

GENERAL NOTES :

1. ALL ELECTRICAL WORKS SHALL CONFORM TO THE LATEST EDITION OF THE PHILIPPINE ELECTRICAL CODE, TO THE RULES AND REGULATIONS OF LOCAL AND NATIONAL AUTHORITIES CONCERNED AND THE REQUIREMENTS OF THE UTILITY COMPANIES CONCERNED.
2. THE WIRING INSTALLATION SHALL BE USE FLEXIBLE PVC CORRUGATED CONDUIT PIPE FOR LIGHTING & POWER LAYOUT AND FOR MAIN SERVICE ENTRANCE SHALL BE USE INTERMEDIATE CONDUIT(IMC) GALVANIZED.
3. MINIMUM SIZE OF WIRES AND CONDUITS SHALL BE 3.5 sq. mm. AND 16 mm NOMINAL DIAMETER, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
4. PROVIDE NECESSARY ENCLOSE CIRCUIT BREAKER, SQUARE BOXES WHENEVER NECESSARY OR REQUIRED FOR THE ROUGHING IN ELECTRICAL WORKS.
5. TYPE OF SERVICE POWER SHALL BE 230 V, 1ϕ 60 Hz
6. ALL LIGHTING FIXTURES WILL BE COOL WHITE FOR ENERGY EFFICIENT (CENTER LAMP, PINLIGHT&DOWNLIGHT, WALL LAMP) SHALL BE SUPPLIED BY THE OWNER, BUT TO BE INSTALLED BY THE ELECTRICAL CONTRACTOR.
7. INSTALLATION OF (ER) ELECTRIC COOKING EQUIPMENT SHALL BE INSTALL 36-48 INCHES FROM THE FLOOR.
8. INSTALLATION OF SWITCH SHALL BE 48-52 INCHES FROM THE FLOOR.
9. INSTALLATION OF OUTLET SHALL BE 12-18 INCHES FROM THE FLOOR.
10. INSTALLATION OF OUTLET WATER HEATER IN T&B SHALL BE AT LEAST 2.4 meter FROM THE FLOOR.
11. ALL MATERIALS AND EQUIPMENTS TO BE INSTALLED SHALL BE BRAND NEW AND OF APPROVED TYPE AS TO LOCATION AND PURPOSE INTENDED.
12. INSTALLATION OF SERVICE DROP SHALL BE 8 FOOT OR 2.5 METER FROM THE GROUND.
13. THE ELECTRICAL CONTRACTOR SHALL PROVIDE TAGGING AT THE PANEL BOARD FOR POSSIBLE EXACT LOCATION OF THE BRANCH CIRCUIT.
14. PROVIDE GROUNDING SYSTEM WHICH SHALL BE PROPERLY ADEQUATELY
15. THERE SHALL BE ONLY ONE SERVICE DROP ENTERING THE STRUCTURE.
16. ALL OUTDOOR INSTALLATION , SHALL BE WEATHERPROOF TYPE.
17. ALL LIGHTING SWITCHES SHALL BE RATED 10A, 15A., 250V. & AC RATED.
18. PROVIDE OUTLET FOR EMERGENCY LIGHT AT LEAST 1 GANG.
19. ALL RECEPTACLES USE HEREIN SHALL BE 16A 250V. & AC RATED.
20. ALL ELECTRICAL WORKS HEREIN SHALL BE EXECUTED BY EXPERIENCE ELECTRICIAN.
21. ALL WIRES AND CABLES ARE COLOR - CODED AND LISTED AS FOLLOWS: LINE - 1 (BLUE), LINE - 2 (RED), GROUND - (GREEN)

