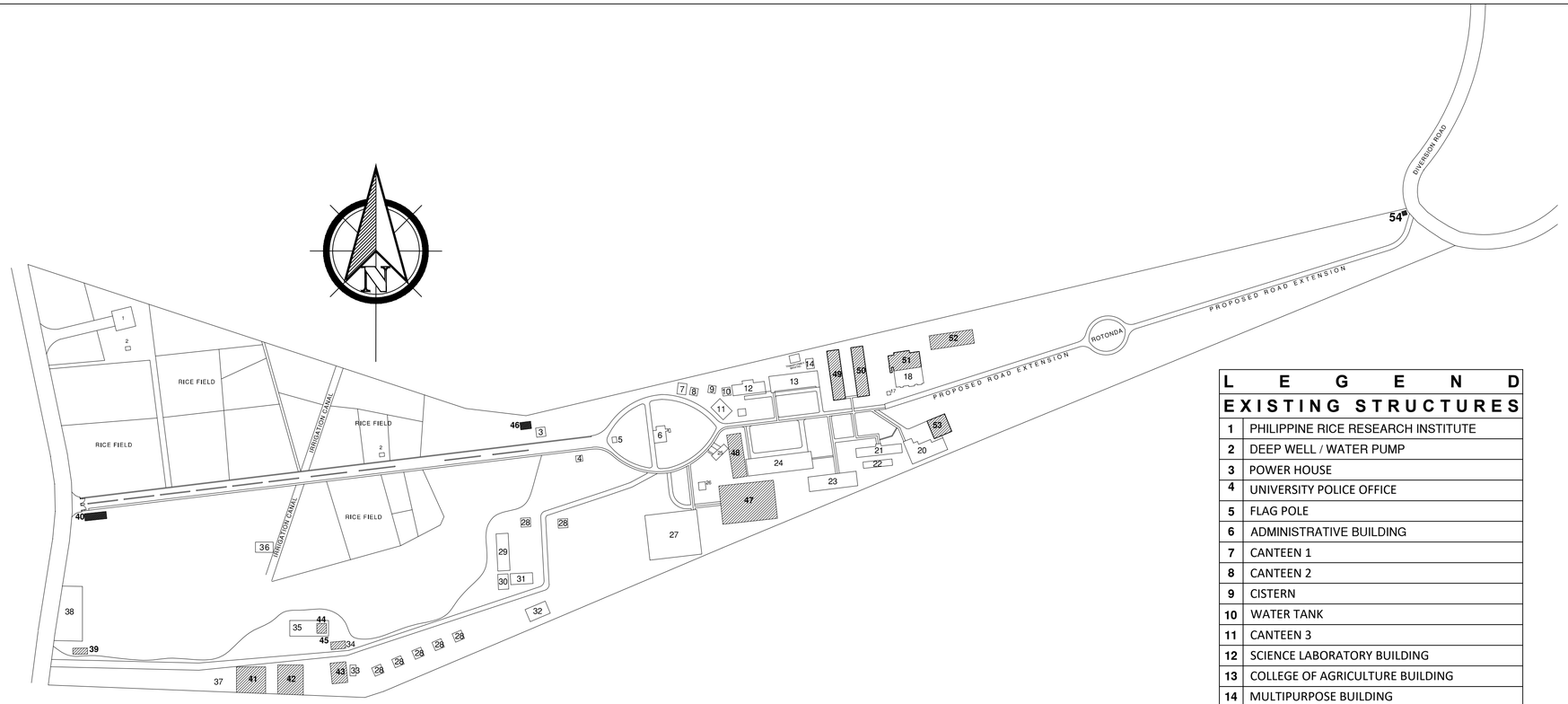


1/A1 SITE DEVELOPMENT PLAN

SCALE 1:2500

0 10 30 50 100M

L E G E N D

EXISTING STRUCTURES

1	PHILIPPINE RICE RESEARCH INSTITUTE
2	DEEP WELL / WATER PUMP
3	POWER HOUSE
4	UNIVERSITY POLICE OFFICE
5	FLAG POLE
6	ADMINISTRATIVE BUILDING
7	CANTEEN 1
8	CANTEEN 2
9	CISTERN
10	WATER TANK
11	CANTEEN 3
12	SCIENCE LABORATORY BUILDING
13	COLLEGE OF AGRICULTURE BUILDING
14	MULTIPURPOSE BUILDING
15	CANTEEN 4
16	BASKETBALL COURT
17	DOST EQUIPMENT
18	REGIONAL FARMERS TRAINING CENTER BUILDING
19	GREENHOUSE
20	TISSUE CULTURE LABORATORY BUILDING
21	CAGRI FACULTY BUILDING
22	CAGRI LIBRARY BUILDING
23	FOOD TECHNOLOGY BUILDING
24	CAGRI ACADEMIC BUILDING
25	CSC OFFICE
26	CLINIC
27	LADIES DORMITORY
28	FACULTY BOARDING HOUSE
29	"ITIK PINAS" PRODUCTION FACILITY
30	"ITIK PINAS" BROODING FACILITY
31	"ITIK PINAS" GROWING UNIT
32	5 DOORS APARTMENT
33	ARTIFICIAL INSEMINATION LAB
34	"ZAMPEN NATIVE CHICKEN" HARDENING AND GROWING FACILITY
35	"ZAMPEN NATIVE CHICKEN" BROODING FACILITY
36	PLANT & ANIMAL CLINIC (ABANDONED PROJECT)
37	"ZAMPEN NATIVE CHICKEN" PEN
38	BAMBOO NURSERY

PROPOSED INFRASTRUCTURES & PROJECTS

39	PROPOSED "PASALUBONG" CENTER
40	PROPOSED ORIENTATION/HOLDING AREA
41	PROPOSED ENHANCEMENT OF NATIVE CHICKEN BREEDING FACILITY
42	GROWING FACILITY FOR THE CONSERVATION AND SUSTAINABLE PRODUCTION OF QUALITY ZAMPEN NATIVE CHICKEN
43	NATIVE CHICKEN R&D CENTER
44	PROPOSED BROODING CAGES
45	PROPOSED HARDENING AND GROWING FACILITY
46	PROPOSED FARM SHOP
47	PROPOSED LADIES DORMITORY
48	PROPOSED LIBRARY
49	PROPOSED CHEMISTRY AND BIOLOGY LABORATORY
50	PROPOSED CAGRI ACADEMIC BUILDING
51	PROPOSED REGIONAL FARMERS TRAINING CENTER ENHANCEMENT EXTENSION FACILITY
52	CONSTRUCTION OF AGRICULTURE INNOVATION CENTER
53	RENOVATION OF GREEN HOUSE AND WATER SYSTEM
54	PROPOSED SECURITY POST

TABLE OF CONTENTS

DPWH

OFFICE OF THE BUILDING OFFICIALS
ZAMBOANGA CITY

LAND USE AND ZONING

LINE AND GRADE

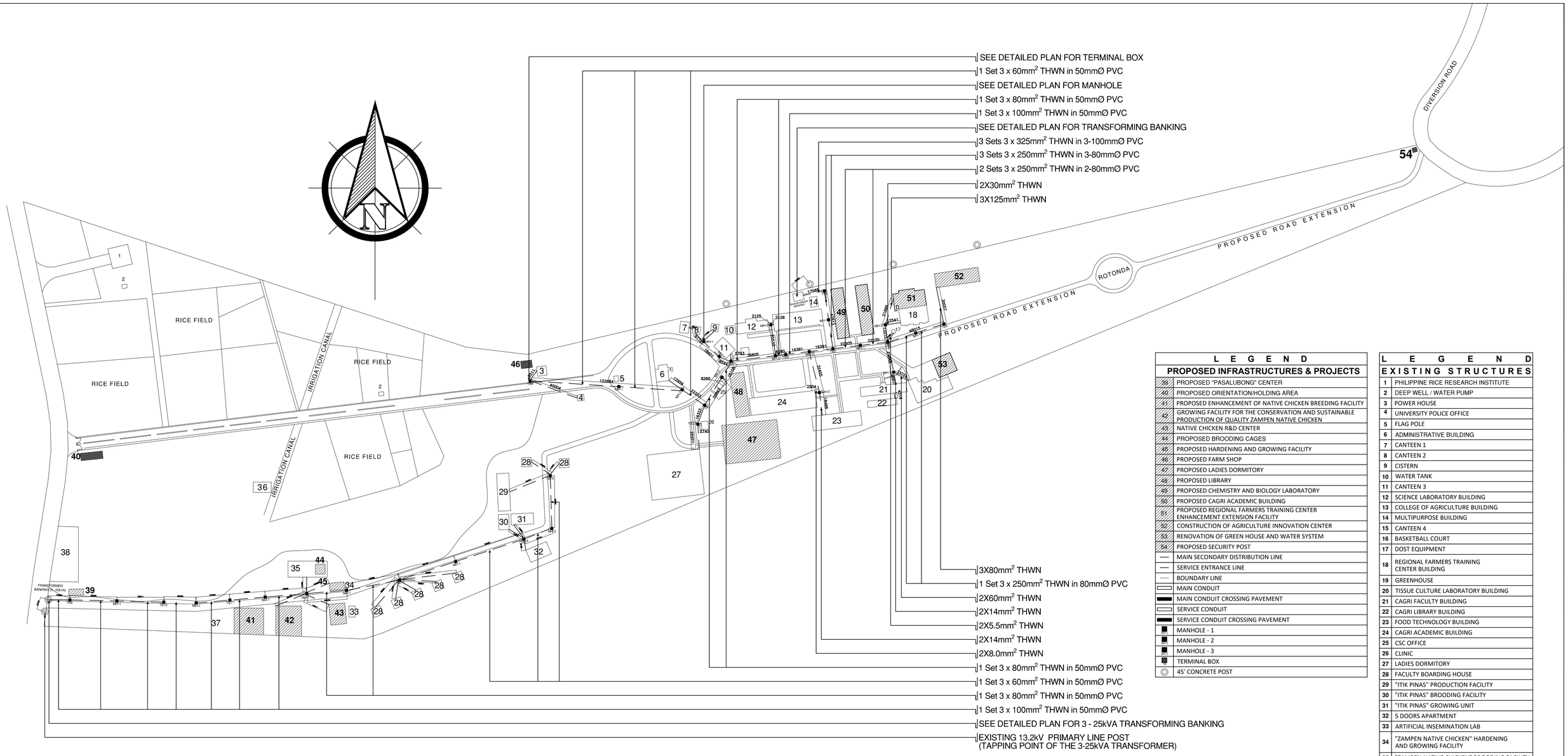
ARCHITECTURAL

STRUCTURAL

SANITARY

ELECTRICAL

REVIEWED AND CHECKED BY: **ENGR. ALMUHUZIN A. KUHUTAN, ACPE, AER** PROFESSIONAL ELECTRIC ENGINEER PRC : 0004914 Date Issued: 07/27/21 Valid Until: 11/24/24 PTR: 2559453 TIN: 938 - 586 - 833	DESIGNED BY: **ENGR. RICARDO B. GONZALES** UNIVERSITY ELECTRICAL ENGINEER PRC: 23724 PTR: TIN: 275203179	PROJECT TITLE: **UPGRADING OF PRIMARY FEEDER LINE AND SECONDARY DISTRIBUTION LINE FROM SINGLE-PHASE TO THREE-PHASE LINE** LOCATION: WMSU, SAN RAMON, ZAMBOANGA CITY	REQUISITIONER **ELDERICO P. TABAL** OIC DEAN, COLLEGE OF AGRICULTURE	RECOMMENDING APPROVAL **ARCH. JOSEPH ANDREW L. SAHIAL,uap** OIC, DIRECTOR OF PHYSICAL PLANT AND ENGINEERING SERVICES PRC: 0010577 PTR: 2559115 TIN: 445013228	RECOMMENDING APPROVAL **JOSELITO D. MADROÑAL, DPA** VICE PRESIDENT FOR ADMININISTRATION AND FINANCE	APPROVED BY: **MA. CARLA A. OCHOTORENA, RN, PhD** UNIVERSITY PRESIDENT	SHEET CONTENTS -ELECTRICAL CONDUCTOR SITE DEVELOPMENT PLAN DRAFTED BY: KXF	SHEET NO. A1 01|11



