



DESIGN ANALYSIS						
LOAD TYPE	VA PER LOAD	VOLTAGE	PHASE CURRENT (w/ DF)			
			AB	BC	CA	3Ø
LIGHTING OUTLET	52880.00	230	97.74	67.83	64.35	0.00
CONVENIENCE OUTLET	57372.00	230	78.73	90.21	80.50	0.00
AIRCON	118565.00	230	134.50	157.00	224.00	0.00
MOTOR (NON-CONTINUOUS)	10000.00	230	0.00	0.00	0.00	25.10
MOTOR (CONTINUOUS)	10038.97	230	0.00	0.00	0.00	25.20
LARGEST MOTOR	27089.27	230	0.00	0.00	0.00	68.00
SPARE	22800.00	230	52.17	36.52	0.00	10.43
TOTAL DEMAND LOAD	298745.24	230	363.14	351.56	368.85	128.74

DEMAND FACTOR CALCULATION		LINE CURRENT CALCULATION	
DEMAND FACTOR = TOTAL DEMAND LOAD / TOTAL CONNECTED LOAD		IL = TOTAL DEMAND LOAD / (VOLTAGE x √3)	
TOTAL CONNECTED (VOLT-AMPERE)	325753.24	IL = 325753.24 / (230 x √3)	
OVERALL DEMAND FACTOR	91.71%	749.915849454706 A	



MAIN CIRCUIT BREAKER/SECONDARY CIRCUIT BREAKER - SCHEDULE OF LOADS																											
PANEL NO.	CKT NO.	LOAD DESCRIPTION	L.O.	C.O.	OTHER LOADS	HP RATING	SWITCHES					VOLTAGE RATING	OUTLET (VA) RATING	VA PER CIRCUIT	DEMAND FACTOR	DEMAND VA	CIRCUIT LOAD CURRENT				CIRCUIT BREAKER				CIRCUIT CONDUCTOR AND CONDUIT		
							S ₁	S ₂	S ₃	S _{3W}	S _{4W}						AB	BC	CA	3Ø	F	P	AT	AF	WIRE (sq. mm)	CONDUIT	GROUNDING
MCB/SCB	C1	MDP – Main Distribution Panel									230	285625	285625	0.91	259217	363.14	351.56	368.85	25.10	60	3	800	1200	(3) 3 – 250 mm2 THWN-2 Copper Wire	(3) 90 mm Ø Conduit – PVC	(3) 1– 30 mm² THWN-2 Copper Wire	
	C2	PPB – Plumbing Panel Board									230	9215	9215	0.93	8615	0.00	0.00	0.00	26.03	60	3	35	50	3 – 8 mm2 THHN Copper Wire	32 mm Ø Conduit – PVC	1 – 5.5mm² THHN Copper Wire	
	C3	FPP – Fire Protection Panel									230	30914	30914	1.00	30914	0.00	0.00	0.00	77.60	60	3	175	250	3 – 50mm2 THHN Copper Wire	63 mm Ø Conduit – PVC	1 – 14 mm² THHN Copper Wire	
TOTAL			0	0	0	0	0	0	0	0	230		325753	0.92	298745	363.14	351.56	368.85	128.74								

Calculation:	For Service Conductor		For Service Protection		SERVICE CONDUCTOR
	I _c = [(52880 + 57372 + 27089.27) x 125% + 118565 + 10000 + 10038.97 + 22800] / (230 x √3)		I _{cb} = [(27089.27 x 250%) + (52880 + 57372) x 125% + 118565 + 10000 + 10038.97 + 22800] / (230 x √3)		USE: 3 sets of 3 - 250 mm ² THWN-2 CU (L) + 1 - 30 mm ² THWN-2 CU (G) @ 90 mm Ø PVC SCH 80
	I _c = 836.11 A		I _{cb} = 921.11 A		SERVICE PROTECTION USE: 1000AT/1200AF, 230V, 60HZ, 3P

Load Type	VA	FLC			
		AB	BC	CA	3P
LO	52880.00	97.74	67.83	64.35	0.00
CO	57372.00	78.73	90.21	80.50	0.00
ACU	118565.00	67.50	224.00	224.00	0.00
MOTOR (NC)	10000.00	0.00	0.00	0.00	25.10
MOTOR (C)	10038.97	0.00	0.00	0.00	25.20
LARGEST MOTOR	27089.27	0.00	0.00	0.00	68.00
SPARE	22800.00	73.04	15.65	0.00	10.43
TOTAL	298745.24	317.01	397.69	368.85	128.74

PLUMBING PANEL BOARD - SCHEDULE OF LOADS																											
PANEL NO.	CKT NO.	LOAD DESCRIPTION	L.O.	C.O.	OTHER LOADS	HP RATING	SWITCHES					VOLTAGE RATING	OUTLET (VA) RATING	VA PER CIRCUIT	DEMAND FACTOR	DEMAND VA	CIRCUIT LOAD CURRENT				CIRCUIT BREAKER				CIRCUIT CONDUCTOR AND CONDUIT		
							S ₁	S ₂	S ₃	S _{3W}	S _{4W}						AB	BC	CA	3Ø	F	P	AT	AF	WIRE (sq. mm)	CONDUIT	GROUNDING
PPB	C1	Plumbing Transfer Pump - Main			1	3						230	3824	3824	1.00	3824	-	-	-	9.60	60	3	20	50	2 - 5.5 mm² THHN Copper Wire	32 mm Ø Conduit - PVC	1 - 5.5 mm² THHN Copper Wire
	C2	Plumbing Transfer Pump - Backup			1	1.5						230	2390	2390	1.00	2390	-	-	-	6.00	60	3	20	50	2 - 5.5 mm² THHN Copper Wire	32 mm Ø Conduit - PVC	1 - 5.5 mm² THHN Copper Wire
	C3	SPARE										230	1500	1500	0.80	1200	-	-	-	5.22	60	3	20	50			
	C4	SPARE										230	1500	1500	0.80	1200	-	-	-	5.22	60	3	20	50			
TOTAL			0	0	2	4.5	0	0	0	0	0	230		9214.6	0.93	8615	0.00	0.00	0.00	26.03							

Calculation:	For Feeder Conductor		For Feeder Protection		FEEDER CONDUCTOR
	I _c = [(3824.37 x 125%) + 2390.23 + 2400] / (230 x √3)		I _{cb} = [(3824.37 x 250%) + 2390.23 + 2400] / (230 x √3)		USE: 3 - 8.0 mm ² THHN CU (L) + 1 - 5.5 mm ² THHN CU (G) @ 32 mm Ø PVC
	I _c = 24.02 A		I _{cb} = 36.02 A		FEEDER PROTECTION USE: 35AT/50AF, 230V, 60HZ, 3P

Load Type	VA	FLC			
		AB	BC	CA	3P
LO	0.00	0.00	0.00	0.00	0.00
CO	0.00	0.00	0.00	0.00	0.00
ACU	0.00	0.00	0.00	0.00	0.00
MOTOR (NC)	0.00	0.00	0.00	0.00	0.00
MOTOR (C)	2390.23	0.00	0.00	0.00	6.00
LARGEST MOTOR	3824.37	0.00	0.00	0.00	9.60
SPARE	2400.00	0.00	0.00	0.00	10.43
TOTAL	8614.60	0.00	0.00	0.00	26.03

FIRE PROTECTION PANEL – SCHEDULE OF LOADS																											
PANEL NO.	CKT NO.	LOAD DESCRIPTION	L.O.	C.O.	OTHER LOADS	HP RATING	SWITCHES					VOLTAGE RATING	OUTLET (VA) RATING	VA PER CIRCUIT	DEMAND FACTOR	DEMAND VA	CIRCUIT LOAD CURRENT				CIRCUIT BREAKER				CIRCUIT CONDUCTOR AND CONDUIT		
							S ₁	S ₂	S ₃	S _{3W}	S _{4W}						AB	BC	CA	3Ø	F	P	AT	AF	WIRE (sq. mm)	CONDUIT	GROUNDING
FPP	C1	Fire Pump			1	25					230	27089	27089	1.00	27089	-	-	-	68.00	60	3	150	225	3 – 38 mm² THHN Copper Wire	40 mm Ø Conduit –PVC	1 – 8.0 mm² THHN Copper Wire	
	C2	Jockey Pump			1	3					230	3824	3824	1.00	3824	-	-	-	9.60	60	3	20	50	3 – 5.5 mm² THHN Copper Wire	32 mm Ø Conduit –PVC	1 – 5.5 mm² THHN Copper Wire	
	C3	SPACE																									
	C4	SPACE																									
TOTAL			0	0	2	28	0	0	0	0	230		30913.6	1.00	30914	0.00	0.00	0.00	77.60								