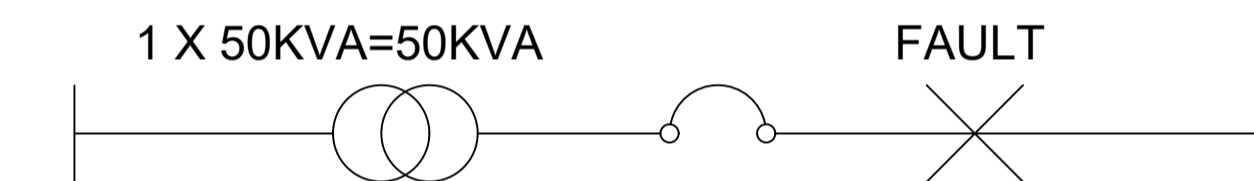
DESIGN ANALYSIS
E 1-11 SCALE 1:50MTS

1. CONTINUOUS LOAD (GENERAL LIGHTING LOAD)
 LIGHTING LOAD = (50M²/FLOOR) x (24VA/M²) = 1,200 VA
 LAUNDRY : 1 x 1500VA = 1,500 VA
 WEATHERPROOF OUTLET : 2 x 180VA = 360 VA
 WATER HEATER : 1 x 3200 VA = 3,200 VA
 OUTLET 14 x 180VA = 2,520 VA
 SUB TOTAL = 7,780 VA
 APPLICATION OF OF DEMAND FACTOR BASE ON (TABLE 2.20.3.3)
 3,000VA @ 100% = 3,000 VA
 0.35 X (7,780-3,000) = 1673 VA
2. OTHER LOADS
 RANGE: 8000 VA x 80% (TABLE 2.20.3.16) = 6,400 VA
 AIR-CONDITIONING LOAD: @ 100% D.F
 1.5 HP (10A x 230V) = 2,300 VA
 1 HP (8A x 230V) x 2 = 1,840 VA
NET LOAD TOTAL = 15,213 VA
3. SERVICE FEEDER CONDUCTORS FOR EACH DWELLING UNIT (TABLE 3.10.2.6(B)(16))
 IF = (15,213)/(230) + 0.25 X (10)
IF = 68.64 A
USE 2-14mm² THHN WIRE
2-8.0mm² TW GROUND WIRE
1-21mm² IMC CONDUIT
4. SERVICE FEEDER CIRCUIT BREAKER FOR EACH DWELLING UNIT
 ICB = (15,213/230) + 1.5 X (10)
ICB = 81.14 A
USE 2P,MCB 100AT/100AF, 10 KAIC, 240V RMS
5. TOTAL LOAD OF 4 DWELLING UNIT
 LIGHTING LOAD = (50M²/FLOOR) x (24VA/M²) x 4 = 4,800 VA
 LAUNDRY : 1 x 1500VA X 4 = 6,000 VA
 WEATHERPROOF OUTLET : 2 x 180VA x 4 = 1,440 VA
 WATER HEATER : 1 x 3200 VA x 4 = 12,800 VA
 OUTLET 14 x 180VA x 4 = 10,080 VA
 RANGE : 8000 VA x 4 = 32,000 VA
 AIRCON - 1.5 HP (10A x 230V) x 4 = 9,200 VA
 AIRCON -1 HP (8A x 230V) x 2 x4 = 14,720 VA
 TOTAL LOAD = 91,040 VA
 APPLICATION OF DEMAND FACTOR BASE ON (TABLE 2.20.4.5)
 91,040 VA X 45% D.F = 40,968 VA
6. MAIN SERVICE ENTRANCE CONDUCTOR
 40,968 VA / 230V = 178.12 AMP
USE 2-80mm² THW WIRE
1-14mm² TW GROUND WIRE
1-41mm² IMC CONDUIT
6. MAIN SERVICE ENTRANCE PROTECTION
 40,968 VA / 230V = 178.12 AMP
USE 225AT/225AF 2 POLE MCCB
7. VOLTAGE DROP CALCULATION:
 Vd = (I) X √ [(R")² + (X")²] X (L) / (305m)

NOTE : SINCE THE POWER SOURCE FROM SERVICE POLE TO SERVICE ENTRANCE WITH A DISTANCE OF LESS THAN 15 METERS, VOLTAGE DROP SHOULD NOT MORE THAN 5%
 D - LENGTH & WIRE FROM THE MAIN SOURCE IS LESS THAN (10meter)
 A - CROSS SECTION AREA OF WIRE IN (125 mm² THW)
 R" - RESISTIVITY OF COPPER WIRE (0.079 ohm/305meter)
 X" - REACTANCE OF COPPER WIRE (0.052 ohm/305meter)
 I - LOAD CURRENT IS (178.12 AMP)

Vd % = (178.12AMP) X √ [(0.079)² + (0.052)²] X (10m) / (305m)
 Vd % = 0.5523 volts
 Vd % = 0.5523/230 x 100%
Vd % = 0.24%, ACCEPTABLE VALUE, LESS THAN 5%

8. SHORT CIRCUIT ANALYSIS
 KVA CAP. OF TRANSFORMER = [(178.12)(230V)] /1000 = 40.97KVA
 REQUIRED SIZE OF TRANSFORMER MUST BE 50KVA
 Z = 1.2%



Step1: If.I. = 50KVA/[(230)] = 217.39 A
 Step 2: Mult. = 100/1.2 = 83.3
 Step 3: Is.c. = 217.39 x 83.3 = 18,115.21 A

Step 4: "f" factor= $\frac{2 \times L \times I_{L-L}}{C \times n \times E_{L-L}}$
 at length of 10mtrs or 32.81ft
 $f = \frac{2 \times 32.81 \times 18,115.21}{10,755 \times 1 \times 230V} = 0.4806$

Step 5: M = $\frac{1}{1 + 0.4806} = 0.6754$

Step 6: Is.c. sym RMS = 18,115.21 x 0.6754 = 12,235.05A

THEREFORE, USE 18 KAIC MINIMUM INTERRUPTING CAPACITY OF MAIN CIRCUIT T BREAKER FOR SERVICE ENTRANCE AND USE 10 KAIC FOR BRANCH CIRCUIT.

DESIGNER:		PEE:		PROJECT TITLE:	APPROVED BY:	REVISIONS	SHEET CONTENTS:	SHEET NO.
				PROPOSED 2 STOREY TOWNHOUSE (ELECTRICAL DESIGN LAYOUT)		DRAWN BY:	GENERAL NOTE DESIGN ANALYSIS	
						DATE:		
PRC:		VALID:				REVISION:		
PTR:		DATE:			OWNER:	REV. DATE:		
								PAGE 1 OF 4