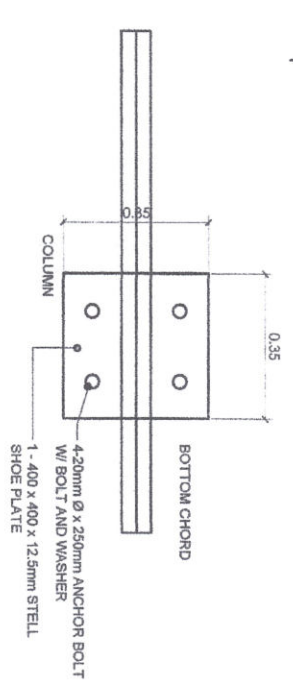
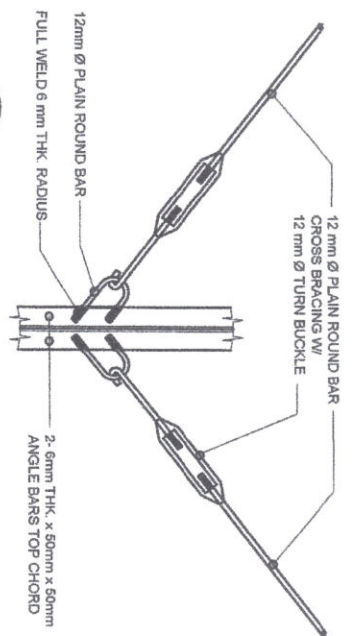
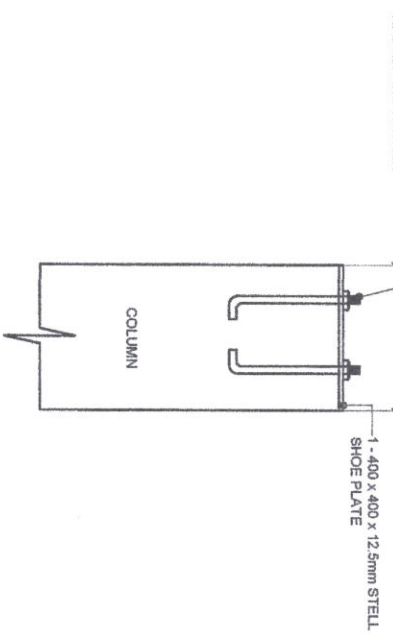


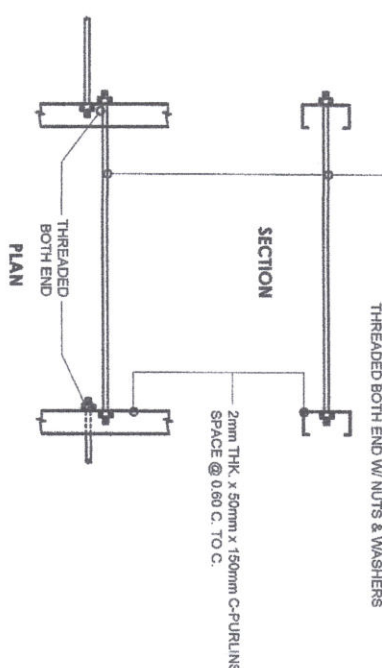
S CONNECTION DETAIL OF PURLINS
NTS.



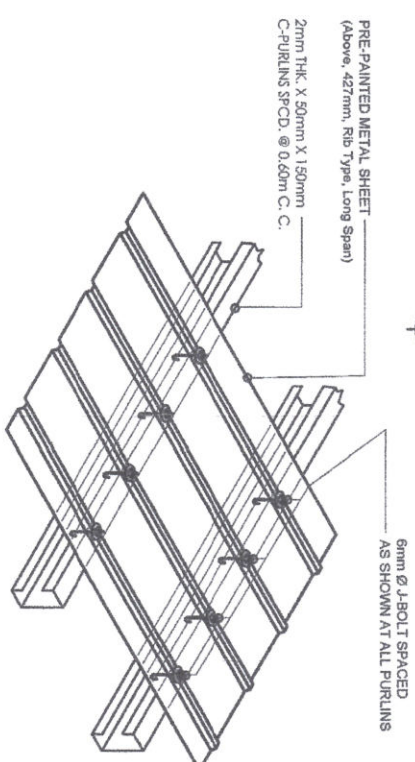
S DET. CONN. OF ANCHOR BOLT
NTS.



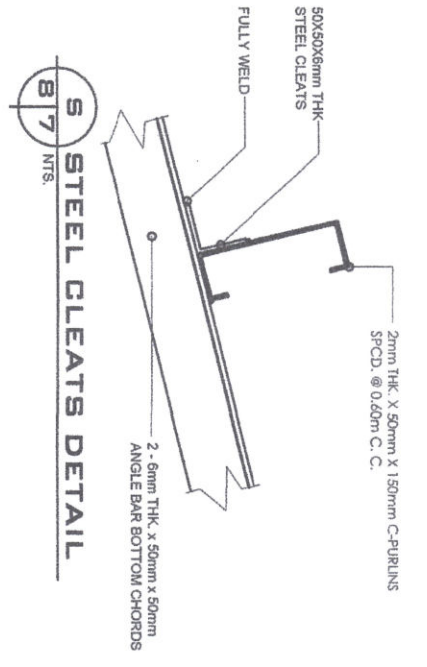
S CROSS BRACING DETAIL
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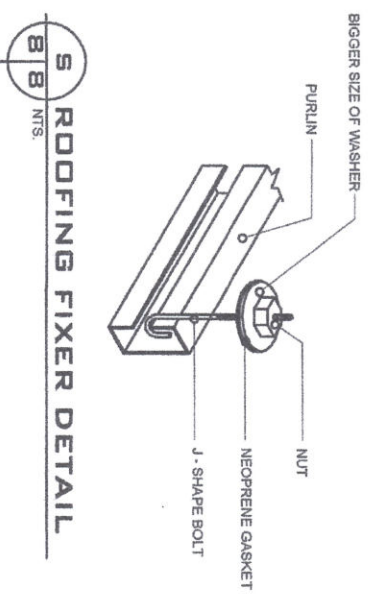
S DETAIL OF SAGROD
NTS.



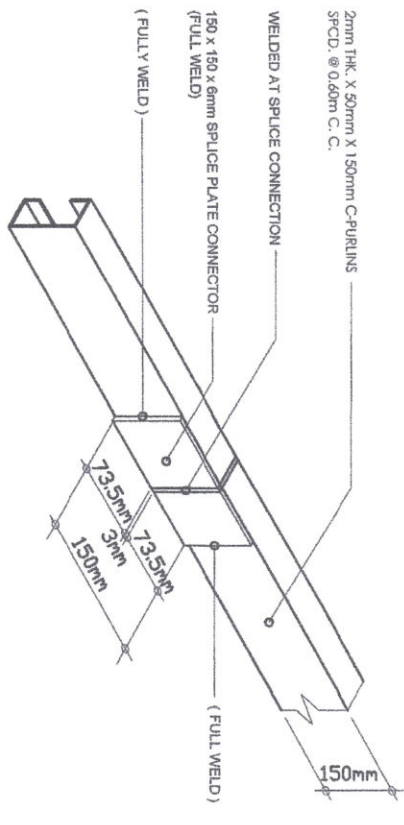
S ISOMETRIC VIEW CONNECTION SHOWING G.I. SHT., PURLINS & J-BOLT
NTS.



S STEEL CLEATS DETAIL
NTS.



S ROOFING FIXER DETAIL
NTS.

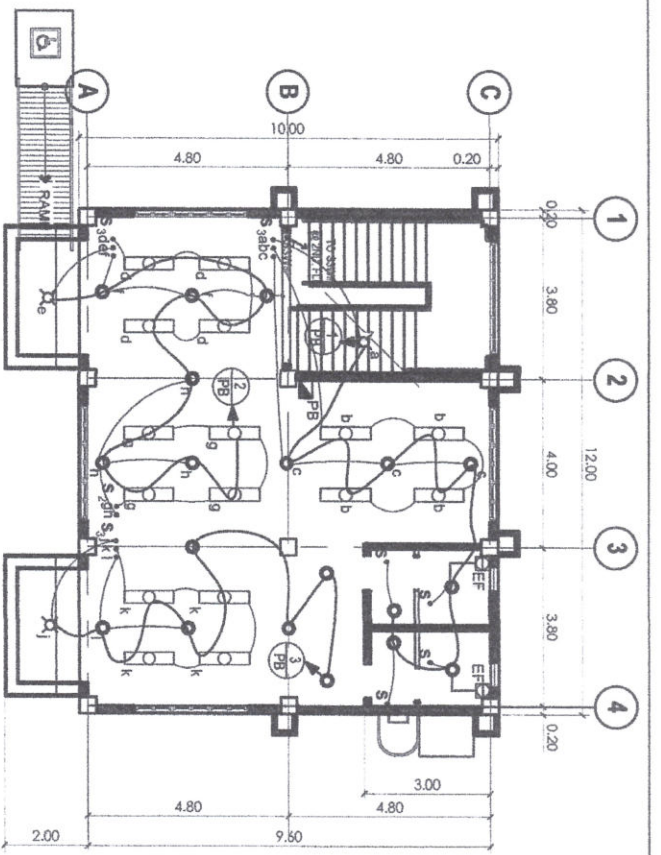


S SPLICE DETAIL OF C-PURLINS
NTS.

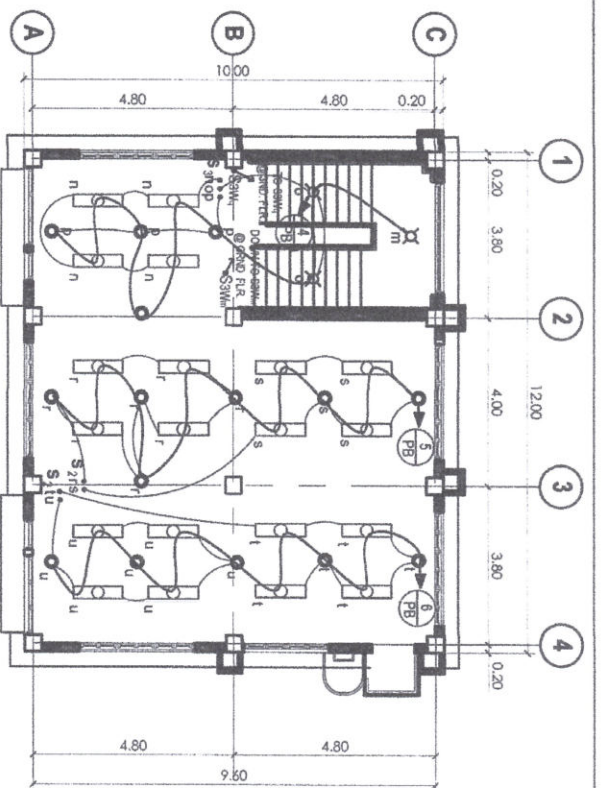
 DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGION IX 1ST DISTRICT ENGINEERING OFFICE SEGABE, PIVAN, ZAMBOANGA DEL NORTE		PROJECT & LOCATION : CONSTRUCTION OF A RAEMV BUILDING DAPITAN CITY, ZAMBOANGA DEL NORTE	
SHEET CONTENT : CONNECTION DETAIL OF PURLINS CROSS BRACING DETAIL STEEL CLEATS DETAIL DETAIL OF SAGROD ISOMETRIC VIEW CONNECTION SHOWING G.I. SHT., PURLINS & J-BOLT SPLICE DETAIL OF C-PURLINS		ARCHITECTURAL DESIGNER : OSCAR F. SIKARES JR. ENGINEERING ASSISTANT II STRUCTURAL DESIGN JOHN REO Q. BAEL ENGINEER II	
CHECKER : FERNANDO S. MIRASOL ARCHITECT II		SUBMITTED : ENGR. EMM A. TRANI CHIEF, PLANNING & DESIGN SECTION RECOMMENDING APPROVAL : ATTY. MARISOL D. LEGASPI REGIONAL DIRECTOR	
RECOMMENDED : OMBERTO HERIBERTO ASST. DISTRICT ENGINEER		APPROVED : VERONICA T. MISHANABAY DISTRICT ENGINEER	
SET NO. : S 129		SHEET NO. : 19 29	