Calculation:	For Feeder Conductor		For Feeder Protection		FEEDER CONDUCTOR
	I _c = [(27089.27 x 125%) + 3824.37] / (230 x √3)		I _{cb} = [(27089.27 x 250%) + 3824.37] / (230 x √3)		USE: 3 - 50 mm ² THHN CU (L) + 1 - 14 mm ² THHN CU (G) @ 63 mm Ø PVC
	I _c = 94.60 A		I _{cb} = 179.60 A		FEEDER PROTECTION USE: 175AT/250AF, 230V, 60HZ, 3P

Load Type	VA	FLC			
		AB	BC	CA	3P
LO	0.00	0.00	0.00	0.00	0.00
CO	0.00	0.00	0.00	0.00	0.00
ACU	0.00	0.00	0.00	0.00	0.00
MOTOR (NC)	0.00	0.00	0.00	0.00	0.00
MOTOR (C)	3824.37	0.00	0.00	0.00	9.60
LARGEST MOTOR	27089.27	0.00	0.00	0.00	68.00
SPARE	0.00	0.00	0.00	0.00	0.00
TOTAL	30913.64	0.00	0.00	0.00	77.60

SCHEDULE OF LOADS - MCB/SCB, FPP AND PPB



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PROFESSIONAL ELECTRICAL ENGINEER		PROJECT
PRC NO.	PTR NO.	
DATE	PLACE	LOCATION
TIN NO.		OWNER

CONSTRUCTION OF INNOVATION AND COLLABORATION HUB PHASE II, ALUBIJO (MAIN) CAMPUS	LOCATION USTP AGILA S&T PARK, ALUBIJO, MISAMIS ORIENTAL	OWNER UNIVERSITY OF SCIENCE & TECHNOLOGY OF SOUTHERN PHILIPPINES
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RECOMMENDING APPROVAL:
ENGR. GRACE C. BABA
DIRECTOR, INFRASTRUCTURE PLANNING & FACILITY DEVELOPMENT OFFICE

RECOMMENDING APPROVAL:
DR. LORY LIZA D. BULAY-OG
DIRECTOR, USTP ALUBIJO

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

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

SHEET CONTENTS:
DESIGN ANALYSIS SCHEDULE OF LOADS - MCB/SCB, FPP AND PPB
DATE DRAWN:
REV:

DRAWN BY:



MAIN DISTRIBUTION PANEL - SCHEDULE OF LOADS

PANEL NO.	CKT NO.	LOAD DESCRIPTION	L.O.	C.O.	OTHER LOADS	HP RATING	SWITCHES					VOLTAGE RATING	OUTLET (VA) RATING	VA PER CIRCUIT	DEMAND FACTOR	DEMAND VA	CIRCUIT LOAD CURRENT				CIRCUIT BREAKER				CIRCUIT CONDUCTOR AND CONDUIT		
							S ₁	S ₂	S ₃	S _{3W}	S _{4W}						AB	BC	CA	3Ø	F	P	AT	AF	WIRE (sq. mm)	CONDUIT	GROUNDING
MDP	C1	PB-B									230	28440	28440	0.83	23484	38.05	39.08	24.97	0.00	60	3	125	250	3 - 50 mm² THHN Copper Wire	63 mm Ø Conduit - PVC	1 - 14 mm² THHN Copper Wire	
	C2	PB-GF									230	39820	39820	0.84	33596	53.34	55.30	37.43	0.00	60	3	125	250	3 - 50 mm² THHN Copper Wire	63 mm Ø Conduit - PVC	1 - 14 mm² THHN Copper Wire	
	C3	PB-2F									230	36820	36820	0.83	30704	53.67	39.65	40.17	0.00	60	3	125	250	3 - 50 mm² THHN Copper Wire	63 mm Ø Conduit - PVC	1 - 14 mm² THHN Copper Wire	
	C4	PB-3F									230	36980	36980	0.83	30868	52.28	39.65	42.28	0.00	60	3	125	250	3 - 50 mm² THHN Copper Wire	63 mm Ø Conduit - PVC	1 - 14 mm² THHN Copper Wire	
	C5	APB-B									230	31760	31760	0.96	30560	20.87	56.00	56.00	0.00	60	3	100	250	3 - 38 mm² THHN Copper Wire	50 mm Ø Conduit - PVC	1 - 8.0 mm² THHN Copper Wire	
	C6	APB-GF									230	33935	33935	0.98	33335	32.93	56.00	56.00	0.00	60	3	100	250	3 - 38 mm² THHN Copper Wire	50 mm Ø Conduit - PVC	1 - 8.0 mm² THHN Copper Wire	
	C7	APB-2F									230	33935	33935	0.98	33335	56.00	32.93	56.00	0.00	60	3	100	250	3 - 38 mm² THHN Copper Wire	50 mm Ø Conduit - PVC	1 - 8.0 mm² THHN Copper Wire	
	C8	APB-3F									230	33935	33935	0.98	33335	56.00	32.93	56.00	0.00	60	3	100	250	3 - 38 mm² THHN Copper Wire	50 mm Ø Conduit - PVC	1 - 8.0 mm² THHN Copper Wire	
	C9	Elevator				1	10					230	10000	10000	1.00	10000	-	-	-	25.10	60	3	60	100	3 - 8.0 mm² THHN Copper Wire	32 mm Ø Conduit - PVC	1 - 5.5 mm² THHN Copper Wire
	C10	SPACE																									
TOTAL			0	0	0	1	10	0	0	0	0	230		285625	0.91	259217	363.14	351.56	368.85	25.10							

Calculation:

For Feeder Conductor
 $I_c = [(52880 + 57372 + 6440) \times 125\% + 112125 + 10000 + 20400] / (230 \times \sqrt{3})$
 $I_c = 723.92 \text{ A}$

For Feeder Protection
 $I_{cb} = [(52880 + 57372 + 6440) \times 225\% + 112125 + 10000 + 20400] / (230 \times \sqrt{3})$
 $I_{cb} = 740.09 \text{ A}$

FEEDER CONDUCTOR
 USE: 3 sets of 3 - 250 mm² THWN-2 CU (L) + 1 - 30 mm² THWN-2 CU (G) @ 90 mm Ø PVC
FEEDER PROTECTION
 USE: 800AT/1200AF, 230V, 60HZ, 3P

Load Type	VA	FLC			
		AB	BC	CA	3P
LO	52880.00	97.74	67.83	64.35	0.00
CO	57372.00	78.73	90.21	80.50	0.00
ACU	112125.00	106.50	157.00	224.00	0.00
MOTOR (NC)	10000.00	0.00	0.00	0.00	25.10
MOTOR (C)	0.00	0.00	0.00	0.00	0.00
LARGEST MOTOR	6440.00	28.00	0.00	0.00	0.00
SPARE	20400.00	52.17	36.52	0.00	0.00
TOTAL	259217.00	363.14	351.56	368.85	25.10

