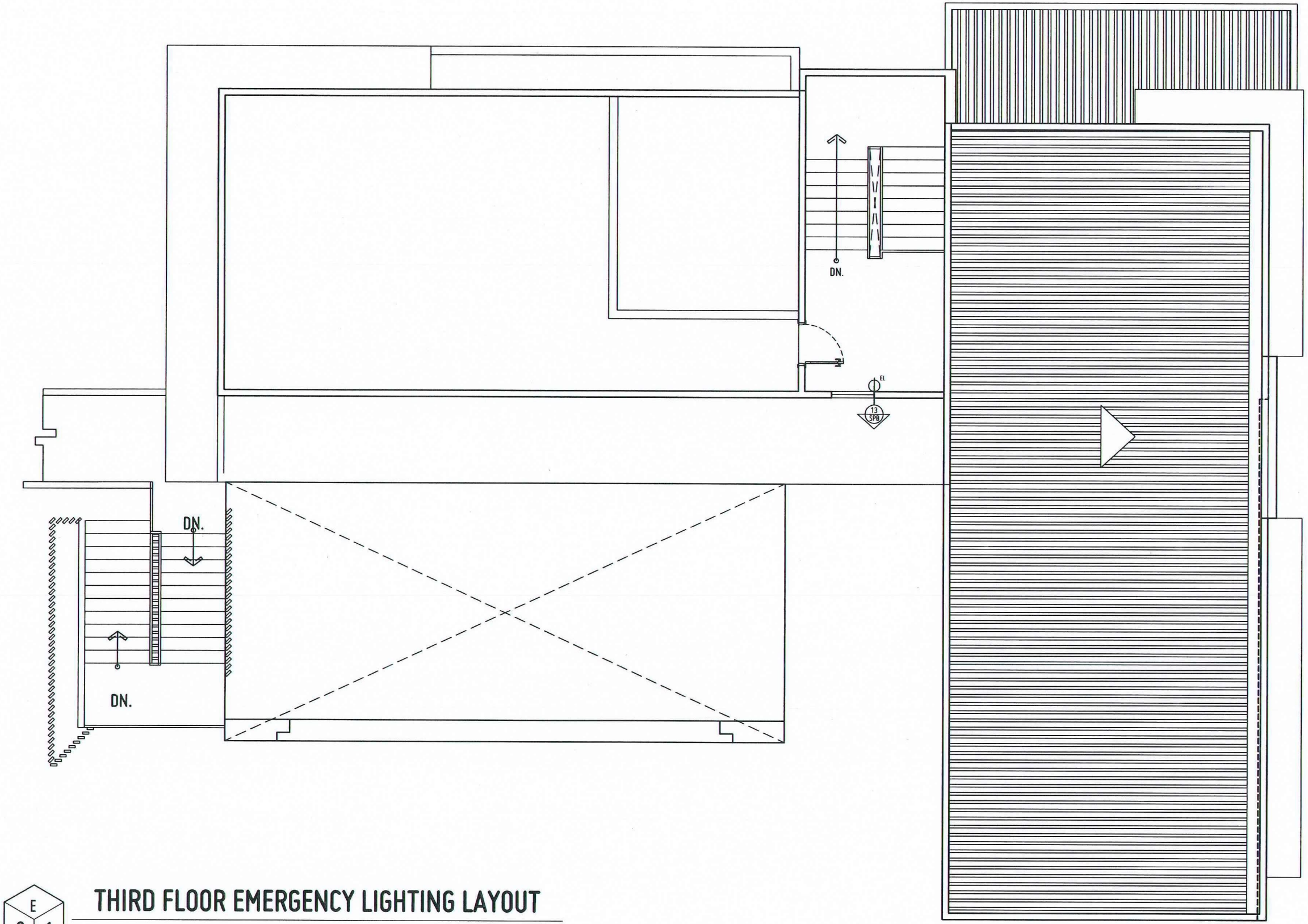
REPUBLIC OF THE PHILIPPINES
OFFICE OF THE BUILDING OFFICIAL

Approved by:



E
9 1

THIRD FLOOR EMERGENCY LIGHTING LAYOUT

SCALE 1:100 METERS

REPUBLIC OF THE PHILIPPINES
UNIVERSITY OF SCIENCE AND TECHNOLOGY OF SOUTHERN PHILIPPINES
CAGAYAN DE ORO CAMPUS
INFRASTRUCTURE PLANNING AND FACILITY DEVELOPMENT UNIT
CLARO M. RECTO AVENUE, LAPASAN, CAGAYAN DE ORO CITY 9000
TELEPHONE # (08822) 72-60-65 / (088) 856-1738 / 856-1739 | TELE FAX (088) 856-4696
WEBSITE: www.ustp.edu.ph

PROFESSIONAL ELECTRICAL ENGINEER
PRC NO. | PTR NO.
DATE:
TIN: | PLACE:

PROJECT	PROVISION FUNDING FOR CONSTRUCTION OF MULTI-PURPOSE BUILDING
LOCATION	USTP JASAAN CAMPUS, UPPER JASAAN, MISAMIS ORIENTAL
OWNER	UNIVERSITY OF SCIENCE & TECHNOLOGY OF SOUTHERN PHILIPPINES

RECOMMENDING APPROVAL:	RECOMMENDING APPROVAL:	APPROVED BY:	SHEET CONTENTS:	DRAWN BY:
ENGR. GRACE C. BABA	ATTY. JONATHAN S. OCHE	AMBROSIO B. CULTURA II, PH.D	ROOF DECK EMERGENCY LIGHTING LAYOUT	DATE DRAWN:
DIRECTOR, INFRASTRUCTURE PLANNING & FACILITY DEVELOPMENT OFFICE	VP FOR ADMINISTRATION & LEGAL AFFAIRS	PRESIDENT, USTP SYSTEM		FNT:

E9

GENERAL NOTES:

1. ALL WORKS SHALL COMPLY WITH THE PROVISIONS OF THE LATEST EDITION OF THE PHILIPPINE ELECTRICAL CODE, THE RULES & REGULATIONS OF THE NATIONAL AND LOCAL AUTHORITY CONCERNED IN THE ENFORCEMENT OF ELECTRICAL LAWS AND ORDINANCES AND THE REGULATIONS OF THE UTILITY COMPANY CONCERNED.

2. POWER SERVICE TO THE BUILDING SHALL BE 230 VOLTS 3 PHASE 3 WIRE & GROUND.

4. SMALLEST CONDUCTOR FOR POWER AND LIGHTING SHALL BE 3.5mm2 THHN AND SMALLEST RACEWAY SHALL BE 15mm DIA. TRADE SIZE. CONDUCTOR SHALL BE TYPE THHN EXCEPT AS OTHERWISE REQUIRED BY THE DRAWING AND INSULATED FOR 600 VOLTS.

5. GROUNDING WIRE SHALL BE PROVIDED TO ALL EQUIPMENTS, OUTLETS AND LIGHTING CIRCUITS AND ALL NON-CURRENT CARRYING METAL PARTS.

6. MATERIALS AND EQUIPMENT TO BE USED SHALL BE NEW AND OF APPROVED TYPE.FOR BOTH LOCATION AND PURPOSE INTENDED, SUBMIT SAMPLES OF MATERIALS TO THE ARCHITECT/ DESIGN ENGINEER FOR APPROVAL PRIOR TO INSTALLATION.

7. NO BRANCH CKT. SHALL HAVE A LOAD OF MORE THAN 80% OF ITS RATING.

8. EMERGENCY LIGHTING SHALL BE PROVIDED WITH A DEDICATED CIRCUIT.

9. CIRCUIT BREAKERS SHALL BE BOLT ON TYPE. USE ONLY ONE BRAND ALL THROUGHOUT.

10. MOUNTING HEIGHT SHALL BE AS FOLLOWS;
a. LIGHT CONTROL SWITCH - 1.52 ABOVE FINISHED FLOOR
b. CONVENIENCE OUTLET - 0.30 ABOVE FINISHED FLOOR
c. SPECIAL PURPOSE OUTLET - 0.30 ABOVE FINISHED FLOOR OR AS REQUIRED BY THE ARCHITECT
d. PANEL BOARDS, FIRE ALARM-PANE 1.80 FROM TOP OF PANEL TO FINISHED FLOOR

10. ALL WORKS SHALL BE COORDINATED WITH THE ARCHITECT AND OTHER TRADE DISCIPLINE PRIOR TO INSTALLATION.

11. CONTRACTOR SHALL SUBMIT AS-BUILT DRAWINGS SIGNED AND SEALED BY PROFESSIONAL ELECTRICAL ENGINEER.

12. CONTRACTOR TO PERFORM ALL TEST NECESSARY BUT NOT LIMITED TO THE FOLLOWING.

a. CABLE INSULATION INTEGRITY TEST
b. PHASE SEQUENCE TEST
c. LOAD TEST
d. COMPLETE TEST FOR TRANSFORMER

13. ALL WIRES SHALL BE COLOR CODED AS FOLLOWS:
PHASE - A - BLACK GROUND - GREEN
PHASE - B - RED PHASE - C - BLUE

14. NO CHANGE OR MODIFICATION SHALL BE MADE ON THESE PLANS WITHOUT THE ENGINEER'S/OWNER'S WRITTEN COMMENT.

15. ALL MOTORS AND AIR-CONDITIONING UNITS MUST HAVE INDIVIDUAL ENCLOSED THERMAL MAGNETIC CIRCUIT BREAKER.

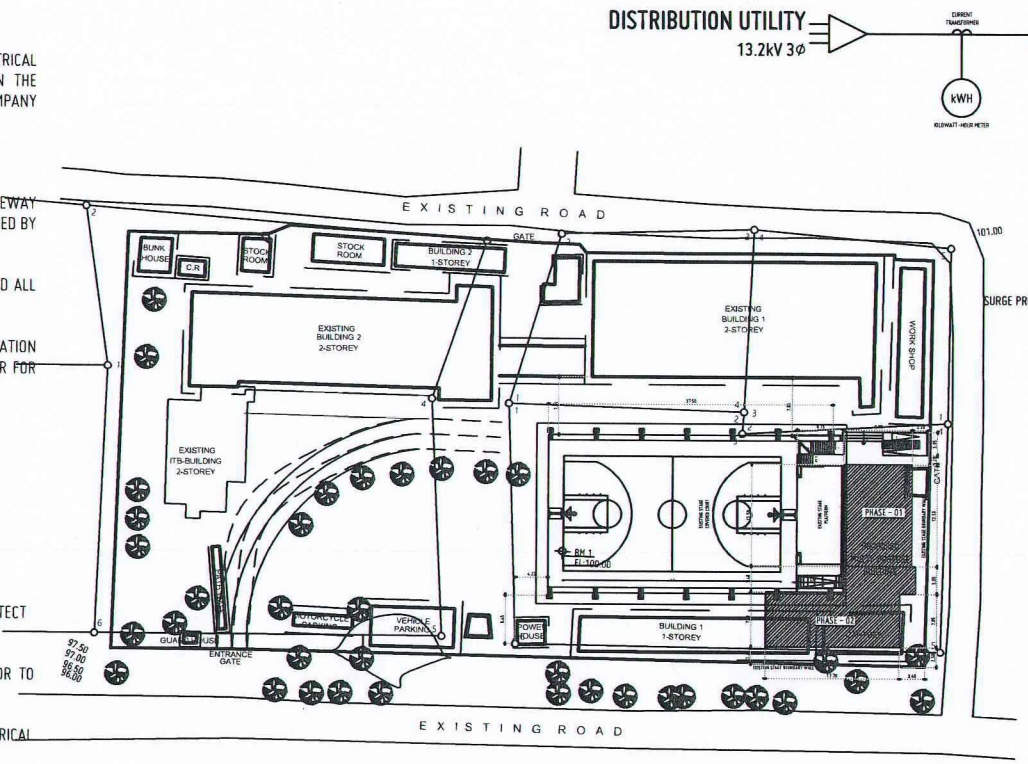
16. ENCLOSURE TYPE FOR PANEL BOARDS SHALL BE NEMA 3R FOR INDOORS AND NEMA 4X FOR OUTDOORS.

