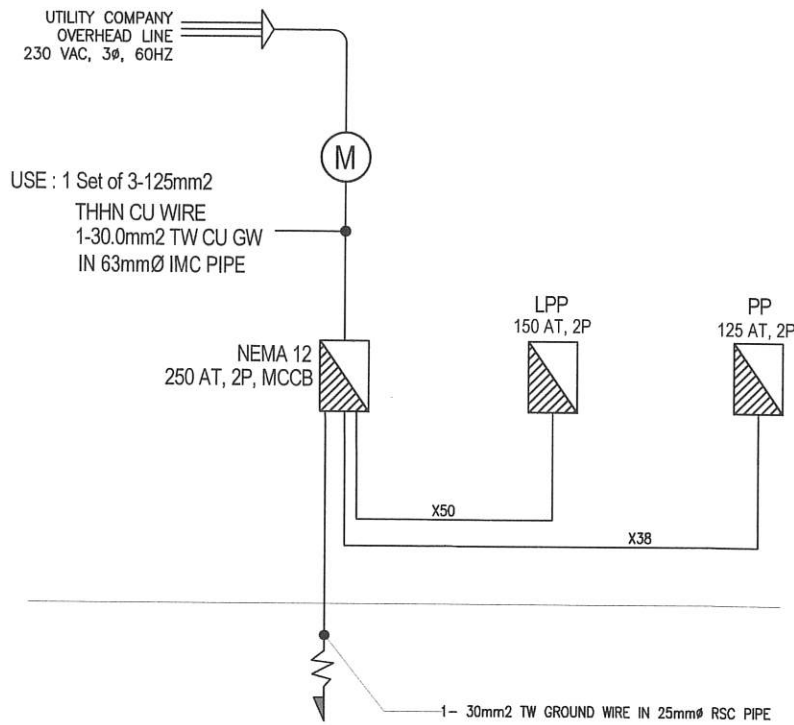
GENERAL NOTES

1. ALL ELECTRICAL WORKS SHALL BE DONE IN ACCORDANCE WITH THE PROVISIONS OF THE LATEST EDITION OF THE PHILIPPINE ELECTRICAL CODE, THE LAWS AND ORDINANCES OF THE LOCAL CODE ENFORCING AUTHORITIES AND THE REQUIREMENTS OF THE LOCAL POWER AND TELEPHONE UTILITY COMPANY.
2. THE CONTRACTOR SHALL SECURE ALL PERMITS AND PAY ALL FEES REQUIRED FOR THE WORK AND SHALL FURNISH THE OWNER THROUGH THE ENGINEERS, FINAL CERTIFICATES OF ELECTRICAL INSPECTION AND APPROVAL FROM PROPER GOVERNMENT AUTHORITIES FOR COMPLETION OF WORK.
3. LOCATION OF CONDUITS SHOWN ON THE DRAWING/PLAN ARE DIAGRAMMATIC, ALL CONDUITS SHALL BE INSTALLED IN A MANNER HEREINAFTER SPECIFIED AND SHALL WHEN NECESSARY BE BUILT-IN DURING CONSTRUCTION.
4. ALL MATERIALS TO BE USED SHALL BE NEW AND INSTALLED IN APPLICATION FOR WHICH THEY ARE INTENDED.
5. ALL ITEMS NOT SPECIFICALLY SHOWN ON THE PLAN BUT OBVIOUSLY REQUIRED IN CONSTRUCTION TO OBTAIN A WORKABLE INSTALLATION SHALL BE INCLUDED.
6. ALL CONDUIT PIPES SHALL BE POLYVINYL CHLORIDE CONDUIT (PVC) EXCEPT AS NOTED ON THE PLANS AND SPECIFICATIONS. REFER TO SPECIFICATION FOR INSTALLATION REQUIREMENT.
7. MINIMUM SIZE OF CONDUIT SHALL BE 20 MM DIAMETER.
8. ALL CONDUIT SHALL BE CONCEALED UNLESS SPECIFICALLY SHOWN OR NOTED OTHERWISE. EXPOSED CONDUIT RUNS SHALL BE INSTALLED PARALLEL TO OR PERPENDICULAR WITH THE BUILDING LINE AND SUPPORTED BY CONDUIT CLAMPS EVERY 1.50 METERS.
9. PROVIDE GALVANIZED PULLING WIRE G.A. 18 OR ALL EMPTY CONDUITS.
10. PULL BOXES SHALL BE PROVIDED BY THE CONTRACTOR WHENEVER NECESSARY TO FACILITATE WIRE PULLING EVEN IF THESE ARE NOT INDICATED ON THE PLANS.
11. FOR BOXES WITH MORE THAN FOUR WIRES ENTERING, USE 0.10 M X 0.10 M SQUARE BOX WITH ONE ADAPTER RING. (TYPICAL FOR RECEPTACLE BOXES)
12. ALL LIGHTING AND CONVENIENCE OUTLET CIRCUITS SHALL BE 3 WIRE 3.5 SQ. MM THHN UNLESS OTHERWISE NOTED. MINIMUM SIZE OF WIRE SHALL BE 3.5 SQ. MM THW.