PANEL BOARD - BASEMENT - SCHEDULE OF LOADS

PANEL NO.	CKT NO.	LOAD DESCRIPTION	L.O.	C.O.	OTHER LOADS	HP RATING	SWITCHES					VOLTAGE RATING	OUTLET (VA) RATING	VA PER CIRCUIT	DEMAND FACTOR	DEMAND VA	CIRCUIT LOAD CURRENT				CIRCUIT BREAKER				CIRCUIT CONDUCTOR AND CONDUIT		
							S ₁	S ₂	S ₃	S _{3W}	S _{4W}						AB	BC	CA	3Ø	F	P	AT	AF	WIRE (sq. mm)	CONDUIT	GROUNDING
PB-B	C1	Lighting Outlet	15				1		1			230	100	1500	0.80	1200	5.22	-	-	-	60	2	20	50	2 - 3.5 mm ² THHN Copper Wire	20 mm Ø Conduit - PVC	1 - 3.5 mm ² THHN Copper Wire
	C2	Lighting Outlet	35							4		230	100	3500	0.80	2800	12.17	-	-	-	60	2	20	50	2 - 3.5 mm ² THHN Copper Wire	20 mm Ø Conduit - PVC	1 - 3.5 mm ² THHN Copper Wire
	C3	Lighting Outlet	39				2				4	230	100	3900	0.80	3120	-	13.57	-	-	60	2	20	50	2 - 3.5 mm ² THHN Copper Wire	20 mm Ø Conduit - PVC	1 - 3.5 mm ² THHN Copper Wire
	C4	Lighting Outlet	12				4					230	100	1200	0.80	960	-	4.17	-	-	60	2	20	50	2 - 3.5 mm ² THHN Copper Wire	20 mm Ø Conduit - PVC	1 - 3.5 mm ² THHN Copper Wire
	C5	Lighting Outlet	30		1			1			4	230	100	3100	0.80	2480	-		10.78	-	60	2	20	50	2 - 3.5 mm ² THHN Copper Wire	20 mm Ø Conduit - PVC	1 - 3.5 mm ² THHN Copper Wire
	C6	Convenience Outlet		6								230	180	1080	0.80	864	-		3.76	-	60	2	20	50	2 - 3.5 mm ² THHN Copper Wire	20 mm Ø Conduit - PVC	1 - 3.5 mm ² THHN Copper Wire
	C7	Convenience Outlet		6								230	180	1080	0.80	864	3.76	-	-	-	60	2	20	50	2 - 3.5 mm ² THHN Copper Wire	20 mm Ø Conduit - PVC	1 - 3.5 mm ² THHN Copper Wire
	C8	Convenience Outlet		8	4							230	180	2160	0.80	1728	7.51	-	-	-	60	2	20	50	2 - 3.5 mm ² THHN Copper Wire	20 mm Ø Conduit - PVC	1 - 3.5 mm ² THHN Copper Wire
	C9	Convenience Outlet		7								230	180	1260	0.80	1008	-	4.38	-	-	60	2	20	50	2 - 3.5 mm ² THHN Copper Wire	20 mm Ø Conduit - PVC	1 - 3.5 mm ² THHN Copper Wire
	C10	Convenience Outlet - Server		1	1							230	1500	1500	1.00	1500	-	6.52	-	-	60	2	20	50	2 - 3.5 mm ² THHN Copper Wire	20 mm Ø Conduit - PVC	1 - 3.5 mm ² THHN Copper Wire
	C11	Convenience Outlet - Hand Dryer		1	1							230	1500	1500	0.80	1200	-	-	5.22	-	60	2	20	50	2 - 3.5 mm ² THHN Copper Wire	20 mm Ø Conduit - PVC	1 - 3.5 mm ² THHN Copper Wire
	C12	Convenience Outlet - Hand Dryer		1	1							230	1500	1500	0.80	1200	-	-	5.22	-	60	2	20	50	2 - 3.5 mm ² THHN Copper Wire	20 mm Ø Conduit - PVC	1 - 3.5 mm ² THHN Copper Wire
	C13	Convenience Outlet - Emergency		6								230	180	1080	1.00	1080	4.70	-	-	-	60	2	20	50	2 - 3.5 mm ² THHN Copper Wire	20 mm Ø Conduit - PVC	1 - 3.5 mm ² THHN Copper Wire
	C14	Convenience Outlet - Emergency		6								230	180	1080	1.00	1080	4.70	-	-	-	60	2	20	50	2 - 3.5 mm ² THHN Copper Wire	20 mm Ø Conduit - PVC	1 - 3.5 mm ² THHN Copper Wire
	C15	SPARE										230	1500	1500	0.80	1200	-	5.22	-	-	60	2	20	50			
	C16	SPARE										230	1500	1500	0.80	1200	-	5.22	-	-	60	2	20	50			
	C17	SPACE																									
	C18	SPACE																									
	C19	SPACE																									
	C20	SPACE																									
	C21	SPACE																									
	C22	SPACE																									
TOTAL			131	42	8	0	7	1	1	12	0	230		28440	0.83	23484	38.05	39.08	24.97	0.00							

Calculation:

For Feeder Conductor and Protection
 $I_c = [(10560 + 10524) \times 125\% + 2400] / (230 \times \sqrt{3})$
 $I_c = 72.18 \text{ A}$

FEEDER CONDUCTOR
 USE: 3 - 50 mm² THHN CU (L) + 1 - 14 mm² THHN CU (G) @ 63 mm Ø PVC
FEEDER PROTECTION
 USE: 125AT/250AF, 230V, 60HZ, 3P

Load Type	VA	FLC			
		AB	BC	CA	3P
LO	10560.00	17.39	17.74	10.78	0.00
CO	10524.00	20.66	10.90	14.19	0.00
ACU	0.00	0.00	0.00	0.00	0.00
MOTOR (NC)	0.00	0.00	0.00	0.00	0.00
MOTOR (C)	0.00	0.00	0.00	0.00	0.00
LARGEST MOTOR	0.00	0.00	0.00	0.00	0.00
SPARE	2400.00	0.00	10.43	0.00	0.00
TOTAL	23484.00	38.05	39.08	24.97	0.00

SCHEDULE OF LOADS - MDP AND PB-B



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PROFESSIONAL ELECTRICAL ENGINEER	PROJECT	LOCATION	OWNER
PRC NO. _____ DATE _____ TIN NO. _____	CONSTRUCTION OF INNOVATION AND COLLABORATION HUB PHASE II, ALUBIJID (MAIN) CAMPUS	USTP AGILA S&T PARK, ALUBIJID, MISAMIS ORIENTAL	UNIVERSITY OF SCIENCE & TECHNOLOGY OF SOUTHERN PHILIPPINES

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

SHEET CONTENTS:	DRAWN BY:
SCHEDULE OF LOADS - MDP AND PB-B	DATE DRAWN: _____
	FIG: _____



Load Type	VA	FLC			
		AB	BC	CA	3P
LO	14960.00	28.87	16.70	19.48	0.00
CO	17436.00	24.47	33.39	17.95	0.00
ACU	0.00	0.00	0.00	0.00	0.00
MOTOR (NC)	0.00	0.00	0.00	0.00	0.00
MOTOR (C)	0.00	0.00	0.00	0.00	0.00
LARGEST MOTOR	0.00	0.00	0.00	0.00	0.00
SPARE	1200.00	0.00	5.22	0.00	0.00
TOTAL	33596.00	53.34	55.30	37.43	0.00

Load Type	VA	FLC			
		AB	BC	CA	3P
LD	13760.00	26.43	16.70	16.70	0.00
CO	14544.00	16.80	22.96	23.48	0.00
ACU	0.00	0.00	0.00	0.00	0.00
MOTOR (NC)	0.00	0.00	0.00	0.00	0.00
MOTOR (C)	0.00	0.00	0.00	0.00	0.00
LARGEST MOTOR	0.00	0.00	0.00	0.00	0.00
SPARE	2400.00	10.43	0.00	0.00	0.00
TOTAL	30704.00	53.67	39.65	40.17	0.00

Calculation:	For Feeder Conductor and Protection $I_c = [(13760 + 14544) \times 125\% + 2400] / (230 \times \sqrt{3})$ $I_c = 94.84 \text{ A}$	FEEDER CONDUCTOR USE: 3 – 50 mm² THHN CU (L) + 1 – 14 mm² THHN CU (G) @ 63 mm Ø PVC FEEDER PROTECTION USE: 125AT/250AF, 230V, 60HZ, 3P