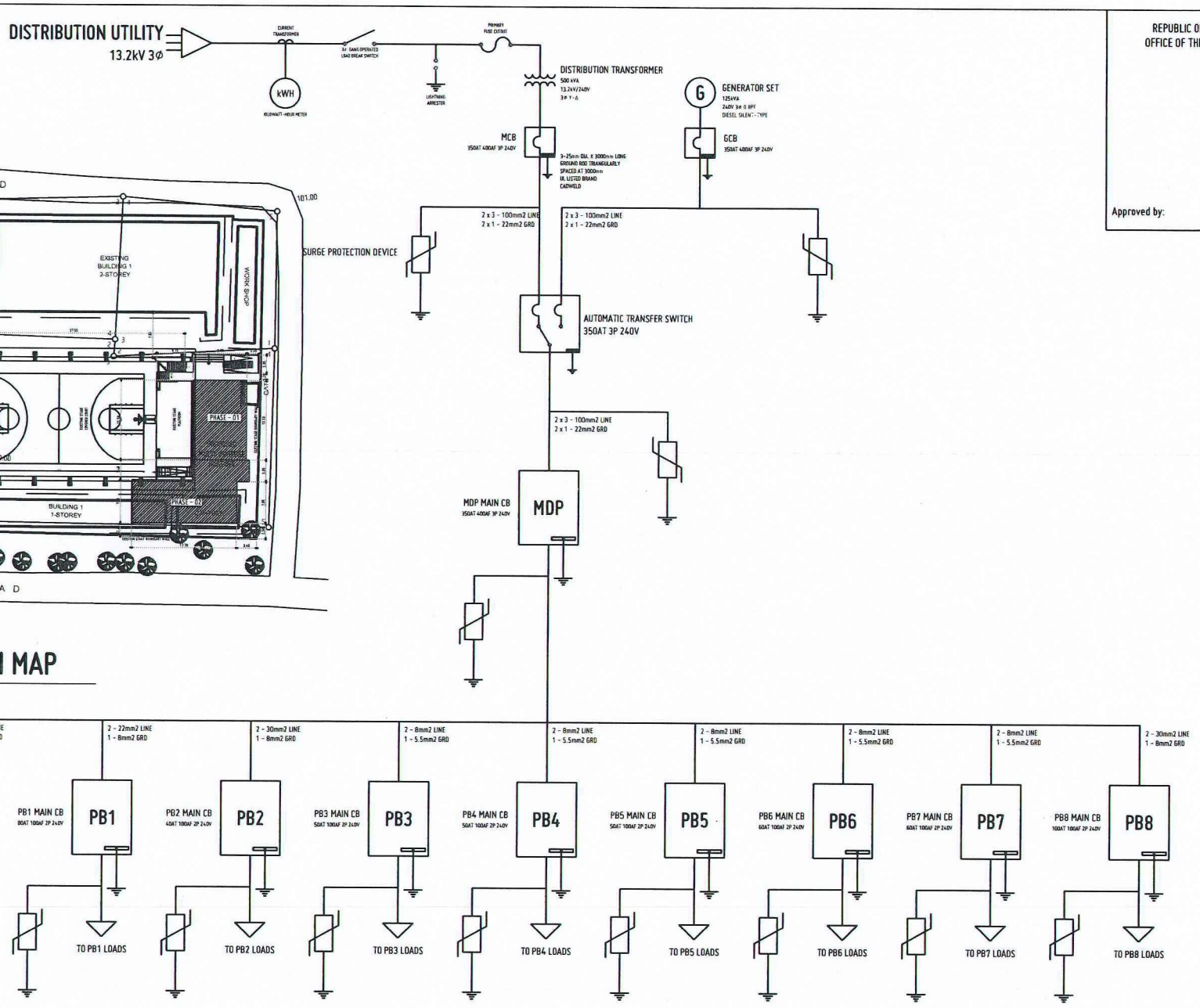
17. ALL CONVENIENCE OUTLETS SHALL BE TAMPER-RESISTANT (TRR), GFCI CONVENIENCE OUTLETS SHALL BE USED IN WET LOCATIONS.

18. EMERGENCY LIGHTING AND FIRE EXIT SIGNAGE OUTLETS SHALL BE CEILING-MOUNTED.

IMPORTANT NOTES

1. STRUCTURAL DESIGN/DETAILS OF PEDESTAL, DUCTBANK AND GENERATOR PADS SHALL BE COORDINATED WITH STRUCTURAL ENGINEER PRIOR TO IMPLEMENTATION
2. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH POWER UTILITY COMPANY FOR TOTAL LOAD REQUIREMENTS OF THE PROJECT TO ASSURE AVAILABILITY OF 3-PHASE OR 1-PHASE TO BE SUPPLIED BY THE UTILITY COMPANY. THIS SHALL BE DONE PRIOR TO FABRICATION OR PURCHASE OF PANELBOARD & INSTALLATION OF SERVICE & FEEDERS.
3. ELECTRICAL CONTRACTOR SHALL COORDINATE LOCATION OF SERVICE PEDESTAL WITH EXISTING UTILITY POLE AT SITE & WITH ELECTRIC UTILITY COMPANY PRIOR TO IMPLEMENTATION. IN GENERAL, LOCATE PEDESTAL ON THE SIDE NEAR THE EXISTING POLE.
4. A=3.0M FOR PEDESTRIAN AREAS
=3.7M FOR DRIVEWAYS SUBJECT TO CAR TRAFFIC
=5.5M FOR DRIVEWAYS/STREET SUBJECT TO TRUCK TRAFFIC





E 10 4

LOCATION MAP

NOT TO SCALE

E 10 1

SINGLE LINE DIAGRAM

DRAWN NOT TO SCALE

	6" Ø 18W PINLIGHT COOL WHITE (RECESSED TYPE)	EL	EMERGENCY LIGHT
	6" Ø 18W PINLIGHT COOL WHITE (SURFACE TYPE)	EXIT	FIRE EXIT OUTLET
	32W T8 LED LAMP WITH REFLECTOR	FACP	FIRE ALARM CONTROL PANEL
	SIMPLEX UNIVERSAL CONVENIENCE OUTLET		AIR-COOLED CONDENSING UNIT (ACCU)
	DUPLEX UNIVERSAL CONVENIENCE OUTLET	EF	EXHAUST FAN
TRR	DUPLEX TAMPER RESISTANT RECEPTACLE (TRR) UNIVERSAL CONVENIENCE OUTLET	B1 PBA	CIRCUIT HOMERUN
TRR-WP	DUPLEX TAMPER RESISTANT RECEPTACLE (TRR) UNIVERSAL CONVENIENCE OUTLET WITH WEATHERPROOF COVER		PANEL BOARD
TRR$_{REF}$	DUPLEX TAMPER RESISTANT RECEPTACLE (TRR) UNIVERSAL CONVENIENCE OUTLET FOR REFRIGERATOR		SERVICE PEDESTAL
GFCI	DUPLEX GROUND FAULT CIRCUIT INTERRUPTER (GFCI) UNIVERSAL CONVENIENCE OUTLET		ENCLOSED CIRCUIT BREAKER
GFCI$_{HD}$	DUPLEX GROUND FAULT CIRCUIT INTERRUPTER (GFCI) UNIVERSAL CONVENIENCE OUTLET FOR HAND DRYER		

E 10 2

ELECTRICAL LEGEND AND SYMBOLS

DRAWN NOT TO SCALE

REPUBLIC OF THE PHILIPPINES
OFFICE OF THE BUILDING OFFICIAL

Approved by:

USTP Southern

REPUBLIC OF THE PHILIPPINES
UNIVERSITY OF SCIENCE AND TECHNOLOGY OF SOUTHERN PHILIPPINES
CAGAYAN DE ORO CAMPUS
INFRASTRUCTURE PLANNING AND FACILITY DEVELOPMENT UNIT
CLARO M. RECTO AVENUE, LAPASAN, CAGAYAN DE ORO CITY 9000
TELEPHONE # (08822) 72-60-65 / (088) 856-1738 / 856-1739 | TELE FAX (088) 856-4696
WEBSITE: www.ustp.edu.ph

PROFESSIONAL ELECTRICAL ENGINEER
PRC NO. | PTR NO.
DATE:
TIN: | PLACE:

PROJECT	PROVISION FUNDING FOR CONSTRUCTION OF MULTI-PURPOSE BUILDING
LOCATION	USTP JASAAN CAMPUS, UPPER JASAAN, MISAMIS ORIENTAL
OWNER	UNIVERSITY OF SCIENCE & TECHNOLOGY OF SOUTHERN PHILIPPINES

RECOMMENDING APPROVAL:
ENGR. GRACE C. BABA
DIRECTOR, INFRASTRUCTURE PLANNING & FACILITY DEVELOPMENT OFFICE

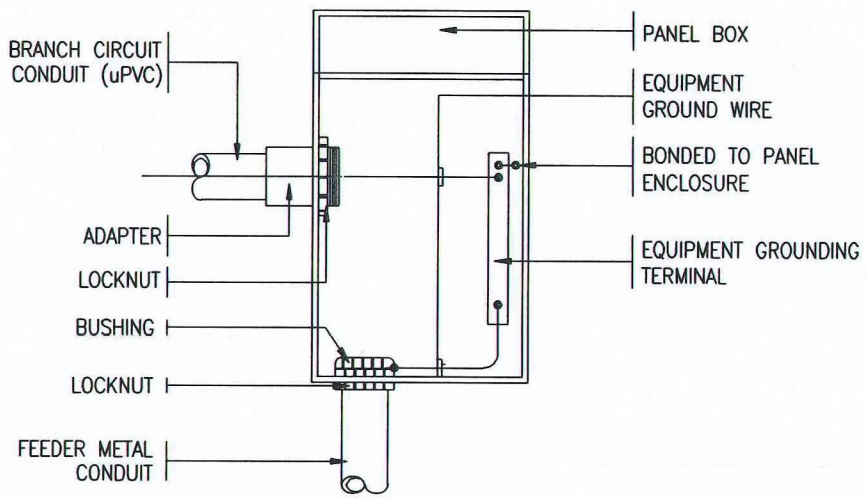
RECOMMENDING APPROVAL:
ATTY. JONATHAN S. OCHE
VP FOR ADMINISTRATION & LEGAL AFFAIRS