ELECTRICAL CONDUCTOR SITE DEVELOPMENT PLAN

SCALE 1:1750

0 10 30 50 100M

LEGEND	
PROPOSED INFRASTRUCTURES & PROJECTS	
39	PROPOSED "PASALUBONG" CENTER
40	PROPOSED ORIENTATION/HOLDING AREA
41	PROPOSED ENHANCEMENT OF NATIVE CHICKEN BREEDING FACILITY
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51	PROPOSED REGIONAL FARMERS TRAINING CENTER ENHANCEMENT EXTENSION FACILITY
52	CONSTRUCTION OF AGRICULTURE INNOVATION CENTER
53	RENOVATION OF GREEN HOUSE AND WATER SYSTEM
54	PROPOSED SECURITY POST
	MAIN SECONDARY DISTRIBUTION LINE
	SERVICE ENTRANCE LINE
	BOUNDARY LINE
	MAIN CONDUIT
	MAIN CONDUIT CROSSING PAVEMENT
	SERVICE CONDUIT
	SERVICE CONDUIT CROSSING PAVEMENT
MH-1	MANHOLE - 1
MH-2	MANHOLE - 2
MH-3	MANHOLE - 3
	TERMINAL BOX
	45' CONCRETE POST

LEGEND	
EXISTING STRUCTURES	
1	PHILIPPINE RICE RESEARCH INSTITUTE
2	DEEP WELL / WATER PUMP
3	POWER HOUSE
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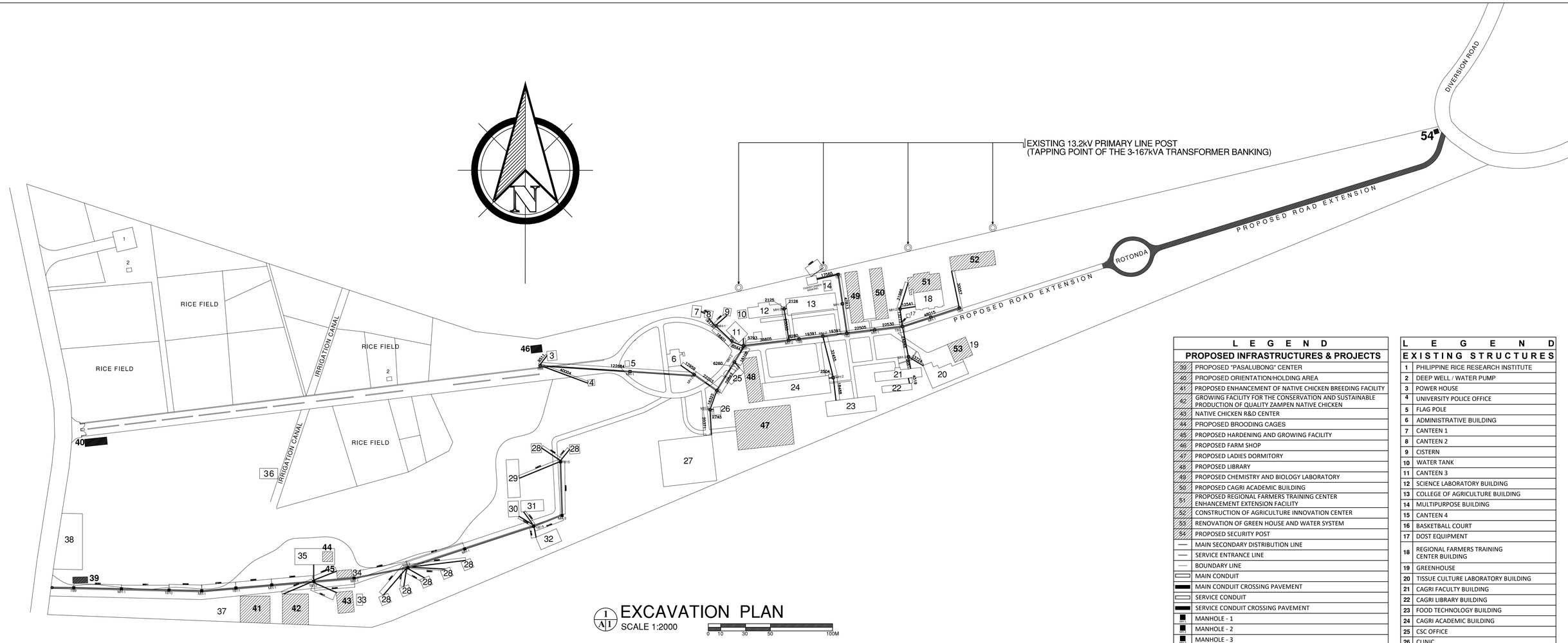
37	"ZAMPEN NATIVE CHICKEN" PEN
38	BAMBOO NURSERY

NOTE:

PROVIDE TWO (2) 4" Ø PVC PIPE FROM TB1 TO TB4 & TWO (2) 2" PVC PIPE FROM TB2 TO TB8 AS SPARE FOR FUTURE ENHANCEMENT.

PROVIDE ONE (1) 2" PVC PIPE FROM TB9 TO TB15 AS SPARE FOR FUTURE ENHANCEMENT.

REVIEWED AND CHECKED BY:	DESIGNED BY:	PROJECT TITLE:	REQUISITIONER	RECOMMENDING APPROVAL	RECOMMENDING APPROVAL	APPROVED BY:	SHEET CONTENTS	SHEET NO.
ENGR. ALMUHUZIN A. KUHUTAN, ACPE, AER PROFESSIONAL ELECTRIC ENGINEER	**ENGR. RICARDO B. GONZALES** UNIVERSITY ELECTRICAL ENGINEER	**UPGRADING OF PRIMARY FEEDER LINE AND SECONDARY DISTRIBUTION LINE FROM SINGLE-PHASE TO THREE-PHASE LINE**	**ELDERICO P. TABAL** OIC DEAN, COLLEGE OF AGRICULTURE	**ARCH. JOSEPH ANDREW L. SAHIAL,uap** OIC, DIRECTOR OF PHYSICAL PLANT AND ENGINEERING SERVICES	**JOSELITO D. MADROÑAL, DPA** VICE PRESIDENT FOR ADMININISTRATION AND FINANCE	**MA. CARLA A. OCHOTORENA, RN, PhD** UNIVERSITY PRESIDENT	-ELECTRICAL CONDUCTOR SITE DEVELOPMENT PLAN	E1 02|11
PRC : 0004914 Date Issued: 07/27/21 Valid Until: 11/24/24 PTR: 2559453 TIN: 938 - 586 - 833	PRC: 23724 PTR: TIN: 275203179	LOCATION: WMSU, SAN RAMON, ZAMBOANGA CITY		PRC: 0010577 PTR: 2559115 TIN: 445013228			DRAFTED BY: KXF	



EXCAVATION PLAN

1/A1 SCALE 1:2000

0 10 30 50 100M

L E G E N D	
PROPOSED INFRASTRUCTURES & PROJECTS	
39	PROPOSED "PASALUBONG" CENTER
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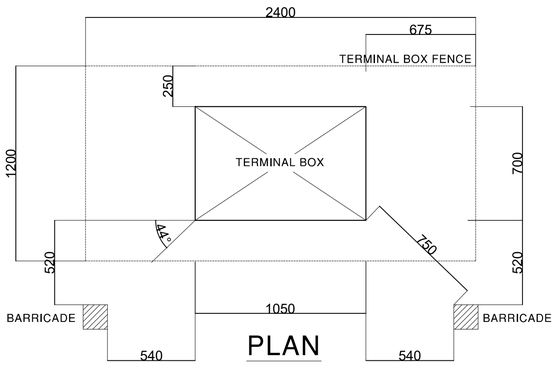
REVIEWED AND CHECKED BY:			DESIGNED BY:			PROJECT TITLE:
ENGR. ALMUHUZIN A. KUHUTAN, ACPE, AER PROFESSIONAL ELECTRIC ENGINEER			**ENGR. RICARDO B. GONZALES** UNIVERSITY ELECTRICAL ENGINEER			**UPGRADING OF PRIMARY FEEDER LINE AND SECONDARY DISTRIBUTION LINE FROM SINGLE-PHASE TO THREE-PHASE LINE**
PRC : 0004914 Date Issued: 07/27/21 Valid Until: 11/24/24	PTR: 2559453	TIN: 938 - 586 - 833	PRC: 23724	PTR:	TIN: 275203179	LOCATION: WMSU, SAN RAMON, ZAMBOANGA CITY

REQUISITIONER	RECOMMENDING APPROVAL			RECOMMENDING APPROVAL	APPROVED BY:	SHEET CONTENTS	SHEET NO.
ELDERICO P. TABAL OIC DEAN, COLLEGE OF AGRICULTURE	**ARCH. JOSEPH ANDREW L. SAHIAL,uap** OIC, DIRECTOR OF PHYSICAL PLANT AND ENGINEERING SERVICES			**JOSELITO D. MADROÑAL, DPA** VICE PRESIDENT FOR ADMINININISTRATION AND FINANCE	**MA. CARLA A. OCHOTORENA, RN, PhD** UNIVERSITY PRESIDENT	-EXCAVATION PLAN DRAFTED BY: KXF	E2 03 11
	PRC: 0010577	PTR: 2559115	TIN: 445013228				

CERTIFICATION INTERNATIONAL ISO 9001:2015

AB Accredited QMS Certification Body Accreditation No: MSA-001



BARRICADE DETAIL

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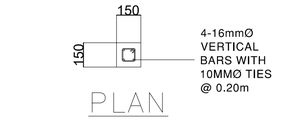

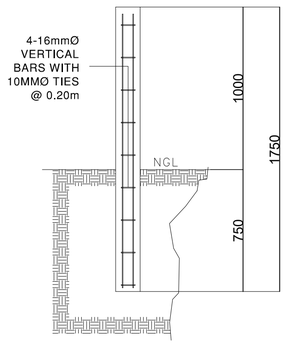

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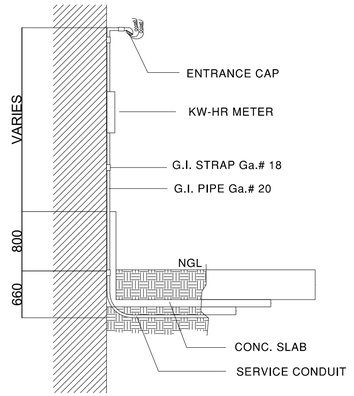

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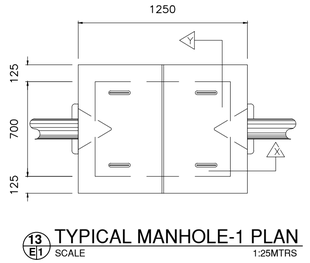

13 E1 TYPICAL MANHOLE-1 PLAN
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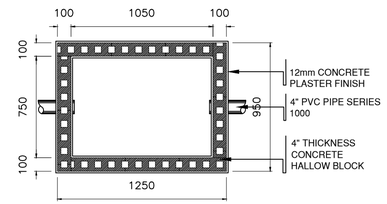

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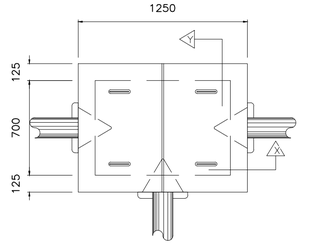