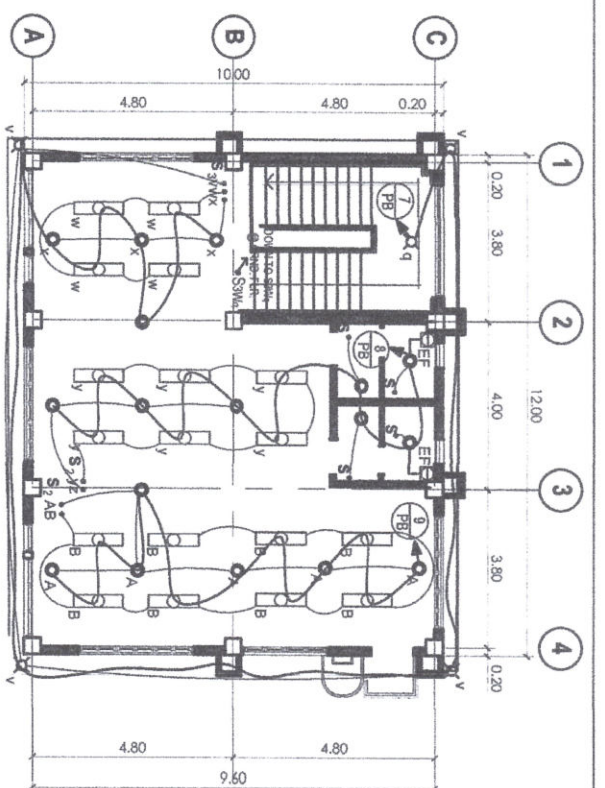
REPUBLIC OF THE PHILIPPINES
COMMISSION ON AUDIT
REGION IX



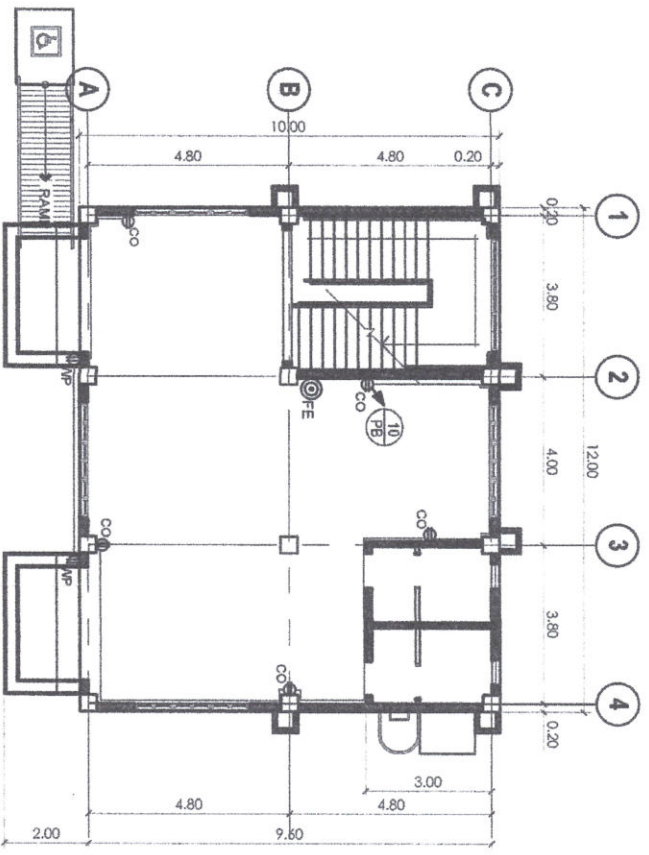
E-11 GROUND FLOOR LIGHTING LAYOUT PLAN
SCALE: 1:100 MTRS.



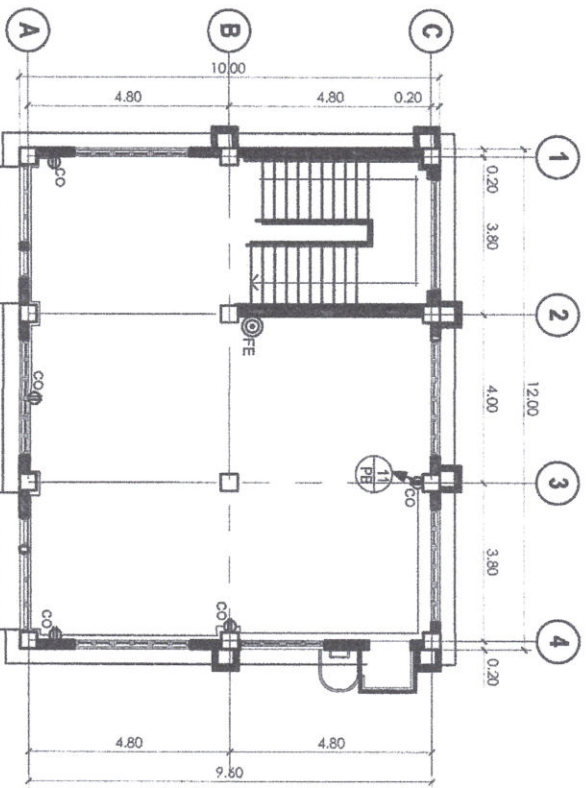
E-12 SECOND FLOOR LIGHTING LAYOUT PLAN
SCALE: 1:100 MTRS.



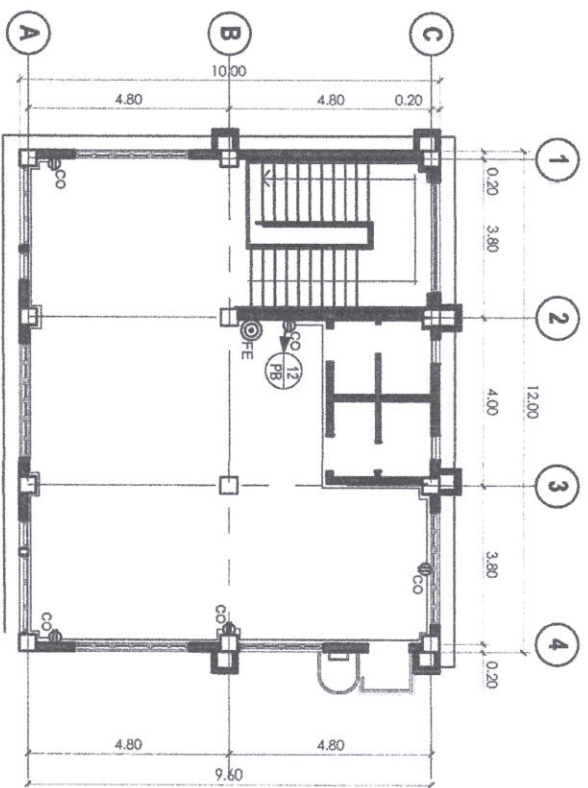
E-13 THIRD FLOOR LIGHTING LAYOUT PLAN
SCALE: 1:100 MTRS.





E-14 GROUND FLOOR POWER LAYOUT PLAN
SCALE: 1:100 MTRS.

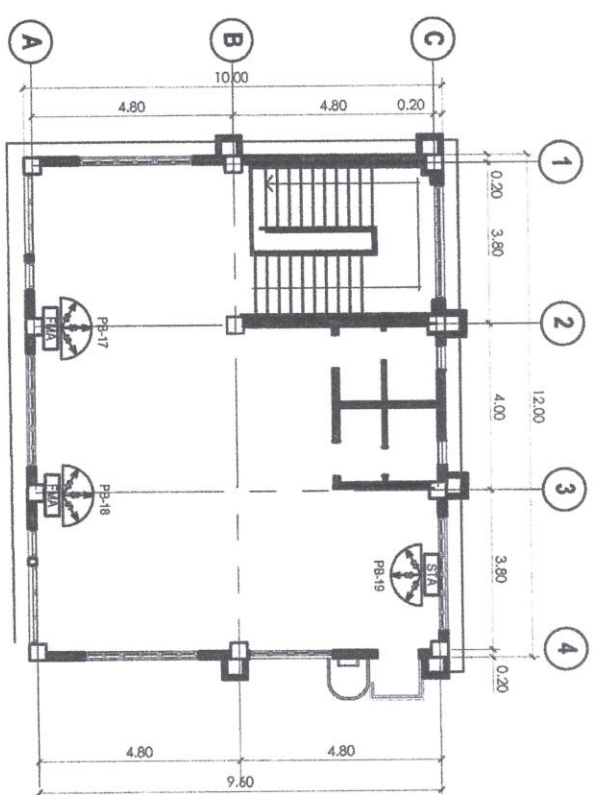
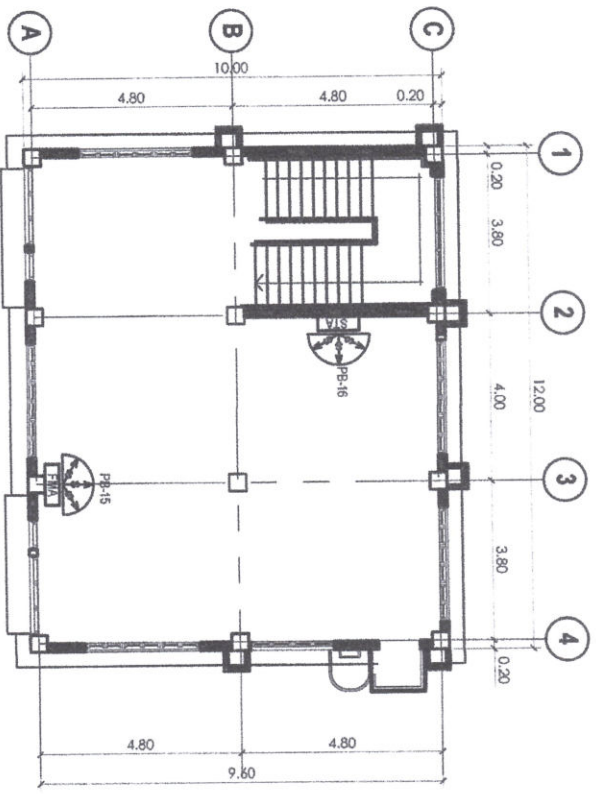
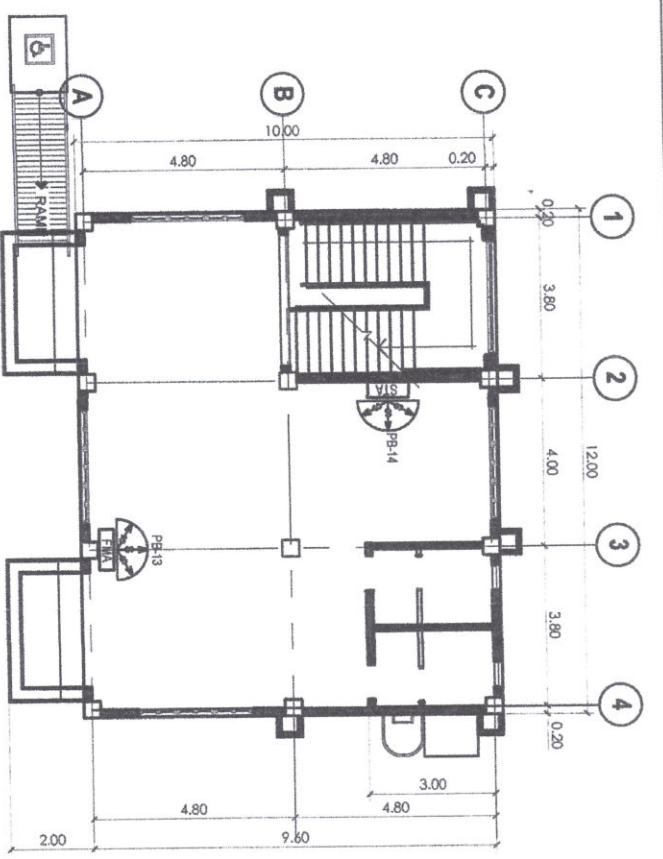


E-15 SECOND FLOOR POWER LAYOUT PLAN
SCALE: 1:100 MTRS.