PANEL BOARD - THIRD FLOOR - SCHEDULE OF LOADS

PANEL NO.	CKT NO.	LOAD DESCRIPTION	L.O.	C.O.	OTHER LOADS	HP RATING	SWITCHES					VOLTAGE RATING	OUTLET (VA) RATING	VA PER CIRCUIT	DEMAND FACTOR	DEMAND VA	CIRCUIT LOAD CURRENT				CIRCUIT BREAKER				CIRCUIT CONDUCTOR AND CONDUIT			
							S ₁	S ₂	S ₃	S _{3W}	S _{4W}						AB	BC	CA	3Ø	F	P	AT	AF	WIRE (sq. mm)	CONDUIT	GROUNDING	
PB-3F	C1	Lighting Outlet	25						1	2		230	100	2500	0.80	2000	8.70	-	-	-	60	2	20	50	2 - 3.5 mm ² THHN Copper Wire	20 mm Ø Conduit - PVC	1 - 3.5 mm ² THHN Copper Wire	
	C2	Lighting Outlet	35							4		230	100	3500	0.80	2800	12.17	-	-	-	60	2	20	50	2 - 3.5 mm ² THHN Copper Wire	20 mm Ø Conduit - PVC	1 - 3.5 mm ² THHN Copper Wire	
	C3	Lighting Outlet	36				2				4		230	100	3600	0.80	2880	-	12.52	-	-	60	2	20	50	2 - 3.5 mm ² THHN Copper Wire	20 mm Ø Conduit - PVC	1 - 3.5 mm ² THHN Copper Wire
	C4	Lighting Outlet	12				4						230	100	1200	0.80	960	-	4.17	-	-	60	2	20	50	2 - 3.5 mm ² THHN Copper Wire	20 mm Ø Conduit - PVC	1 - 3.5 mm ² THHN Copper Wire
	C5	Lighting Outlet	28		1			1			4		230	100	2900	0.80	2320	-	-	10.09	-	60	2	20	50	2 - 3.5 mm ² THHN Copper Wire	20 mm Ø Conduit - PVC	1 - 3.5 mm ² THHN Copper Wire
	C6	Lighting Outlet	21				1			2			230	100	2100	0.80	1680	-	-	7.30	-	60	2	20	50	2 - 3.5 mm ² THHN Copper Wire	20 mm Ø Conduit - PVC	1 - 3.5 mm ² THHN Copper Wire
	C7	Lighting Outlet	12				1	1					230	100	1200	0.80	960	4.17	-	-	-	60	2	20	50	2 - 3.5 mm ² THHN Copper Wire	20 mm Ø Conduit - PVC	1 - 3.5 mm ² THHN Copper Wire
	C8	Convenience Outlet		6									230	180	1080	0.80	864	3.76	-	-	-	60	2	20	50	2 - 3.5 mm ² THHN Copper Wire	20 mm Ø Conduit - PVC	1 - 3.5 mm ² THHN Copper Wire
	C9	Convenience Outlet		6									230	180	1080	0.80	864	-	3.76	-	-	60	2	20	50	2 - 3.5 mm ² THHN Copper Wire	20 mm Ø Conduit - PVC	1 - 3.5 mm ² THHN Copper Wire
	C10	Convenience Outlet		10	4								230	180	2520	0.80	2016	-	8.77	-	-	60	2	20	50	2 - 3.5 mm ² THHN Copper Wire	20 mm Ø Conduit - PVC	1 - 3.5 mm ² THHN Copper Wire
	C11	Convenience Outlet		8									230	180	1440	0.80	1152	-	-	5.01	-	60	2	20	50	2 - 3.5 mm ² THHN Copper Wire	20 mm Ø Conduit - PVC	1 - 3.5 mm ² THHN Copper Wire
	C12	Convenience Outlet		8									230	180	1440	0.80	1152	-	-	5.01	-	60	2	20	50	2 - 3.5 mm ² THHN Copper Wire	20 mm Ø Conduit - PVC	1 - 3.5 mm ² THHN Copper Wire
	C13	Convenience Outlet - Server		1	1								230	1500	1500	1.00	1500	6.52	-	-	-	60	2	20	50	2 - 3.5 mm ² THHN Copper Wire	20 mm Ø Conduit - PVC	1 - 3.5 mm ² THHN Copper Wire
	C14	Convenience Outlet - Server		1	1								230	1500	1500	1.00	1500	6.52	-	-	-	60	2	20	50	2 - 3.5 mm ² THHN Copper Wire	20 mm Ø Conduit - PVC	1 - 3.5 mm ² THHN Copper Wire
	C15	Convenience Outlet - Hand Dryer		1	1								230	1500	1500	0.80	1200	-	5.22	-	-	60	2	20	50	2 - 3.5 mm ² THHN Copper Wire	20 mm Ø Conduit - PVC	1 - 3.5 mm ² THHN Copper Wire
	C16	Convenience Outlet - Hand Dryer		1	1								230	1500	1500	0.80	1200	-	5.22	-	-	60	2	20	50	2 - 3.5 mm ² THHN Copper Wire	20 mm Ø Conduit - PVC	1 - 3.5 mm ² THHN Copper Wire
	C17	Convenience Outlet - Emergency		8									230	180	1440	1.00	1440	-	-	6.26	-	60	2	20	50	2 - 3.5 mm ² THHN Copper Wire	20 mm Ø Conduit - PVC	1 - 3.5 mm ² THHN Copper Wire
	C18	Convenience Outlet - Emergency		11									230	180	1980	1.00	1980	-	-	8.61	-	60	2	20	50	2 - 3.5 mm ² THHN Copper Wire	20 mm Ø Conduit - PVC	1 - 3.5 mm ² THHN Copper Wire
	C19	SPARE											230	1500	1500	0.80	1200	5.22	-	-	-	60	2	20	50			
	C20	SPARE											230	1500	1500	0.80	1200	5.22	-	-	-	60	2	20	50			
	C21	SPACE																										
	C22	SPACE																										
TOTAL			169	41	8	0	8	2	3	14	0	230		36980	0.83	30868	52.28	39.65	42.28	0.00								

Calculation:

For Feeder Conductor and Protection

$$I_c = [(13600 + 14868) \times 125\% + 2400] / (230 \times \sqrt{3})$$

$$I_c = 95.35 \text{ A}$$

FEEDER CONDUCTOR

USE: 3 - 50 mm² THHN CU (L) + 1 - 14 mm² THHN CU (G) @ 63 mm Ø PVC

FEEDER PROTECTION

USE: 125AT/250AF, 230V, 60HZ, 3P

ACU PANEL BOARD - BASEMENT - SCHEDULE OF LOADS

PANEL NO.	CKT NO.	LOAD DESCRIPTION	L.O.	C.O.	OTHER LOADS	HP RATING	SWITCHES					VOLTAGE RATING	OUTLET (VA) RATING	VA PER CIRCUIT	DEMAND FACTOR	DEMAND VA	CIRCUIT LOAD CURRENT				CIRCUIT BREAKER				CIRCUIT CONDUCTOR AND CONDUIT		
							S ₁	S ₂	S ₃	S _{3W}	S _{4W}						AB	BC	CA	3Ø	F	P	AT	AF	WIRE (sq. mm)	CONDUIT	GROUNDING
APB-B	C1	ACCU B-01				1 4TR						230	6440	6440	1.00	6440	-	-	28.00	-	60	2	50	50	2 - 8.0 mm ² THHN Copper Wire	25 mm Ø Conduit - PVC	1 - 5.5 mm ² THHN Copper Wire
	C2	ACCU B-01				1 4TR						230	6440	6440	1.00	6440	-	-	28.00	-	60	2	50	50	2 - 8.0 mm ² THHN Copper Wire	25 mm Ø Conduit - PVC	1 - 5.5 mm ² THHN Copper Wire
	C3	ACCU B-02				1 4TR						230	6440	6440	1.00	6440	-	28.00	-	-	60	2	50	50	2 - 8.0 mm ² THHN Copper Wire	25 mm Ø Conduit - PVC	1 - 5.5 mm ² THHN Copper Wire
	C4	ACCU B-02				1 4TR						230	6440	6440	1.00	6440	-	28.00	-	-	60	2	50	50	2 - 8.0 mm ² THHN Copper Wire	25 mm Ø Conduit - PVC	1 - 5.5 mm ² THHN Copper Wire
	C5	SPARE										230	3000	3000	0.80	2400	10.43	-	-	-	60	2	20	50			
	C6	SPARE										230	3000	3000	0.80	2400	10.43	-	-	-	60	2	20	50			
	C7	SPACE																									
	C8	SPACE																									
	C9	SPACE																									
	C10	SPACE																									
TOTAL			0	0	4	0	0	0	0	0	0	230		31760	0.96	30560	20.87	56.00	56.00	0.00							

Calculation:

For Feeder Conductor

$$I_c = [(6440 \times 125\%) + 19320 + 4800] / (230 \times \sqrt{3})$$

$$I_c = 80.75 \text{ A}$$

For Feeder Protection

$$I_{cb} = [(6440 \times 225\%) + 19320 + 4800] / (230 \times \sqrt{3})$$

$$I_{cb} = 96.92 \text{ A}$$

FEEDER CONDUCTOR

USE: 3 - 38 mm² THHN CU (L) + 1 - 8 mm² THHN (G) @ 50 mm Ø PVC

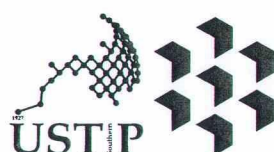
FEEDER PROTECTION

USE: 100AT/250AF, 230V, 60HZ, 3P

Load Type	VA	FLC			
		AB	BC	CA	3P
LO	13600.00	25.04	16.70	17.39	0.00
CO	14868.00	16.80	22.96	24.89	0.00
ACU	0.00	0.00	0.00	0.00	0.00
MOTOR (NC)	0.00	0.00	0.00	0.00	0.00
MOTOR (C)	0.00	0.00	0.00	0.00	0.00
LARGEST MOTOR	0.00	0.00	0.00	0.00	0.00
SPARE	2400.00	10.43	0.00	0.00	0.00
TOTAL	30868.00	52.28	39.65	42.28	0.00

Load Type	VA	FLC			
		AB	BC	CA	3P
LO	0.00	0.00	0.00	0.00	0.00
CO	0.00	0.00	0.00	0.00	0.00
ACU	19320.00	0.00	56.00	28.00	0.00
MOTOR (NC)	0.00	0.00	0.00	0.00	0.00
MOTOR (C)	0.00	0.00	0.00	0.00	0.00
LARGEST MOTOR	6440.00	0.00	0.00	28.00	0.00
SPARE	4800.00	20.87	0.00	0.00	0.00
TOTAL	30560.00	20.87	56.00	56.00	0.00

SCHEDULE OF LOADS - PB-3F AND APB-B



REPUBLIC OF THE PHILIPPINES
UNIVERSITY OF SCIENCE AND TECHNOLOGY OF SOUTHERN PHILIPPINES
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PROFESSIONAL ELECTRICAL ENGINEER
PRC NO. PTR NO.
DATE
TIN NO. PLACE

PROJECT
CONSTRUCTION OF INNOVATION AND COLLABORATION HUB PHASE II, ALUBIJOD (MAIN) CAMPUS
LOCATION
USTP AGILA S&T PARK, ALUBIJOD, MISAMIS ORIENTAL
OWNER
UNIVERSITY OF SCIENCE & TECHNOLOGY OF SOUTHERN PHILIPPINES

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VP FOR ADMINISTRATION & LEGAL AFFAIRS

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

SHEET CONTENTS:
SCHEDULE OF LOADS - PB-3F AND APB-B
DRAWN BY:
DATE DRAWN:
FNT:

E14

ACU PANEL BOARD – GROUND FLOOR – SCHEDULE OF LOADS																											
PANEL NO.	CKT NO.	LOAD DESCRIPTION	L.O.	C.O.	OTHER LOADS	HP RATING	SWITCHES					VOLTAGE RATING	OUTLET (VA) RATING	VA PER CIRCUIT	DEMAND FACTOR	DEMAND VA	CIRCUIT LOAD CURRENT				CIRCUIT BREAKER				CIRCUIT CONDUCTOR AND CONDUIT		
							S ₁	S ₂	S ₃	S _{3W}	S _{4W}						AB	BC	CA	3Ø	F	P	AT	AF	WIRE (sq. mm)	CONDUIT	GROUNDING
APB-GF	C1	ACCU 1-01			1	4TR						230	6440	6440	1.00	6440	-	-	28.00	-	60	2	50	50	2 – 8.0 mm2 THHN Copper Wire	25 mm Ø Conduit – PVC	1 – 5.5 mm² THHN Copper Wire
	C2	ACCU 1-01			1	4TR						230	6440	6440	1.00	6440	-	-	28.00	-	60	2	50	50	2 – 8.0 mm2 THHN Copper Wire	25 mm Ø Conduit – PVC	1 – 5.5 mm² THHN Copper Wire
	C3	ACCU 1-02			1	4TR						230	6440	6440	1.00	6440	-	28.00	-	-	60	2	50	50	2 – 8.0 mm2 THHN Copper Wire	25 mm Ø Conduit – PVC	1 – 5.5 mm² THHN Copper Wire
	C4	ACCU 1-02			1	4TR						230	6440	6440	1.00	6440	-	28.00	-	-	60	2	50	50	2 – 8.0 mm2 THHN Copper Wire	25 mm Ø Conduit – PVC	1 – 5.5 mm² THHN Copper Wire
	C5	ACCU 1-04			1	3TR						230	5175	5175	1.00	5175	22.50	-	-	-	60	2	40	50	2 – 8.0 mm2 THHN Copper Wire	25 mm Ø Conduit – PVC	1 – 5.5 mm² THHN Copper Wire
	C6	SPARE										230	3000	3000	0.80	2400	10.43	-	-	-	60	2	20	50			
	C7	SPACE																									
	C8	SPACE																									
	C9	SPACE																									
	C10	SPACE																									
TOTAL			0	0	5	0	0	0	0	0	0	230		33935	0.98	33335	32.93	56.00	56.00	0.00							

Calculation:

For Feeder Conductor
 $I_c = [(6440 \times 125\%) + 24495 + 2400] / (230 \times \sqrt{3})$
 $I_c = 87.72 \text{ A}$

For Feeder Protection
 $I_{cb} = [(6440 \times 225\%) + 24495 + 2400] / (230 \times \sqrt{3})$
 $I_{cb} = 103.89 \text{ A}$

FEEDER CONDUCTOR
USE: 3 - 38 mm² THHN CU (L) + 1 - 8 mm² THHN (G) @ 50 mm Ø PVC
FEEDER PROTECTION
USE: 100AT / 250AF, 230V, 60HZ, 3P

Load Type	VA	FLC			
		AB	BC	CA	3P
LO	0.00	0.00	0.00	0.00	0.00
CO	0.00	0.00	0.00	0.00	0.00
ACU	24495.00	22.50	56.00	28.00	0.00
MOTOR (NC)	0.00	0.00	0.00	0.00	0.00
MOTOR (C)	0.00	0.00	0.00	0.00	0.00
LARGEST MOTOR	6440.00	0.00	0.00	28.00	0.00
SPARE	2400.00	10.43	0.00	0.00	0.00
TOTAL	33335.00	32.93	56.00	56.00	0.00

ACU PANEL BOARD – SECOND FLOOR – SCHEDULE OF LOADS																											
PANEL NO.	CKT NO.	LOAD DESCRIPTION	L.O.	C.O.	OTHER LOADS	HP RATING	SWITCHES					VOLTAGE RATING	OUTLET (VA) RATING	VA PER CIRCUIT	DEMAND FACTOR	DEMAND VA	CIRCUIT LOAD CURRENT				CIRCUIT BREAKER				CIRCUIT CONDUCTOR AND CONDUIT		
							S ₁	S ₂	S ₃	S _{3W}	S _{4W}						AB	BC	CA	3Ø	F	P	AT	AF	WIRE (sq. mm)	CONDUIT	GROUNDING
APB-2F	C1	ACCU 2-01			1	4TR					230	6440	6440	1.00	6440	28.00	–	–	–	60	2	50	50	2 – 8.0 mm2 THHN Copper Wire	25 mm Ø Conduit – PVC	1 – 5.5 mm² THHN Copper Wire	
	C2	ACCU 2-01			1	4TR					230	6440	6440	1.00	6440	28.00	–	–	–	60	2	50	50	2 – 8.0 mm2 THHN Copper Wire	25 mm Ø Conduit – PVC	1 – 5.5 mm² THHN Copper Wire	
	C3	ACCU 2-02			1	4TR					230	6440	6440	1.00	6440	–	–	28.00	–	60	2	50	50	2 – 8.0 mm2 THHN Copper Wire	25 mm Ø Conduit – PVC	1 – 5.5 mm² THHN Copper Wire	
	C4	ACCU 2-02			1	4TR					230	6440	6440	1.00	6440	–	–	28.00	–	60	2	50	50	2 – 8.0 mm2 THHN Copper Wire	25 mm Ø Conduit – PVC	1 – 5.5 mm² THHN Copper Wire	
	C5	ACCU 2-04			1	3TR					230	5175	5175	1.00	5175	–	22.50	–	–	60	2	40	50	2 – 8.0 mm2 THHN Copper Wire	25 mm Ø Conduit – PVC	1 – 5.5 mm² THHN Copper Wire	
	C6	SPARE									230	3000	3000	0.80	2400	–	10.43	–	–	60	2	20	50				
	C7	SPACE																									
	C8	SPACE																									
	C9	SPACE																									
	C10	SPACE																									
TOTAL			0	0	5	0	0	0	0	0	230		33935	0.98	33335	56.00	32.93	56.00	0.00								