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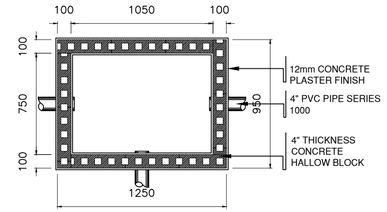

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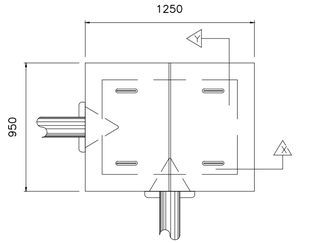

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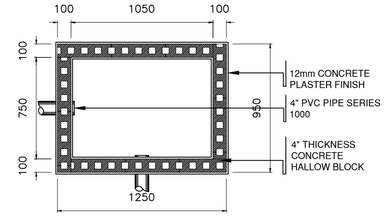
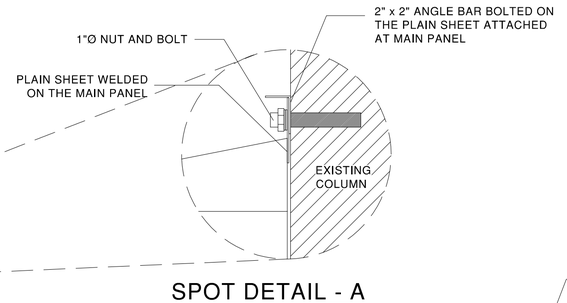


13 E1 TYPICAL MANHOLE-3 DETAIL
SCALE 1:25MTRS

13 P1 MANHOLE DETAILS

SCALE 1:25MTRS



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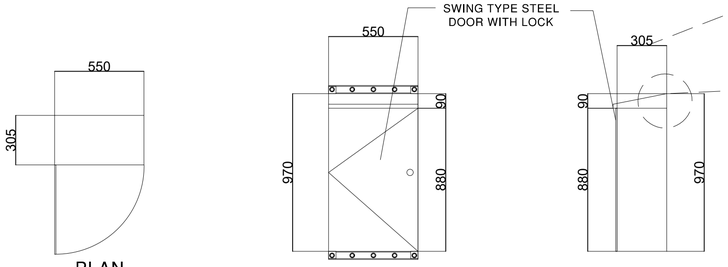

MAIN PANEL SWITCH

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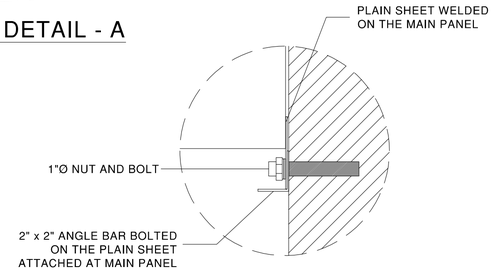
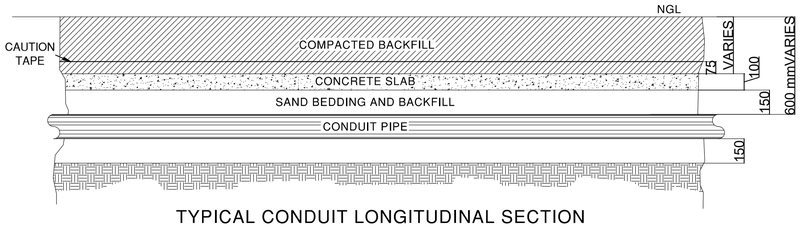


SPOT DETAIL - B



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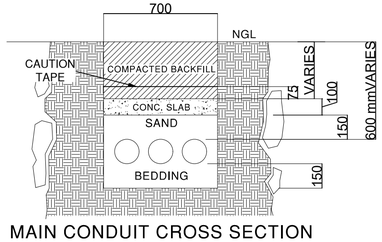
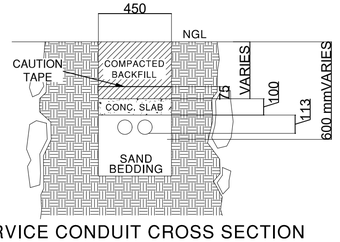
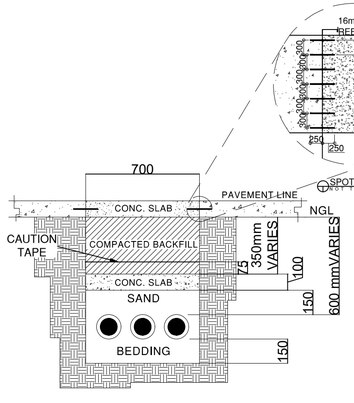


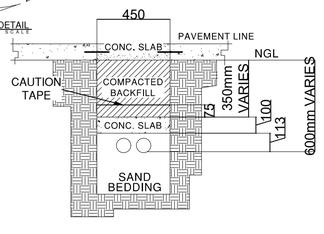
MAIN CONDUIT CROSS SECTION
NATURAL GROUND LINE



SERVICE CONDUIT CROSS SECTION
NATURAL GROUND LINE



MAIN CONDUIT
CROSS SECTION
PAVEMENT LINE

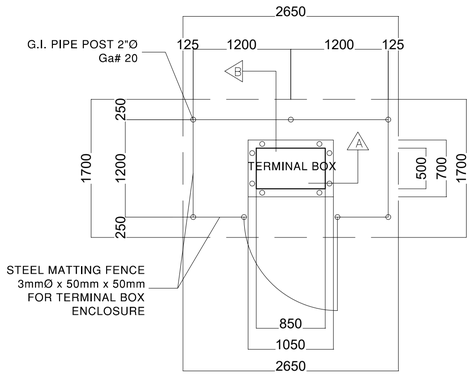


SERVICE CONDUIT
CROSS SECTION
PAVEMENT LINE

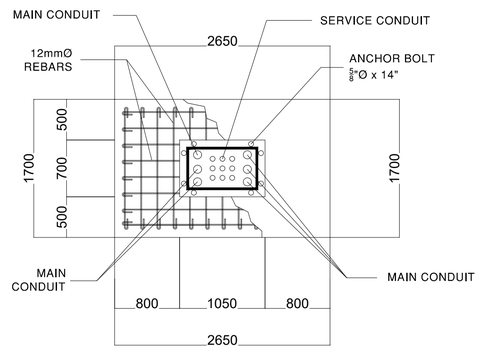
CONDUIT INSTALLATION DETAILS

NOT TO SCALE

WESTERN MINDANAO STATE UNIVERSITY	REVIEWED AND CHECKED BY:		DESIGNED BY:		PROJECT TITLE:	REQUISITIONER	RECOMMENDING APPROVAL		RECOMMENDING APPROVAL	APPROVED BY:	SHEET CONTENTS	SHEET NO.	
	ENGR. ALMUHUZIN A. KUHUTAN, ACPE, AER PROFESSIONAL ELECTRIC ENGINEER		ENGR. RICARDO B. GONZALES UNIVERSITY ELECTRICAL ENGINEER		UPGRADING OF PRIMARY FEEDER LINE AND SECONDARY DISTRIBUTION LINE FROM SINGLE-PHASE TO THREE-PHASE LINE	ELDERICO P. TABAL OIC DEAN, COLLEGE OF AGRICULTURE	ARCH. JOSEPH ANDREW L. SAHIAL,uap OIC, DIRECTOR OF PHYSICAL PLANT AND ENGINEERING SERVICES		JOSELITO D. MADROÑAL, DPA VICE PRESIDENT FOR ADMININISTRATION AND FINANCE	MA. CARLA A. OCHOTORENA, RN, PhD UNIVERSITY PRESIDENT	-CONDUIT INSTALLATION DETAILS -MANHOLE DETAILS	E3 04 11	CERTIFICATION INTERNATIONAL ISO 9001:2015
	PRC : 0004914 Date Issued: 07/27/21 Valid Until: 11/24/24	PTR: 2559453	TIN: 938 - 586 - 833	PRC: 23724 PTR:	TIN: 275203179	LOCATION: WMSU, SAN RAMON, ZAMBOANGA CITY	PRC: 0010577	PTR: 2559115	TIN: 445013228		DRAFTED BY: KXF		



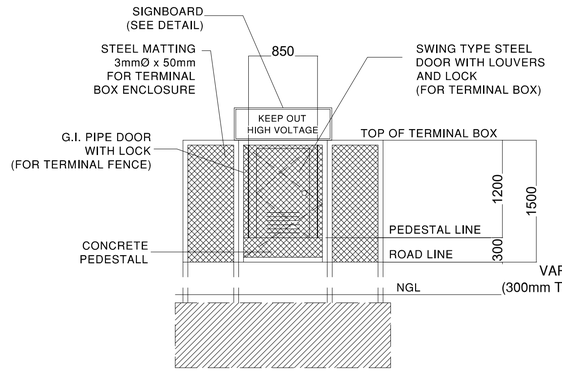
PLAN



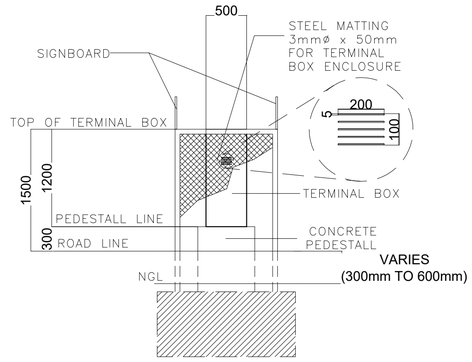
FOUNDATION PLAN

TERMINAL BOX DETAIL

NOT TO SCALE



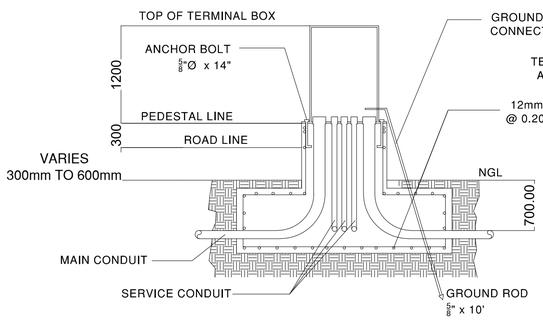
FRONT ELEVATION



SIDE ELEVATION

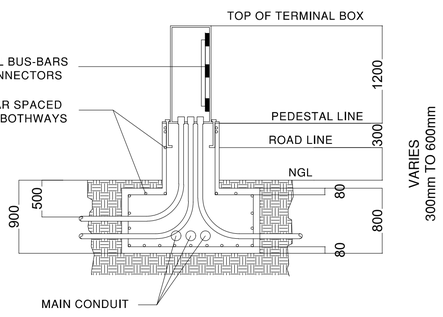
FENCE FOR TERMINAL BOX

NOT TO SCALE



SECTION THRU - A

NOT TO SCALE



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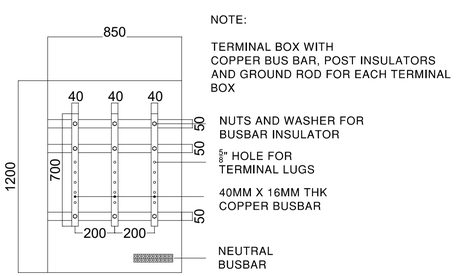
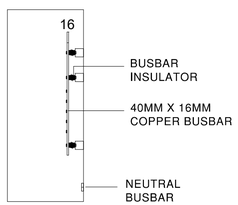
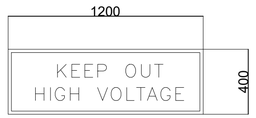


