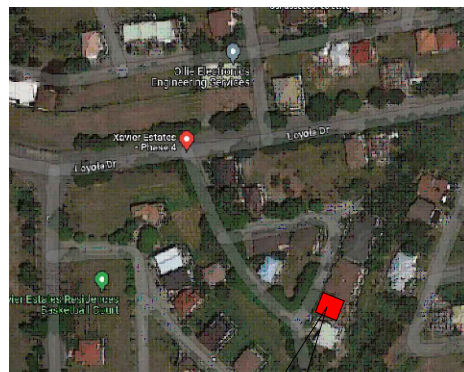


ELECTRICAL NOTES & SPECIFICATIONS

- ALL ELECTRICAL WORKS SHALL BE DONE IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS, THE APPLICABLE PROVISIONS OF THE LATEST EDITIONS OF THE PHILIPPINE ELECTRICAL CODE, THE RULES AND REGULATIONS OF THE LOCAL ENFORCING AUTHORITY AND THE REQUIREMENTS OF THE LOCAL POWER & TELEPHONE COMPANY.
- SERVICE TO THE BUILDING SHALL BE 230V, 1Ø, 2-WIRES, 60 HZ.
- WIRING METHOD SHALL BE AS FOLLOWS:
 - THE MINIMUM SIZE OF ALL CONDUIT SHALL BE 12Ø ELECTRICAL TRADES.
 - ALL FEEDERS AND POWER SERVICE ENTRANCE SHALL BE IN RIGID STEEL CONDUITS.
 - ALL POWER AND LIGHTING CIRCUIT SHALL BE EMT CONDUIT UNLESS OTHERWISE SPECIFIED.
- MINIMUM SIZE OF A CONDUCTORS SHALL BE 3.50MM SQUARE MILLIMETERS UNLESS OTHERWISE INDICATED.
- THE CONTRACTOR SHALL VERIFY AND ORIENT THE ACTUAL LOCATION OF SERVICE ENTRANCE FOR CONNECTION TO THE POWER SUPPLY.
- ALL PIPES AND SLEEVES SHALL BE PROVIDED WITH PROPER SUPPORT OR ANCHORAGE RUNWAY OR PERMANENT CONNECTION WITH CONCRETE WALL OR BEAM.
- ALL ELECTRICAL EQUIPMENT SHALL BE BONDED TOGETHER BY MEANS OF COPPER STRAP ALL PROPERLY GROUNDED TO GROUND ROD INSTALLED FOR THE PURPOSE.
- ALL 20 AMPERES CIRCUIT HOMERUNS TO PANEL BOARD MORE THAN 30 meters IN LENGTH SHALL BE 5.5 square millimeters UNLESS OTHERWISE SPECIFIED.
- ROUTING OF FEEDERS AND BRANCH CIRCUITS SHALL BE DONE IN THE FIELD WITH THE APPROVAL OF THE SUPERVISING REPRESENTATIVE OF THE OWNER.
- PULL BOXES, MANHOLES, HANDHOLES, SHALL BE PROVIDED EVEN IF NOT INDICATED ON THE PLANS, IF THE FIELD CONDITIONS REQUIRES.
- ANY DISCREPANCY IN PLANS, SPECIFICATIONS AND LOCATIONS OF THE EQUIPMENTS AND APPARATUS SHALL BE VERIFIED W/ THE OWNER OR ANY OF HIS REPRESENTATIVES BEFORE CHANGES CAN BE MADE.
- ALL MATERIALS TO BE USED AS EQUIPMENTS TO BE CONTROLLED SHALL BE BRAND NEW AND MUST BE OF THE APPROVED TYPE FOR THE LOCATIONS AND PURPOSES.
- MINIMUM MOUNTING HEIGHT SHALL BE AS FOLLOWS:
 - LIGHTING SWITCHES _____ 1.40m ABOVE FINISHED FLOOR LINE OR AS REQUIRED.
 - CONVENIENCE OUTLET _____ 0.30m ABOVE FINISHED FLOOR LINE OR AS REQUIRED.
 - PANEL BOARD _____ 1.40m ABOVE FINISHED FLOOR LINE OR AS REQUIRED.
- ALL ELECTRICAL WORKS SHALL BE UNDER THE DIRECT SUPERVISION OF A DULY LICENSED PROFESSIONAL ELECTRICAL ENGINEER OR MASTER ELECTRICIAN.