Calculation:

For Feeder Conductor
 $I_c = [(6440 \times 125\%) + 24495 + 2400] / (230 \times \sqrt{3})$
 $I_c = 87.72 \text{ A}$

For Feeder Protection
 $I_{cb} = [(6440 \times 225\%) + 24495 + 2400] / (230 \times \sqrt{3})$
 $I_{cb} = 103.89 \text{ A}$

FEEDER CONDUCTOR
USE: 3 - 38 mm² THHN CU (L) + 1 - 8 mm² THHN (G) @ 50 mm Ø PVC
FEEDER PROTECTION
USE: 100AT / 250AF, 230V, 60HZ, 3P

Load Type	VA	FLC			
		AB	BC	CA	3P
LO	0.00	0.00	0.00	0.00	0.00
CO	0.00	0.00	0.00	0.00	0.00
ACU	24495.00	28.00	22.50	56.00	0.00
MOTOR (NC)	0.00	0.00	0.00	0.00	0.00
MOTOR (C)	0.00	0.00	0.00	0.00	0.00
LARGEST MOTOR	6440.00	28.00	0.00	0.00	0.00
SPARE	2400.00	0.00	10.43	0.00	0.00
TOTAL	33335.00	56.00	32.93	56.00	0.00

ACU PANEL BOARD – THIRD FLOOR – SCHEDULE OF LOADS																											
PANEL NO.	CKT NO.	LOAD DESCRIPTION	L.O.	C.O.	OTHER LOADS	HP RATING	SWITCHES					VOLTAGE RATING	OUTLET (VA) RATING	VA PER CIRCUIT	DEMAND FACTOR	DEMAND VA	CIRCUIT LOAD CURRENT				CIRCUIT BREAKER				CIRCUIT CONDUCTOR AND CONDUIT		
							S ₁	S ₂	S ₃	S _{3W}	S _{4W}						AB	BC	CA	3Ø	F	P	AT	AF	WIRE (sq. mm)	CONDUIT	GROUNDING
APB-3F	C1	ACCU 3-01			1	4TR					230	6440	6440	1.00	6440	28.00	–	–	–	60	2	50	50	2 – 8.0 mm2 THHN Copper Wire	25 mm ø Conduit – PVC	1 – 5.5 mm² THHN Copper Wire	
	C2	ACCU 3-01			1	4TR					230	6440	6440	1.00	6440	28.00	–	–	–	60	2	50	50	2 – 8.0 mm2 THHN Copper Wire	25 mm ø Conduit – PVC	1 – 5.5 mm² THHN Copper Wire	
	C3	ACCU 3-02			1	4TR					230	6440	6440	1.00	6440	–	–	28.00	–	60	2	50	50	2 – 8.0 mm2 THHN Copper Wire	25 mm ø Conduit – PVC	1 – 5.5 mm² THHN Copper Wire	
	C4	ACCU 3-02			1	4TR					230	6440	6440	1.00	6440	–	–	28.00	–	60	2	50	50	2 – 8.0 mm2 THHN Copper Wire	25 mm ø Conduit – PVC	1 – 5.5 mm² THHN Copper Wire	
	C5	ACCU 3-04			1	3TR					230	5175	5175	1.00	5175	–	22.50	–	–	60	2	40	50	2 – 8.0 mm2 THHN Copper Wire	25 mm ø Conduit – PVC	1 – 5.5 mm² THHN Copper Wire	
	C6	SPARE									230	3000	3000	0.80	2400	–	10.43	–	–	60	2	20	50				
	C7	SPACE																									
	C8	SPACE																									
	C9	SPACE																									
	C10	SPACE																									
TOTAL			0	0	5	0	0	0	0	0	230		33935	0.98	33335	56.00	32.93	56.00	0.00								

Calculation:

For Feeder Conductor
 $I_c = [(6440 \times 125\%) + 24495 + 2400] / (230 \times \sqrt{3})$
 $I_c = 87.72 \text{ A}$

For Feeder Protection
 $I_{cb} = [(6440 \times 225\%) + 24495 + 2400] / (230 \times \sqrt{3})$
 $I_{cb} = 103.89 \text{ A}$

FEEDER CONDUCTOR
USE: 3 - 38 mm² THHN CU (L) + 1 - 8 mm² THHN (G) @ 50 mm Ø PVC
FEEDER PROTECTION
USE: 100AT / 250AF, 230V, 60HZ, 3P

Load Type	VA	FLC			
		AB	BC	CA	3P
LO	0.00	0.00	0.00	0.00	0.00
CO	0.00	0.00	0.00	0.00	0.00
ACU	24495.00	28.00	22.50	56.00	0.00
MOTOR (NC)	0.00	0.00	0.00	0.00	0.00
MOTOR (C)	0.00	0.00	0.00	0.00	0.00
LARGEST MOTOR	6440.00	28.00	0.00	0.00	0.00
SPARE	2400.00	0.00	10.43	0.00	0.00
TOTAL	33335.00	56.00	32.93	56.00	0.00

SCHEDULE OF LOADS - APB-GF, APB-2F AND APB-3F



TRANSFORMER - SCHEDULE OF LOADS

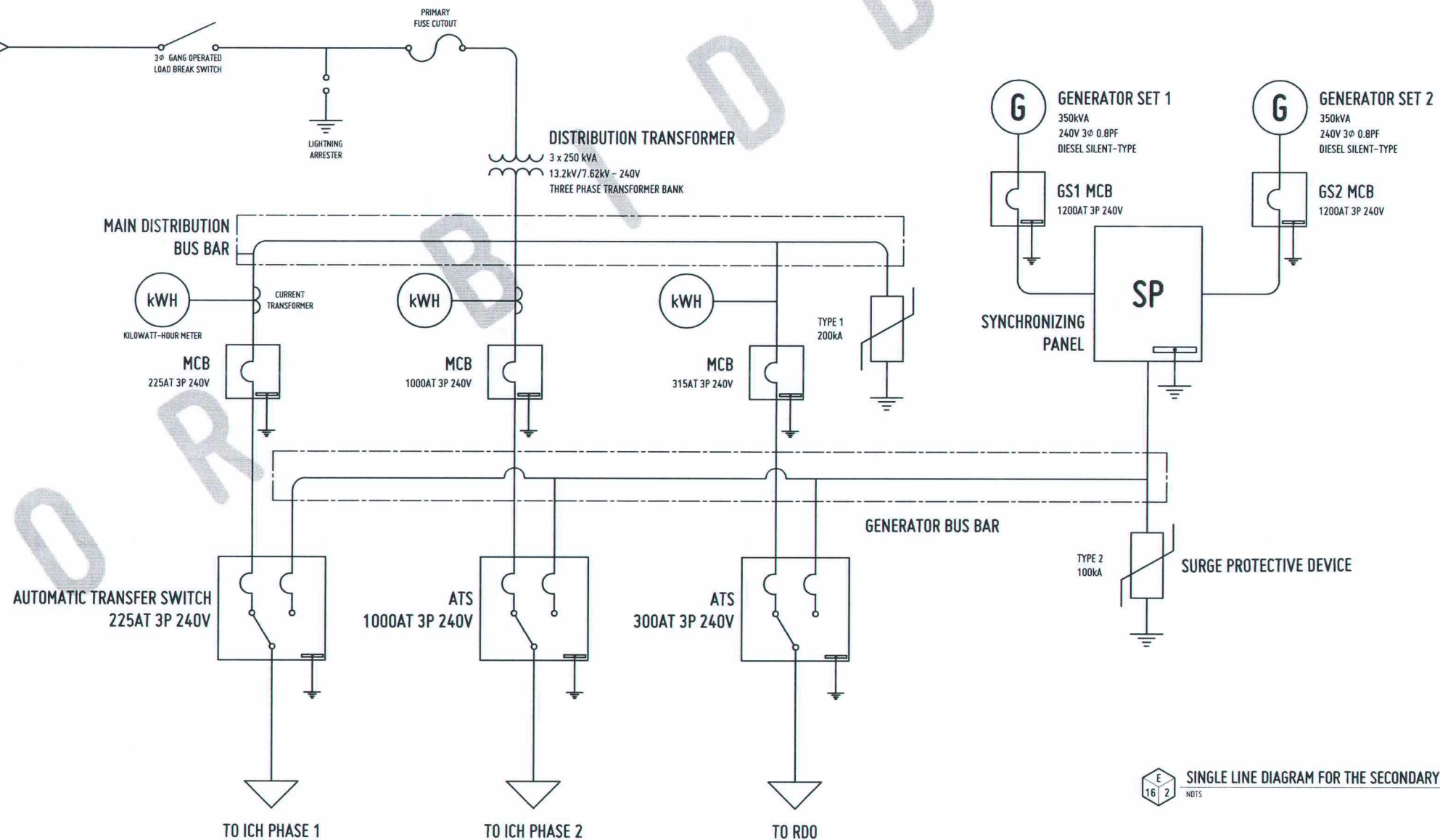
SOURCE	CKT NO.	LOAD DESCRIPTION	VOLTAGE RATING	VA PER CIRCUIT	DEMAND FACTOR	DEMAND VA	CIRCUIT LOAD CURRENT				CIRCUIT BREAKER				CIRCUIT CONDUCTOR AND CONDUIT		
							AB	BC	CA	3P	F	P	AT	AF	WIRE (sq. mm)	CONDUIT	GROUNDING
TRANSFORMER	C1	ICH Building 1 (2 Storey)	230	71756	0.90	64580	77.47	75.33	80.77	20.87	60	3	225	250	3 - 100 mm ² THWN-2 Copper Wire	80 mm Ø Conduit - PVC	1- 22 mm ² THWN-2 Copper Wire
	C2	ICH Building 1 (4 Storey)	230	325753	0.92	298745	363.14	351.56	368.85	128.74	60	3	1000	1200	(3) 3 - 250 mm ² THWN-2 Copper Wire	(3) 80 mm Ø Conduit - PVC SCH 80	(3) 1- 30 mm ² THWN-2 Copper Wire
	C3	RDO	230	84740	0.73	61860	62.91	30.91	31.91	106.64	60	3	315	400	3 - 100 mm ² THWN-2 Copper Wire	63 mm Ø Conduit - PVC	1- 22 mm ² THWN-2 Copper Wire
TOTAL							425185	503.52	457.79	481.54	256.25						