APPROVED BY:
AMBROSIO B. CULTURA II, PH.D
PRESIDENT, USTP SYSTEM

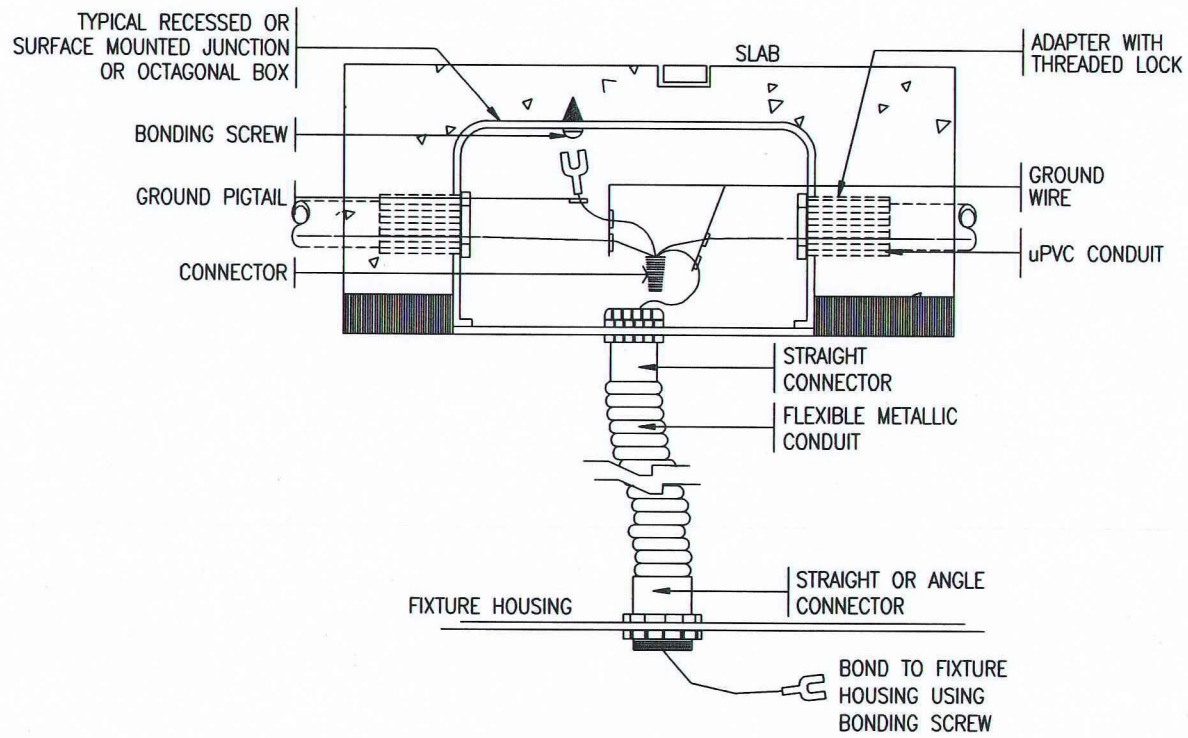
SHEET CONTENTS:
SINGLE LINE DIAGRAM
ELECTRICAL LEGEND AND SYMBOLS

DRAWN BY:
DATE DRAWN:
FNT:

E10



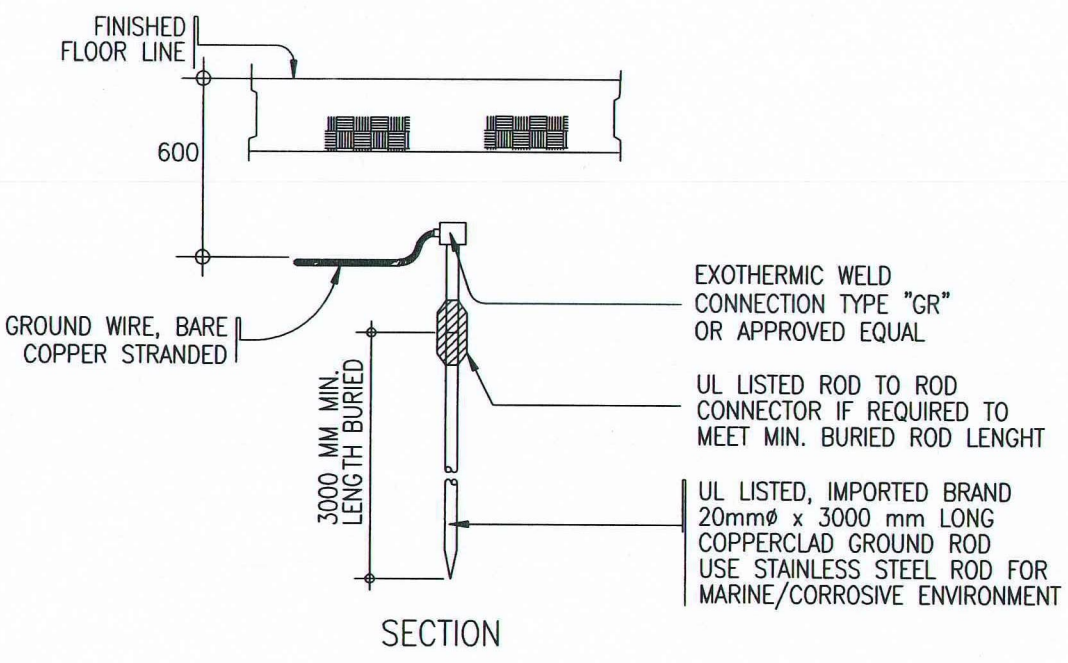
PANELBOARD



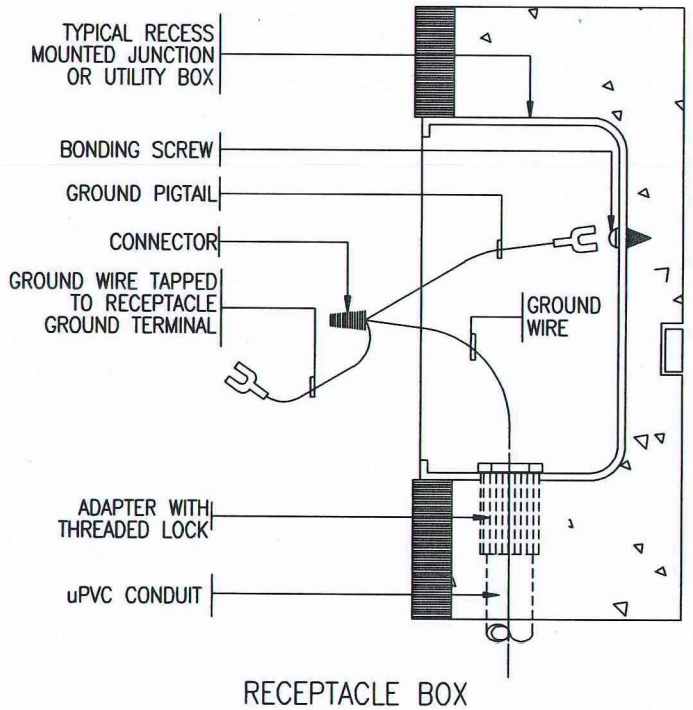
LIGHTING FIXTURE BOX

REPUBLIC OF THE PHILIPPINES
OFFICE OF THE BUILDING OFFICIAL

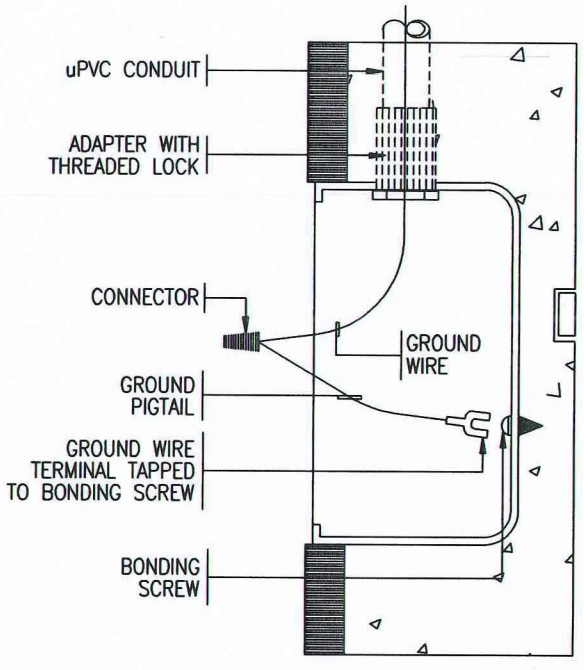
Approved by:



SECTION



RECEPTACLE BOX



SWITCH BOX

E 11 1 **TYPICAL GROUND ROD DETAIL**

DRAWN NOT TO SCALE

E 11 2 **TYPICAL GROUNDING CONNECTION DETAILS**

DRAWN NOT TO SCALE

USTP

REPUBLIC OF THE PHILIPPINES
UNIVERSITY OF SCIENCE AND TECHNOLOGY OF SOUTHERN PHILIPPINES
CAGAYAN DE ORO CAMPUS
INFRASTRUCTURE PLANNING AND FACILITY DEVELOPMENT UNIT

CLARO M. RECTO AVENUE, LAPASAN, CAGAYAN DE ORO CITY 9000
TELEPHONE # (08822) 72-60-65 / (088) 856-1738 / 856-1739 | TELE FAX (088) 856-4696
WEBSITE: www.ustp.edu.ph

PROFESSIONAL ELECTRICAL ENGINEER
PRC NO. | PTR NO.
DATE:
TIN: | PLACE:

PROJECT	PROVISION FUNDING FOR CONSTRUCTION OF MULTI-PURPOSE BUILDING
LOCATION	USTP JASAAN CAMPUS, UPPER JASAAN, MISAMIS ORIENTAL
OWNER	UNIVERSITY OF SCIENCE & TECHNOLOGY OF SOUTHERN PHILIPPINES

RECOMMENDING APPROVAL:
ENGR. GRACE C. BABA
DIRECTOR, INFRASTRUCTURE PLANNING & FACILITY DEVELOPMENT OFFICE

RECOMMENDING APPROVAL:
ATTY. JONATHAN S. OCHE
VP FOR ADMINISTRATION & LEGAL AFFAIRS

APPROVED BY:
AMBROSIO B. CULTURA II, PH.D
PRESIDENT, USTP SYSTEM

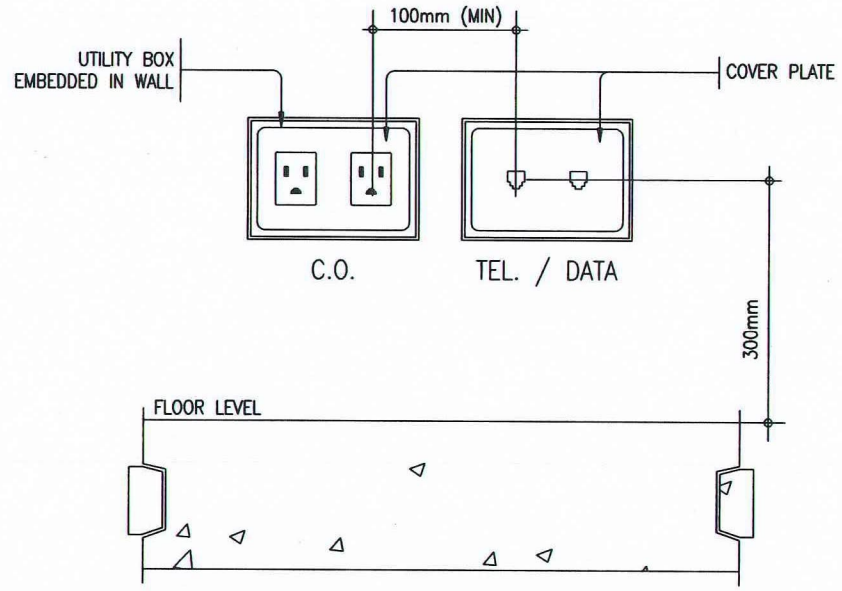
SHEET CONTENTS:
TYPICAL GROUND ROD DETAILS
TYPICAL GROUNDING CONNECTION DETAILS

DRAWN BY:
DATE DRAWN:
FNT:

E11

REPUBLIC OF THE PHILIPPINES
OFFICE OF THE BUILDING OFFICIAL

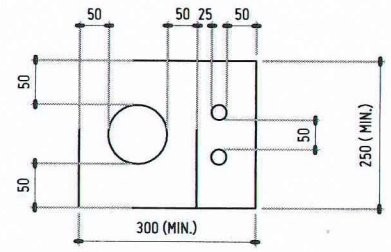
Approved by:



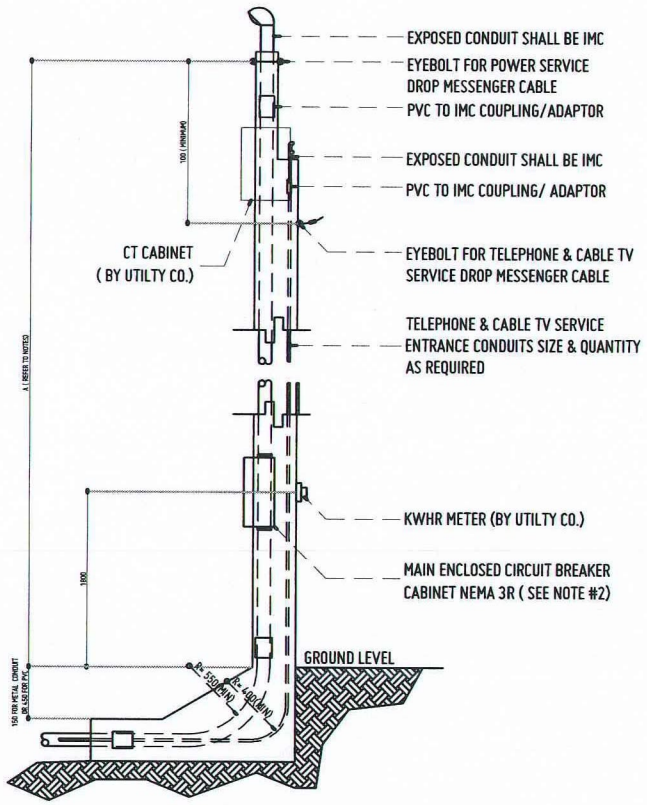
TYPICAL C.O. AND TELEPHONE , DATA OUTLETS MOUNTING DETAILS

EE 12 1

DRAWN NOT TO SCALE



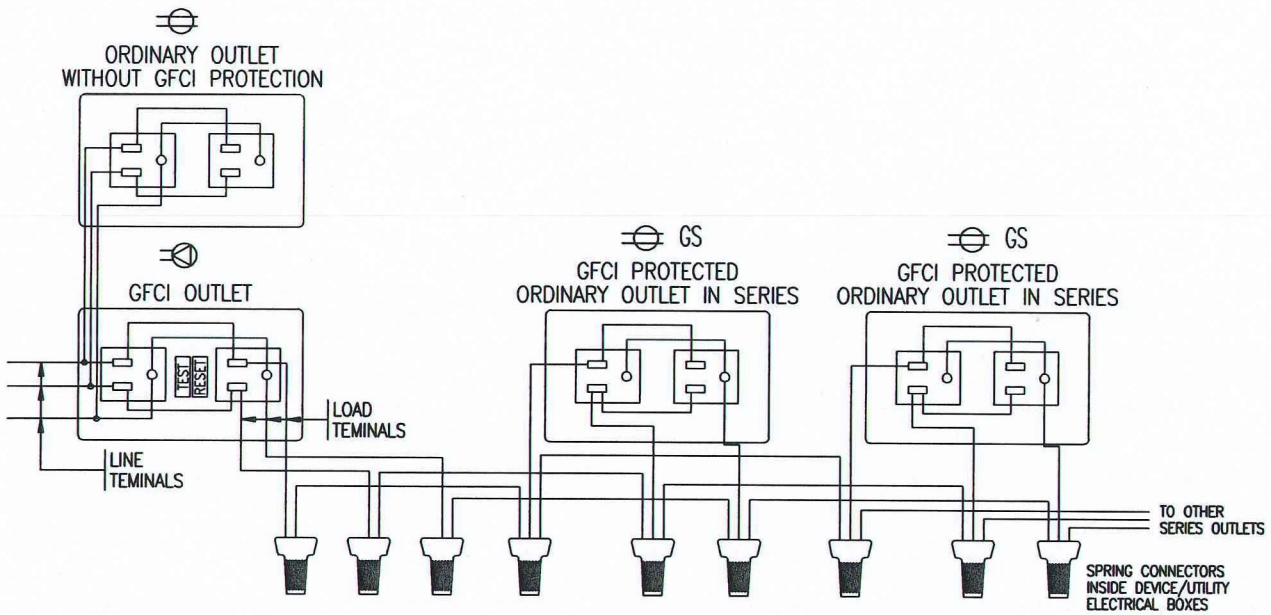
PLAN



SERVICE PEDESTAL DETAIL

EE 12 3

DRAWN NOT TO SCALE



CONV. OUTLET IN SERIES WITH GCFI OUTLET WIRING CONNECTION DETAIL

EE 12 2

DRAWN NOT TO SCALE

REPUBLIC OF THE PHILIPPINES
UNIVERSITY OF SCIENCE AND TECHNOLOGY OF SOUTHERN PHILIPPINES
CAGAYAN DE ORO CAMPUS
INFRASTRUCTURE PLANNING AND FACILITY DEVELOPMENT UNIT
CLARO M. RECTO AVENUE, LAPASAN, CAGAYAN DE ORO CITY 9000
TELEPHONE # (08822) 72-60-65 / (088) 856-1738 / 856-1739 | TELE FAX (088) 856-4696
WEBSITE: www.ustp.edu.ph

PROFESSIONAL ELECTRICAL ENGINEER
PRC NO. | PTR NO.
DATE:
TIN: | PLACE:

PROJECT	PROVISION FUNDING FOR CONSTRUCTION OF MULTI-PURPOSE BUILDING
LOCATION	USTP JASAAN CAMPUS, UPPER JASAAN, MISAMIS ORIENTAL
OWNER	UNIVERSITY OF SCIENCE & TECHNOLOGY OF SOUTHERN PHILIPPINES

RECOMMENDING APPROVAL:	RECOMMENDING APPROVAL:	APPROVED BY:	SHEET CONTENTS:	DRAWN BY:
ENGR. GRACE C. BABA	ATTY. JONATHAN S. OCHE	AMBROSIO B. CULTURA II, PH.D	TYPICAL CO AND TELEPHONE, DATA OUTLETS MOUNTING DETAILS	
DIRECTOR, INFRASTRUCTURE PLANNING & FACILITY DEVELOPMENT OFFICE	VP FOR ADMINISTRATION & LEGAL AFFAIRS	PRESIDENT, USTP SYSTEM	CONVENIENCE OUTLET IN SERIES WITH GFCI OUTLET WIRING CONNECTION DETAILS	DATE DRAWN:
			SERVICE PEDESTAL DETAILS	FNT:

E12

REPUBLIC OF THE PHILIPPINES
OFFICE OF THE BUILDING OFFICIAL

Approved by:

DESIGN ANALYSIS						
LOAD TYPE	VA PER LOAD	VOLTAGE	FLC PER PHASE (w/ DF)			
			AB	BC	CA	3Ø
LIGHTING OUTLET	18980.00	230	33.67	18.09	14.26	0.00
CONVENIENCE OUTLET	24780.00	230	44.19	24.73	23.95	0.00
AIRCON	33120.00	230	20.00	51.00	73.00	0.00
MOTOR (NON-CONTINUOUS)	7500.00	230	26.09	0.00	0.00	0.00
MOTOR (CONTINUOUS)	11300.00	230	10.00	39.13	0.00	0.00
LARGEST MOTOR	0.00	230	0.00	0.00	0.00	0.00
SPARE	39000.00	230	31.30	31.30	52.17	12.05
TOTAL CONNECTED VA	134680.00	230	165.25	164.25	163.38	12.05

DEMAND FACTOR CALCULATION	
DEMAND FACTOR = TOTAL DEMAND VA/TOTAL CONNECTED VA	
TOTAL DEMAND VA	118164.00
OVERALL DEMAND FACTOR	87.74%

LINE CURRENT CALCULATION
IL= LARGEST TOTAL PHASE CURRENT + TOTAL 3Ø CURRENT
IL=165.252173913043(1.732) + 12.0494025504569
298.266167767848 A

DEMAND FACTORS PER PB		TOTAL VA	DEMAND VA
MCB	0.88	134680	118164.00
MDP	0.88	128680.00	113364.00
PB1	0.92	14180.00	12980.00
PB2	0.91	17940.00	16260.00
PB3	0.87	7100.00	6176.00
PB4	0.87	7100.00	6176.00
PB5	0.88	9135.00	8011.00
PB6	0.88	9135.00	8011.00
PB7	0.86	8100.00	6976.00
PB8	0.92	16730.00	15342.00
SPB	0.86	33260.00	28632.00

PERCENT LOADING		
PB ID	% MOTOR LOAD	% STATIC LOAD
PB1	55.15%	44.85%
PB2	50.17%	49.83%
PB3	32.39%	67.61%
PB4	32.39%	67.61%
PB5	36.51%	63.49%
PB6	36.51%	63.49%
PB7	28.40%	71.60%
PB8	56.37%	43.63%
SPB	36.38%	63.62%

TRANSFORMER SIZING	
TOTAL LINE CURRENT	CALCULATION
298.2661678	TRANSFORMER SIZE
	S= (1.732 x V x I) x 125%
	S = (1.732 x 230 x 298.27) x 125%
	S = 148.52163824 kVA
THEREFORE USE 150 KVA 3P 13.2KV/240V WYE-DELTA DISTRIBUTION TRANSFORMER	

GENERATOR SIZING	
CALCULATION	
kW LOAD	P = (1.732 x V x I x PF)/1000
	P = (1.732 x 230 x 298.27 x 0.80)/1000
	P = 95.0538484736kW
RESERVE CAPACITY	P = 95.05 x 0.25
	P =23.76kW
GENERATOR SIZE	P = 95.05 + 23.76
	P = 118.82kW
THEREFORE USE 125kVA 3P 240V 60HZ 0.8PF SILENT-TYPE DIESEL GENERATOR SET	

E 13 1

SCHEDULE OF LOADS, TRANSFORMER AND GENERATOR SIZING

DRAWN NOT TO SCALE

USTP

REPUBLIC OF THE PHILIPPINES
UNIVERSITY OF SCIENCE AND TECHNOLOGY OF SOUTHERN PHILIPPINES
CAGAYAN DE ORO CAMPUS
INFRASTRUCTURE PLANNING AND FACILITY DEVELOPMENT UNIT
CLARO M. RECTO AVENUE, LAPASAN, CAGAYAN DE ORO CITY 9000
TELEPHONE # (08822) 72-60-65 / (088) 856-1738 / 856-1739 | TELE FAX (088) 856-4696
WEBSITE: www.ustp.edu.ph

PROFESSIONAL ELECTRICAL ENGINEER
PRC NO. | PTR NO.
DATE:
TIN: | PLACE:

PROJECT: PROVISION FUNDING FOR CONSTRUCTION OF MULTI-PURPOSE BUILDING
LOCATION: USTP JASAAN CAMPUS, UPPER JASAAN, MISAMIS ORIENTAL
OWNER: UNIVERSITY OF SCIENCE & TECHNOLOGY OF SOUTHERN PHILIPPINES

RECOMMENDING APPROVAL: ENGR. GRACE C. BABA, DIRECTOR, INFRASTRUCTURE PLANNING & FACILITY DEVELOPMENT OFFICE
RECOMMENDING APPROVAL: ATTY. JONATHAN S. OCHE, VP FOR ADMINISTRATION & LEGAL AFFAIRS
APPROVED BY: AMBROSIO B. CULTURA II, PH.D, PRESIDENT, USTP SYSTEM

SHEET CONTENTS: SCHEDULE OF LOADS; TRANSFORMER AND GENERATOR SIZING
DRAWN BY:
DATE DRAWN:
FNT:

E13

REPUBLIC OF THE PHILIPPINES
OFFICE OF THE BUILDING OFFICIAL

Approved by:

MAIN CIRCUIT BREAKER - SCHEDULE OF LOADS

PANEL NO.	CKT NO.	LOAD DESCRIPTION	L.O.	C.O.	OTHER LOADS	HP RATING	SWITCHES S_1	S_2	S_3	S_{3W}	VOLTAGE RATING	OUTLET (VA) RATING	VA PER CIRCUIT	CIRCUIT LOAD CURRENT (W/DF) AB	BC	CA	3P	SIZE OF BREAKERS F	P	T	SIZE OF HOMERUN CKT WIRE (sq. mm)	CONDUIT	GROUNDING
MCB	C1	MDP - Main Distribution Panel									230	128680	128680	165.25	164.25	163.38	0.00	60	2	90	(2) 3 - 100 mm2 XLPE Copper Wire	(2) 50 mm ø Conduit - PVC	2 - 22 mm² THWN Copper Wire
	C2	SPARE									230	6000	6000				12.05						
TOTAL			0	0	0	0	0	0	0	0			134680	165.25	164.25	163.38	12.05						