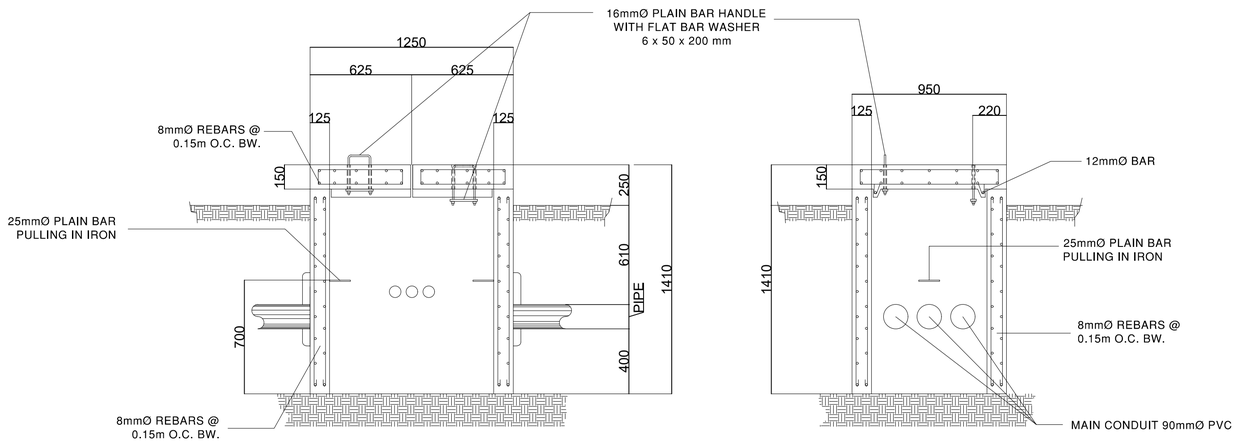
TERMINAL BUS-BAR & CONNECTION



TERMINAL BOX SIDE SECTION



SIGNBOARD DETAIL



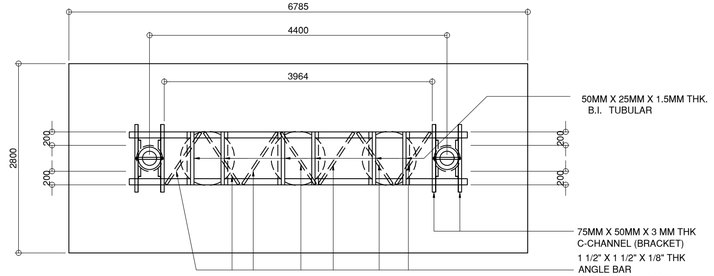
SECTION THRU - X

SECTION THRU - Y

TYPICAL MANHOLE SECTION

NOT TO SCALE

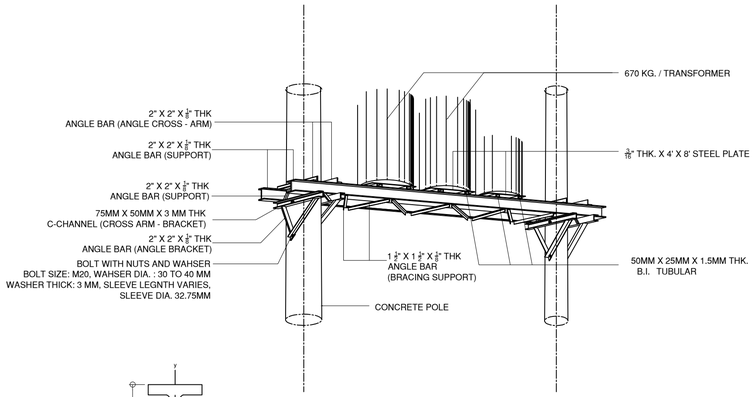
REVIEWED AND CHECKED BY:	DESIGNED BY:	PROJECT TITLE:	REQUISITIONER	RECOMMENDING APPROVAL	RECOMMENDING APPROVAL	APPROVED BY:	SHEET CONTENTS	SHEET NO.
ENGR. ALMUHUZIN A. KUHUTAN, ACPE, AER PROFESSIONAL ELECTRIC ENGINEER PRC : 0004914 Date Issued: 07/27/21 Valid Until: 11/24/24 PTR: 2559453 TIN: 938 - 586 - 833	**ENGR. RICARDO B. GONZALES** UNIVERSITY ELECTRICAL ENGINEER PRC: 23724 PTR: TIN: 275203179	**UPGRADING OF PRIMARY FEEDER LINE AND SECONDARY DISTRIBUTION LINE FROM SINGLE-PHASE TO THREE-PHASE LINE** LOCATION: WMSU, SAN RAMON, ZAMBOANGA CITY	**ELDERICO P. TABAL** OIC DEAN, COLLEGE OF AGRICULTURE	**ARCH. JOSEPH ANDREW L. SAHIAL,uap** OIC, DIRECTOR OF PHYSICAL PLANT AND ENGINEERING SERVICES PRC: 0010577 PTR: 2559115 TIN: 445013228	**JOSELITO D. MADROÑAL, DPA** VICE PRESIDENT FOR ADMININISTRATION AND FINANCE	**MA. CARLA A. OCHOTORENA, RN, PhD** UNIVERSITY PRESIDENT	-TERMINAL BOX DETAIL -FENCE FOR TERMINAL BOX -TYPICAL MANHOLE SECTION DRAFTED BY: KXF	E4 05 11

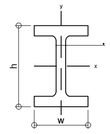


TOP VIEW

PLAN TRANSFORMER BANKING

SCALE: 1:100MTRS



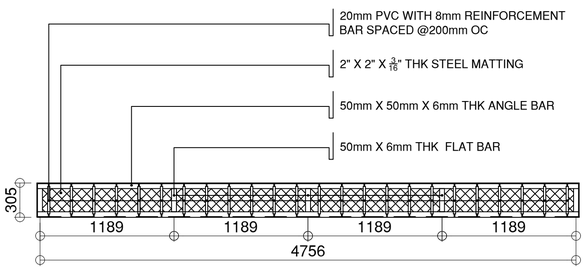


SCHEDULE OF I - BEAM

Designation Imperial (in x lb/ft)	Depth h (in)	Width w (in)	Web Thickness tw (in)	Flange Thickness tf (in)	Sectional Area (in²)	Weight (lbf/ft)	Static Parameters			
							Moment of Inertia		Elastic Section Modulus	
							Ix (in⁴)	Iy (in⁴)	Sx (in³)	Sy (in³)
W6x12	6.03	4	0.230	0.280	3.6	12	22.1	3	7.3	1.5