TRANSFORMER SIZING		GENERATOR SIZING	
TOTAL LINE CURRENT	CALCULATION	kw LOAD	CALCULATION
1022.836723	TRANSFORMER SIZE		$P = (1.732 \times V \times I \times PF) / 1000$
	$S = (1.732 \times V \times I) \times 125\%$		$P = (1.732 \times 240 \times 1022.84 \times 0.80) / 1000$
	$S = (1.732 \times 240 \times 1022.84) \times 125\%$		$P = 340.138215062169kW$
	$S = 531.465961034639 kVA$		$P = 340.14 \times 0.25$
THEREFORE USE 3 x 250 KVA THREE PHASE DISTRIBUTION TRANSFORMER BANK WITH 13.2kV/7.62kV PRIMARY AND 240V SECONDARY		RESERVE CAPACITY	$P = 85.03kW$
			$P = 340.14 + 85.03$
		GENERATOR SIZE	$P = 425.17kW$
		THEREFORE USE 2 x 350kVA 3 PHASE 240V 60HZ 0.8PF SILENT-TYPE DIESEL GENERATOR SET	

SIZING AND SCHEDULE OF LOADS - TRANSFORMER AND GENERATOR

DISTRIBUTION UTILITY

13.2kV/7.62kV
3Ø 4W



SINGLE LINE DIAGRAM FOR THE SECONDARY DISTRIBUTION SYSTEM

Approved by:

TRANSFORMER TO MCB	
LENGTH	10 m
FLC	749.92 A
SETS	3
PHASE	3
FACTOR	1.732
CABLE	
250mm ²	
RESISTANCE	0.027 Ω
REACTANCE	0.039 Ω
COMPUTATION	$VD = [1.732 \times (749.92/3) \times \sqrt{(0.027^2 + 0.039^2)}] / 305m \times 10m$
VOLTAGE DROP	0.673334063 V

MCB TO ATS	
LENGTH	5 m
FLC	749.92 A
SETS	3
PHASE	3
FACTOR	1.732
CABLE	
250mm ²	
RESISTANCE	0.027 Ω
REACTANCE	0.039 Ω
COMPUTATION	$VD = [1.732 \times (749.92/3) \times \sqrt{(0.027^2 + 0.039^2)}] / 305m \times 5m$
VOLTAGE DROP	0.336667031 V

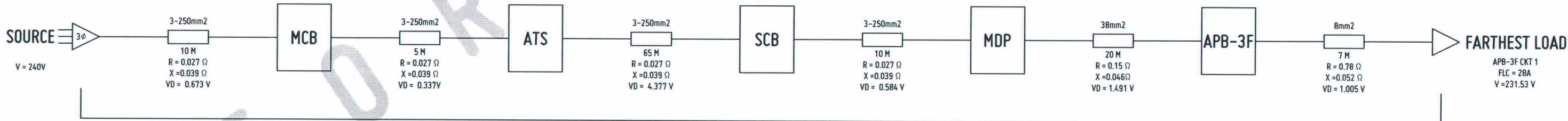
ATS TO SCB	
LENGTH	65 m
FLC	749.92 A
SETS	3
PHASE	3
FACTOR	1.732
CABLE	
250mm ²	
RESISTANCE	0.027 Ω
REACTANCE	0.039 Ω
COMPUTATION	$VD = [1.732 \times (749.92/3) \times \sqrt{(0.027^2 + 0.039^2)}] / 305m \times 65m$
VOLTAGE DROP	4.376671408 V

SCB TO MDP	
LENGTH	10 m
FLC	650.69 A
SETS	3
PHASE	3
FACTOR	1.732
CABLE	
250mm ²	
RESISTANCE	0.027 Ω
REACTANCE	0.039 Ω
COMPUTATION	$VD = [1.732 \times (650.69/3) \times \sqrt{(0.027^2 + 0.039^2)}] / 305m \times 10m$
VOLTAGE DROP	0.584242397 V

MDP TO APB-3F	
LENGTH	20 m
FLC	83.68 A
SETS	1
PHASE	3
FACTOR	1.732
CABLE	
38mm ²	
RESISTANCE	0.15 Ω
REACTANCE	0.046 Ω
COMPUTATION	$VD = [1.732 \times (83.68/1) \times \sqrt{(0.15^2 + 0.046^2)}] / 305m \times 20m$
VOLTAGE DROP	1.491072573 V

SPB TO FARTHEST MOTOR LOAD (CKT1)	
LENGTH	7 m
FLC	28.00 A
SETS	1
PHASE	1
FACTOR	2
CABLE	
8mm ²	
RESISTANCE	0.78 Ω
REACTANCE	0.052 Ω
COMPUTATION	$VD = [2 \times (28/1) \times \sqrt{(0.78^2 + 0.052^2)}] / 305m \times 7m$
VOLTAGE DROP	1.004717093 V

VOLTAGE DROP ANALYSIS			
TOTAL VOLTAGE DROP FROM SERVICE TO FARTHEST LOAD	$0.67 + 0.34 + 4.38 + 0.58 + 1.49 + 1$	8.47 V	PERCENT VOLTAGE DROP
VOLTAGE DROP COMPUTATION USING NOMINAL VOLTAGE (240V)	$240 - 8.47 V$	231.53V	3.53%

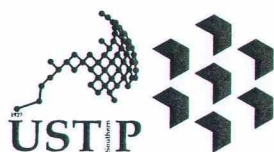


8.47V OR 3.53%



VOLTAGE DROP ANALYSIS

NOTS



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PROFESSIONAL ELECTRICAL ENGINEER
PRC NO. PTR NO. DATE PLACE

PROJECT
LOCATION
OWNER

CONSTRUCTION OF
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ALUBUIJOD (MAIN) CAMPUS
USTP AGILA S&T PARK, ALUBUIJOD, MISAMIS ORIENTAL
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ATTY. JONATHAN S. OCHE
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APPROVED BY:
DR. AMBROSIO B. CULTURA II
PRESIDENT, USTP SYSTEM