Calculation:	For Service Conductor	For Service Protection	
	IL = (165.25 x 1.732) + 25% (17) + 12.05 302.52 A	IL = (165.25 x 1.732) + 150% (17) + 12.05 323.77 A	THEREFORE USE 350 AMPERE CIRCUIT BREAKER, 3 PHASE, 230V USE 2 SETS OF 3 - 100 mm² XLPE COPPER, 1 - 22 mm² GROUND @ 50 mm ø Conduit - RSC

MAIN DISTRIBUTION PANEL - SCHEDULE OF LOADS

PANEL NO.	CKT NO.	LOAD DESCRIPTION	L.O.	C.O.	OTHER LOADS	HP RATING	SWITCHES S_1	S_2	S_3	S_{3W}	VOLTAGE RATING	OUTLET (VA) RATING	VA PER CIRCUIT	CIRCUIT LOAD CURRENT (W/DF) AB	BC	CA	3P	SIZE OF BREAKERS F	P	T	SIZE OF HOMERUN CKT WIRE (sq. mm)	CONDUIT	GROUNDING
MDP	C1	PB1 - Panel Board 1									230	14180	14180			56.43		60	2	90	2 - 22 mm² THHN Copper Wire	32 mm ø Conduit - PVC	1 - 8 mm² THHN Copper Wire
	C2	PB2 - Panel Board 2									230	17940	17940		70.70			60	2	100	2 - 30 mm² THHN Copper Wire	40 mm ø Conduit - PVC	1 - 8 mm² THHN Copper Wire
	C3	PB3 - Panel Board 3									230	7100	7100			26.85		60	2	50	2 - 8 mm² THHN Copper Wire	25 mm ø Conduit - PVC	1 - 5.5 mm² THHN Copper Wire
	C4	PB4 - Panel Board 4									230	7100	7100		26.85			60	2	50	2 - 8 mm² THHN Copper Wire	25 mm ø Conduit - PVC	1 - 5.5 mm² THHN Copper Wire
	C5	PB5 - Panel Board 5									230	9135	9135			34.83		60	2	60	2 - 8 mm² THHN Copper Wire	25 mm ø Conduit - PVC	1 - 5.5 mm² THHN Copper Wire
	C6	PB6 - Panel Board 6									230	9135	9135			34.83		60	2	60	2 - 8 mm² THHN Copper Wire	25 mm ø Conduit - PVC	1 - 5.5 mm² THHN Copper Wire
	C7	PB7 - Panel Board 7									230	8100	8100	30.33				60	2	50	2 - 8 mm² THHN Copper Wire	25 mm ø Conduit - PVC	1 - 5.5 mm² THHN Copper Wire
	C8	PB8 - Panel Board 8									230	16730	16730		66.70			60	2	100	2 - 30 mm² THHN Copper Wire	40 mm ø Conduit - PVC	1 - 8 mm² THHN Copper Wire
	C9	SPB - Sub Panel Board									230	33260	33260	124.49				60	2	150	2 - 60 mm² THHN Copper Wire	50 mm ø Conduit - PVC	1 - 14 mm² THHN Copper Wire
	C10	SPARE									230	3000	3000			10.43							
	C11	SPARE									230	3000	3000	10.43									
TOTAL			0	0	0	0	0	0	0	0			128680	165.25	164.25	163.38	0.00						

Calculation:	For Service Conductor	For Service Protection	
	IL = (165.25 x 1.732) + 25% (17) + 0 290.48 A	IL = (165.25 x 1.732) + 150% (17) + 0 311.73 A	THEREFORE USE 350 AMPERE CIRCUIT BREAKER, 3 PHASE, 230V USE 2 SETS OF 3 - 100 mm² XLPE COPPER, 1 - 22 mm² GROUND @ 50 mm ø Conduit - RSC

PANEL BOARD 1 (PB1) - SCHEDULE OF LOADS

PANEL NO.	CKT NO.	LOAD DESCRIPTION	L.O.	C.O.	OTHER LOADS	HP RATING	SWITCHES S_1	S_2	S_3	S_{3W}	S_{CW}	VOLTAGE RATING	OUTLET (VA) RATING	VA PER CIRCUIT	CIRCUIT LOAD CURRENT (W/DF)	SIZE OF BREAKERS F	P	T	SIZE OF HOMERUN CKT WIRE (sq. mm)	CONDUIT	GROUNDING
PB1	C1	Lighting Outlet	12									230	100	1200	4.17	60	2	15	2 - 3.5 mm² THHN Copper Wire	20 mm ø Conduit - PVC	1 - 3.5 mm² THHN Copper Wire
	C2	Convenience Outlet		10								230	180	1800	6.26	60	2	20	2 - 3.5 mm² THHN Copper Wire	20 mm ø Conduit - PVC	1 - 3.5 mm² THHN Copper Wire
	C3	ACU			1	3						230	3910	3910	17.00	60	2	50	2 - 3.5 mm² THHN Copper Wire	20 mm ø Conduit - PVC	1 - 3.5 mm² THHN Copper Wire
	C4	ACU			1	3						230	3910	3910	17.00	60	2	50	2 - 5.5mm² THHN Copper Wire	20 mm ø Conduit - PVC	1 - 5.5 mm² THHN Copper Wire
	C5	Convenience Outlet - Emergency		2								230	180	360	1.57	60	2	20	2 - 5.5mm² THHN Copper Wire	20 mm ø Conduit - PVC	1 - 5.5 mm² THHN Copper Wire
	C6	SPARE										230	1500	1500	5.22						
	C7	SPARE										230	1500	1500	5.22						
TOTAL			12	12	2	6	0	0	0	0	0			14180	56.43						

Calculation:	For Service Conductor	For Service Protection	
	IL = 56.43 + 25%(17) 60.68	IL = 56.43 + 150%(17) 81.93	THEREFORE USE 90 AMPERE CIRCUIT BREAKER, 1 PHASE, 230V USE 2 - 22 mm² THHN COPPER, 1 - 8 mm² GROUND @ 32 mm ø Conduit - PVC

PANEL BOARD 2 (PB2) - SCHEDULE OF LOADS

PANEL NO.	CKT NO.	LOAD DESCRIPTION	L.O.	C.O.	OTHER LOADS	HP RATING	SWITCHES S_1	S_2	S_3	S_{3W}	S_{CW}	VOLTAGE RATING	OUTLET (VA) RATING	VA PER CIRCUIT	CIRCUIT LOAD CURRENT (W/DF)	SIZE OF BREAKERS F	P	T	SIZE OF HOMERUN CKT WIRE (sq. mm)	CONDUIT	GROUNDING
PB2	C1	Lighting Outlet	12									230	100	1200	4.17	60	2	15	2 - 3.5 mm² THHN Copper Wire	20 mm ø Conduit - PVC	1 - 3.5 mm² THHN Copper Wire
	C2	Lighting Outlet	15									230	100	1500	5.22	60	2	15	2 - 3.5 mm² THHN Copper Wire	20 mm ø Conduit - PVC	1 - 3.5 mm² THHN Copper Wire
	C3	Convenience Outlet		14	1							230	180	2700	9.39	60	2	20	2 - 3.5 mm² THHN Copper Wire	20 mm ø Conduit - PVC	1 - 3.5 mm² THHN Copper Wire
	C4	Refrigerator 1			1							230	3000	3000	13.04	60	2	20	2 - 3.5 mm² THHN Copper Wire	20 mm ø Conduit - PVC	1 - 3.5 mm² THHN Copper Wire
	C5	Refrigerator 2			1							230	3000	3000	13.04	60	2	20	2 - 3.5 mm² THHN Copper Wire	20 mm ø Conduit - PVC	1 - 3.5 mm² THHN Copper Wire
	C6	Refrigerator 3			1							230	3000	3000	13.04	60	2	20	2 - 3.5 mm² THHN Copper Wire	20 mm ø Conduit - PVC	1 - 3.5 mm² THHN Copper Wire
	C7	Convenience Outlet - Emergency		3								230	180	540	2.35	60	2	20	2 - 3.5 mm² THHN Copper Wire	20 mm ø Conduit - PVC	1 - 3.5 mm² THHN Copper Wire
	C8	SPARE										230	1500	1500	5.22						
	C9	SPARE										230	1500	1500	5.22						
TOTAL			27	17	4	0	0	0	0	0	0			17940	70.70						

Calculation:	For Service Conductor	For Service Protection	
	IL = 70.7 + 25%(13.04) 73.96	IL = 70.7 + 150%(13.04) 90.26	THEREFORE USE 100 AMPERE CIRCUIT BREAKER, 1 PHASE, 230V USE 2 - 30 mm² THHN COPPER, 1 - 8 mm² GROUND @ 40 mm ø Conduit - PVC

REPUBLIC OF THE PHILIPPINES
UNIVERSITY OF SCIENCE AND TECHNOLOGY OF SOUTHERN PHILIPPINES
CAGAYAN DE ORO CAMPUS
INFRASTRUCTURE PLANNING AND FACILITY DEVELOPMENT UNIT
CLARO M. RECTO AVENUE, LAPASAN, CAGAYAN DE ORO CITY 9000
TELEPHONE # (08822) 72-60-65 / (088) 856-1738 / 856-1739 | TELE FAX (088) 856-4696
WEBSITE: www.ustp.edu.ph

PROFESSIONAL ELECTRICAL ENGINEER
PRC NO. | PTR NO.
DATE:
TIN: | PLACE:

PROJECT: PROVISION FUNDING FOR CONSTRUCTION OF MULTI-PURPOSE BUILDING
LOCATION: USTP JASAAN CAMPUS, UPPER JASAAN, MISAMIS ORIENTAL
OWNER: UNIVERSITY OF SCIENCE & TECHNOLOGY OF SOUTHERN PHILIPPINES

RECOMMENDING APPROVAL: ENGR. GRACE C. BABA — DIRECTOR, INFRASTRUCTURE PLANNING & FACILITY DEVELOPMENT OFFICE
RECOMMENDING APPROVAL: ATTY. JONATHAN S. OCHE — VP FOR ADMINISTRATION & LEGAL AFFAIRS
APPROVED BY: AMBROSIO B. CULTURA II, PH.D — PRESIDENT, USTP SYSTEM

SHEET CONTENTS: SCHEDULE OF LOADS
DRAWN BY:
DATE DRAWN:
FNT:

E14

REPUBLIC OF THE PHILIPPINES
OFFICE OF THE BUILDING OFFICIAL

Approved by:

PANEL BOARD 3 (PB3) – SCHEDULE OF LOADS

PANEL NO.	CKT NO.	LOAD DESCRIPTION	L.O.	C.O.	OTHER LOADS	HP RATING	SWITCHES S_1	S_2	S_3	S_{3W}	S_{4W}	VOLTAGE RATING	OUTLET (VA) RATING	VA PER CIRCUIT	CIRCUIT LOAD CURRENT (W/DF)	SIZE OF BREAKERS F	P	T	SIZE OF HOMERUN CKT WIRE (sq. mm)	CONDUIT	GROUNDING
PB3	C1	Lighting Outlet	9									230	100	900	3.13	60	2	15	2 - 3.5 mm^2 THHN Copper Wire	20 mm ø Conduit - PVC	1 - 3.5 mm^2 THHN Copper Wire
	C2	Convenience Outlet		4								230	180	720	2.50	60	2	20	2 - 3.5 mm^2 THHN Copper Wire	20 mm ø Conduit - PVC	1 - 3.5 mm^2 THHN Copper Wire
	C3	ACU			1	1.5						230	2300	2300	10.00	60	2	25	2 - 5.5 mm^2 THHN Copper Wire	20 mm ø Conduit - PVC	1 - 5.5 mm^2 THHN Copper Wire
	C4	Convenience Outlet - Emergency		1								230	180	180	0.78	60	2	20	2 - 3.5 mm^2 THHN Copper Wire	20 mm ø Conduit - PVC	1 - 3.5 mm^2 THHN Copper Wire
	C5	SPARE										230	1500	1500	5.22						
	C6	SPARE										230	1500	1500	5.22						
TOTAL			9	5	1	1.5	0	0	0	0				7100	26.85						