ISOMETRIC VIEW

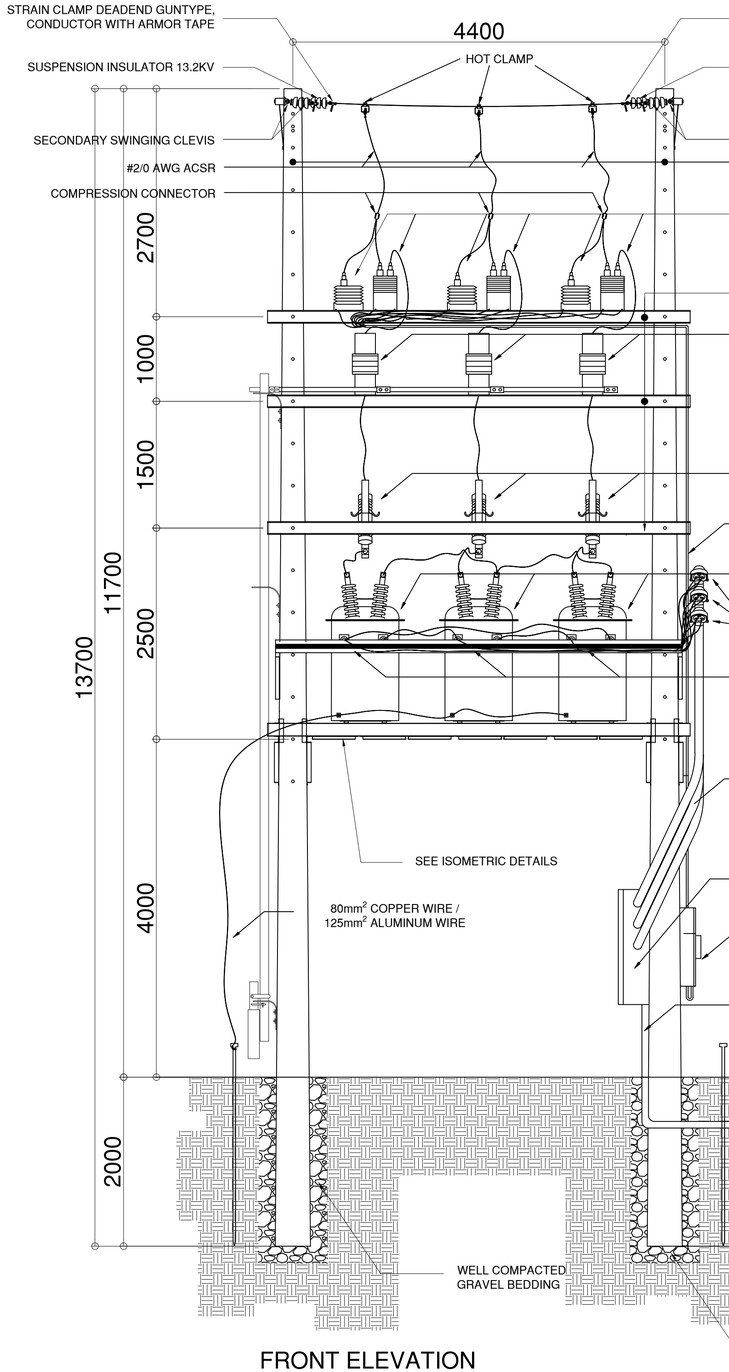
SCALE: 1:100MTRS



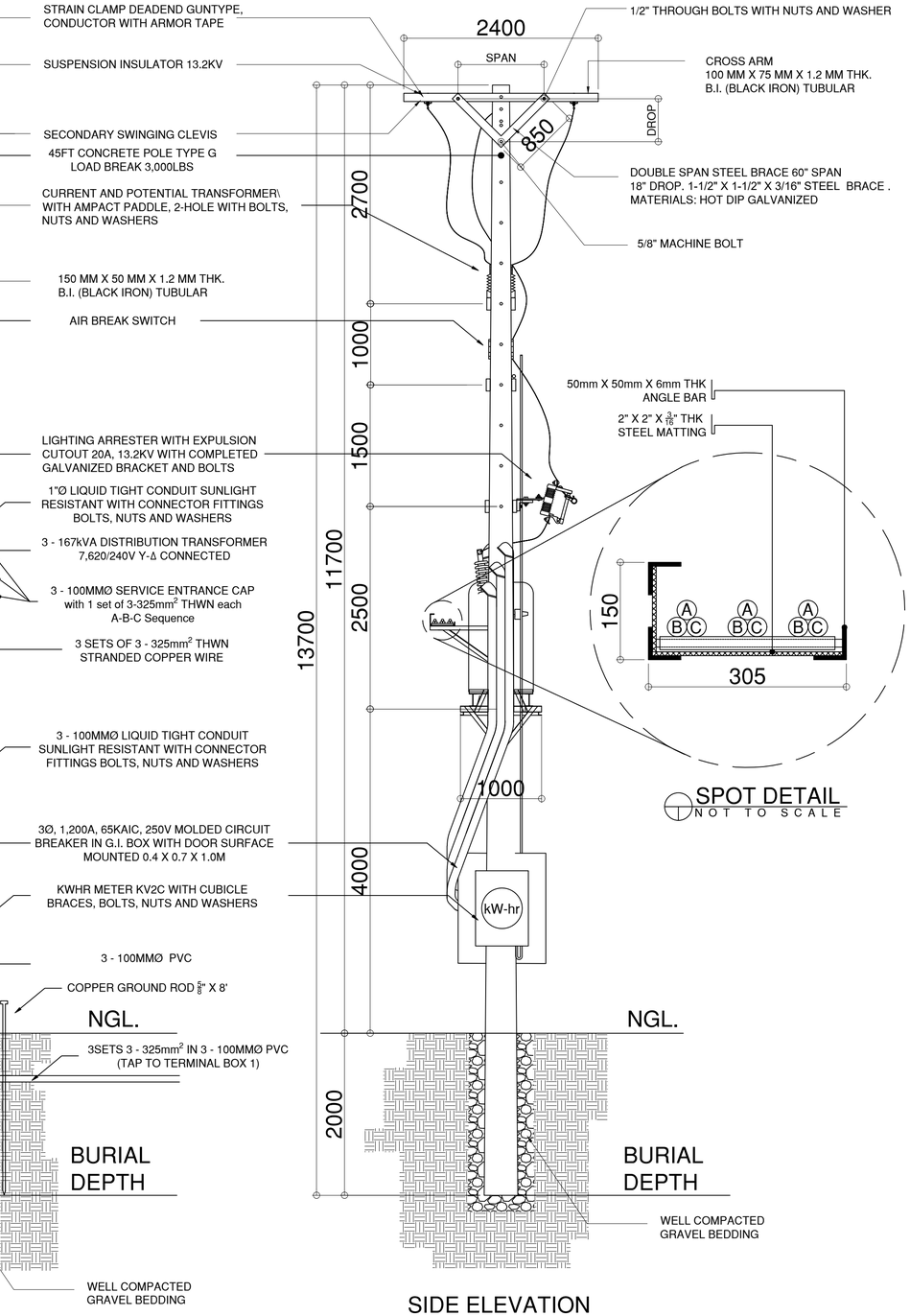
TOP VIEW

CABLE TRAY DETAIL

SCALE: 1:30MTRS



FRONT ELEVATION



SPOT DETAIL

NOT TO SCALE

SIDE ELEVATION

3 - 167kVA TRANSFORMER BANKING DETAILS

SCALE: 1:50MTRS

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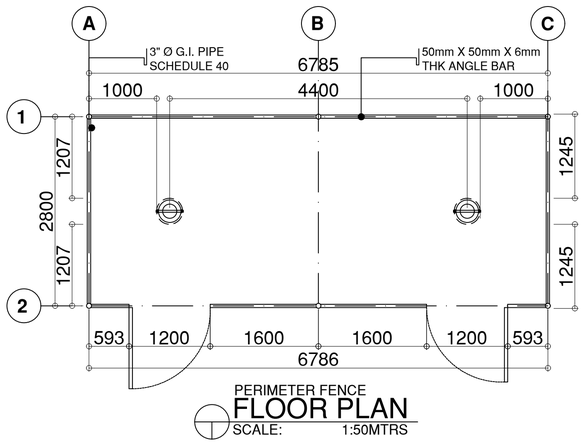
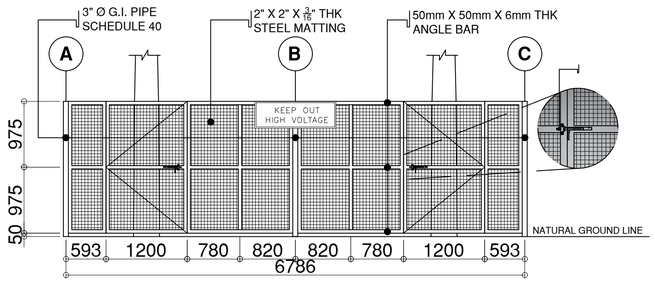
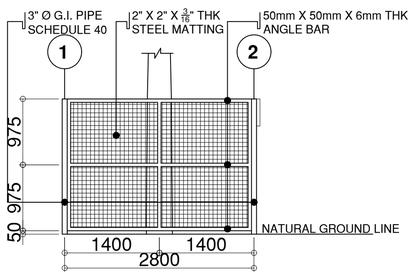
ENGR. ALMUHUZIN A. KUHUTAN, ACPE, AER PROFESSIONAL ELECTRIC ENGINEER	**ENGR. RICARDO B. GONZALES** UNIVERSITY ELECTRICAL ENGINEER	**UPGRADING OF PRIMARY FEEDER LINE AND SECONDARY DISTRIBUTION LINE FROM SINGLE-PHASE TO THREE-PHASE LINE**	**ELDERICO P. TABAL** OIC DEAN, COLLEGE OF AGRICULTURE	**ARCH. JOSEPH ANDREW L. SAHIAL,uap** OIC, DIRECTOR OF PHYSICAL PLANT AND ENGINEERING SERVICES	**JOSELITO D. MADROÑAL, DPA** VICE PRESIDENT FOR ADMININISTRATION AND FINANCE	**MA. CARLA A. OCHOTORENA, RN, PhD** UNIVERSITY PRESIDENT	-MANHOLE DETAILS -3-167KVA TRANSFORMER BANKING DETAIL -TRANSFORMER BANKING DETAIL -CABLE TRAY DETAIL	E5 06|11
PRC : 0004914 Date Issued: 07/27/21 Valid Until: 11/24/24 PTR: 2559453 TIN: 938 - 586 - 833	PRC: 23724 PTR: TIN: 275203179	LOCATION: WMSU, SAN RAMON, ZAMBOANGA CITY		PRC: 0010577 PTR: 2559115 TIN: 445013228			DRAFTED BY: KXF	



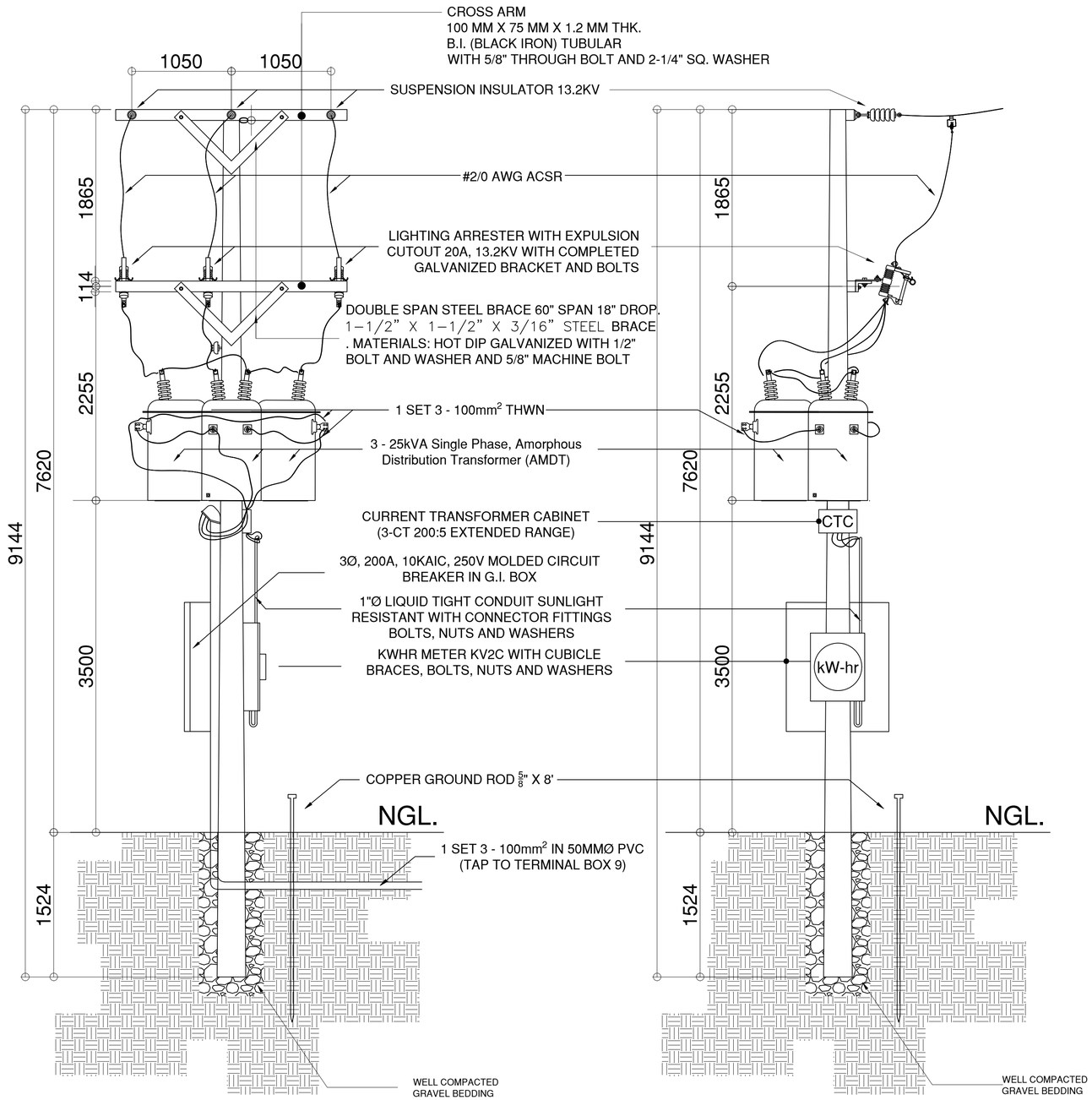
PERIMETER FENCE
FLOOR PLAN
SCALE: 1:50MTRS



PERIMETER FENCE
FRONT ELEVATION
SCALE: 1:50MTRS



PERIMETER FENCE
LEFT ELEVATION
SCALE: 1:50MTRS



FRONT ELEVATION SIDE ELEVATION

3 - 25kVA TRANSFORMER BANKING DETAILS
SCALE: 1:30MTRS

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PRC : 0004914 Date Issued: 07/27/21 Valid Until: 11/24/24 | PTR: 2559453 | TIN: 938 - 586 - 833	PRC: 23724 | PTR: | TIN: 275203179	LOCATION: WMSU, SAN RAMON, ZAMBOANGA CITY		PRC: 0010577 | PTR: 2559115 | TIN: 445013228			DRAFTED BY: KXF		

GENERAL NOTES AND SPECIFICATION:

1. All works herein shall be done in accordance with the latest edition of the Philippine Electrical Code(PEC). Relatively the same, it should follow rules and regulations of the National Building Code enforced by the building official of City of Zamboanga, and of local electric cooperative the Zamboanga City Electric Cooperative (ZAMCELCO).

2. Service Voltage Service voltage must come from 13,200/7620V, 3Ø power supply and stepped down to 230 V, 3Ø, 4-wire, through 3 - 167kva Single Phase Distribution Type oil filled Transformers.

3. All non-current carrying electrical materials such as motor frames, metal enclosures, pull boxes and panel shall be adequately grounded in accordance with the latest edition of the PEC.

4. Electrical wiring installation shall be done in polivinyl chloride conduits (PVC). Minimum size for all conduits shall be 20mm diameter electrical trade except for service entrance it must be done with Rigid Metal Conduit (RMC) with Service Entrance Cap.

5. All wires shall be copper and thermoplastic heat and water resistance with nylon coating type "THWN"

Line A	**-Red**
Line B	**-Blue**
Line C	**-Yellow**
Neutral	**-Yellow with green stripes**
Equipment Grounding	**-Green**

6. All Main line conduit must be PVC and 100mm in diameter

7. All distribution conduit must be PVC and All service entrance conduit must be RMC with Entrance Cap

8. All bundled conductors must be provided with 1 Conduit in every set of Conductors and must be in A B C configuration with proper label/taggings.

9. There shall be adequate and effective equipment grounding. Ground resistance should be no more than 5 ohms. If ground resistance exceeds 5 ohms, additional ground rods shall be provided.