E-16 THIRD FLOOR POWER LAYOUT PLAN
SCALE: 1:100 MTRS.

 <p>REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGION IX 1ST DISTRICT ENGINEERING OFFICE SEGABE, PIGAN, ZAMBOANGA DEL NORTE</p>		 <p>REPUBLIC OF THE PHILIPPINES COMMISSION ON AUDIT REGION IX</p>	
PROJECT & LOCATION:		CONSTRUCTION OF A RAEMU BUILDING DAPITAN CITY, ZAMBOANGA DEL NORTE	
SHEET CONTENT:		GROUND FLOOR LIGHTING & POWER LAYOUT PLAN SECOND FLOOR LIGHTING & POWER LAYOUT PLAN THIRD FLOOR LIGHTING & POWER LAYOUT PLAN	
DESIGNED:	PROFESSIONAL ELECTRICAL ENGINEER	CHECKED:	ARCHITECT II
PREPARED:	CLARENCE B. DOMIDYANO ENGINEER I	APPROVED:	VERONICO O. NISARANDAYO DISTRICT ENGINEER
SUBMITTED:	ENGINEER III EVA A. TRAMI	RECOMMENDED:	ASSISTANT DISTRICT ENGINEER CHRISTOPHER I. BALI
RECOMMENDING APPROVAL:	CHIEF, PLANNING & DESIGN SECTION ATTN: MARISOL D. LEGASPI OIC-DIRECTOR IV REGIONAL DIRECTOR	RECOMMENDING APPROVAL:	ASSISTANT COMMISSIONER ADMINISTRATION SECTION LORNA D. CABOCHANI
SET NO.:	E-16	APPROVED:	ASSISTANT COMMISSIONER ADMINISTRATION SECTION LORNA D. CABOCHANI
SHEET NO.:	20	APPROVED:	ASSISTANT COMMISSIONER ADMINISTRATION SECTION LORNA D. CABOCHANI

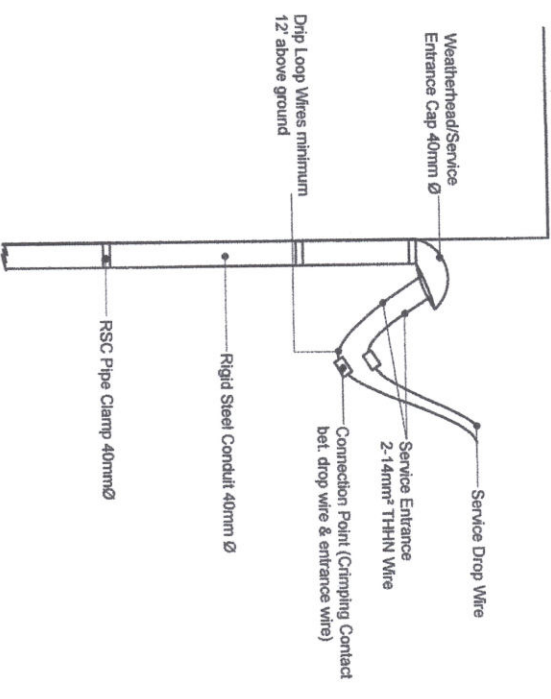


E 21 GROUND FLOOR ACU OUTLET LAYOUT PLAN
SCALE: 1:100 MTRS.

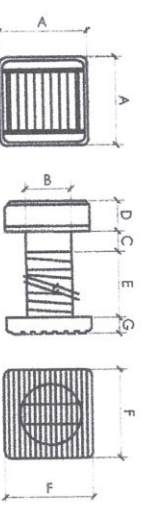
E 22 SECOND FLOOR ACU OUTLET LAYOUT PLAN
SCALE: 1:100 MTRS.

E 23 THIRD FLOOR ACU OUTLET LAYOUT PLAN
SCALE: 1:100 MTRS.

NOTE: VERIFY EXACT LOCATION THE LOCATION OF SERVICE ENTRANCE MAY DEPEND ON THE NEAREST ELECTRIC UTILITY SUPPLY



E 24 SERVICE ENTRANCE DETAIL
NTS.



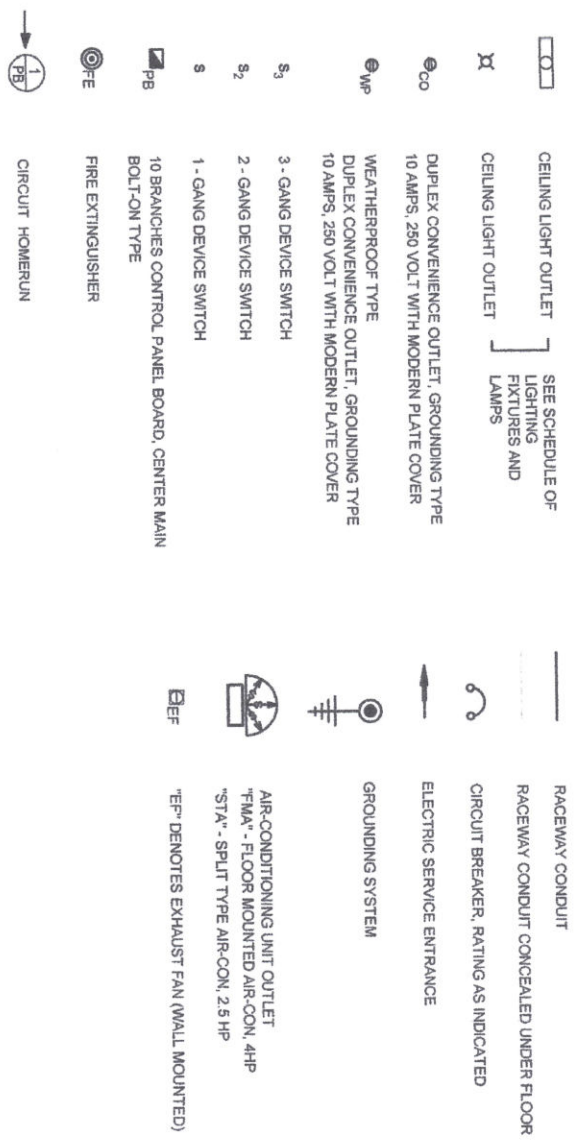
- FAN TYPE-AXIAL**
- Catalogue Number: WVK450
 - Cubic meters per hour: 230 m³/h
 - Litres per second: 64 l/s
 - Overall intake size (A): 210 mm x 210 mm
 - Duct size dia (B): 146 mm Ø
 - Internal protrusion (C): 62 mm
 - Overall intake size (A): 54 mm
 - Wall depth required (E): Min. 86mm / Max. 450mm
 - Outlet grille size (F): 207mm X 207mm
 - Outlet external protrusion (G): 28mm
 - Hole size dia: 170mm Ø
 - Number of speeds: 1
 - Rated voltage: 220-240V
 - Watts: 45W
 - Full load current: 0.13A
 - Motor type (IPXX4): Ball bearing
 - Decibel rating @ 3 meters: 44dB(A)

Features:

- Ball bearing motors
- Splashproof (IPXX4 Protection Rating)
- Automatic shutters
- Supplied with fixed grille outlet

Extra Miniature with Auto Shutters:

The main benefit of the Miniature Series is its versatility. For the convenience, fans can be either wall or ceiling mounted. Automatic shutters are incorporated into these units to ensure unwanted draughts are kept outside.



E 25 EXHAUST FAN DETAIL
NTS.

PROJECT & LOCATION:

SHEET CONTENT:

DESIGNED BY: CLARENCE B. DONOVANO	CHECKED BY: [Signature]	SUBMITTED BY: [Signature]	RECOMMENDED BY: [Signature]	APPROVED BY: [Signature]	SET NO.: E 25	SHEET NO.: 21
PROFESSIONAL ELECTRICAL ENGINEER	ARCHITECT II	ENGINEER III	ASST. DISTRICT ENGINEER	DISTRICT ENGINEER		
PREPARED BY: [Signature]	ARCHITECT II	ENGINEER III	ASST. DISTRICT ENGINEER	DISTRICT ENGINEER		
RECOMMENDING APPROVAL: [Signature]	RECOMMENDING APPROVAL: [Signature]	APPROVED: [Signature]	APPROVED: [Signature]	APPROVED: [Signature]		
CHIEF, PLANNING & DESIGN SECTION	CHIEF, PLANNING & DESIGN SECTION	DIRECTOR IV	DIRECTOR IV	ASSISTANT COMMISSIONER ADMINISTRATION SECTION		
ENGINEER III	ENGINEER III	DIRECTOR IV	DIRECTOR IV	ASSISTANT COMMISSIONER ADMINISTRATION SECTION		
ENGINEER III	ARCHITECT II	ENGINEER III	ASST. DISTRICT ENGINEER	DISTRICT ENGINEER		
ENGINEER III	ARCHITECT II	ENGINEER III	ASST. DISTRICT ENGINEER	DISTRICT ENGINEER		

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGION IX
1ST DISTRICT ENGINEERING OFFICE
SEGABE, PIRAN, ZAMBOANGA DEL NORTE

CONSTRUCTION OF A RAEMU BUILDING
DARIWAN CITY, ZAMBOANGA DEL NORTE

GROUND, SECOND & THIRD FLOOR
ACU OUTLET PLAN
SERVICE ENTRANCE DETAIL
EXHAUST FAN DETAIL
LEGEND

RECOMMENDING APPROVAL: [Signature]

RECOMMENDING APPROVAL: [Signature]

APPROVED: [Signature]

APPROVED: [Signature]



REPUBLIC OF THE PHILIPPINES
COMMISSION ON AUDIT
REGION IX

ATTY. MARISSOL B. LEGASPI
OIC-DIRECTOR IV
REGIONAL DIRECTOR

AMELIA P. VALDEZ
DIRECTOR IV
GSO

LORNA D. CABOCHAN
ASSISTANT COMMISSIONER
ADMINISTRATION SECTION

ELECTRICAL NOTES:

1. ALL ELECTRICAL WORKS SHALL BE DONE IN ACCORDANCE TO THE REQUIREMENTS OF THE LATEST EDITION OF THE PHILIPPINE ELECTRICAL CODE (PEC) AND THE REQUIREMENTS OF THE LOCAL POWER COMPANY.
2. ELECTRICAL SERVICE SHALL BE 230 VOLTS, 1-PHASE, 60 HZ.
3. ALL MATERIALS TO BE USED FOR THE WORK SHALL BE NEW AND CONFORM TO THE RELEVANT STANDARDS REQUIRED.
4. ALL WIRES AND CABLES SHALL BE 98% CONDUCTIVITY COPPER, SOFT DRAW AND ANNEALED. ALL WIRE SIZE 3.5mm² THINWALL & LARGER SHALL BE STRANDED COPPER. ALL WIRES SHALL BE COLOR CODED EASY IDENTIFICATION.
5. ALL CONDUITS FOR INTERIOR SYSTEMS SHALL EMPLOY RIGID PVC UNLESS OTHERWISE STATED IN THE PLAN. NO CONDUIT IN ANY SYSTEM SHALL BE SMALLER THAN 20mm dia. SIZE NOT SHALL HAVE NO MORE THAN FOUR BENDS IN ANY RUN.
6. ALL METALLIC CONDUITS, CABINETS AND EQUIPMENT SHALL BE PROPERLY GROUNDED AND BONDED BY MEANS OF COPPER STRAPS.
7. ALL MATERIALS & EQUIPMENT TO BE EMPLOYED SHALL BE OF THE APPROVED TYPE FOR LOCATION AND PURPOSE.
8. ALL LIGHTING FIXTURES SHALL BE SURFACE MOUNTED, UNLESS OTHERWISE STATED IN THE PLANS & DRAWINGS.
9. ALL SPECIAL PURPOSE OUTLETS SHALL HAVE AMPERE RATINGS OF NOT LESS THAN THEIR CIRCUIT AMPERE RATINGS.
10. MOUNTING HEIGHTS MEASURED FROM FLOOR FINISH TO CENTER LINE OF THE DEVICES / EQUIPMENT SHALL BE AS FOLLOWS:
 SWITCHES 1.2 m
 CONV. OUTLET 0.3 m
 PANEL BOARD 1.5 m
11. SPLICES & TAPS SHALL BE MADE ONLY IN JUNCTION OR OUTLET BOXES.
12. CONDUITS FOR UNDERGROUND OUTDOOR INSTALLATIONS SHALL SET AS A MINIMUM OF 600 mm BELOW GROUND. ALL CONDUIT RUN SHALL HAVE A MINIMUM OF 75 mm THK. CONCRETE ENVELOPE.
13. THE SPARE CIRCUITS SHALL BE PROVIDED WITH AN EMPTY ELECTRICAL PIPE SIZE OF 20mm dia. & 4" X 4" JUNCTION BOX WITH COVER THAT SHOULD EXTEND THE CEILING LINE OR OUTSIDE OF THE BUILDING.
14. LOCAL ELECTRICAL PERMITS AND OTHER GOVERNMENT AND LOCAL ELECTRICAL COOPERATIVE REQUIREMENTS SHALL BE COMPLIED WITH BY THE CONTRACTOR.
15. ELECTRICAL WORKS SHALL BE UNDER THE DIRECT SUPERVISION OF LICENSED ELECTRICAL ENGINEER OR MASTER ELECTRICIAN AS PROVIDED FOR R.A. 7920.