Calculation:	For Service Conductor IL = 26.85 + 25%(10) = 29.35	For Service Protection IL = 26.85 + 150%(10) = 41.85	THEREFORE USE 50 AMPERE CIRCUIT BREAKER, 1 PHASE, 230V USE 2 – 8 mm^2 THHN COPPER, 1 – 5.5 mm^2 GROUND @ 25 mm ø Conduit – PVC

PANEL BOARD 4 (PB4) – SCHEDULE OF LOADS

PANEL NO.	CKT NO.	LOAD DESCRIPTION	L.O.	C.O.	OTHER LOADS	HP RATING	SWITCHES S_1	S_2	S_3	S_{3W}	S_{4W}	VOLTAGE RATING	OUTLET (VA) RATING	VA PER CIRCUIT	CIRCUIT LOAD CURRENT (W/DF)	SIZE OF BREAKERS F	P	T	SIZE OF HOMERUN CKT WIRE (sq. mm)	CONDUIT	GROUNDING
PB4	C1	Lighting Outlet	9									230	100	900	3.13	60	2	15	2 - 3.5 mm^2 THHN Copper Wire	20 mm ø Conduit - PVC	1 - 3.5 mm^2 THHN Copper Wire
	C2	Convenience Outlet		4								230	180	720	2.50	60	2	20	2 - 3.5 mm^2 THHN Copper Wire	20 mm ø Conduit - PVC	1 - 3.5 mm^2 THHN Copper Wire
	C3	ACU			1	1.5						230	2300	2300	10.00	60	2	25	2 - 5.5 mm^2 THHN Copper Wire	20 mm ø Conduit - PVC	1 - 5.5 mm^2 THHN Copper Wire
	C4	Convenience Outlet - Emergency		1								230	180	180	0.78	60	2	20	2 - 3.5 mm^2 THHN Copper Wire	20 mm ø Conduit - PVC	1 - 3.5 mm^2 THHN Copper Wire
	C5	SPARE										230	1500	1500	5.22						
	C6	SPARE										230	1500	1500	5.22						
TOTAL			0	5	1	1.5	0	0	0	0				7100	26.85						

Calculation:	For Service Conductor IL = 26.85 + 25%(10) = 29.35	For Service Protection IL = 26.85 + 150%(10) = 41.85	THEREFORE USE 50 AMPERE CIRCUIT BREAKER, 1 PHASE, 230V USE 3 – 8 mm^2 THHN COPPER, 1 – 5.5 mm^2 GROUND @ 25 mm ø Conduit – PVC

PANEL BOARD 5 (PB5) – SCHEDULE OF LOADS

PANEL NO.	CKT NO.	LOAD DESCRIPTION	L.O.	C.O.	OTHER LOADS	HP RATING	SWITCHES S_1	S_2	S_3	S_{3W}	S_{4W}	VOLTAGE RATING	OUTLET (VA) RATING	VA PER CIRCUIT	CIRCUIT LOAD CURRENT (W/DF)	SIZE OF BREAKERS F	P	T	SIZE OF HOMERUN CKT WIRE (sq. mm)	CONDUIT	GROUNDING
PB5	C1	Lighting Outlet	10									230	100	1000	3.48	60	2	15	2 - 3.5 mm^2 THHN Copper Wire	20 mm ø Conduit - PVC	1 - 3.5 mm^2 THHN Copper Wire
	C2	Convenience Outlet		9								230	180	1620	5.63	60	2	20	2 - 3.5 mm^2 THHN Copper Wire	20 mm ø Conduit - PVC	1 - 3.5 mm^2 THHN Copper Wire
	C3	ACU			1	2.5						230	3335	3335	14.50	60	2	40	2 - 5.5 mm^2 THHN Copper Wire	20 mm ø Conduit - PVC	1 - 5.5 mm^2 THHN Copper Wire
	C4	Convenience Outlet - Emergency		1								230	180	180	0.78	60	2	20	2 - 3.5 mm^2 THHN Copper Wire	20 mm ø Conduit - PVC	1 - 3.5 mm^2 THHN Copper Wire
	C5	SPARE										230	1500	1500	5.22						
	C6	SPARE										230	1500	1500	5.22						
TOTAL			10	10	1	2.5	0	0	0	0				9135	34.83						

Calculation:	For Service Conductor IL = 34.83 + 25%(14.5) = 38.46	For Service Protection IL = 34.83 + 150%(14.5) = 56.58	THEREFORE USE 60 AMPERE CIRCUIT BREAKER, 1 PHASE, 230V USE 2 – 8 mm^2 THHN COPPER, 1 – 5.5 mm^2 GROUND @ 25 mm ø Conduit – PVC

PANEL BOARD 6 (PB6) – SCHEDULE OF LOADS

PANEL NO.	CKT NO.	LOAD DESCRIPTION	L.O.	C.O.	OTHER LOADS	HP RATING	SWITCHES S_1	S_2	S_3	S_{3W}	S_{4W}	VOLTAGE RATING	OUTLET (VA) RATING	VA PER CIRCUIT	CIRCUIT LOAD CURRENT (W/DF)	SIZE OF BREAKERS F	P	T	SIZE OF HOMERUN CKT WIRE (sq. mm)	CONDUIT	GROUNDING
PB6	C1	Lighting Outlet	10									230	100	1000	3.48	60	2	15	2 - 3.5 mm^2 THHN Copper Wire	20 mm ø Conduit - PVC	1 - 3.5 mm^2 THHN Copper Wire
	C2	Convenience Outlet		9								230	180	1620	5.63	60	2	20	2 - 3.5 mm^2 THHN Copper Wire	20 mm ø Conduit - PVC	1 - 3.5 mm^2 THHN Copper Wire
	C3	ACU			1	2.5						230	3335	3335	14.50	60	2	40	2 - 5.5 mm^2 THHN Copper Wire	20 mm ø Conduit - PVC	1 - 5.5 mm^2 THHN Copper Wire
	C4	Convenience Outlet - Emergency		1								230	180	180	0.78	60	2	20	2 - 3.5 mm^2 THHN Copper Wire	20 mm ø Conduit - PVC	1 - 3.5 mm^2 THHN Copper Wire
	C5	SPARE										230	1500	1500	5.22						
	C6	SPARE										230	1500	1500	5.22						
TOTAL			10	10	1	2.5	0	0	0	0				9135	34.83						

Calculation:	For Service Conductor IL = 34.83 + 25%(14.5) = 38.46	For Service Protection IL = 34.83 + 150%(14.5) = 56.58	THEREFORE USE 60 AMPERE CIRCUIT BREAKER, 1 PHASE, 230V USE 2 – 8 mm^2 THHN COPPER, 1 – 5.5 mm^2 GROUND @ 25 mm ø Conduit – PVC

REPUBLIC OF THE PHILIPPINES
UNIVERSITY OF SCIENCE AND TECHNOLOGY OF SOUTHERN PHILIPPINES
CAGAYAN DE ORO CAMPUS
INFRASTRUCTURE PLANNING AND FACILITY DEVELOPMENT UNIT
CLARO M. RECTO AVENUE, LAPASAN, CAGAYAN DE ORO CITY 9000
TELEPHONE # (08822) 72-60-65 / (088) 856-1738 / 856-1739 | TELE FAX (088) 856-4696
WEBSITE: www.ustp.edu.ph

PROFESSIONAL ELECTRICAL ENGINEER
PRC NO. | PTR NO.
DATE:
TIN: | PLACE:

PROJECT	PROVISION FUNDING FOR CONSTRUCTION OF MULTI-PURPOSE BUILDING
LOCATION	USTP JASAAN CAMPUS, UPPER JASAAN, MISAMIS ORIENTAL
OWNER	UNIVERSITY OF SCIENCE & TECHNOLOGY OF SOUTHERN PHILIPPINES

RECOMMENDING APPROVAL:	RECOMMENDING APPROVAL:	APPROVED BY:	SHEET CONTENTS:	DRAWN BY:
ENGR. GRACE C. BABA DIRECTOR, INFRASTRUCTURE PLANNING & FACILITY DEVELOPMENT OFFICE	ATTY. JONATHAN S. OCHE VP FOR ADMINISTRATION & LEGAL AFFAIRS	AMBROSIO B. CULTURA II, PH.D PRESIDENT, USTP SYSTEM	SCHEDULE OF LOADS	DATE DRAWN: FNT:

E15

REPUBLIC OF THE PHILIPPINES
OFFICE OF THE BUILDING OFFICIAL

Approved by:

PANEL BOARD 7 (PB7) – SCHEDULE OF LOADS

PANEL NO.	CKT NO.	LOAD DESCRIPTION	L.O.	C.O.	OTHER LOADS	HP RATING	SWITCHES S_1	S_2	S_3	S_{3W}	S_{4W}	VOLTAGE RATING	OUTLET (VA) RATING	VA PER CIRCUIT	CIRCUIT LOAD CURRENT (W/DF)	SIZE OF BREAKERS F	P	T	SIZE OF HOMERUN CKT WIRE (sq. mm)	CONDUIT	GROUNDING
PB7	C1	Lighting Outlet	10									230	100	1000	3.48	60	2	15	2 - 3.5 mm² THHN Copper Wire	20 mm ø Conduit - PVC	1 - 3.5 mm² THHN Copper Wire
	C2	Convenience Outlet		9								230	180	1620	5.63	60	2	20	2 - 3.5 mm² THHN Copper Wire	20 mm ø Conduit - PVC	1 - 3.5 mm² THHN Copper Wire
	C3	ACU			1	1.5						230	2300	2300	10.00	60	2	25	2 - 5.5mm² THHN Copper Wire	20 mm ø Conduit - PVC	1 - 5.5 mm² THHN Copper Wire
	C4	Convenience Outlet - Emergency		1								230	180	180	0.78	60	2	20	2 - 3.5 mm² THHN Copper Wire	20 mm ø Conduit - PVC	1 - 3.5 mm² THHN Copper Wire
	C5	SPARE										230	1500	1500	5.22						
	C6	SPARE										230	1500	1500	5.22						
TOTAL			10	10	1	1.5	0	0	0	0				8100	30.33						

Calculation:	For Service Conductor	For Service Protection	
	IL = 30.33 + 25%(10)	IL = 30.33 + 150%(10)	THEREFORE USE 50 AMPERE CIRCUIT BREAKER, 3 PHASE, 230V
	32.83	45.33	USE 2 – 8 mm² THHN COPPER, 1 – 5.5 mm² GROUND @ 25 mm ø Conduit – PVC