13. ALL DUPLEX RECEPTACLE OUTLETS SHALL BE GROUNDING TYPE WITH PARALLEL SLOTS FOR 220 V.
14. PROVIDE GROUND FAULT CURRENT INTERRUPTER CIRCUIT BREAKER FOR LOADS MARKED "GFCI" ON THE PLAN.
15. ALL METALLIC CONDUITS, CABINETS AND EQUIPMENT SHALL BE PROPERLY GROUNDED AND BONDED.
16. UNLESS OTHERWISE NOTED, MOUNTING HEIGHT FOR WALL MOUNTED DEVICES SHALL BE AS FOLLOWS:  
RECEPTACLE OUTLET - 300 MM AFF  
TELEPHONE OUTLET - 300 MM AFF  
CATV OUTLET - 300 MM AFF  
LIGHTING SWITCH - 1370 MM AFF
17. LOCATION OF ELECTRICAL FIXTURES ARE APPROXIMATE ONLY FINAL LOCATIONS OF FIXTURES SHALL BE DETERMINED ON SITE TO AVOID INTERFERENCE WITH OTHER SYSTEMS AND/OR EQUIPMENT.
18. REFER TO MECHANICAL, PLUMBING AND FIRE PROTECTION DRAWINGS FOR RATINGS AND LOCATIONS OF EQUIPMENT AS WELL AS THEIR CONTROL SEQUENCES AS SPECIFIED AND OR SHOWN UNDER THEIR RESPECTIVE SECTIONS.



VICINITY MAP

SERVICE ENTRANCE



RISER DIAGRAM

DPWH LOAD SCHEDULE

CKT. NO.	LOAD DESCRIPTION	VOLTS	VA	AMP.	CKT. BREAKER			SIZE OF	
					AT	AF	P	WIRES	CONDUITS
1	DPWH BLDG	230	29,320	129.98	150	200	2	2-50mm² THHN-2 COPPER WIRE 1-22mm² THHN GROUND WIRE	IN 20mmØ PVC PIPE
2	PROVISION CEILING FAN & ACU	230	17,040	76.08	125	200	2	2-50mm² THHN-2 COPPER WIRE 1-14mm² THHN GROUND WIRE	IN 40mmØ PVC PIPE
3									
TOTAL			46,360						

COMPUTATION :

$$IT = \frac{46,360 + (2,300VA \times 25\%)}{230 V}$$
$$= 204.06 \text{ AMPERES}$$

OVER CURRENT PROTECTION DEVICE

USE : 250AT,CB, 2P, 230V

MAIN FEEDER LINE

USE : 3 - 125 mm² THHN WIRE & 1-30mm² TW GROUND WIRE  
IN 63mmØ IMC PIPE

SCHEDULE OF LOADS (1 OF 2)



Republika ng Pilipinas  
Lungsod ng Quezon  
CITY ENGINEERING DEPARTMENT

PROJECT TITLE:  
PROPOSED INSTALLATION OF  
ELECTRICAL SYSTEM OF EMILIO JACINTO  
NATIONAL HIGH SCHOOL  
LOCATION:  
BARANGAY PASONG TAMO, DISTRICT 6, QUEZON CITY