ILLUMINATION LEVEL:

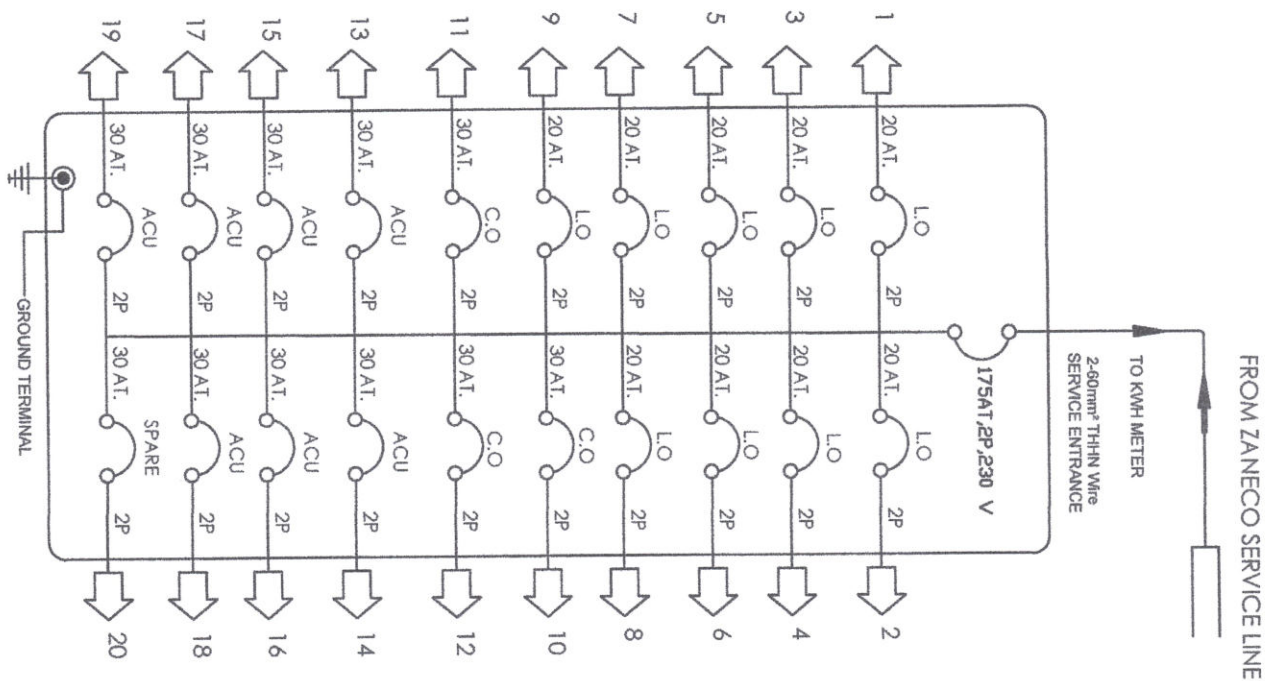
- TYPE 28 VA SQ.M. (OFFICE BUILDING)
 GROUND FLOOR
 RECORDS AREA:
 FLOOR AREA: 91 SQ.M.
 ILLUMINATION: (91)(90)(28) = 152890 LUMMENS
 NO. OF LAMPS = $\frac{152890}{(90)(90)} = 31$
- SECOND FLOOR
 RECORDS AREA:
 FLOOR AREA: 102 SQ.M.
 ILLUMINATION: (102)(90)(28) = 171360 LUMMENS
 NO. OF LAMPS = $\frac{171360}{(90)(90)} = 35$
- THIRD FLOOR
 FUNCTION HALL:
 FLOOR AREA: 92 SQ.M.
 FLOURESCENT LAMP: 80 LUMMENS/VA
 ILLUMINATION: (92)(90)(28) = 154560 LUMMENS
 NO. OF LAMPS = $\frac{154560}{(90)(90)} = 32$

SCHEDULE OF LIGHTING FIXTURES AND LAMPS:

SYMBOLS	DESCRIPTION	INSTRUCTION
□	TWO (2) 40W, 230V, 60Hz AC FLOURESCENT LIGHTING FIXTURE, BOX TYPE WITH REFLECTORIZED DIFFUSER.	MOUNTING SURFACE CEILING MOUNTED
⊕	25W, 230V, 60Hz AC LED BULB LIGHTING FIXTURE W/ KEYLESS RECEPTACLE	MOUNTING SURFACE CEILING MOUNTED
○	25W, 230V, 60Hz AC LED BULB (PHILIGHT) LIGHTING FIXTURE W/ PHILIGHT HOLDER	MOUNTING SURFACE CEILING MOUNTED

NOTE: ALL LIGHTING FIXTURES SHALL BE EQUIPPED WITH A HIGH POWER FACTOR, PRE-HEAT WITH STARTER AND THERMALLY PROTECTED BALLAST, COMPLETE WITH ALL NECESSARY ACCESSORIES, WIRING AND READY FOR USE.

E SITE DEVELOPMENT PLAN
 SCALE: 1:500 NTS.



16mmø RSC PIPE x 2400 mm LENGTH
 GROUNDING ROD COPPERWELD
E SINGLE LINE DIAGRAM
 SCALE: 3/3 NTS.

E LOCATION PLAN
 SCALE: 3/1 NTS.

<p>REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGION IX 1ST DISTRICT ENGINEERING OFFICE SEGABE, BUKAY, ZAMBOANGA DEL NORTE</p>		<p>PROJECT & LOCATION: CONSTRUCTION OF A RAEMU BUILDING DAPIAN CITY, ZAMBOANGA DEL NORTE</p>	
<p>SHEET CONTENT: ELECTRICAL NOTES ILLUMINATION LEVEL COMPUTATION SCHEDULE OF LIGHTING FIXTURE & LAMPS SITE DEVELOPMENT PLAN SINGLE LINE DIAGRAM</p>		<p>DESIGNED: PROFESSIONAL ELECTRICAL ENGINEER PREPARED: CLARENCE R. DOMODOYANO ARCHITECT II</p>	
<p>CHECKED: FERNANDO C. MIRASOL ARCHITECT II</p>		<p>SUBMITTED: ENGINEER III EVA A. TRANI CHIEF, PLANNING & DESIGN SECTION</p>	
<p>RECOMMENDED: APRILSOPHIE EBAL ASST. DISTRICT ENGINEER</p>		<p>APPROVED: VERONICO M. MICALANDAYO DISTRICT ENGINEER</p>	
<p>RECOMMENDING APPROVAL: ATTY. MARICELLE ROSA CHIEF, REGIONAL DIRECTOR</p>		<p>RECOMMENDING APPROVAL: AMELIA P. VALDEZ DIRECTOR IV</p>	
<p>APPROVED: LORNA D. CABOCHAN ASSISTANT COMMISSIONER ADMINISTRATION SECTOR</p>		<p>SET NO.: A SHEET NO.: 22</p>	



SCHEDULE OF LOADS:

CCT. NO.	DESCRIPTION	VOLT	VA LOAD	AMP.	CB, BOLT ON TYPE				FEEDER WIRES	CONDUIT SIZE
					AT	AF	FOLE	KAC		
C-1	LIGHTING OUTLET (4nos.-2x40W/8' & 8nos.-25W/8')	230	820	2.26	20	50	2	10	2-3.5mm ² THHN WIRE STRANDED	20mm PVC PIPE
C-2	LIGHTING OUTLET (8nos.-2x40W/8' & 7nos.-25W/8')	230	815	3.54	20	50	2	10	2-3.5mm ² THHN WIRE STRANDED	20mm PVC PIPE
C-3	LIGHTING OUTLET (4nos.-2x40W/8' & 7nos.-25W/8')	230	495	2.15	20	50	2	10	2-3.5mm ² THHN WIRE STRANDED	20mm PVC PIPE
C-4	LIGHTING OUTLET (4nos.-2x40W/8' & 7nos.-25W/8')	230	495	2.15	20	50	2	10	2-3.5mm ² THHN WIRE STRANDED	20mm PVC PIPE
C-5	LIGHTING OUTLET (8nos.-2x40W/8' & 6nos.-25W/8')	230	790	3.43	20	50	2	10	2-3.5mm ² THHN WIRE STRANDED	20mm PVC PIPE
C-6	LIGHTING OUTLET (8nos.-2x40W/8' & 5nos.-25W/8')	230	745	3.33	20	50	2	10	2-3.5mm ² THHN WIRE STRANDED	20mm PVC PIPE
C-7	LIGHTING OUTLET (6nos.-2x40W/8' & 7nos.-25W/8')	230	545	2.37	20	50	2	10	2-3.5mm ² THHN WIRE STRANDED	20mm PVC PIPE
C-8	LIGHTING OUTLET (6nos.-2x40W/8' & 7nos.-25W/8' & 2nos.-45W/8')	230	745	3.24	20	50	2	10	2-3.5mm ² THHN WIRE STRANDED	20mm PVC PIPE
C-9	LIGHTING OUTLET (8nos.-2x40W/8' & 6nos.-25W/8')	230	790	3.43	20	50	2	10	2-3.5mm ² THHN WIRE STRANDED	20mm PVC PIPE
C-10	DUPLEX CONVENIENCE OUTLET (7nos.-180 VA)	230	1260	5.48	30	50	2	10	2-5.5mm ² THHN WIRE STRANDED	20mm PVC PIPE
C-11	DUPLEX CONVENIENCE OUTLET (6nos.-180 VA)	230	900	3.91	30	50	2	10	2-5.5mm ² THHN WIRE STRANDED	20mm PVC PIPE
C-12	DUPLEX CONVENIENCE OUTLET (5nos.-180 VA)	230	900	3.91	30	50	2	10	2-5.5mm ² THHN WIRE STRANDED	20mm PVC PIPE
C-13	ACU (INVERTER, FLOOR MOUNTED TYPE)	230	3000	13.04	30	50	2	10	2-5.5mm ² THHN WIRE STRANDED	20mm PVC PIPE
C-14	ACU (INVERTER, SPLIT TYPE)	230	2000	8.70	30	50	2	10	2-5.5mm ² THHN WIRE STRANDED	20mm PVC PIPE
C-15	ACU (INVERTER, FLOOR MOUNTED TYPE)	230	3000	13.04	30	50	2	10	2-5.5mm ² THHN WIRE STRANDED	20mm PVC PIPE
C-16	ACU (INVERTER, SPLIT TYPE)	230	2000	8.70	30	50	2	10	2-5.5mm ² THHN WIRE STRANDED	20mm PVC PIPE
C-17	ACU (INVERTER, FLOOR MOUNTED TYPE)	230	3000	13.04	30	50	2	10	2-5.5mm ² THHN WIRE STRANDED	20mm PVC PIPE
C-18	ACU (INVERTER, FLOOR MOUNTED TYPE)	230	3000	13.04	30	50	2	10	2-5.5mm ² THHN WIRE STRANDED	20mm PVC PIPE
C-19	ACU (INVERTER, SPLIT TYPE)	230	2000	13.04	30	50	2	10	2-5.5mm ² THHN WIRE STRANDED	20mm PVC PIPE
C-20	SPARE	230	1000	4.35	30	50	2	10	2-5.5mm ² THHN WIRE STRANDED	20mm PVC PIPE
TOTAL			28,020	124.15						