PANEL BOARD 8 (PB8) – SCHEDULE OF LOADS

PANEL NO.	CKT NO.	LOAD DESCRIPTION	L.O.	C.O.	OTHER LOADS	HP RATING	SWITCHES S_1	S_2	S_3	S_{3W}	S_{4W}	VOLTAGE RATING	OUTLET (VA) RATING	VA PER CIRCUIT	CIRCUIT LOAD CURRENT (W/DF)	SIZE OF BREAKERS F	P	T	SIZE OF HOMERUN CKT WIRE (sq. mm)	CONDUIT	GROUNDING
PB8	C1	Lighting Outlet	16									230	100	1600	5.57	60	2	15	2 - 3.5 mm² THHN Copper Wire	20 mm ø Conduit - PVC	1 - 3.5 mm² THHN Copper Wire
	C2	Convenience Outlet		13								230	180	2340	8.14	60	2	20	2 - 3.5 mm² THHN Copper Wire	20 mm ø Conduit - PVC	1 - 3.5 mm² THHN Copper Wire
	C3	ACU			1	3						230	3910	3910	17.00	60	2	50	2 - 5.5mm² THHN Copper Wire	20 mm ø Conduit - PVC	1 - 5.5 mm² THHN Copper Wire
	C4	ACU			1	2						230	2760	2760	12.00	60	2	30	2 - 5.5mm² THHN Copper Wire	20 mm ø Conduit - PVC	1 - 5.5 mm² THHN Copper Wire
	C5	ACU			1	2						230	2760	2760	12.00	60	2	30	2 - 5.5mm² THHN Copper Wire	20 mm ø Conduit - PVC	1 - 5.5 mm² THHN Copper Wire
	C6	Convenience Outlet - Emergency		2								230	180	360	1.57	60	2	20	2 - 3.5 mm² THHN Copper Wire	20 mm ø Conduit - PVC	1 - 3.5 mm² THHN Copper Wire
	C7	SPARE										230	1500	1500	5.22						
	C8	SPARE										230	1500	1500	5.22						
TOTAL			16	15	3	7	0	0	0	0				16730	66.70						

Calculation:	For Service Conductor	For Service Protection	
	IL = 66.7 + 25%(17)	IL = 66.7 + 150%(17)	THEREFORE USE 100 AMPERE CIRCUIT BREAKER, 3 PHASE, 230V
	70.95	92.2	USE 2 – 30 mm² THHN COPPER, 1 – 8 mm² GROUND @ 40 mm ø Conduit – PVC

SUB PANEL BOARD (SPB) – SCHEDULE OF LOADS

PANEL NO.	CKT NO.	LOAD DESCRIPTION	L.O.	C.O.	OTHER LOADS	HP RATING	SWITCHES S_1	S_2	S_3	S_{3W}	S_{4W}	VOLTAGE RATING	OUTLET (VA) RATING	VA PER CIRCUIT	CIRCUIT LOAD CURRENT (W/DF)	SIZE OF BREAKERS F	P	T	SIZE OF HOMERUN CKT WIRE (sq. mm)	CONDUIT	GROUNDING
SPB	C1	Lighting Outlet	13									230	100	1300	4.52	60	2	15	2 - 3.5 mm² THHN Copper Wire	20 mm ø Conduit - PVC	1 - 3.5 mm² THHN Copper Wire
	C2	Lighting Outlet	15									230	100	1500	5.22	60	2	15	2 - 3.5 mm² THHN Copper Wire	20 mm ø Conduit - PVC	1 - 3.5 mm² THHN Copper Wire
	C3	Lighting Outlet	16									230	100	1600	5.57	60	2	15	2 - 3.5 mm² THHN Copper Wire	20 mm ø Conduit - PVC	1 - 3.5 mm² THHN Copper Wire
	C4	Lighting Outlet	11									230	100	1100	3.83	60	2	15	2 - 3.5 mm² THHN Copper Wire	20 mm ø Conduit - PVC	1 - 3.5 mm² THHN Copper Wire
	C5	Lighting Outlet	8		1							230	100	980	3.41	60	2	15	2 - 3.5 mm² THHN Copper Wire	20 mm ø Conduit - PVC	1 - 3.5 mm² THHN Copper Wire
	C6	Lighting Outlet	11									230	100	1100	3.83	60	2	15	2 - 3.5 mm² THHN Copper Wire	20 mm ø Conduit - PVC	1 - 3.5 mm² THHN Copper Wire
	C7	Lighting Outlet	11									230	100	1100	3.83	60	2	15	2 - 3.5 mm² THHN Copper Wire	20 mm ø Conduit - PVC	1 - 3.5 mm² THHN Copper Wire
	C8	Convenience Outlet		5								230	180	900	3.13	60	2	20	2 - 3.5 mm² THHN Copper Wire	20 mm ø Conduit - PVC	1 - 3.5 mm² THHN Copper Wire
	C9	Convenience Outlet		6								230	180	1080	3.76	60	2	20	2 - 3.5 mm² THHN Copper Wire	20 mm ø Conduit - PVC	1 - 3.5 mm² THHN Copper Wire
	C10	Convenience Outlet		11								230	180	1980	6.89	60	2	20	2 - 3.5 mm² THHN Copper Wire	20 mm ø Conduit - PVC	1 - 3.5 mm² THHN Copper Wire
	C11	ACU			1	1.5						230	2300	2300	10.00	60	2	25	2 - 5.5mm² THHN Copper Wire	20 mm ø Conduit - PVC	1 - 5.5 mm² THHN Copper Wire
	C12	Convenience Outlet - Emergency		6								230	180	1080	4.70	60	2	20	2 - 3.5 mm² THHN Copper Wire	20 mm ø Conduit - PVC	1 - 3.5 mm² THHN Copper Wire
	C13	Convenience Outlet - Emergency		8								230	180	1440	6.26	60	2	20	2 - 3.5 mm² THHN Copper Wire	20 mm ø Conduit - PVC	1 - 3.5 mm² THHN Copper Wire
	C14	Fire Detection and Alarm System			1							230	1500	1500	6.52	60	2	20	2 - 3.5 mm² THHN Copper Wire	20 mm ø Conduit - PVC	1 - 3.5 mm² THHN Copper Wire
	C15	CCTV System			1							230	1500	1500	6.52	60	2	20	2 - 3.5 mm² THHN Copper Wire	20 mm ø Conduit - PVC	1 - 3.5 mm² THHN Copper Wire
	C16	Hand Dryer 1			1							230	1500	1500	5.22	60	2	20	2 - 3.5 mm² THHN Copper Wire	20 mm ø Conduit - PVC	1 - 3.5 mm² THHN Copper Wire
	C17	Hand Dryer 2			1							230	1500	1500	5.22	60	2	20	2 - 3.5 mm² THHN Copper Wire	20 mm ø Conduit - PVC	1 - 3.5 mm² THHN Copper Wire
	C18	Hand Dryer 3			1							230	1500	1500	5.22	60	2	20	2 - 3.5 mm² THHN Copper Wire	20 mm ø Conduit - PVC	1 - 3.5 mm² THHN Copper Wire
	C19	Hand Dryer 4			1							230	1500	1500	5.22	60	2	20	2 - 3.5 mm² THHN Copper Wire	20 mm ø Conduit - PVC	1 - 3.5 mm² THHN Copper Wire
	C20	Hand Dryer 5			1							230	1500	1500	5.22	60	2	20	2 - 3.5 mm² THHN Copper Wire	20 mm ø Conduit - PVC	1 - 3.5 mm² THHN Copper Wire
	C21	Plumbing Transfer Pump			1	1.5						230	2300	2300	10.00	60	2	25	2 - 5.5mm² THHN Copper Wire	20 mm ø Conduit - PVC	1 - 5.5 mm² THHN Copper Wire
	C22	SPARE										230	1500	1500	5.22						
	C23	SPARE										230	1500	1500	5.22						
TOTAL			85	36	10	3	0	0	0	0	0	230		33260	124.49						

Calculation:	For Service Conductor	For Service Protection	
	IL = 124.49 + 25%(10)	IL = 124.49 + 150%(10)	THEREFORE USE 150 AMPERE CIRCUIT BREAKER, 1 PHASE, 230V
	126.99	139.49	USE 2 – 60 mm² THHN COPPER, 1 – 14 mm² GROUND @ 50 mm ø Conduit – PVC

USTP

REPUBLIC OF THE PHILIPPINES
UNIVERSITY OF SCIENCE AND TECHNOLOGY OF SOUTHERN PHILIPPINES
CAGAYAN DE ORO CAMPUS
INFRASTRUCTURE PLANNING AND FACILITY DEVELOPMENT UNIT
CLARO M. RECTO AVENUE, LAPASAN, CAGAYAN DE ORO CITY 9000
TELEPHONE # (08822) 72-60-65 / (088) 856-1738 / 856-1739 | TELE FAX (088) 856-4696
WEBSITE: www.ustp.edu.ph

PROFESSIONAL ELECTRICAL ENGINEER
PRC NO. | PTR NO.
DATE:
TIN: | PLACE:

PROJECT	PROVISION FUNDING FOR CONSTRUCTION OF MULTI-PURPOSE BUILDING
LOCATION	USTP JASAAN CAMPUS, UPPER JASAAN, MISAMIS ORIENTAL
OWNER	UNIVERSITY OF SCIENCE & TECHNOLOGY OF SOUTHERN PHILIPPINES

RECOMMENDING APPROVAL:
ENGR. GRACE C. BABA
DIRECTOR, INFRASTRUCTURE PLANNING & FACILITY DEVELOPMENT OFFICE

RECOMMENDING APPROVAL:
ATTY. JONATHAN S. OCHE
VP FOR ADMINISTRATION & LEGAL AFFAIRS

APPROVED BY:
AMBROSIO B. CULTURA II, PH.D
PRESIDENT, USTP SYSTEM

SHEET CONTENTS: SCHEDULE OF LOADS

DRAWN BY:
DATE DRAWN:
FNT:

E16

TRANSFORMER TO MCB		
LENGTH	60	m
FLC	298.27	A
SETS	2	
PHASE	3	
FACTOR	1.732	
CABLE		
100mm2		
RESISTANCE	0.063	Ω
REACTANCE	0.051	Ω
COMPUTATION	VD = [1.732 x (298.27/2) x √(0.063^2 + 0.051^2)]/305m x 60m	
VOLTAGE DROP	4.118660381	V

MCB TO ATS		
LENGTH	17	m
FLC	298.27	A
SETS	2	
PHASE	3	
FACTOR	1.732	
CABLE		
100mm2		
RESISTANCE	0.063	Ω
REACTANCE	0.051	Ω
COMPUTATION	VD = [1.732 x (298.27/2) x √(0.063^2 + 0.051^2)]/305m x 17m	
VOLTAGE DROP	1.166953775	V

ATS TO MDP		
LENGTH	5	m
FLC	286.22	A
SETS	2	
PHASE	3	
FACTOR	1.732	
CABLE		
100mm2		
RESISTANCE	0.063	Ω
REACTANCE	0.051	Ω
COMPUTATION	VD = [1.732 x (286.22/2) x √(0.063^2 + 0.051^2)]/305m x 5m	
VOLTAGE DROP	0.329356175	V

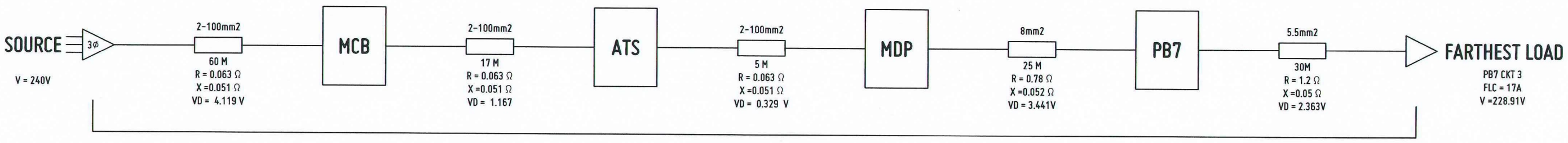
MDP TO PB7		
LENGTH	25	m
FLC	26.85	A
SETS	1	
PHASE	1	
FACTOR	2	
CABLE		
8mm2		
RESISTANCE	0.78	Ω
REACTANCE	0.052	Ω
COMPUTATION	VD = [2 x (26.85/1) x √(0.78^2 + 0.052^2)]/305m x 25m	
VOLTAGE DROP	3.441178331	V

PB7 TO FARTHEST MOTOR LOAD (CKT3)		
LENGTH	30	m
FLC	10.00	A
SETS	1	
PHASE	1	
FACTOR	2	
CABLE		
5.5mm2		
RESISTANCE	1.2	Ω
REACTANCE	0.05	Ω
COMPUTATION	VD = [2 x (10/1) x √(1.2^2 + 0.05^2)]/305m x 30m	
VOLTAGE DROP	2.362704029	V