10. Conductors, Main Breaker, Feeders and Circuit Protection to be used shall be compliant with PS Standard.

11. Grounding Electrode Conductor shall not be smaller than 80mm^2 copper(Cu) or 125mm^2 Aluminum(Al).

12. All Conductors must undergo insulation resistance test prior to testing.

13. All new service entrance must be parallel and level with the old service entrance.

14. All electrical installation shall be done under the direct supervision of a valid license and experienced Electrical Engineer (PEE, REE or RME).

15. No Revision in the design shall be done without prior knowledge and approval of the WMSU Physical Plant and Engineering Services, any revisions done without approval shall cause responsibility of the designer to cease as a whole.

TRANSFORMER BANKING 3-167KVA

TERMINAL BOX 1

BUILDING	AB	BC	CA	3Ø	KVA	CB SIZE	CONDUCTOR SIZE	CONDUIT SIZE
TB2	332.01	328.81	335.2	61.76	227.78			

IL = (√3) (IØ) (DF) ; DF = 80% **USE: 3 SET OF 3 x 325mm^2 THWN IN 3-100mmØ PVC**
IL = [(√3) (332.01A) + 61.76A] (0.80)
IL = 509.45A

TERMINAL BOX 2

BUILDING	AB	BC	CA	3Ø	KVA	CB SIZE	CONDUCTOR SIZE	CONDUIT SIZE
TB3	251.15	256.8	280.3	61.76	220.1			
TB5	47.48	72.01	54.9	0				
FOOD TECHNOLOGY BUILDING	18.69				4.30	40	14	25
COLLEGE OF AGRICULTURE ACADEMIC BUILDING	14.69				3.38	30	8.0	20
T O T A L	332.01	328.81	335.2	61.76	227.78			

IL = (√3) (IØ) (DF) ; DF = 80% **USE: 3 SET OF 3 x 250mm^2 THWN IN 3-80mmØ PVC**
IL = [(√3) (332.01A) + 61.76A] (0.80)
IL = 509.45A

TERMINAL BOX 3

BUILDING	AB	BC	CA	3Ø	KVA	CB SIZE	CONDUCTOR SIZE	CONDUIT SIZE
TB4	139.8	132.24	125.8	0	91.5			
GREEN HOUSE & TISSUE CULTURE LABORATORY BUILDING			107.38		24.7	20	60	50
REGIONAL FARMERS TRAINING CENTER		48.92			11.3	100	30	25
REGIONAL FARMERS TRAINING CENTER EXTENSION	44.08	52.6	47.12	61.76	74.1	250	125	65
COLLEGE OF AGRICULTURE FACULTY BUILDING	67.27				15.5	40	14	25
COLLEGE OF AGRICULTURE LIBRARY BUILDING		13.04			3	30	8.0	20
DOST EQUIPMENT		10			2.3	20	10	20
T O T A L	251.15	256.8	280.3	61.76	220.1			

IL = (√3) (IØ) (DF) ; DF = 80% **USE: 2 SET OF 3 x 250mm^2 THWN IN 2-80mmØ PVC**
IL = [(√3) (280.3A) + 61.76A] (0.80)
IL = 437.80A

TERMINAL BOX 4

BUILDING	AB	BC	CA	3Ø	KVA	CB SIZE	CONDUCTOR SIZE	CONDUIT SIZE
AGRITECH	139.8	132.24	125.8		91.5	175	100	50

IL = (√3) (IØ) (DF) ; DF = 80% **USE: 1 SET OF 3 x 250mm^2 THWN IN 80mmØ PVC**
IL = (√3) (139.8A) (0.80)
IL = 193.71A

TERMINAL BOX 5

BUILDING	AB	BC	CA	3Ø	KVA	CB SIZE	CONDUCTOR SIZE	CONDUIT SIZE
TB6	31.54	72.01	39.41	0	31.1			
SCIENCE LABORATORY BUILDING	15.94				3.67	100	60	40
COLLEGE OF AGRICULTURE BUILDING			15.49		3.56	200	60	40
T O T A L	47.48	72.01	54.9	0	38.329			

IL = (√3) (IØ) (DF) ; DF = 80% **USE: 1 SET OF 3 x 100mm^2 THWN IN 50mmØ PVC**
IL = (√3) (72.01A) (0.80)
IL = 99.78A

TERMINAL BOX 6

BUILDING	AB	BC	CA	3Ø	KVA	CB SIZE	CONDUCTOR SIZE	CONDUIT SIZE
TB7	15.8	72.01	23.54	0	23.83			
CANTEEN 1			3.87		0.89	30	8.0	20
CANTEEN 3	3.87				0.89	30	8.0	20
CSC OFFICE	11.87				2.73	30	8.0	20
2HP WATER PUMP			12		2.76	30	8.0	20
T O T A L	31.54	72.01	39.41	0	31.1			

IL = (√3) (IØ) (DF) ; DF = 80% **USE: 1 SET OF 3 x 80mm^2 THWN IN 50mmØ PVC**
IL = (√3) (72.01A) (0.80)
IL = 99.78A

TERMINAL BOX 7

BUILDING	AB	BC	CA	3Ø	KVA	CB SIZE	CONDUCTOR SIZE	CONDUIT SIZE
TB8			7.74		1.78			
CLINIC	15.8				3.63	60	8.0	20
LADIES DORMITORY		72.01			16.56	250	80	50
ADMINISTRATIVE BUILDING			15.8		3.63		8.0	20
T O T A L	15.8	72.01	23.54		23.83			

IL = (√3) (IØ) (DF) ; DF = 80% **USE: 1 SET OF 3 x 80mm^2 THWN IN 50mmØ PVC**
IL = (√3) (72.01A) (0.80)
IL = 99.78A

TERMINAL BOX 8

BUILDING	1Ø	KVA	CB SIZE	CONDUCTOR SIZE	CONDUIT SIZE
UNIVERSITY POLICE OFFICE	3.87	0.89	30	8.0	20
POWER HOUSE	3.87	0.89	30	8.0	20
T O T A L	7.74	1.78			

IL = (IL) (DF) ; DF = 80% **USE: 1 SET OF 3 x 60mm^2 THWN IN 50mmØ PVC**
IL = (7.74) (0.80)
IL = 6.192A

TRANSFORMER BANKING 3-25KVA

TERMINAL BOX 9

BUILDING	AB	BC	CA	KVA	CB SIZE	CONDUCTOR SIZE	CONDUIT SIZE
TB10-12	30.53	30.89	66.41	28.00	N/A	150	100
T O T A L	30.53	30.89	66.41	28.00			

IL = (√3) (IØ) (DF) ; DF = 80% **USE: 1 SET OF 3 x 100mm^2 THWN IN 50mmØ PVC**
IL = (√3) (66.41A) (0.80)
IL = 92.02A

TERMINAL BOX 12

BUILDING	AB	BC	CA	KVA	CB SIZE	CONDUCTOR SIZE	CONDUIT SIZE
TB13	22.79	22.79	20.33	15.16	N/A	100	100
GROWING FACILITY	3.87			0.89	30	8.0	20
NATIVE CHICKEN R&D CENTER			46.08	9.2	60	8.0	40
PROPOSED BROODING FACILITY		8.1		1.86	30	8.0	20
PROPOSED HARDENING AND GROWING FACILITY	3.87			0.89	30	8.0	20
T O T A L	30.53	30.89	66.41	28.00			

IL = (√3) (IØ) (DF) ; DF = 80% **USE: 1 SET OF 3 x 100mm^2 THWN 50mmØ PVC**
IL = (√3) (66.41A) (0.80)
IL = 92.02A

TERMINAL BOX 13

BUILDING	AB	BC	CA	KVA	CB SIZE	CONDUCTOR SIZE	CONDUIT SIZE
TB14	12.69	12.69	15.28	9.36	N/A	80	100
FACULTY BOARDING HOUSE	5.05			1.16	30	8.0	20
FACULTY BOARDING HOUSE		5.05		1.16	30	8.0	20
FACULTY BOARDING HOUSE			5.05	1.16	30	8.0	20
FACULTY BOARDING HOUSE	5.05			1.16	30	8.0	20
FACULTY BOARDING HOUSE		5.05		1.16	30	8.0	20
T O T A L	22.79	22.79	20.33	15.16			

IL = (√3) (IØ) (DF) ; DF = 80% **USE: 1 SET OF 1 x 80mm^2 THWN IN 50mmØ PVC**
IL = (√3) (22.79A) (0.80)
IL = 31.58A

TERMINAL BOX 14

BUILDING	AB	BC	CA	KVA	CB SIZE	CONDUCTOR SIZE	CONDUIT SIZE
TB15	5.05	5.05	7.64	4.08	N/A	60	100
5 DOOR APARTMENT	7.64			1.76	30	8.0	20
"ITIK PINAS" BROODING FACILITY		7.64		1.76	30	8.0	20
"ITIK PINAS" GROWING UNIT			7.64	1.76	30	8.0	20
T O T A L	12.69	12.69	15.28	9.36			

IL = (√3) (IØ) (DF) ; DF = 80% **USE: 1 SET OF 3 x 60mm^2 THWN IN 50mmØ PVC**
IL = (√3) (15.28A) (0.80)
IL = 21.17A

TERMINAL BOX 15

BUILDING	AB	BC	CA	KVA	CB SIZE	CONDUCTOR SIZE	CONDUIT SIZE
FACULTY BOARDING HOUSE	5.05			1.16	30	8.0	20
FACULTY BOARDING HOUSE		5.05		1.16	30	8.0	20
"ITIK PINAS" PRODUCTION FACILITY			7.64	1.76	30	8.0	20
T O T A L	5.05	5.05	7.64	4.08			

