DESIGN ANALYSIS

CIRCUIT NO. - 1

16 - 18W. FLOURESCENT LAMP
1 - 12W. PEN LIGHT

I = 300 VA / 230 V = 1.31 AMP.
AMPACITY = 1.31 x 1.25 = 1.64 A

USE : 2-2.0mm² THHN CU WIRE
IN 20mm² ø uPVC CONDUIT;
15 A 2POLE CIRCUIT BREAKER

CIRCUIT NO. - 2

7-18W. FLOURESCENT LAMP
6 - 12W. PEN LIGHT
2 - 5W. PEN LIGHT
4 - 25W CEILING EXHAUST FAN
I = 308 VA / 230 V = 1.34AMP.
AMPACITY = 1.34 x 1.25 = 1.67 A

USE : 2-2.0mm² THHN CU WIRE
IN 20mm² ø uPVC CONDUIT;
15 A 2POLE CIRCUIT BREAKER

CIRCUIT NO. - 3

10 - 18W. FLOURESCENT LAMP
6 - 12W. PEN LIGHT
2 - 5W. PEN LIGHT
3 - 25W CEILING EXHAUST FAN
I = 337 VA / 230 V = 1.47AMP.
AMPACITY = 1.47 x 1.25 = 1.83 A

USE : 2-2.0mm² THHN CU WIRE
IN 20mm² ø uPVC CONDUIT;
15 A 2POLE CIRCUIT BREAKER

CIRCUIT NO. - 4

16 - 18W. FLOURESCENT LAMP
2 - 12W. PEN LIGHT
4 - 5W PEN LIGHT
1 - 100W DECORATIVE LIGHT
I = 432 VA / 230 V = 1.88 AMP.
AMPACITY = 1.88 x 1.25 = 2.35 A

USE : 2-2.0mm² THHN CU WIRE
IN 20mm² ø uPVC CONDUIT;
15 A 2POLE CIRCUIT BREAKER

CIRCUIT NO. - 5

11-DUPLEX CONVENIENCE OUTLET
AT 180 VA / OUTLET
I = 1980 VA / 230 V = 8.61 Amp.
AMPACITY = 8.61 x 1.25 = 10.76 A

USE : 2-3.5mm² THHN CU WIRE
IN 20mm² ø uPVC CONDUIT;
20 A 2POLE CIRCUIT BREAKER
1-2.0 mm² TW. CU. GRND WIRE

CIRCUIT NO. - 6

13-DUPLEX CONVENIENCE OUTLET
AT 180 VA / OUTLET
I = 2340 VA / 230 V = 10.17 Amp.
AMPACITY = 10.17 x 1.25 = 12.72 A

USE : 2-3.5mm² THHN CU WIRE
IN 20mm² ø uPVC CONDUIT;
20 A 2POLE CIRCUIT BREAKER
1-2.0 mm² TW. CU. GRND WIRE

CIRCUIT NO. - 7

12-DUPLEX CONVENIENCE OUTLET
AT 180 VA / OUTLET
I = 2160 VA / 230 V = 9.39 Amp.
AMPACITY = 9.39 x 1.25 = 11.74 A

USE : 2-3.5mm² THHN CU WIRE
IN 20mm² ø uPVC CONDUIT;
20 A 2POLE CIRCUIT BREAKER
1-2.0 mm² TW. CU. GRND WIRE

CIRCUIT NO. - 8

15-DUPLEX CONVENIENCE OUTLET
AT 180 VA / OUTLET
I = 2700 VA / 230 V = 11.74 Amp.
AMPACITY = 11.74 x 1.25 = 14.67 A

USE : 2-3.5mm² THHN CU WIRE
IN 20mm² ø uPVC CONDUIT;
20 A 2POLE CIRCUIT BREAKER
1-2.0 mm² TW. CU. GRND WIRE

TYPICAL CIRCUIT NO. - 9 to CIRCUIT NO. 20

1-SPARE AT 2500 VA / OUTLET
I = 2500 VA / 230 V = 10.87 Amp.
AMPACITY = 10.87 x 1.25 = 13.59A

USE : 2-3.5mm² THHN CU WIRE
IN 20mm² ø uPVC CONDUIT;
30 A 2POLE CIRCUIT BREAKER
1-2.0 mm² TW. CU. GRND WIRE

TOTAL CONNECTED LOAD:

I total=165.21 AMPERES
@ 80% DEMAND FACTOR
I = 0.8 (165.21) = 132.17 A

USE : 2-22mm² THW CU WIRE
IN 45mm² ø uPVC CONDUIT;
1- 5.5mm² TW. CU. GRND WIRE

MAIN PROTECTION:
200 At 2POLE, 250V BOLT - ON TYPE
ACB W/ MINIMUM OF 8 KAIC

REPUBLIC OF THE PHILIPPINES
OFFICE OF THE BUILDING
OFFICAL
MUNICIPALITY OF CABATUAN

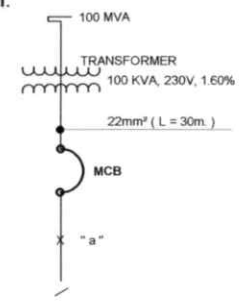
BUILDING OFFICIAL

ELECTRICAL

SHORT CIRCUIT CALCULATION

EXISTING TRANSFORMER , 100KVA / 230V, 1PHASE, % Z = 1.6%
SHORT CIRCUIT CURRENT CALCULATION (PER UNIT METHOD)

SYSTEM DIAGRAM:



UTILITY SHORT CIRCUIT AVAILABLE , 100MVA
USE: 100KVA BASE

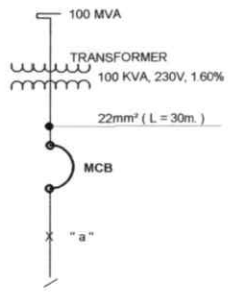
Compute PU value of Utility source (pu Zs)
Pu Zs = KVA base / Utility SC KVA = 100 / 100,000 = 0.01 pu
Compute PU for Transformer , (pu Zt)
Pu Zt = Impedence in percent / 100 = 1.6 / 100 = .016 pu

Compute value of feeder line

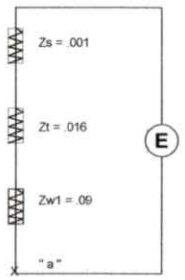
For 1 - Set 0f 2 x 22 mm sq. (PVC Conduit) L = 30m.
from PEC Table 9.1.1.9
XI = 0.051 R = .49
Z = sqrt (.051 x 0.51 + .49 x .49) x 30 / (305) = .048
Convert cable impedance from ohm to "pu"
pu Z = ohm impedance x KVA base / (KVsquare x 1000)
= .048 x 100 / (.230 x .230 x 1000) = .09

@ fault " a "

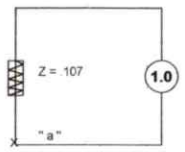
SINGEL LINE DIAGRAM



IMPEDANCE DIAGRAM



SIMPLIFIED DIAGRAM

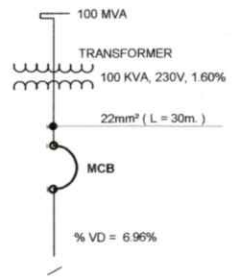


$$Isc = \frac{E}{Z} \times \frac{\text{base Va}}{\text{base V}}$$

$$Isc = \frac{1.0}{.107} \times \frac{100{,}000}{230\ V} = 4063$$

VOLTAGE DROP CALCULATION

Voltage Drop (VD) = I (sqrt (R sq + XI sq)
Where I = Line Current
R = Line AC Resistance , Ohms
X = Line reactance @ 60Hz, Ohms



@ MCB

Length - 30 mtrs. Size of wire - 2 x 22 mm sq. (PVC Conduit)
Total Current = 165.21Amps.
from PEC Table 9.1.1.9
XI = 0.51
R = 0.49
Vd = 165.21 (sqrt (0.051 x 0.051 + 0.49 x 0.49) x 30 x 2/
(305 m) = 16.01 Volts
% Vd = 16.01 x 100 / 230V = 6.96 %

PROJECT TITLE:	SEC. 33 R.A. 9266	PREPARED BY:	CHECKED BY:	APPROVED BY:	SHEET CONTENTS	SHEET NO.
EXTENSION OF RURAL HEALTH UNIT	DRAWINGS &SPECIFICATIONS DULY SIGNED & SEALED OR STAMPED , AS AN INSTRUMENTS OF SERVICE, ARE THE PROPERTY & DOCUMENTS OF THE ARCHITECT , WHETHER THE OBJECT FOR WHICH THEY ARE MADE IS EXECUTED OR NOT. IT SHALL BE UNLAWFUL FOR ANY PERSON , WITHOUT THE WRITTEN CONSENT OF THE ARCHITECT OR AUTHOR OF SAID DOCUMENTS TO DUPLICATE OR TO MAKE COPIES OF SAID DOCUMENTS FOR USE IN THE REPETITION OF AND FOR OTHER PROJECTS OF BUILDINGS, WHETHER EXECUTED PARTLY OR IN WHOLE.	**JOSE JOEL S. PARIS, JR.**	**RIC ARMANDO T. VALENZUELA**	**HON. ELIZALDE G. RUEYO**	AS SHOWN	**E-1**
LOCATION: CABATUAN, ILOILO		BUILDING INSPECTOR	MUNICIPAL ENGINEER	MUNICIPAL MAYOR		CADD by : JOHN ROVEL CORTEZ Checked by : DATE :