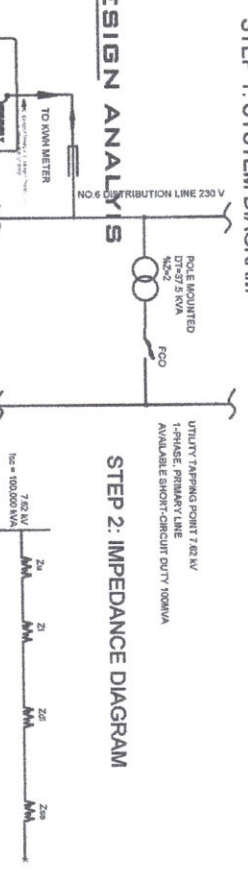
DESIGN ANALYSIS: SHORT CIRCUIT & VOLTAGE DROP

SHORT CIRCUIT CALCULATION

STEP 1: SYSTEM DIAGRAM

USE 2-40 mm² THHN + 14mm² THHN (G)
In 40mm Ø RSC PIPE

COMPUTATION & DESIGN ANALYSIS



STEP 2: IMPEDANCE DIAGRAM



STEP 3: COLLECT DATA

Item 1: Grid Line (Utility)
Zu = kVA base / Utility SC kVA
Zu = 37.5 kVA / 100,000 kVA
Zu = 0.000375

Item 2: Transformer
Note: Pole Mounted 37.5 kVA (assuming Cu-Cu windings, use %Z = 1.2 %). The percentage impedance (%Z) can be found in Table 14 of ANSI/IEEE std. 242-1986, TRANSFORMER, p.23
IMPEDANCE DATA OF SINGLE PHASE TRANSFORMER, p.23
Z1 = Impedance in percent / 100
Z1 = 1.2 / 100
Z1 = 0.012 Ω

Item 3: Resistance & Reactance
Distribution Line: 198.85 ft
Service Entrance: 65.62 ft
No. 3/0 Cable, 198.85 ft
Rdl = 0.0068/100ft
Xdl = 0.00324/100ft
Rse = 0.00457/100ft
Xse = 0.00221/100ft
Zdl = 0.00323 + j(198.85ft/100ft)
Zse = 0.00221 + j(65.62ft/100ft)
Zdl = 0.014 Ω
Zse = 0.0021 Ω

Item 4: Impedances
Rdl = 0.013
Xdl = 0.0064
Zdl = √(0.013² + 0.0064²)
Zdl = 0.014 Ω

Item 5: Resistances
Rdl = 0.0068
Xdl = 0.00324
Zdl = 0.00323 + j(198.85ft/100ft)
Zse = 0.00221 + j(65.62ft/100ft)
Zdl = 0.014 Ω
Zse = 0.0021 Ω

Item 6: Compute for the Resistance & Reactance
Zu = 0.000375
Z1 = 0.012
Zdl = 0.01351
Zse = 0.00421
Zcombine = Zu + Z1 + Zdl + Zse
Zcombine = 0.000375 + 0.012 + 0.01351 + 0.00421 + 0.004
Zcombine = 0.034

Item 7: Combine the Zs
Therefore, MCB shall be rated not less than 10,000 amperes RMS
Use 10 kAIC

STEP 4: Compute for the Resistance & Reactance

Reference: 2009 Philippine Electrical Code Part V-1
Remarks: The allowable voltage drop from the transformer secondary terminal to the furthest load did not exceed the allowable voltage drop of 5%
Distribution Transf. to MDP:
R=10.100(20/50m) x 20 m
R=0.07 Ω
X=0.043(20/50m) x 20 m
X=0.020 Ω
VD=103.55 A x √(0.007² + 0.020²)
VD=0.78 V

VOLTAGE AT MDP=VS-VD=230-0.78 V
=229.22 V
%VD = (230-229.22/230) x 100 = 0.34

Item 8: Resistances
Rdl = 0.0068
Xdl = 0.00324
Zdl = 0.00323 + j(198.85ft/100ft)
Zse = 0.00221 + j(65.62ft/100ft)
Zdl = 0.014 Ω
Zse = 0.0021 Ω

Item 9: Impedances
Rdl = 0.013
Xdl = 0.0064
Zdl = √(0.013² + 0.0064²)
Zdl = 0.014 Ω

Item 10: Resistances
Rdl = 0.0068
Xdl = 0.00324
Zdl = 0.00323 + j(198.85ft/100ft)
Zse = 0.00221 + j(65.62ft/100ft)
Zdl = 0.014 Ω
Zse = 0.0021 Ω

Item 11: Compute for Short Circuit Current
Zu = 0.000375
Z1 = 0.012
Zdl = 0.01351
Zse = 0.00421
Zcombine = Zu + Z1 + Zdl + Zse
Zcombine = 0.000375 + 0.012 + 0.01351 + 0.00421 + 0.004
Zcombine = 0.034

Item 12: Compute for the Resistance & Reactance
Distribution Line: 198.85 ft
Service Entrance: 65.62 ft
No. 3/0 Cable, 198.85 ft
Rdl = 0.0068/100ft
Xdl = 0.00324/100ft
Rse = 0.00457/100ft
Xse = 0.00221/100ft
Zdl = 0.00323 + j(198.85ft/100ft)
Zse = 0.00221 + j(65.62ft/100ft)
Zdl = 0.014 Ω
Zse = 0.0021 Ω

Item 13: Impedances
Rdl = 0.013
Xdl = 0.0064
Zdl = √(0.013² + 0.0064²)
Zdl = 0.014 Ω

Item 14: Resistances
Rdl = 0.0068
Xdl = 0.00324
Zdl = 0.00323 + j(198.85ft/100ft)
Zse = 0.00221 + j(65.62ft/100ft)
Zdl = 0.014 Ω
Zse = 0.0021 Ω

Item 15: Compute for Short Circuit Current
Zu = 0.000375
Z1 = 0.012
Zdl = 0.01351
Zse = 0.00421
Zcombine = Zu + Z1 + Zdl + Zse
Zcombine = 0.000375 + 0.012 + 0.01351 + 0.00421 + 0.004
Zcombine = 0.034

Item 16: Compute for the Resistance & Reactance
Distribution Line: 198.85 ft
Service Entrance: 65.62 ft
No. 3/0 Cable, 198.85 ft
Rdl = 0.0068/100ft
Xdl = 0.00324/100ft
Rse = 0.00457/100ft
Xse = 0.00221/100ft
Zdl = 0.00323 + j(198.85ft/100ft)
Zse = 0.00221 + j(65.62ft/100ft)
Zdl = 0.014 Ω
Zse = 0.0021 Ω

Item 17: Impedances
Rdl = 0.013
Xdl = 0.0064
Zdl = √(0.013² + 0.0064²)
Zdl = 0.014 Ω

Item 18: Resistances
Rdl = 0.0068
Xdl = 0.00324
Zdl = 0.00323 + j(198.85ft/100ft)
Zse = 0.00221 + j(65.62ft/100ft)
Zdl = 0.014 Ω
Zse = 0.0021 Ω

Item 19: Compute for Short Circuit Current
Zu = 0.000375
Z1 = 0.012
Zdl = 0.01351
Zse = 0.00421
Zcombine = Zu + Z1 + Zdl + Zse
Zcombine = 0.000375 + 0.012 + 0.01351 + 0.00421 + 0.004
Zcombine = 0.034

Item 20: Compute for the Resistance & Reactance
Distribution Line: 198.85 ft
Service Entrance: 65.62 ft
No. 3/0 Cable, 198.85 ft
Rdl = 0.0068/100ft
Xdl = 0.00324/100ft
Rse = 0.00457/100ft
Xse = 0.00221/100ft
Zdl = 0.00323 + j(198.85ft/100ft)
Zse = 0.00221 + j(65.62ft/100ft)
Zdl = 0.014 Ω
Zse = 0.0021 Ω

Item 21: Impedances
Rdl = 0.013
Xdl = 0.0064
Zdl = √(0.013² + 0.0064²)
Zdl = 0.014 Ω

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGION IX
1ST DISTRICT ENGINEERING OFFICE
SEBASTIAN PIÑAN, ZAMBOANGA DEL NORTE