REPUBLIC OF THE PHILIPPINES
OFFICE OF THE BUILDING OFFICIAL

Approved by:

VOLTAGE DROP ANALYSIS			
PERCENT VOLTAGE DROP			
TOTAL VOLTAGE DROP FROM SERVICE TO FARTHEST LOAD	4.12 + 1.17 + 3.44 + 2.36	11.09 V	PERCENT VOLTAGE DROP
VOLTAGE DROP COMPUTATION USING NOMINAL VOLTAGE (240V)	240 - 11.09 V	228.91V	4.62%



11.09V OR 4.62%

E 17 1

VOLTAGE DROP ANALYSIS

DRAWN NOT TO SCALE

REPUBLIC OF THE PHILIPPINES
UNIVERSITY OF SCIENCE AND TECHNOLOGY OF SOUTHERN PHILIPPINES
CAGAYAN DE ORO CAMPUS
INFRASTRUCTURE PLANNING AND FACILITY DEVELOPMENT UNIT
CLARO M. RECTO AVENUE, LAPASAN, CAGAYAN DE ORO CITY 9000
TELEPHONE # (088822) 72-60-65 / (088) 856-1738 / 856-1739 | TELE FAX (088) 856-4696
WEBSITE: www.ustp.edu.ph

PROFESSIONAL ELECTRICAL ENGINEER
PRC NO. | PTR NO.
DATE:
TIN: | PLACE:

PROJECT	PROVISION FUNDING FOR CONSTRUCTION OF MULTI-PURPOSE BUILDING
LOCATION	USTP JASAAN CAMPUS, UPPER JASAAN, MISAMIS ORIENTAL
OWNER	UNIVERSITY OF SCIENCE & TECHNOLOGY OF SOUTHERN PHILIPPINES

RECOMMENDING APPROVAL:	RECOMMENDING APPROVAL:	APPROVED BY:	SHEET CONTENTS:	DRAWN BY:
ENGR. GRACE C. BABA	ATTY. JONATHAN S. OCHE	AMBROSIO B. CULTURA II, PH.D	VOLTAGE DROP ANALYSIS	DATE DRAWN:
DIRECTOR, INFRASTRUCTURE PLANNING & FACILITY DEVELOPMENT OFFICE	VP FOR ADMINISTRATION & LEGAL AFFAIRS	PRESIDENT, USTP SYSTEM		FNT:

E17

USING POINT TO POINT METHOD

Transformer Full Load Current ($I_{F.L.A.}$)

For 3Ø Transformer:
$I_{F.L.A.} = (kVA \times 1000) / (E_{L-L} \times \sqrt{3})$

For 1Ø Transformer:
$I_{F.L.A.} = (kVA \times 1000) / E_{L-L}$

1. For 3Ø System:
   $f = (1.732 \times L \times I_{3\phi}) / (C \times n \times E_{L-L})$
2. For Line-to-Line:
   $f = (2 \times L \times I_{L-L}) / (C \times n \times E_{L-L})$
3. For Line-to-Neutral: $f = (2 \times L \times I_{L-N}) / (C \times n \times E_{L-N})$

Multiplier = $100 / (\%Z_{transformer})$
$M = 1 / (1 + f)$
$I_{S.C.sym.RMS} = I_{S.C.} \times M$
$I_{S.C\ Motor\ Contribution} = I_{S.C.} \times 4$

FAULT LOCATION 1		
XMER SECONDARY SIDE		
TRANSFORMER FLC	1202.848345	A
MULTIPLIER	19.3236715	
3P FAULT CURRENT	23243.44628	A
	23.24344628	kA
TOTAL 3P FAULT CURRENT	**24146.4028**	**A**
	24.1464028	**kA**

FAULT LOCATION 2		
MCB		
CONDUCTOR	100mm2	
NO. OF SETS	2	
LENGTH	60	m
C VALUE	15082	
"f" FACTOR	1.094673294	
MULTIPLIER	0.477401418	
3P FAULT CURRENT	11096.4542	A
	11.0964542	kA
TOTAL 3P FAULT CURRENT	**11999.41072**	**A**
	11.99941072	**kA**

FAULT LOCATION 3		
ATS		
CONDUCTOR	100mm2	
NO. OF SETS	2	
LENGTH	17	m
C VALUE	15082	
"f" FACTOR	0.310157433	
MULTIPLIER	0.763267051	
3P FAULT CURRENT	8469.557872	A
	8.469557872	kA
TOTAL 3P FAULT CURRENT	**9372.514394**	**A**
	9.372514394	**kA**

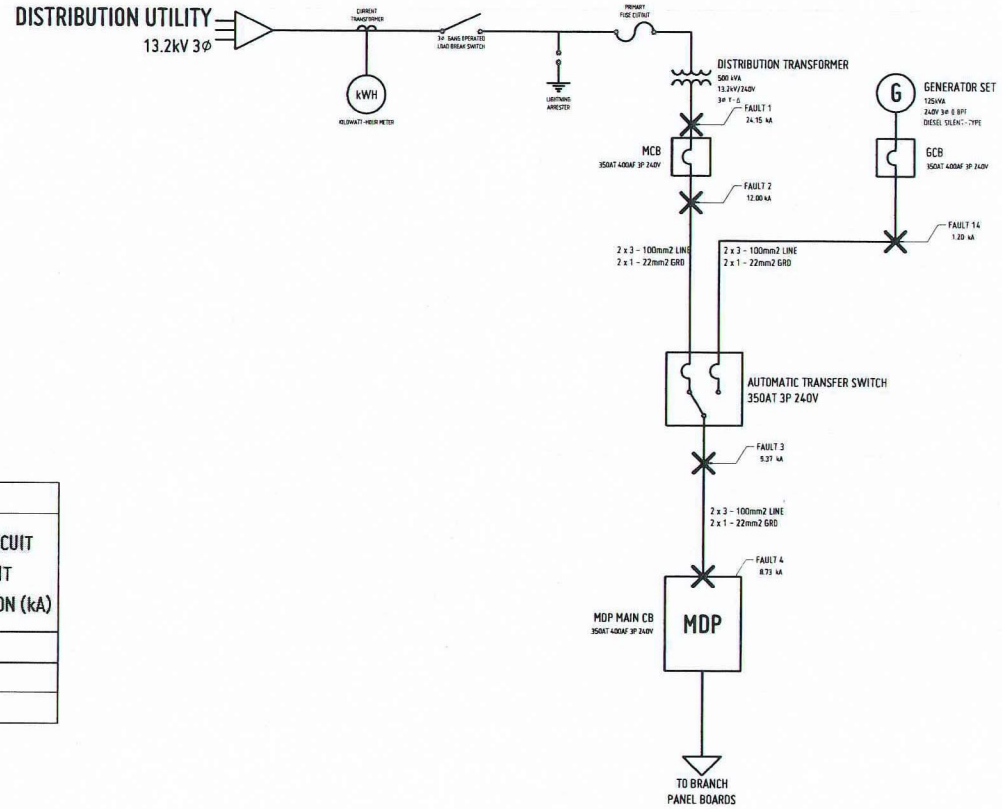
FAULT LOCATION 4		
MDP		
CONDUCTOR	100mm2	
NO. OF SETS	2	
LENGTH	5	m
C VALUE	16673	
"f" FACTOR	0.082517956	
MULTIPLIER	0.923772206	
3P FAULT CURRENT	7823.942155	A
	7.823942155	kA
TOTAL 3P FAULT CURRENT	**8726.898677**	**A**
	8.726898677	**kA**

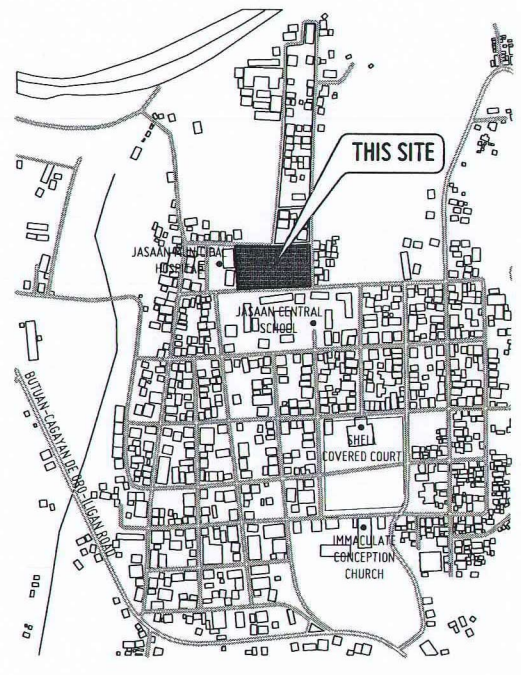
TRANSFORMER RATING	500	kVA
%Z	5.75	(Typical Value)
PRIMARY LINE VOLTAGE	13.2	kV
SECONDARY LINE VOLTAGE	240	V

GENERATOR						
RATING		PF	VOLTAGE	FLC	SUBTRANSIENT REACTANCE (X")	SHORT CIRCUIT CURRENT CONTRIBUTION (kA)
kVA	kW					
125	100	0.8	240	300.7120862	25%	**1.20**

MOTOR LOADS		
TYPE	FLC	SHORT CIRCUIT CURRENT CONTRIBUTION (kA)
AIRCON	144.00	0.58
MOTOR (NON CONTINUOUS)	32.61	0.13
MOTOR (CONTINUOUS)	49.13	0.20
TOTAL MOTOR CONTRIBUTION		**0.90**

SHORT CIRCUIT ANALYSIS			
FAULT NO.	FAULT LOCATION	TOTAL 3P FAULT CURRENT (kA)	SUGGESTED kAIC CB RATING
1	XMER SECONDARY SIDE	**24.15**	30
2	MCB	**12.00**	18
3	ATS	**9.37**	18
4	MDP	**8.73**	18





E 18 1 **SHORT CIRCUIT ANALYSIS**
DRAWN NOT TO SCALE

E 18 2 **VICINITY MAP**
NOT TO SCALE

REPUBLIC OF THE PHILIPPINES
OFFICE OF THE BUILDING OFFICIAL

Approved by:

REPUBLIC OF THE PHILIPPINES
UNIVERSITY OF SCIENCE AND TECHNOLOGY OF SOUTHERN PHILIPPINES
CAGAYAN DE ORO CAMPUS
INFRASTRUCTURE PLANNING AND FACILITY DEVELOPMENT UNIT
CLARO M. RECTO AVENUE, LAPASAN, CAGAYAN DE ORO CITY 9000
TELEPHONE # (08822) 72-60-65 / (088) 856-1738 / 856-1739 | TELE FAX (088) 856-4696
WEBSITE: www.ustp.edu.ph

PROFESSIONAL ELECTRICAL ENGINEER
PRC NO. | PTR NO.
DATE:
TIN: | PLACE:

PROJECT	PROVISION FUNDING FOR CONSTRUCTION OF MULTI-PURPOSE BUILDING
LOCATION	USTP JASAAN CAMPUS, UPPER JASAAN, MISAMIS ORIENTAL
OWNER	UNIVERSITY OF SCIENCE & TECHNOLOGY OF SOUTHERN PHILIPPINES

RECOMMENDING APPROVAL:	RECOMMENDING APPROVAL:	APPROVED BY:	SHEET CONTENTS:	DRAWN BY:
ENGR. GRACE C. BABA	ATTY. JONATHAN S. OCHE	AMBROSIO B. CULTURA II, PH.D	SHORT CIRCUIT ANALYSIS	DATE DRAWN:
DIRECTOR, INFRASTRUCTURE PLANNING & FACILITY DEVELOPMENT OFFICE	VP FOR ADMINISTRATION & LEGAL AFFAIRS	PRESIDENT, USTP SYSTEM		FNT:

E18