DRAWN BY:  
DATE:  
CHECKED BY:  
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

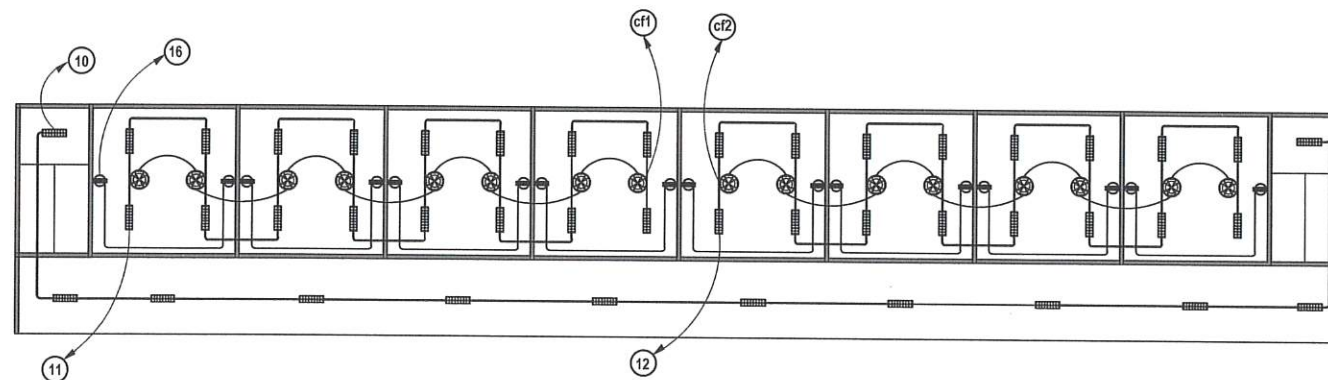
SHEET CONTENTS:

GENERAL SPECIFICATIONS  
VICINITY MAP  
RISER DIAGRAM  
SCHEDULE OF LOADS

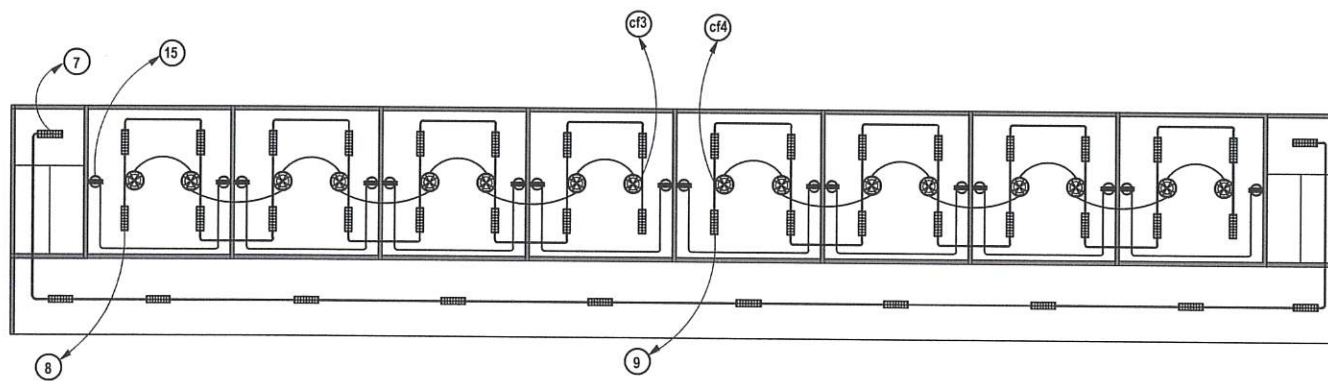
SHEET NO.