REPUBLIC OF THE PHILIPPINES
COMMISSION ON AUDIT
REGION IX

PROJECT & LOCATION:
CONSTRUCTION OF A RAMBU BUILDING
DAMIAN CITY, ZAMBOANGA DEL NORTE

SHEET CONTENT:
SCHEDULE OF LOADS
DESIGN ANALYSIS: SHORT CIRCUIT
ANALYSIS & VOLTAGE DROP

DESIGNED BY:
PROFESSIONAL ELECTRICAL ENGINEER
CLARENCE A. GONZALEZ
REGISTERED

CHECKED BY:
ARCHITECT
FRYDWINA C. MIRASOL

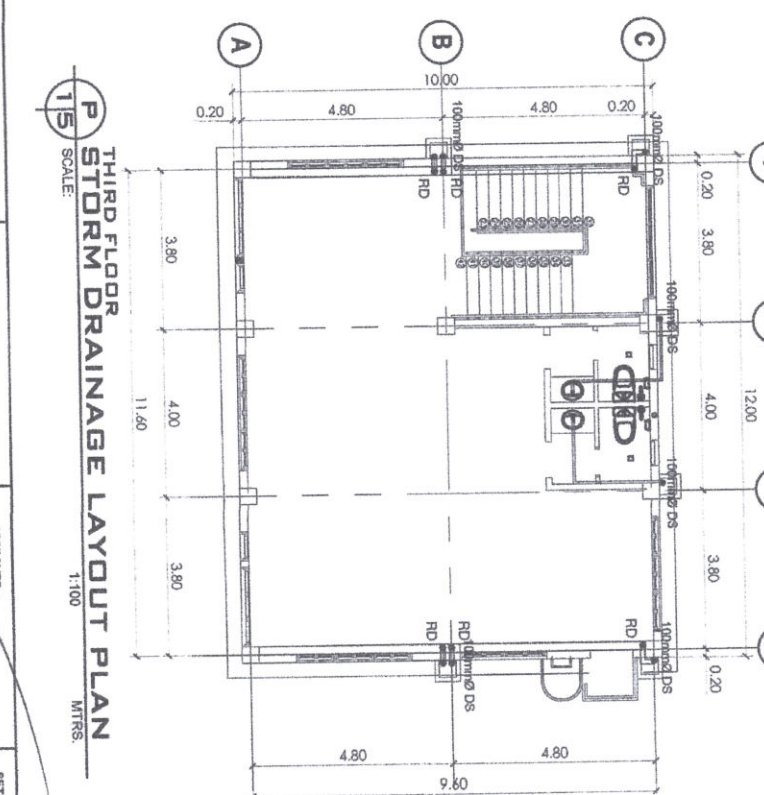
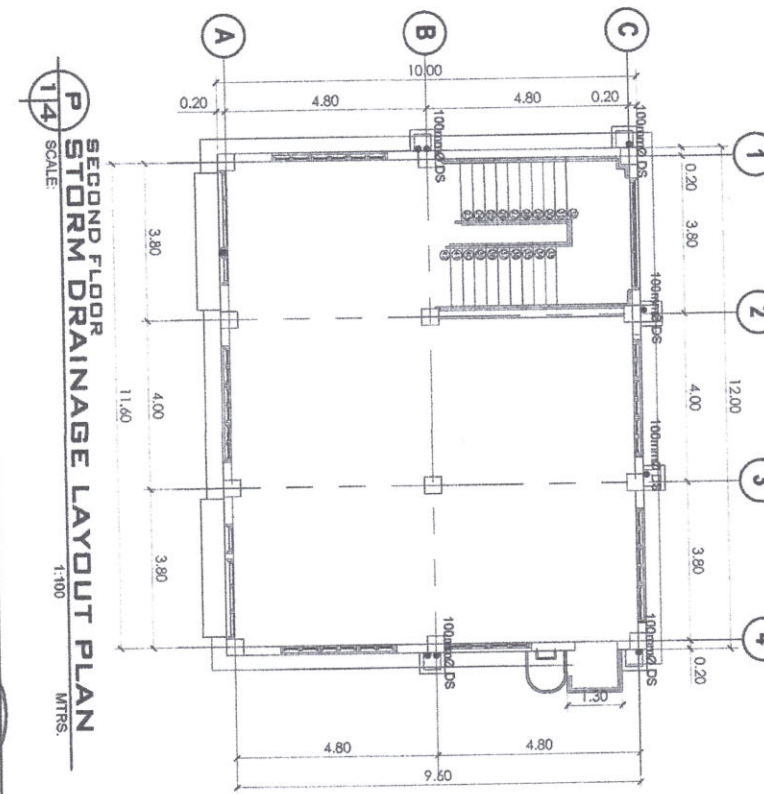
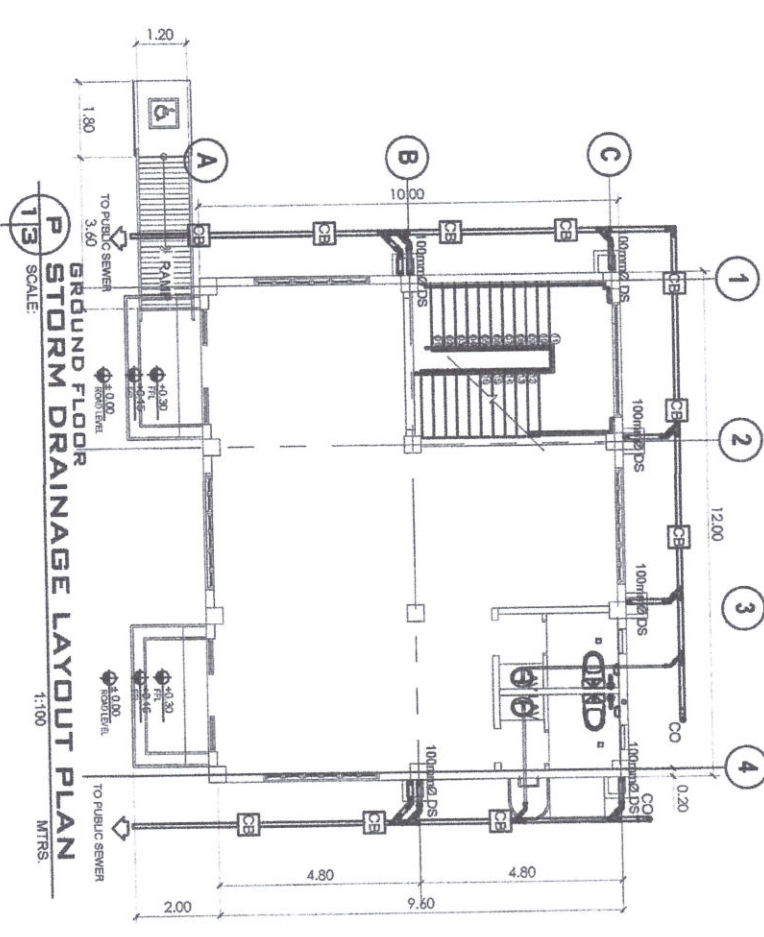
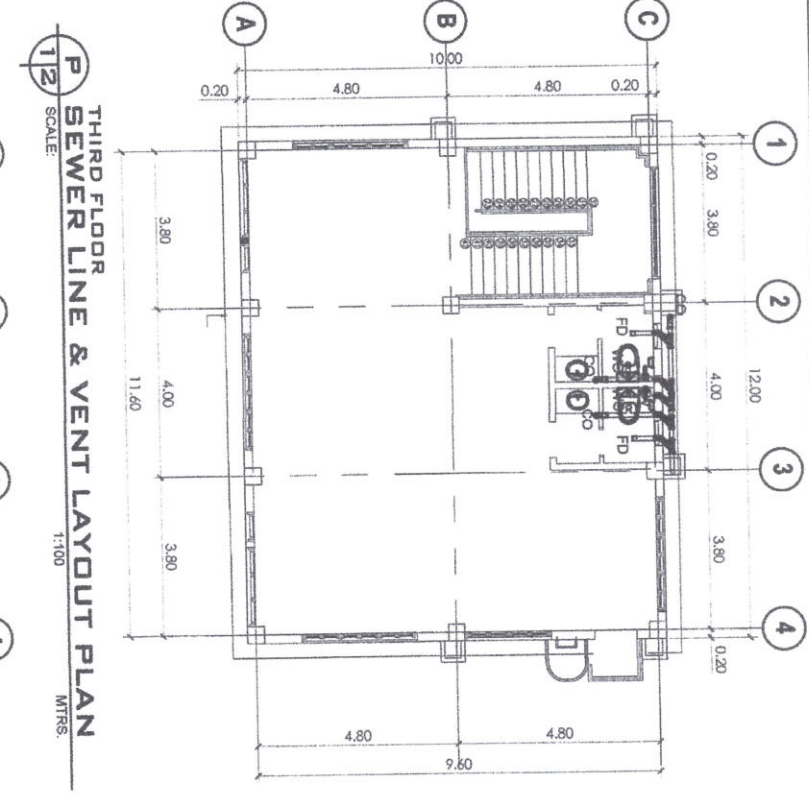
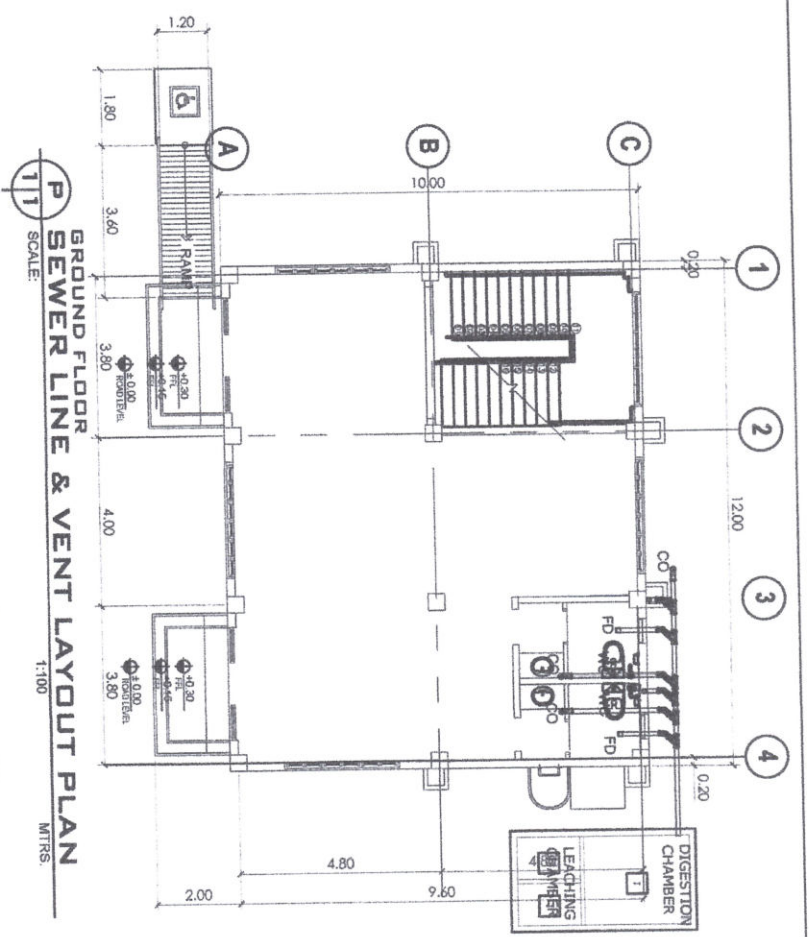
SUBMITTED BY:
ENGINEER III
EVILA, TRANI

RECOMMENDING APPROVAL:
CHIEF PLANNING & DESIGN SECTION
RECOMMENDING APPROVAL:
ASST. DISTRICT ENGINEER
CHRISTOPHER L. EBAL

APPROVED BY:
DISTRICT ENGINEER
VERONICA M. MICALANDAYO

RECOMMENDING APPROVAL:
DIRECTOR IV
ANIELLA P. VALDEZ

APPROVED BY:
ASSISTANT COMMISSIONER
ADMINISTRATION SECTOR
LORNA D. CABOCHAN



TYPES OF FIXTURES	
	WYE 100mm
	ELBOW 100mm
	WYE REDUCER 100mmx50mm
	100mm ELBOW 45
	50mm ELBOW 45
	LONG SWEEP

LEGEND:	
CO	CLEAN OUT
FD	FLOOR DRAIN
FAU	Faucet
GC	GATE VALVE
LAV	LAVATORY
MH	MANHOLE
MWP CWL	MOLD EX BLUE PIPE COLD WATER LINE
PVCOP	POLYVINYL CHLORIDE DRAINAGE PIPE (SERIES 1000) (ASTM D2729 / ASTM D3311, SO 4435 / ASTM D2544)
PVCD5	POLYVINYL CHLORIDE DOWNSPOUT (SERIES 1000) (ASTM D2729 / ASTM D3311, SO 4435 / ASTM D2544)
PVCP3P	POLYVINYL CHLORIDE SOIL PIPE (SERIES 1000) (ASTM D2729 / ASTM D3311, SO 4435 / ASTM D2544)
PVCPWP	POLYVINYL CHLORIDE WASTE PIPE (SERIES 1000) (ASTM D2729 / ASTM D3311, SO 4435 / ASTM D2544)
PVCPYR	POLYVINYL CHLORIDE VENT THRU ROOF (SERIES 1000) (ASTM D2729 / ASTM D3311, SO 4435 / ASTM D2544)
PVCVAC	POLYVINYL CHLORIDE VENT ACCROSS CEILING (SERIES 1000) (ASTM D2729 / ASTM D3311, SO 4435 / ASTM D2544)
PVCVW	POLYVINYL CHLORIDE VENT THRU WALL (SERIES 1000) (ASTM D2729 / ASTM D3311, SO 4435 / ASTM D2544)
PVCVW	POLYVINYL CHLORIDE VENT THRU WALL (SERIES 1000) (ASTM D2729 / ASTM D3311, SO 4435 / ASTM D2544)
PVCVW	POLYVINYL CHLORIDE LOOP VENT (SERIES 1000) (ASTM D2729 / ASTM D3311, SO 4435 / ASTM D2544)
RD	ROOF DRAIN
DS	DOWNSPOUT
WC	WATER CLOSET
SV	SEWIC VAULT