THIS SITE:
PROPOSED 3 STOREY RESIDENCE
XAVIER ESTATES UPPER CARMEN, CAGAYAN
DE ORO CITY, MISAMIS ORIENTAL, PHILIPPINES
9000

VICINITY MAP

SCALE

NTS

SCHEDULE OF LOADS AND DESIGN ANALYSIS									
PANEL BOARD: PB1-M					MAIN: 250AT, 1P, 25KAIC, 230 VAC				
CKT. NO.	LOAD DISCRPTION	QNTY.	VA LOAD	VOLTAGE	CURRENT	CIRCUIT PROTECTION			WIRE AND CONDUIT SIZE
						AT	POLE	KAIC	
1	PB1	1	23560	230	102.43	100.00	2.00	10.00	2 - 30 mm ² THHN & 1 - 8.0 mm ² THHN 25 mm DIA. CONDUIT
2	PB2	1	16220	230	70.52	80.00	2.00	10.00	2 - 22 mm ² THHN & 1 - 5.5 mm ² THHN 25 mm DIA. CONDUIT
3	PB3	1	18420	230	80.09	80.00	2.00	10.00	2 - 22 mm ² THHN & 1 - 5.5 mm ² THHN 25 mm DIA. CONDUIT
6	SPARE	1							PROVIDE 15 MM DIA CONDUIT
TOTAL:			58200		253.04				

COMPUTATION:
I = 253.04(0.8)
I = 202.43 AMPS

FEEDER SIZE:
USE: 2 - 125 mm² THHN COPPER WIRE & 1 - 8.0 mm² THHN COPPER WIRE
IN 50 mm DIA. CONDUIT PIPE
MAIN BREAKER SIZE:
250 AT, 1P, 25KAIC, 230VAC

TRANSFORMER USE:
KVA = 46.559 = 50 KVA SINGLE PHASE X'FORMER USE

SCHEDULE OF LOADS AND DESIGN ANALYSIS									
PANEL BOARD: PB1					MAIN: 100AT, 1P, 10KAIC, 230 VAC				
CKT. NO.	LOAD DISCRPTION	QNTY.	VA LOAD	VOLTAGE	CURRENT	CIRCUIT PROTECTION			WIRE AND CONDUIT SIZE
						AT	POLE	KAIC	
1	LIGHTING OUTLET 1	12	1200	230	5.22	15.00	2.00	10.00	2 - 2.0 mm ² THHN 15 mm DIA. CONDUIT
2	LIGHTING OUTLET 2	14	1400	230	6.09	15.00	2.00	10.00	2 - 2.0 mm ² THHN 15 mm DIA. CONDUIT
3	LIGHTING OUTLET 3	11	1100	230	4.78	15.00	2.00	10.00	2 - 2.0 mm ² THHN 15 mm DIA. CONDUIT
4	CONVENIENCE OUTLET 1	9	1620	230	7.04	20.00	2.00	10.00	2 - 3.5 mm ² THHN & 1 - 2.0 mm ² THHN 15 mm DIA. CONDUIT
5	CONVENIENCE OUTLET 2	9	1620	230	7.04	20.00	2.00	10.00	2 - 3.5 mm ² THHN & 1 - 2.0 mm ² THHN 15 mm DIA. CONDUIT
6	CONVENIENCE OUTLET 3	5	900	230	3.91	20.00	2.00	10.00	2 - 3.5 mm ² THHN & 1 - 2.0 mm ² THHN 15 mm DIA. CONDUIT
7	CONVENIENCE OUTLET 4	4	720	230	3.13	20.00	2.00	10.00	2 - 3.5 mm ² THHN & 1 - 2.0 mm ² THHN 15 mm DIA. CONDUIT
8	RANGE OUTLET	2	3500	230	15.22	30.00	2.00	10.00	2 - 5.5 mm ² THHN & 1 - 2.0 mm ² THHN 15 mm DIA. CONDUIT
9	REF OUTLET	2	4600	230	20.00	30.00	2.00	10.00	2 - 5.5 mm ² THHN & 1 - 2.0 mm ² THHN 15 mm DIA. CONDUIT
10	ACU 1	1	2300	230	10.00	30.00	2.00	10.00	2 - 5.5 mm ² THHN & 1 - 2.0 mm ² THHN 15 mm DIA. CONDUIT
11	ACU 2	1	2300	230	10.00	30.00	2.00	10.00	2 - 5.5 mm ² THHN & 1 - 2.0 mm ² THHN 15 mm DIA. CONDUIT
12	ACU 3	1	2300	230	10.00	30.00	2.00	10.00	2 - 5.5 mm ² THHN & 1 - 2.0 mm ² THHN 15 mm DIA. CONDUIT
TOTAL:			23560		102.43				

COMPUTATION:
I = 102.43(0.8) + 10(1.25)
I = 94.44 AMPS

FEEDER SIZE:
USE: 2 - 30 mm² THHN COPPER WIRE & 1 - 8.0 mm² THHN COPPER WIRE
IN 25 mm DIA. CONDUIT PIPE
MAIN BREAKER SIZE:
100 AT, 1P, 10KAIC, 230VAC