IL = (√3) (IØ) (DF) ; DF = 80% **USE: 1 SET OF 3 x 60mm^2 THWN IN 50mmØ PVC**
IL = (√3) (7.64A) (0.80)
IL = 10.59A

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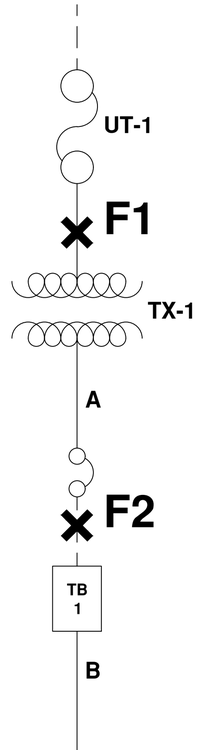
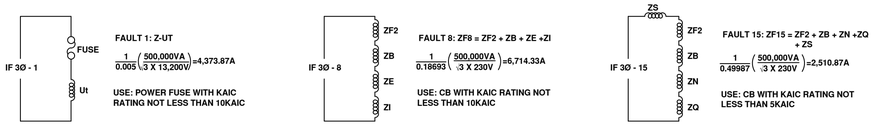
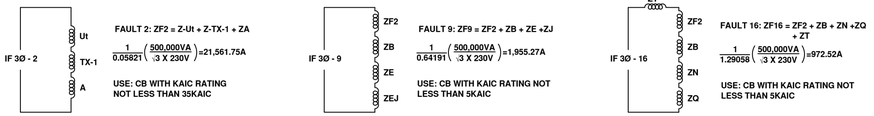
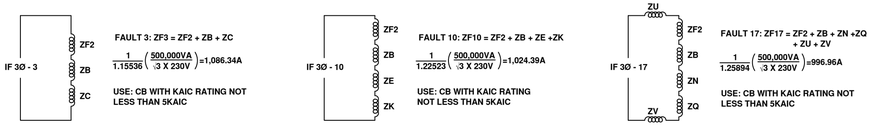
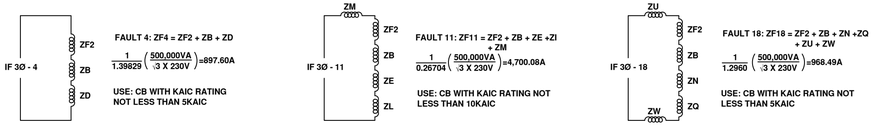
IMPEDANCE ID	DESCRIPTION	CONDUCTOR SIZE(mm²)	CONDUCTOR LENGTH(m)	NO. OF COND/Ø	MVAbase	KVbase	RL 305m	XL 305m	Zpu
Ut	UTILITY IMPEDANCE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.005
Tx	3-167kVA TRANSFORMER	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.045
A	TRANSFORMER SECONDARY TERMINALS TO TB1	325	17.56	3	0.5	0.23	0.023	0.039	0.00821
B	TB1 TO TB2	250	47.81	3	0.5	0.23	0.027	0.039	0.02343
C	FOOD TECHNOLOGY BUILDING	14	70.33	1	0.5	0.23	0.49	0.051	1.07372
D	COLLEGE OF AGRICULTURE ACADEMIC BUILDING	8.0	54.35	1	0.5	0.23	0.78	0.052	1.31665
E	TB2 TO TB3	250	45.04	2	0.5	0.23	0.027	0.039	0.03310
F	GREEN HOUSE	60	38.57	1	0.5	0.23	0.10	0.043	0.13011
G	TISSUE CULTURE BUILDING	60	38.57	1	0.5	0.23	0.10	0.043	0.13011
H	REGIONAL FARMERS TRAINING CENTER	30	25.76	1	0.5	0.23	0.19	0.045	0.15587
I	REGIONAL FARMERS TRAINING CENTER EXTENSION	125	35.18	1	0.5	0.23	0.052	0.041	0.07219
J	COLLEGE OF AGRICULTURE FACULTY	14	34.53	1	0.5	0.23	0.49	0.051	0.52717
K	COLLEGE OF AGRICULTURE LIBRARY	8.0	45.84	1	0.5	0.23	0.78	0.052	1.11049
L	TB3 TO TB4	250	48.02	1	0.5	0.23	0.027	0.039	0.07059
M	AGRITECH	80	30.06	1	0.5	0.23	0.077	0.042	0.08171
N	TB2 TO TB5	100	38.78	1	0.5	0.23	0.062	0.041	0.08933
O	COLLEGE OF AGRICULTURE BUILDING	60	27.66	1	0.5	0.23	0.10	0.043	0.09331
P	SCIENCE LABORATORY BUILDING	60	27.66	1	0.5	0.23	0.10	0.043	0.09331
Q	TB5 TO TB6	80	44.89	1	0.5	0.23	0.077	0.042	0.12201
R	CSB	8.0	21.37	1	0.5	0.23	0.78	0.052	0.51769
S	CANTEEN 3	8.0	8.54	1	0.5	0.23	0.78	0.052	0.20689
T	CANTEEN 1	8.0	41.18	1	0.5	0.23	0.78	0.052	0.99760
U	TB6 TO TB7	80	42.01	1	0.5	0.23	0.077	0.042	0.11419
V	ADMIN BUILDING	8.0	35.16	1	0.5	0.23	0.78	0.052	0.85177
W	LADIES DORMITORY	8.0	36.69	1	0.5	0.23	0.78	0.052	0.88883
X	CLINIC	8.0	19.07	1	0.5	0.23	0.78	0.052	0.46197
Y	TB7 TO TB8	60	144.89	1	0.5	0.23	0.10	0.043	0.48876
Z	POWER HOUSE	8.0	184.89	1	0.5	0.23	0.78	0.052	4.47905
A1	UNIVERSITY POLICE	8.0	154.4	1	0.5	0.23	0.78	0.052	3.74041

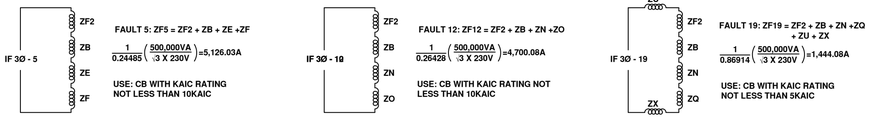


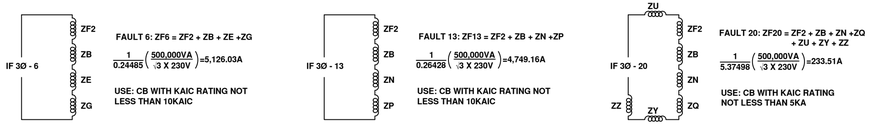


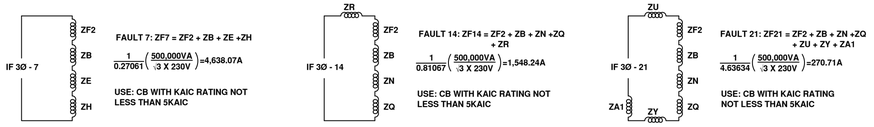


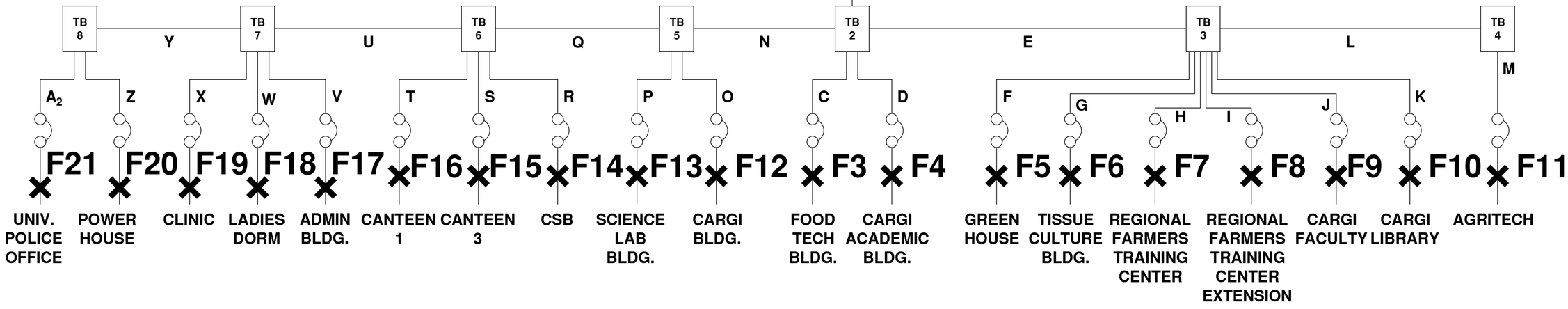






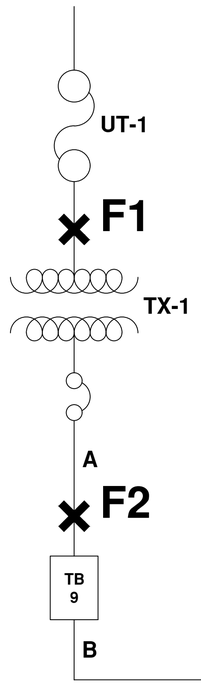




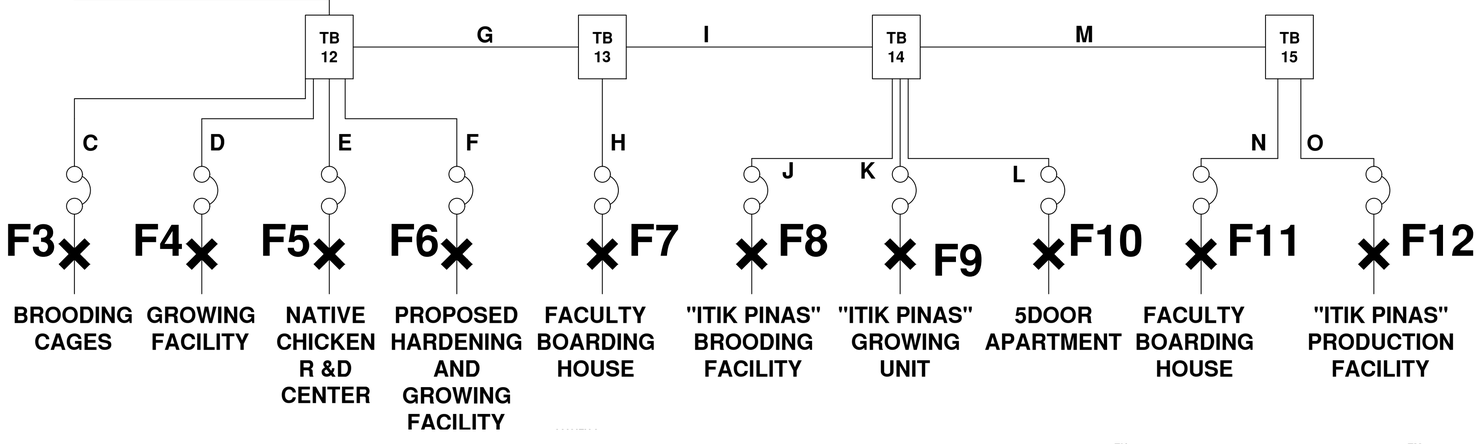


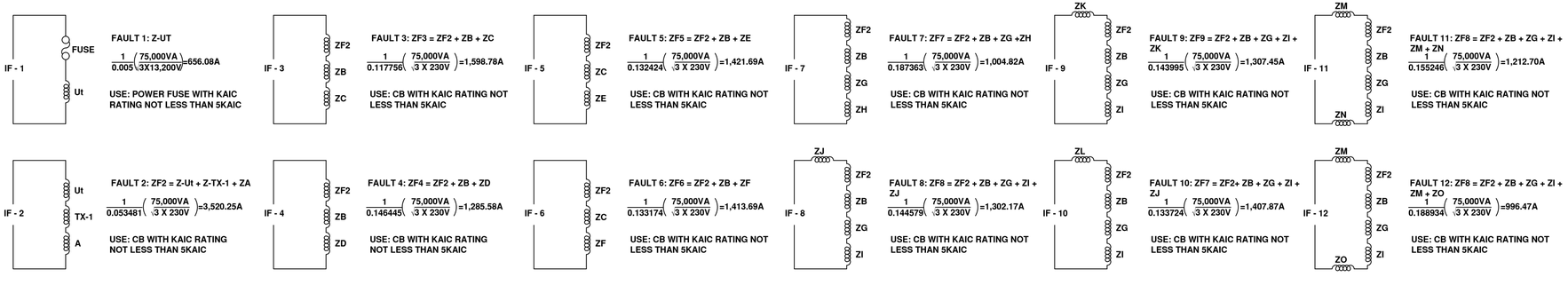
REVIEWED AND CHECKED BY:	DESIGNED BY:	PROJECT TITLE:	REQUISITIONER	RECOMMENDING APPROVAL	RECOMMENDING APPROVAL	APPROVED BY:
ENGR. ALMUHUZIN A. KUHUTAN, ACPE, AER PROFESSIONAL ELECTRIC ENGINEER PRC : 0004914 Date Issued: 07/27/21 Valid Until: 11/24/24 PTR: 2559453 TIN: 938 - 586 - 833	**ENGR. RICARDO B. GONZALES** UNIVERSITY ELECTRICAL ENGINEER PRC: 23724 PTR: TIN: 275203179	**UPGRADING OF PRIMARY FEEDER LINE AND SECONDARY DISTRIBUTION LINE FROM SINGLE-PHASE TO THREE-PHASE LINE** LOCATION: WMSU, SAN RAMON, ZAMBOANGA CITY	**ELDERICO P. TABAL** OIC DEAN, COLLEGE OF AGRICULTURE	**ARCH. JOSEPH ANDREW L. SAHIAL,uap** OIC, DIRECTOR OF PHYSICAL PLANT AND ENGINEERING SERVICES PRC: 0010577 PTR: 2559115 TIN: 445013228	**JOSELITO D. MADROÑAL, DPA** VICE PRESIDENT FOR ADMININISTRATION AND FINANCE	**MA. CARLA A. OCHOTORENA, RN, PhD** UNIVERSITY PRESIDENT