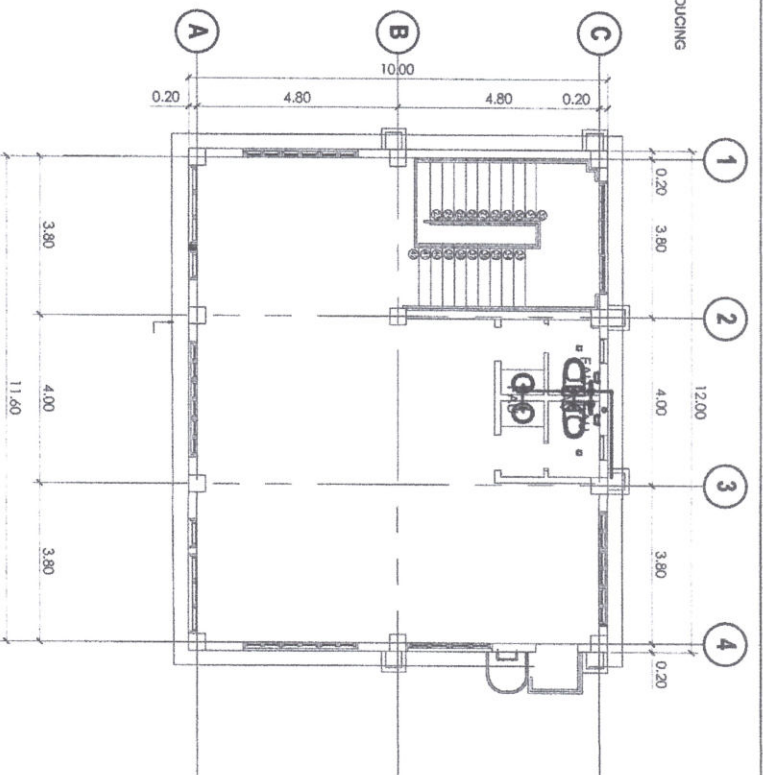
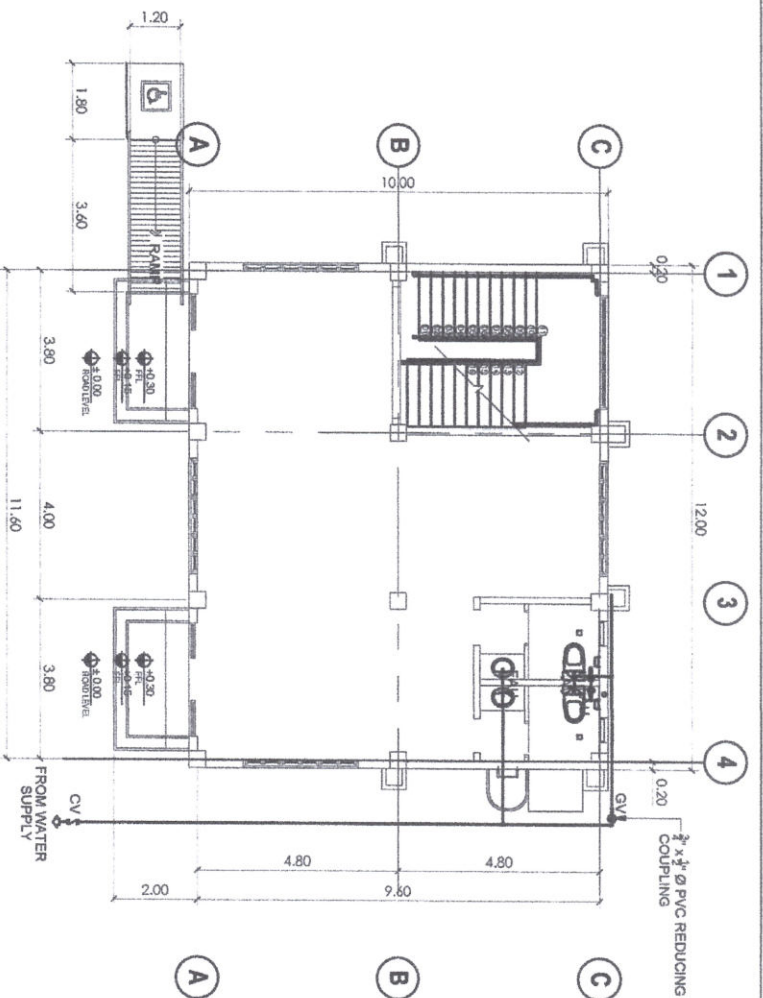
REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGION IX
1ST DISTRICT ENGINEERING OFFICE
SEBASTIAN, PIVAN, ZAMBOANGA DEL NORTE

REPUBLIC OF THE PHILIPPINES
COMMISSION ON AUDIT
REGION IX

PROJECT & LOCATION:
CONSTRUCTION OF A RAEMU BUILDING
DANIVAN CMT., ZAMBOANGA DEL NORTE

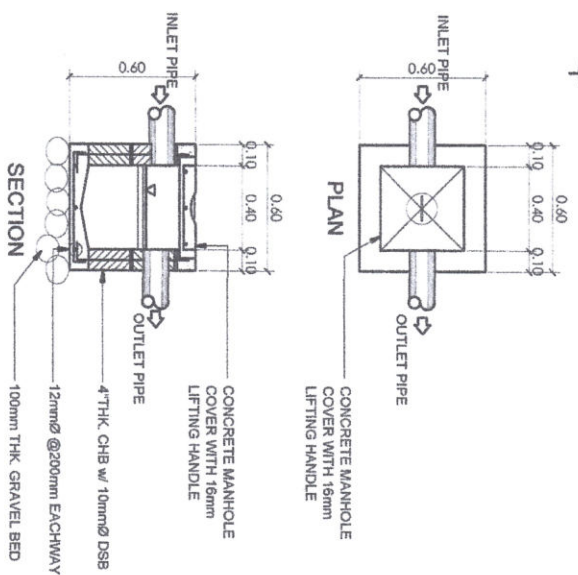
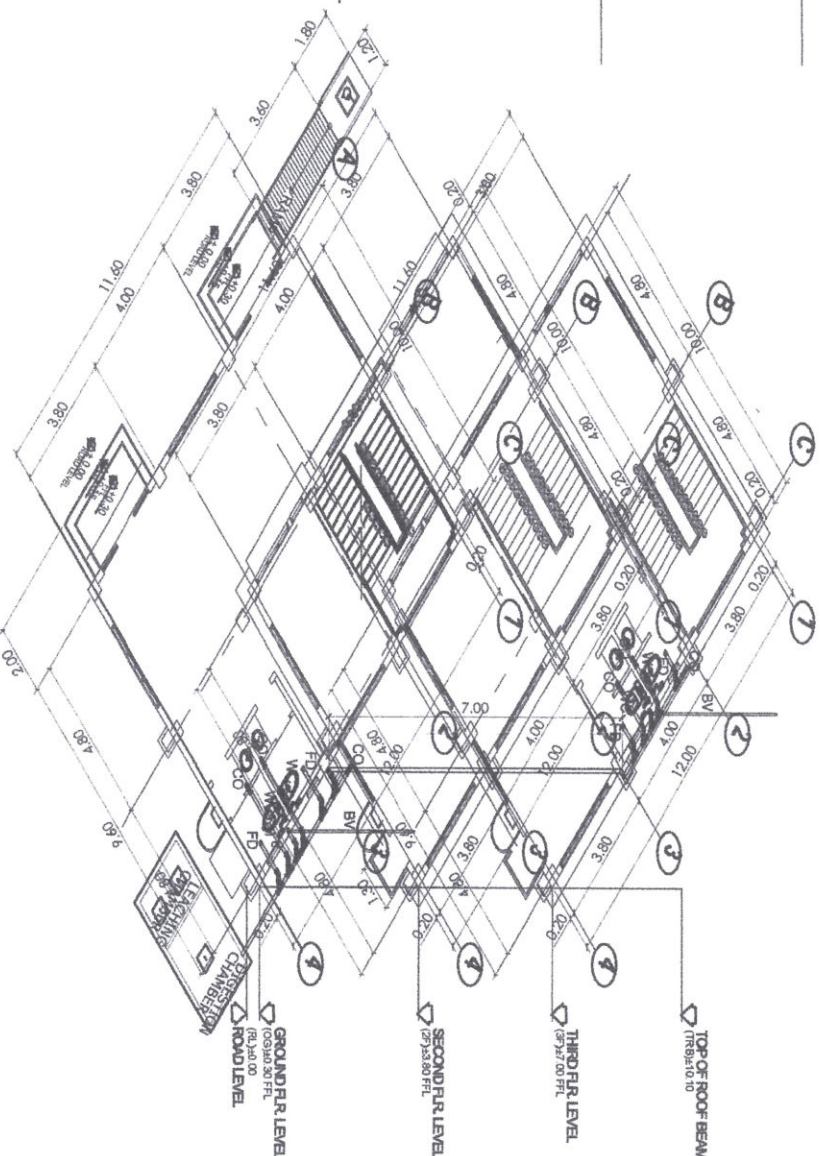
SHEET CONTENT:
GROUND-TO-THIRD FLOOR SEWER & VENT LAYOUT PLAN
GROUND TO THIRD FLOOR STORM DRAINAGE LAYOUT PLAN
LEGEND

DESIGNED:	CHECKED:	SUBMITTED:	RECOMMENDED:	APPROVED:
<p>MASTER PLUMBER</p> <p>PREPARED: OSCAR R. SACARES JR. ENGINEERING ASSISTANT I</p>	<p>ARCHITECT II</p> <p>FERNANDO C. MIRASOL</p>	<p>ENGINEER II</p> <p>EVIL A. TRANI</p> <p>CHIEF PLANNING & DESIGN SECTION</p>	<p>ASST. DISTRICT ENGINEER</p> <p>SHIRIS TORREALBA</p>	<p>DISTRICT ENGINEER</p> <p>VERONICA MICARAYAYO</p>
<p>RECOMMENDING APPROVAL:</p> <p>ATTY. MIRASOL D. LEGASPI OIC-DIRECTOR GENERAL REGIONAL DIRECTOR</p>		<p>RECOMMENDING APPROVAL:</p> <p>AMELIA P. VALDEZ DIRECTOR IV GSO</p>		<p>APPROVED:</p> <p>LORINA D. CABOCHAN ASSISTANT COMMISSIONER ADMINISTRATION SECTION</p>
<p>SET NO.: P 15</p>		<p>SHEET NO.: 24 29</p>		