SCHEDULE OF LOADS AND DESIGN ANALYSIS									
PANEL BOARD: PB2					MAIN: 80AT, 1P, 10KAIC, 230 VAC				
CKT. NO.	LOAD DISCRPTION	QNTY.	VA LOAD	VOLTAGE	CURRENT	CIRCUIT PROTECTION			WIRE AND CONDUIT SIZE
						AT	POLE	KAIC	
1	LIGHTING OUTLET 1	14	1400	230	6.09	15.00	2.00	10.00	2 - 2.0 mm ² THHN 15 mm DIA. CONDUIT
2	LIGHTING OUTLET 2	13	1300	230	5.65	15.00	2.00	10.00	2 - 2.0 mm ² THHN 15 mm DIA. CONDUIT
3	LIGHTING OUTLET 3	12	1200	230	5.22	15.00	2.00	10.00	2 - 2.0 mm ² THHN 15 mm DIA. CONDUIT
4	LIGHTING OUTLET 4	15	1500	230	6.52	20.00	2.00	10.00	2 - 3.5 mm ² THHN & 1 - 2.0 mm ² THHN 15 mm DIA. CONDUIT
5	CONVENIENCE OUTLET 1	9	1620	230	7.04	20.00	2.00	10.00	2 - 3.5 mm ² THHN & 1 - 2.0 mm ² THHN 15 mm DIA. CONDUIT
6	CONVENIENCE OUTLET 2	10	2300	230	10.00	30.00	2.00	10.00	2 - 5.5 mm ² THHN & 1 - 2.0 mm ² THHN 15 mm DIA. CONDUIT
7	ACU 1	1	2300	230	10.00	30.00	2.00	10.00	2 - 5.5 mm ² THHN & 1 - 2.0 mm ² THHN 15 mm DIA. CONDUIT
8	ACU 2	1	2300	230	10.00	30.00	2.00	10.00	2 - 5.5 mm ² THHN & 1 - 2.0 mm ² THHN 15 mm DIA. CONDUIT
9	ACU 3	1	2300	230	10.00	30.00	2.00	10.00	2 - 5.5 mm ² THHN & 1 - 2.0 mm ² THHN 15 mm DIA. CONDUIT
TOTAL:			16220		70.52				

COMPUTATION:
I = 70.52(0.8) + 10(1.25)
I = 68.92 AMPS

FEEDER SIZE:
USE: 2 - 22 mm² THHN COPPER WIRE & 1 - 5.5 mm² THHN COPPER WIRE
IN 25 mm DIA. CONDUIT PIPE
MAIN BREAKER SIZE:
80 AT, 1P, 10KAIC, 230VAC

I. VOLTAGE DROP CALCULATION:

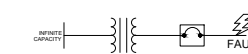
FOR CABLE 1 (C1) - SERVICE DROP TO PANEL BOARD:
CONDUCTOR CROSS - SECTIONAL AREA = 125.0 mm²
VOLTAGE LEVEL = 230 V
LENGTH = 20 m AT 1 SET OF CONDUCTORS/PHASE
VOLTAGE DROP FROM SERVICE DROP TO PANEL BOARD MAIN

$$V_{D_{FEEDER}} = \frac{2 \times L \times Z \times I}{1,000} = \frac{2 \times 65.6 \text{ FT} \times 0.077 \Omega \times 202.43 \text{ A}}{1,000} = 2.05 \text{ V}$$

$$\%V_{D_{FB}} = \frac{V_{D_{FEEDER}}}{230} \times 100 = \frac{2.05 \text{ V}}{230} \times 100 = 0.891\% < 5\%$$

THEREFORE 125 mm² THHN COPPER WIRE IS SUFFICIENT AS SERVICE ENTRANCE.
IF THE VOLTAGE DROP EXCEED 5% OR 12 VOLTS OF 230 VOLTS POWER SUPPLY
LARGER SIZE OF WIRE CONDUCTOR SHOULD BE USED.

II. AVAILABLE SHORT CIRCUIT FOR MDP:



$$I_{SC(SYM)} = \frac{I_{SC(SYM)}}{Z} \quad (\text{FAULT CURRENT, SYMMETRICAL})$$