SHEET CONTENTS	SHEET NO.
FAULT CALCULATION DRAFTED BY: KXF	E8 09|11



IMPEDANCE ID	DESCRIPTION	CONDUCTOR SIZE(mm²)	CONDUCTOR LENGTH(m)	NO. OF COND/Ø	MVAbase	KVbase	RL 305m	XL 305m	Zpu
Ut	UTILITY IMPEDANCE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.005
Tx	3 - 25kVA TRANSFORMER	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.045
A	TRANSFORMER SECONDARY TERMINALS TO TB9	150	17.57	1	0.043	0.23	0.062	0.041	0.0034806
B	TB9 TO TB12	150	193.32	1	0.043	0.23	0.062	0.041	0.0382962
C	BROODING FACILITY	8.0	12.47	1	0.043	0.23	0.78	0.052	0.0259799
D	GROWING FACILITY	8.0	26.24	1	0.043	0.23	0.78	0.052	0.0546681
E	NATIVE CHICKEN R&D CENTER	8.0	19.51	1	0.043	0.23	0.78	0.052	0.0406469
F	PROPOSED HARDENING AND GROWING FACILITY	8.0	19.87	1	0.043	0.23	0.78	0.052	0.0413969
G	TB12 TO TB13	100	76.778	1	0.043	0.23	0.062	0.041	0.0152095
H	FACULTY BOARDING HOUSE	8.0	45.88	1	0.043	0.23	0.78	0.052	0.0955859
I	TB13 TO TB14	80	106.634	1	0.043	0.23	0.077	0.042	0.0249262
J	"ITIK PINAS" BROODING FACILITY	8.0	13.38	1	0.043	0.23	0.78	0.052	0.0278758
K	"ITIK PINAS" GROWING UNIT	8.0	13.1	1	0.043	0.23	0.78	0.052	0.0272924
L	5DOOR APARTMENT	8.0	8.17	1	0.043	0.23	0.78	0.052	0.0170213
M	TB14 TO TB15	60	66.184	1	0.043	0.23	0.10	0.043	0.0192002
N	FACULTY BOARDING HOUSE	8.0	18.5	1	0.043	0.23	0.78	0.052	0.0385427
O	"ITIK PINAS" PRODUCTION FACILITY	8.0	34.67	1	0.043	0.23	0.78	0.052	0.0722311





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ENGR. ALMUHUZIN A. KUHUTAN, ACPE, AER PROFESSIONAL ELECTRIC ENGINEER	ENGR. RICARDO B. GONZALES UNIVERSITY ELECTRICAL ENGINEER	UPGRADING OF PRIMARY FEEDER LINE AND SECONDARY DISTRIBUTION LINE FROM SINGLE-PHASE TO THREE-PHASE LINE	ELDERICO P. TABAL OIC DEAN, COLLEGE OF AGRICULTURE	ARCH. JOSEPH ANDREW L. SAHIAL,uap OIC, DIRECTOR OF PHYSICAL PLANT AND ENGINEERING SERVICES	JOSELITO D. MADROÑAL, DPA VICE PRESIDENT FOR ADMININISTRATION AND FINANCE
PRC : 0004914 Date Issued: 07/27/21 Valid Until: 11/24/24 / PTR: 2559453 / TIN: 938 - 586 - 833	PRC: 23724 / PTR: / TIN: 275203179	LOCATION: WMSU, SAN RAMON, ZAMBOANGA CITY		PRC: 0010577 / PTR: 2559115 / TIN: 445013228	

APPROVED BY:	SHEET CONTENTS	SHEET NO.
MA. CARLA A. OCHOTORENA, RN, PhD UNIVERSITY PRESIDENT	-FAULT CALCULATION DRAFTED BY: KXF	E9 10|11

VOLTAGE DROP CALCULATION

As per PEC Part 1 (Art. 2.10 FPN No. 4 (branch) Art. 2.15 FPN No. 2 (feeder))
Conductors for branch/feeder circuit as defined in Article 1.1, sized to prevent a voltage drop exceeding 3 percent at the farthest outlet of power, heating, and lighting loads, or combinations of such loads, ad where the maximum total voltage drop on both feeders and branch circuits to the farthest outlet does not exceed 5 percent.

Voltage drop (VD) = kDI x $\sqrt{R^2 + X^2}$
I = line current
D = Distance of the device from the source
k = Constant (2 for 1phase and √3 for 3phase)
R = Line ac resistance
X = Line reactance at 60hz

$VD_{TB1} = kDI \times \sqrt{R^2 + X^2}$

$= \sqrt{3}\,(509.45A)\,\frac{\sqrt{0.023^2 + 0.039^2}}{\frac{3}{305m}}\,(17.56m)$

$= 0.76673V$

Voltage at TB1 = 230V - 0.76673V = 229.23327V

$VD_{TB2} = kDI \times \sqrt{R^2 + X^2}$

$= \sqrt{3}\,(509.45A)\,\frac{\sqrt{0.027^2 + 0.039^2}}{\frac{3}{305m}}\,(47.81m)$

$= 2.18701V$

Voltage at TB2 = 229.23327V - 2.18701V = 227.04626V

$VD_{TB3} = kDI \times \sqrt{R^2 + X^2}$

$= \sqrt{3}\,(437.80A)\,\frac{\sqrt{0.027^2 + 0.039^2}}{\frac{2}{305m}}\,(45.04m)$

$= 2.65581V$

Voltage at TB3 = 227.04626V - 2.65581V = 224.39045V

$VD_{TB4} = kDI \times \sqrt{R^2 + X^2}$

$= \sqrt{3}\,(193.71A)\,\frac{\sqrt{0.027^2 + 0.039^2}}{305m}\,(48.02m)$

$= 2.50568V$

Voltage at TB4 = 224.39045V - 2.50568V = 221.88477V

$VD_{AGRITECH} = kDI \times \sqrt{R^2 + X^2}$

$= \sqrt{3}\,(193.71A)\,\frac{\sqrt{0.077^2 + 0.042^2}}{305m}\,(30.06m)$

$= 2.90035V$

Voltage at AGRITECH = 221.88477V - 2.90035V = 218.98442V

PERCENT VOLTAGE REGULATION

$\frac{230V - 218.98442V}{230V} \times 100 = 4.789\%$

Voltage drop (VD) = kDI x $\sqrt{R^2 + X^2}$
I = line current
D = Distance of the device from the source
k = Constant (2 for 1phase and √3 for 3phase)
R = Line ac resistance
X = Line reactance at 60hz

$VD_{TB1} = kDI \times \sqrt{R^2 + X^2}$

$= \sqrt{3}\,(509.45A)\,\frac{\sqrt{0.023^2 + 0.039^2}}{\frac{3}{305m}}\,(17.56m)$

$= 0.76673V$

Voltage at TB1 = 230V - 0.76673V = 229.23327V

$VD_{TB2} = kDI \times \sqrt{R^2 + X^2}$

$= \sqrt{3}\,(509.45A)\,\frac{\sqrt{0.027^2 + 0.039^2}}{\frac{3}{305m}}\,(47.81m)$

$= 2.18701V$

Voltage at TB2 = 229.23327V - 2.18701V = 227.04626V

$VD_{TB5} = kDI \times \sqrt{R^2 + X^2}$

$= \sqrt{3}\,(99.78A)\,\frac{\sqrt{0.062^2 + 0.041^2}}{305m}\,(38.78m)$

$= 1.63335V$

Voltage at TB5 = 227.04626V - 1.63335V = 225.41291V

$VD_{TB6} = kDI \times \sqrt{R^2 + X^2}$

$= \sqrt{3}\,(99.78A)\,\frac{\sqrt{0.077^2 + 0.042^2}}{305m}\,(44.89m)$

$= 2.23101V$

Voltage at TB6 = 225.41291V - 2.23101V = 223.1819V

$VD_{TB7} = kDI \times \sqrt{R^2 + X^2}$

$= \sqrt{3}\,(99.78A)\,\frac{\sqrt{0.077^2 + 0.042^2}}{305m}\,(42.01m)$

$= 2.08788V$

Voltage at TB7 = 223.1819V - 2.08788V = 221.09402V

$VD_{TB8} = kDI \times \sqrt{R^2 + X^2}$

$= 2\,(6.192A)\,\frac{\sqrt{0.10^2 + 0.043^2}}{305m}\,(144.89m)$

$= 0.64038V$

Voltage at TB8 = 221.09402V - 0.64038V = 220.45364V

VD/POWER HOUSE = kDI x √R2/ + X2/

$= 2\,(3.81A)\,\frac{\sqrt{0.78^2 + 0.052^2}}{305m}\,(40m)$

$= 0.78122V$

Voltage at POWER HOUSE = 220.45364V - 0.78122V = 219.76242V

PERCENT VOLTAGE REGULATION

$\frac{230V - 219.76242V}{230V} \times 100 = 4.49\%$

Voltage drop (VD) = kDI x $\sqrt{R^2 + X^2}$
I = line current
D = Distance of the device from the source
k = Constant (2 for 1phase and √3 for 3phase)
R = Line ac resistance
X = Line reactance at 60hz

$VD_{TB9} = kDI \times \sqrt{R^2 + X^2}$

$= \sqrt{3}\,(92.02A)\,\frac{\sqrt{0.062^2 + 0.041^2}}{305m}\,(17.566m)$

$= 0.68231V$

Voltage at TB12= 230V - 0.68231V = 229.31769V

$VD_{TB12} = kDI \times \sqrt{R^2 + X^2}$

$= \sqrt{3}\,(92.02A)\,\frac{\sqrt{0.062^2 + 0.041^2}}{305m}\,(193.317m)$

$= 7.50895V$

Voltage at TB10 = 229.31769V - 7.50895V = 221.80874V

$VD_{TB13} = kDI \times \sqrt{R^2 + X^2}$

$= \sqrt{3}\,(31.58A)\,\frac{\sqrt{0.077^2 + 0.042^2}}{305m}\,(76.778m)$

$= 1.20769V$

Voltage at TB13= 221.80874V - 1.20769V = 220.60105V

$VD_{TB14} = kDI \times \sqrt{R^2 + X^2}$

$= \sqrt{3}\,(21.17A)\,\frac{\sqrt{0.10^2 + 0.043^2}}{305m}\,(106.634m)$

$= 1.39546V$

Voltage at TB14 = 220.60105V - 1.39546V = 219.20559V

$VD_{TB15} = kDI \times \sqrt{R^2 + X^2}$

$= 2\,(8.08A)\,\frac{\sqrt{0.10^2 + 0.043^2}}{305m}\,(66.184m)$

$= 0.50029V$

Voltage at TB15 = 219.20559V - 0.50029V = 218.7053V

PERCENT VOLTAGE REGULATION

$\frac{230V - 218.7053V}{230V} \times 100 = 4.91074\%$

WESTERN MINDANAO STATE UNIVERSITY ZAMBOANGA CITY 1996	REVIEWED AND CHECKED BY:			DESIGNED BY:			PROJECT TITLE:	REQUISITIONER	RECOMMENDING APPROVAL			RECOMMENDING APPROVAL	APPROVED BY:	SHEET CONTENTS	SHEET NO.	
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	PRC : 0004914 Date Issued: 07/27/21 Valid Until: 11/24/24	PTR: 2559453	TIN: 938 - 586 - 833	PRC: 23724	PTR:	TIN: 275203179	LOCATION: WMSU, SAN RAMON, ZAMBOANGA CITY		PRC: 0010577	PTR: 2559115	TIN: 445013228			DRAFTED BY: KXF		