E-01

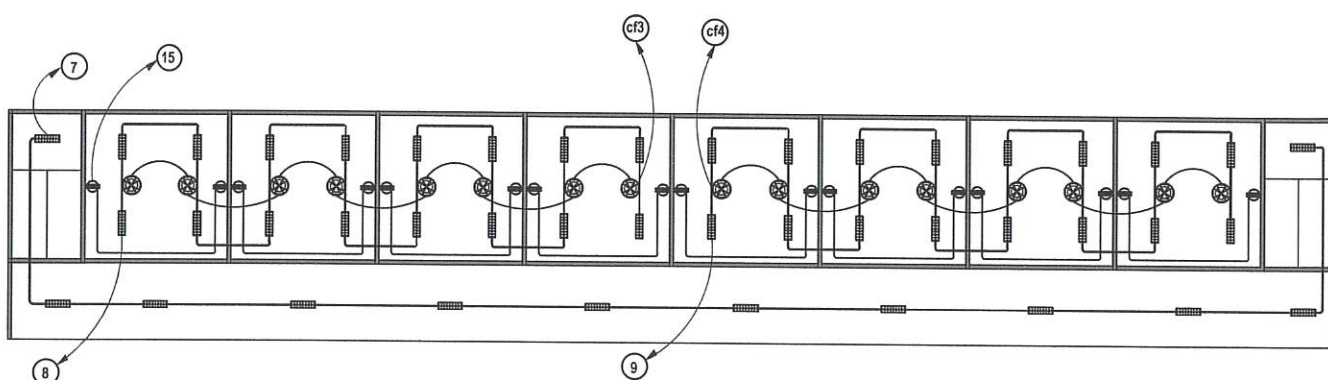




GROUND FLOOR LIGHTING AND POWER LAYOUT



SECOND FLOOR LIGHTING AND POWER LAYOUT



THIRD FLOOR LIGHTING AND POWER LAYOUT  
(TYPICAL TO FOURTH FLOOR LAYOUT)

#### LPP-DPWH (4) STOREY BUILDING

CKT. NO.	LOAD DESCRIPTION	VOLTS	VA	AMP.	AT	AF	P	SIZE OF	
								WIRES	CONDUITS
1	14 LIGHTING	230	1,400	6.08	15	50	2	2-3.5mm <sup>2</sup> THHN-2 COPPER WIRE	IN 20mm"Ø PVC PIPE
2	16 LIGHTING	230	1,600	6.95	15	50	2	2-3.5mm <sup>2</sup> THHN-2 COPPER WIRE	IN 20mm"Ø PVC PIPE
3	16 LIGHTING	230	1,600	1.1	15	50	2	2-3.5mm <sup>2</sup> THHN-2 COPPER WIRE	IN 20mm"Ø PVC PIPE
4	12 LIGHTING	230	1,200	5.17	15	50	2	2-3.5mm <sup>2</sup> THHN-2 COPPER WIRE	IN 20mm"Ø PVC PIPE
5	16 LIGHTING	230	1,600	6.95	15	50	2	2-3.5mm <sup>2</sup> THHN-2 COPPER WIRE	IN 20mm"Ø PVC PIPE
6	16 LIGHTING	230	1,600	1.1	15	50	2	2-3.5mm <sup>2</sup> THHN-2 COPPER WIRE	IN 20mm"Ø PVC PIPE
7	12 LIGHTING	230	1,200	5.17	15	50	2	2-3.5mm <sup>2</sup> THHN-2 COPPER WIRE	IN 20mm"Ø PVC PIPE
8	16 LIGHTING	230	1,600	6.95	15	50	2	2-3.5mm <sup>2</sup> THHN-2 COPPER WIRE	IN 20mm"Ø PVC PIPE
9	16 LIGHTING	230	1,600	1.1	15	50	2	2-3.5mm <sup>2</sup> THHN-2 COPPER WIRE	IN 20mm"Ø PVC PIPE
10	12 LIGHTING	230	1,200	5.17	15	50	2	2-3.5mm <sup>2</sup> THHN-2 COPPER WIRE	IN 20mm"Ø PVC PIPE
11	16 LIGHTING	230	1,600	6.95	15	50	2	2-3.5mm <sup>2</sup> THHN-2 COPPER WIRE	IN 20mm"Ø PVC PIPE
12	16 LIGHTING	230	1,600	1.1	15	50	2	2-3.5mm <sup>2</sup> THHN-2 COPPER WIRE	IN 20mm"Ø PVC PIPE
13	16 OUTLET	230	2,880	12.52	30	50	2	2-3.5mm <sup>2</sup> THHN-2 COPPER WIRE	IN 20mm"Ø PVC PIPE
14	16 OUTLET	230	2,880	12.52	30	50	2	2-3.5mm <sup>2</sup> THHN-2 COPPER WIRE	IN 20mm"Ø PVC PIPE
15	16 OUTLET	230	2,880	12.52	30	50	2	2-3.5mm <sup>2</sup> THHN-2 COPPER WIRE	IN 20mm"Ø PVC PIPE
16	16 OUTLET	230	2,880	12.52	30	50	2	2-3.5mm <sup>2</sup> THHN-2 COPPER WIRE	IN 20mm"Ø PVC PIPE
TOTAL			29,320						