$$= \frac{217.4}{0.011} = 19763.63636 \text{ A}$$

USE A 25KAIC BOLT-ON CIRCUIT BREAKER

$$Z = 1.10\%$$

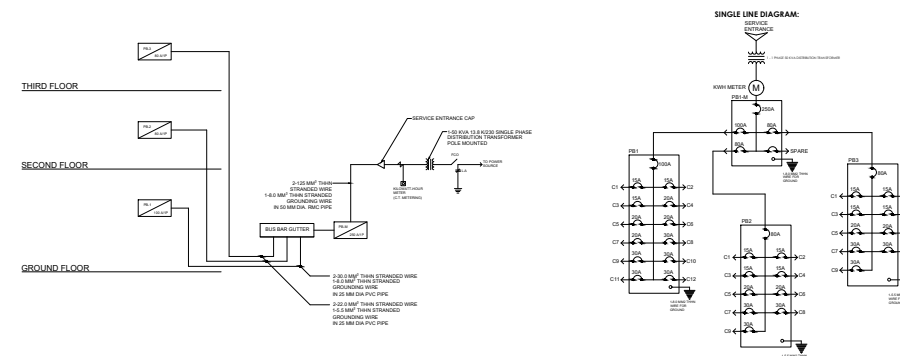
$$I_{SEC} = \frac{\text{TRANSFORMER VOLT-AMPERES}}{\text{SECONDARY VOLTAGE}}$$

$$I_{SEC} = \frac{50,000}{230} = 217.4 \text{ A}$$

SCHEDULE OF LOADS AND DESIGN ANALYSIS									
PANEL BOARD: PB3					MAIN: 80AT, 1P, 10KAIC, 230 VAC				
CKT. NO.	LOAD DISCRPTION	QNTY.	VA LOAD	VOLTAGE	CURRENT	CIRCUIT PROTECTION			WIRE AND CONDUIT SIZE
						AT	POLE	KAIC	
1	LIGHTING OUTLET 1	11	1100	230	4.78	15.00	2.00	10.00	2 - 2.0 mm ² THHN 15 mm DIA. CONDUIT
2	LIGHTING OUTLET 2	15	1500	230	6.52	15.00	2.00	10.00	2 - 2.0 mm ² THHN 15 mm DIA. CONDUIT
3	LIGHTING OUTLET 3	16	1600	230	6.96	20.00	2.00	10.00	2 - 3.5 mm ² THHN & 1 - 2.0 mm ² THHN 15 mm DIA. CONDUIT
4	LIGHTING OUTLET 4	12	1200	230	5.22	20.00	2.00	10.00	2 - 3.5 mm ² THHN & 1 - 2.0 mm ² THHN 15 mm DIA. CONDUIT
5	CONVENIENCE OUTLET 1	19	3420	230	14.87	20.00	2.00	10.00	2 - 3.5 mm ² THHN & 1 - 2.0 mm ² THHN 15 mm DIA. CONDUIT
6	CONVENIENCE OUTLET 2	15	2700	230	11.74	20.00	2.00	10.00	2 - 3.5 mm ² THHN & 1 - 2.0 mm ² THHN 15 mm DIA. CONDUIT
7	ACU BED ROOM 1	1	2300	230	10.00	30.00	2.00	10.00	2 - 5.5 mm ² THHN & 1 - 2.0 mm ² THHN 15 mm DIA. CONDUIT
8	ACU BED ROOM 2	1	2300	230	10.00	30.00	2.00	10.00	2 - 5.5 mm ² THHN & 1 - 2.0 mm ² THHN 15 mm DIA. CONDUIT
9	ACU BED ROOM 3	1	2300	230	10.00	30.00	2.00	10.00	2 - 5.5 mm ² THHN & 1 - 2.0 mm ² THHN 15 mm DIA. CONDUIT
TOTAL:			18420		80.09				

COMPUTATION:
I = 80.09(0.8) + 10(1.25)
I = 76.572 AMPS

FEEDER SIZE:
USE: 2 - 22 mm² THHN COPPER WIRE & 1 - 5.5 mm² THHN COPPER WIRE
IN 25 mm DIA. CONDUIT PIPE
MAIN BREAKER SIZE:
80 AT, 1P, 10KAIC, 230VAC



SCHEDULE OF LOADS & SINGLE LINE DIAGRAM

SCALE

NTS

ARCHITECT		PROFESSIONAL ELECTRICAL ENGINEER		SEAL	PROJECT TITLE	OWNER	SHEET CONTENTS:	SHEET NUMBER:
KIA JOYCE S. ONGAYO		Engr. Yakitchi A. Ohya			A PROPOSED THREE STOREY RESIDENCE		GENERAL NOTES & SPECIFICATIONS SCHEDULE OF LOADS SINGLE LINE DIAGRAM RISER DIAGRAM	E-1
PRC #: 40703	DATE: 01-11-2022	PRC #: 2804	DATE: 8-12-93 MANILA		LOCATION:		DRAFT BY:	PROJECT NUMBER:
PTR #: 5223678	TIN #: 341-116-425-0000	PTR #: 412160	TIN #: 109-689-924		XAVIER ESTATES, UPPER BALLULANG, CAGAYAN DE ORO CITY, MISAMIS ORIENTAL		CHECKED BY:	23-01
							DATE:	