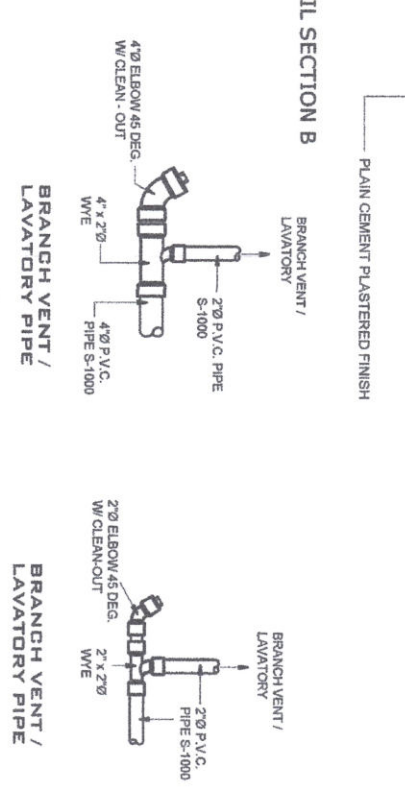
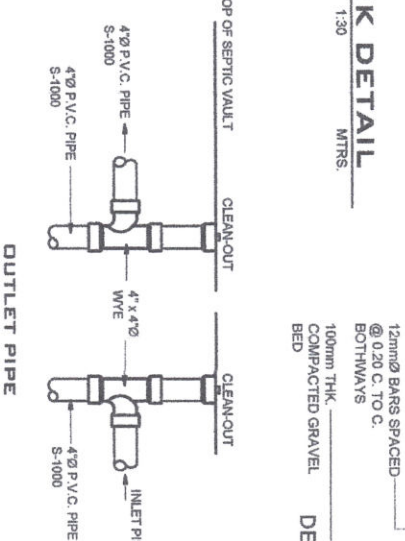
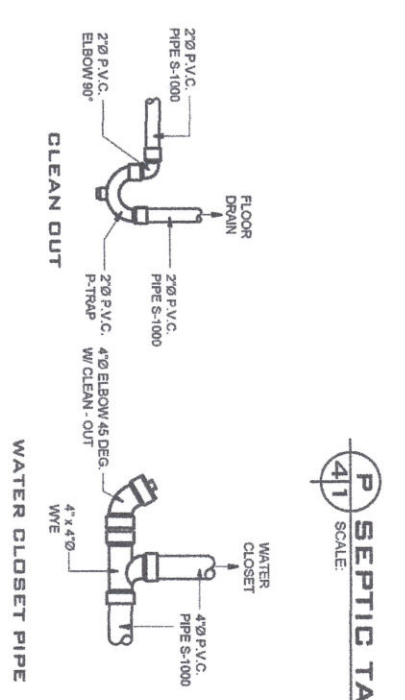
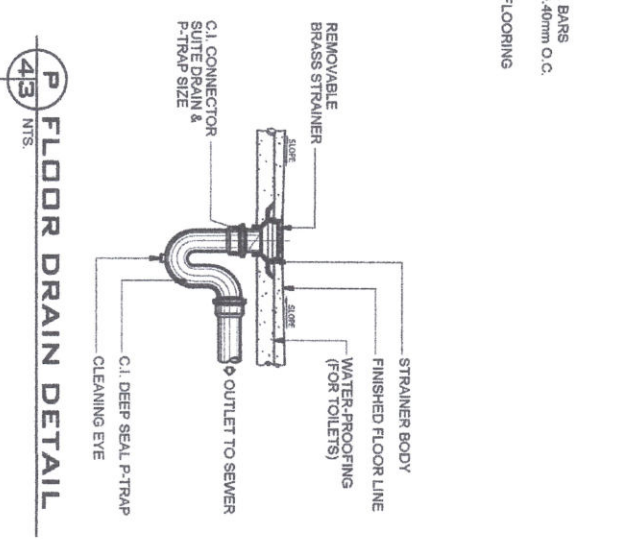
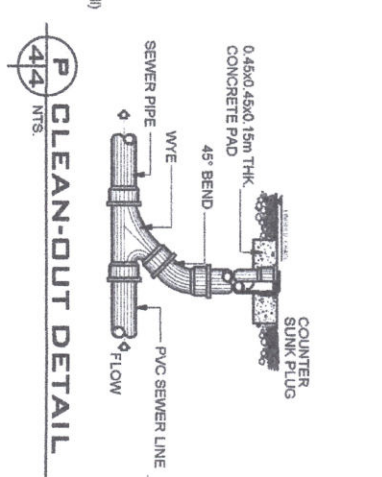
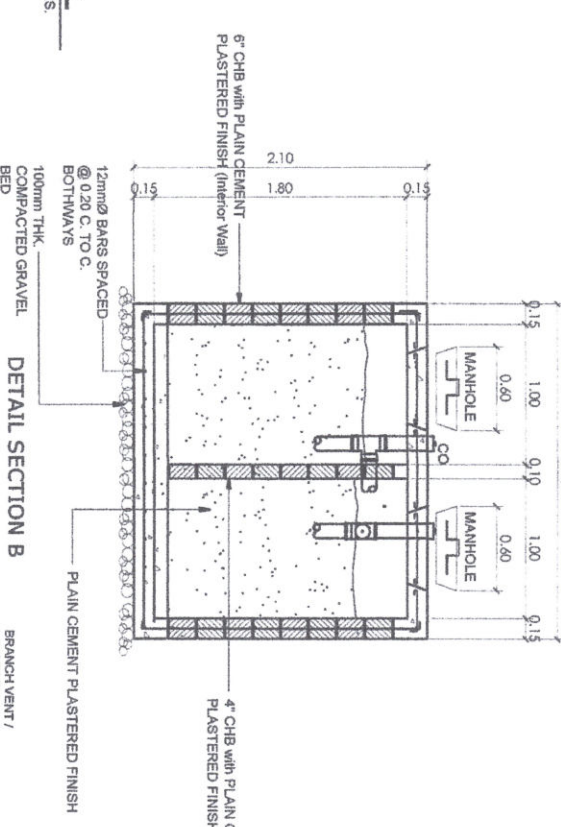
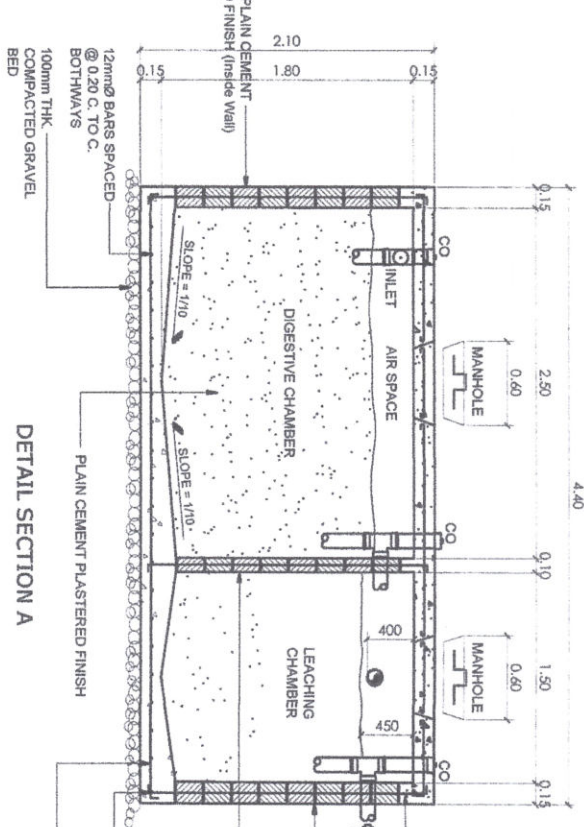
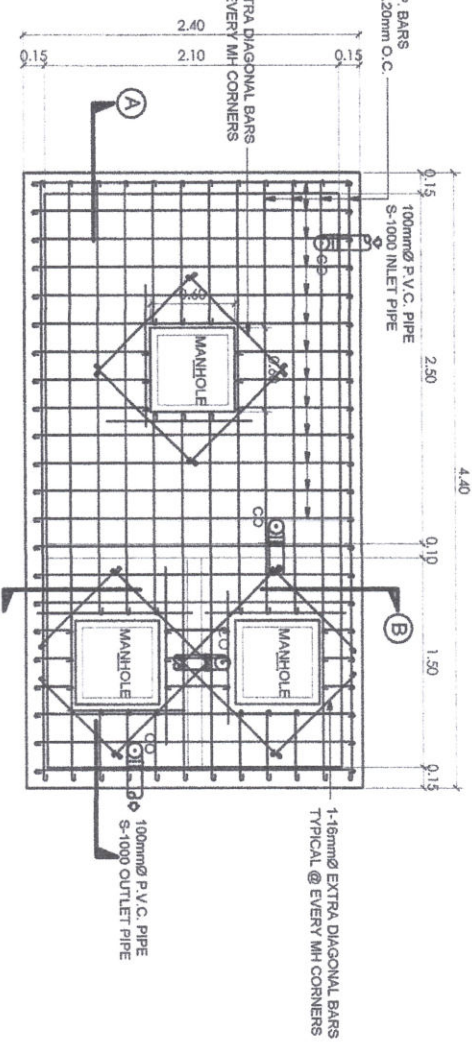
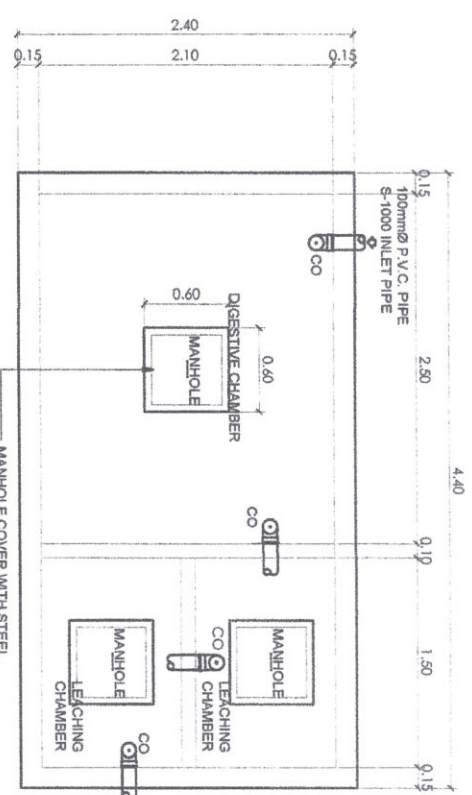
GENERAL NOTES:

- GRADES OF HORIZONTAL PIPINGS RUN ALL HORIZONTAL PIPINGS IN PERFECT ALIGNMENT AND AT A FORM GRADE OF NOT LESS THAN TWO PERCENT (2%).
- CHANGE IN DIRECTION SHALL BE MADE BY APPROPRIATE USE OF FORTY-FIVE DEGREES (45°) WYE LONG SWEEP QUARTER BEND, SIXTY-EIGHT OR SIXTY-NINE BENDS, WHEN THE CHANGE OF FLOW IS FROM HORIZONTAL TO VERTICAL A SINGLE BEND COMBINATION MAY BE USED ON VERTICAL STACKS.
- PROHIBITED FITTINGS:
NO DOUBLE HUBS OR TEE BRANCH SHALL BE USED ON HORIZONTAL SOIL OR WASTE LINES. THE DRILLING OR TAPPING OF HOUSE DRAIN, WASTE OR VENT PIPES AND USE OF SADDLE HUB AND BEND ARE PROHIBITED.
- PIPE CLEAN-OUTS:
CLEAN OUT REQUIRED UNDER THE FOLLOWING CONDITIONS:
A.) EVERY CHANGE IN HORIZONTAL DIRECTION'S EXCEEDING TWENTY-TWO AND ONE-HALF DEGREES (22.5°).
B.) ONE AND ONE-HALF METERS (1.50m) INSIDE THE PROPERTY LINE BEFORE THE HOUSE DRAINAGE CONNECTION.
C.) EVERY FIFTEEN METERS (15.00m) IN HORIZONTAL RUN OF PIPES.
- THE DIGESTION CHAMBER OF SEPTIC VAULT MUST BE WATER PROOFED.
- NOT LESS THAN 0.30m OF AIR SPACE MUST BE LEFT BETWEEN THE TOP OF THE SEWAGE AND THE UNDER PART OF THE VAULT ROOF SLAB.
- NO SEPTIC VAULT SHALL BE CONSTRUCTED UNDER BUILDING.
- ALL PLUMBING WORKS SHALL BE DONE BY A LICENSED MASTER PLUMBER AND A LICENSED PLUMBING CONTRACTOR.



P CATCH BASIN DETAIL
SCALE: 1:20
MTRS.

 <p>REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS REGION IX 1ST DISTRICT ENGINEERING OFFICE SEGADE, PINAN, ZAMBOANGA DEL NORTE</p>		<p>PROJECT & LOCATION: CONSTRUCTION OF A TAENMU BUILDING DAPITAN CITY, ZAMBOANGA DEL NORTE</p>		<p>SHEET CONTENT: GROUND TO THIRD FLOOR WATER LINE LAYOUT PLAN CATCH BASIN DETAIL SEWER LINE & VENT LAYOUT ISOMETRIC DIAGRAM</p>		<p>DESIGNED: MASTER PLUMBER PREPARED: OSCAR R. V. CARRAS JR. ENGINEERING ASSISTANT II</p>		<p>CHECKED: FERNANDO C. MIRASOL ARCHITECT II</p>		<p>SUBMITTED: ENGINEER III EVIA A. TRANI CHIEF PLANNING & DESIGN SECTION RECOMMENDING APPROVAL:</p>		<p>RECOMMENDED: ASST. DISTRICT ENGINEER CHRISTOPHER L. EBAL RECOMMENDING APPROVAL:</p>		<p>APPROVED: DISTRICT ENGINEER VERONICO O. MOCANRANAYO APPROVED:</p>		<p>SET NO.: P 24</p>	<p>SHEET NO.: 25 29</p>
 <p>REPUBLIC OF THE PHILIPPINES COMMISSION ON AUDIT REGION IX</p>																	



REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REGION IX
1ST DISTRICT ENGINEERING OFFICE
SEGABE, PINAN, ZAMBOANGA DEL NORTE

REPUBLIC OF THE PHILIPPINES
COMMISSION ON AUDIT
REGION IX

PROJECT & LOCATION:
CONSTRUCTION OF A RAAMU BUILDING
DAMTAN CMT, ZAMBOANGA DEL NORTE

SHEET CONTENT:
SEPTIC TANK DETAIL
CLEAN OUT DETAIL
FLOOR DRAIN DETAIL
PIPE JOINT DETAIL

DESIGNED:
MASTER PLUMBER
PREPARED:
ENGINEERING ASSISTANT I

CHECKED:
ARCHITECT II

SUBMITTED:
ENGINEER III
CHIEF, PLANNING & DESIGN SECTION

RECOMMENDED:
ASST. DISTRICT ENGINEER
RECOMMENDING APPROVAL:

APPROVED:
DISTRICT ENGINEER

SET NO.:
SHEET NO.:

P 4/4
27
29



ATTY. MARISOL D. LEDESMA
OIC-DIRECTOR IV
REGIONAL DIRECTOR

AMELIA P. VALDEZ
DIRECTOR IV
GSO

LORNA D. CABOCHAN
ASSISTANT COMMISSIONER
ADMINISTRATION SECTION