#### COMPUTATION :

$$IT = \frac{29,320VA + (2,300VA \times 25\%)}{230 V}$$

$$= 129.98 \text{ AMPERES}$$

OVER CURRENT PROTECTION DEVICE  
USE : 150AT,CB, 2P, 230V

MAIN FEEDER LINE  
USE : 2 - 50 mm<sup>2</sup> THHN WIRE & 1-22mm<sup>2</sup> THHN-2 GROUND WIRE  
IN 50mmØ IMC PIPE

#### PP- PROVISION FOR AIRCON/CEILING FAN

CKT. NO.	LOAD DESCRIPTION	VOLTS	VA	AMP.	AT	AF	P	SIZE OF	
								WIRES	CONDUITS
1	8 CELING FAN	230	1,440	6.26	20	50	2	2-3.5mm <sup>2</sup> THHN-2 COPPER WIRE	IN 20mm"Ø PVC PIPE
2	8 CELING FAN	230	1,440	6.26	20	50	2	2-3.5mm <sup>2</sup> THHN-2 COPPER WIRE	IN 20mm"Ø PVC PIPE
3	8 CELING FAN	230	1,440	6.26	20	50	2	2-3.5mm <sup>2</sup> THHN-2 COPPER WIRE	IN 20mm"Ø PVC PIPE
4	8 CELING FAN	230	1,440	6.26	20	50	2	2-3.5mm <sup>2</sup> THHN-2 COPPER WIRE	IN 20mm"Ø PVC PIPE
5	8 CELING FAN	230	1,440	6.26	20	50	2	2-3.5mm <sup>2</sup> THHN-2 COPPER WIRE	IN 20mm"Ø PVC PIPE
6	8 CELING FAN	230	1,440	6.26	20	50	2	2-3.5mm <sup>2</sup> THHN-2 COPPER WIRE	IN 20mm"Ø PVC PIPE
7	8 CELING FAN	230	1,440	6.26	20	50	2	2-3.5mm <sup>2</sup> THHN-2 COPPER WIRE	IN 20mm"Ø PVC PIPE
8	8 CELING FAN	230	1,440	6.26	20	50	2	2-3.5mm <sup>2</sup> THHN-2 COPPER WIRE	IN 20mm"Ø PVC PIPE
9	1 ACU	230	2,760	12	20	50	2	2-3.5mm <sup>2</sup> THHN-2 COPPER WIRE	IN 20mm"Ø PVC PIPE
10	1 ACU	230	2,760	12	20	50	2	2-3.5mm <sup>2</sup> THHN-2 COPPER WIRE	IN 20mm"Ø PVC PIPE
TOTAL			17,040						

#### COMPUTATION :

$$IT = \frac{17,040VA + (2,300VA \times 25\%)}{230 V}$$

$$= 76.58 \text{ AMPERES}$$

OVER CURRENT PROTECTION DEVICE  
USE : 125AT,CB, 2P, 230V

MAIN FEEDER LINE  
USE : 2 - 38 mm<sup>2</sup> THHN WIRE & 1-14mm<sup>2</sup> THHN-2 GROUND WIRE  
IN 40mmØ IMC PIPE

#### SCHEDULE OF LOADS (2 OF 2)



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APPROVED BY:

HON. MA. JOSEFINA G. BELMONTTE  
CITY MAJOR, QUEZON CITY

SHEET CONTENTS:

01 LIGHTING AND POWER LAYOUT  
02 LIGHTING AND POWER LAYOUT  
03 LIGHTING AND POWER LAYOUT  
04 SCHEDULE OF LOADS

SHEET NO.

E-02