SHEET CONTENTS:
VOLTAGE DROP ANALYSIS

DRAWN BY:
DATE DRAWN:
FRT:

E17

USING POINT TO POINT METHOD

Transformer Full Load Current (I_{FLA})

For 3Ø Transformer:

$I_{FLA} = (kVA \times 1000) / (E_{L-L} \times \sqrt{3})$

For 1Ø Transformer:

$I_{FLA} = (kVA \times 1000) / E_{L-L}$

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	1804.272517	A
MULTIPLIER	55.55555556	
3P FAULT CURRENT	100237.3621	A
	100.2373621	kA
TOTAL 3P FAULT CURRENT	103118.9837	A
	103.1189837	kA

FAULT LOCATION 2		
MCB		
CONDUCTOR	250	mm2
NO. OF SETS	3	
LENGTH	10	m
C VALUE	26706	
"f" FACTOR	0.296224663	
MULTIPLIER	0.771471203	
3P FAULT CURRENT	77330.23832	A
	77.33023832	kA
TOTAL 3P FAULT CURRENT	80211.8599	A
	80.2118599	kA

FAULT LOCATION 3		
ATS		
CONDUCTOR	250	mm2
NO. OF SETS	3	
LENGTH	5	m
C VALUE	26706	
"f" FACTOR	0.148112331	
MULTIPLIER	0.870994913	
3P FAULT CURRENT	67354.24419	A
	67.35424419	kA
TOTAL 3P FAULT CURRENT	70235.86577	A
	70.23586577	kA

FAULT LOCATION 4		
SCB		
CONDUCTOR	250	mm2
NO. OF SETS	3	
LENGTH	65	m
C VALUE	26706	
"f" FACTOR	1.925460307	
MULTIPLIER	0.341826549	
3P FAULT CURRENT	23023.46883	A
	23.02346883	kA
TOTAL 3P FAULT CURRENT	25905.09042	A
	25.90509042	kA

TRANSFORMER RATING	750	kVA
%Z	2	(Typical Value)
PRIMARY LINE VOLTAGE	13.2	kV
SECONDARY LINE VOLTAGE	240	V

FAULT LOCATION 5		
MDP		
CONDUCTOR	250	mm2
NO. OF SETS	3	
LENGTH	10	m
C VALUE	26706	
"f" FACTOR	0.296224663	
MULTIPLIER	0.771471203	
3P FAULT CURRENT	14581.09998	A
	14.58109998	kA
TOTAL 3P FAULT CURRENT	17462.72156	A
	17.46272156	kA

FAULT LOCATION 6		
PPB		
CONDUCTOR	8	mm2
NO. OF SETS	1	
LENGTH	10	m
C VALUE	1559	
"f" FACTOR	15.22317352	
MULTIPLIER	0.061640221	
3P FAULT CURRENT	1165.023685	A
	1.165023685	kA
TOTAL 3P FAULT CURRENT	4046.64527	A
	4.04664527	kA

FAULT LOCATION 7		
FPP		
CONDUCTOR	50	mm2
NO. OF SETS	1	
LENGTH	10	m
C VALUE	9317	
"f" FACTOR	2.547271388	
MULTIPLIER	0.281906821	
3P FAULT CURRENT	5328.146436	A
	5.328146436	kA
TOTAL 3P FAULT CURRENT	8209.76802	A
	8.20976802	kA

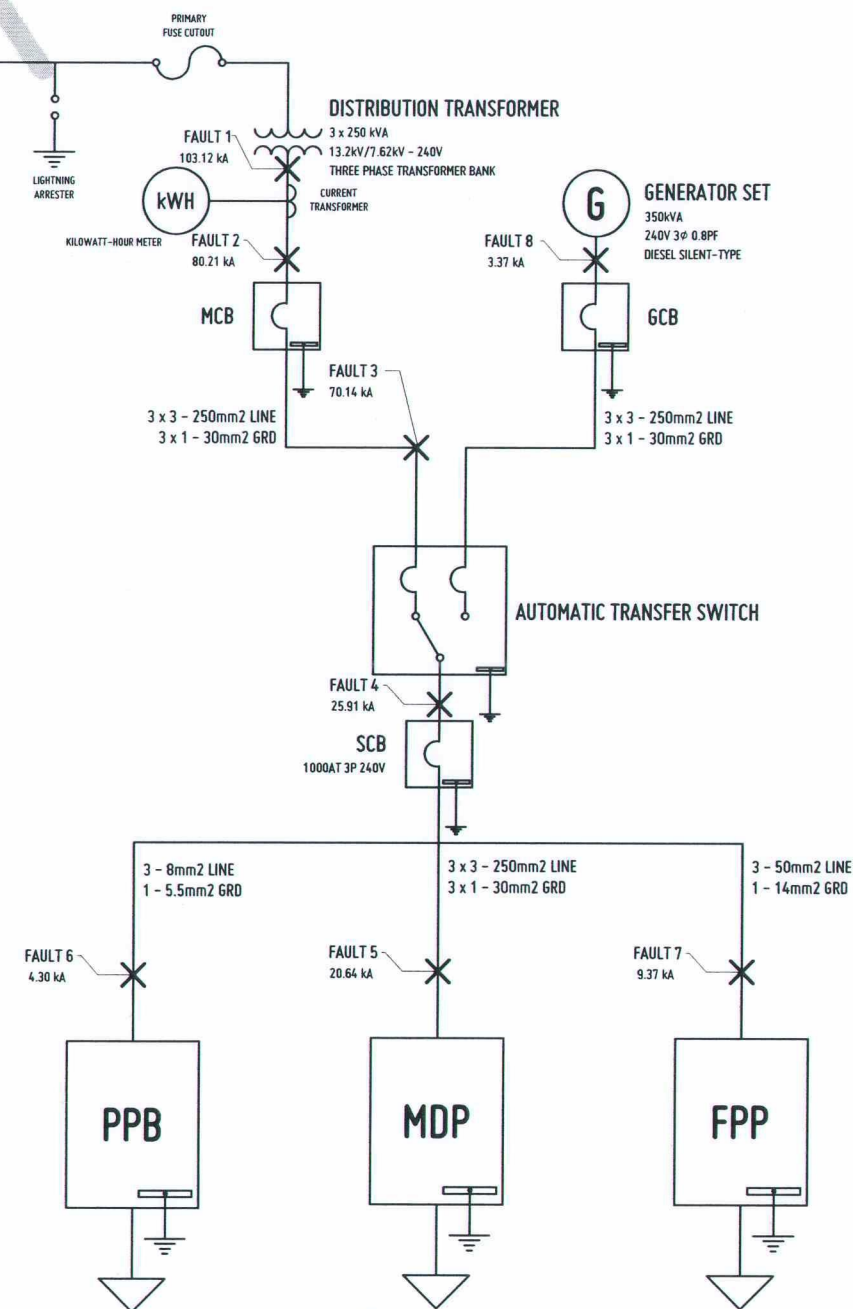
MOTOR LOADS		
TYPE	FLC	SHORT CIRCUIT CURRENT CONTRIBUTION (kA)
AIRCON	515.50	2.06
MOTOR (NON CONTINUOUS)	43.48	0.17
MOTOR (CONTINUOUS)	43.65	0.17
LARGEST MOTOR	117.78	0.47
TOTAL MOTOR CONTRIBUTION		2.88

GENERATOR					
RATING	PF	VOLTAGE	FLC	SUBTRANSIENT REACTANCE (X")	SHORT CIRCUIT CURRENT CONTRIBUTION (kA)
kVA					
350	280	0.8	240	841.993841	25%
					3.37

SHORT CIRCUIT ANALYSIS			
FAULT NO.	FAULT LOCATION	TOTAL 3P FAULT CURRENT (kA)	MINIMUM CB kAIC RATING
1	XMER SECONDARY SIDE	103.12	
2	MCB	80.21	85
3	ATS	70.24	85
4	SCB	25.91	30
5	MDP	20.64	30
6	PPB	4.30	18
7	FPP	9.37	18

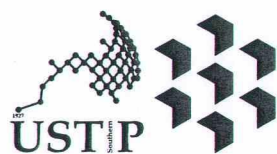
DISTRIBUTION UTILITY

13.2kV/7.62kV
4W



SHORT CIRCUIT ANALYSIS

NOTES



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PROFESSIONAL ELECTRICAL ENGINEER
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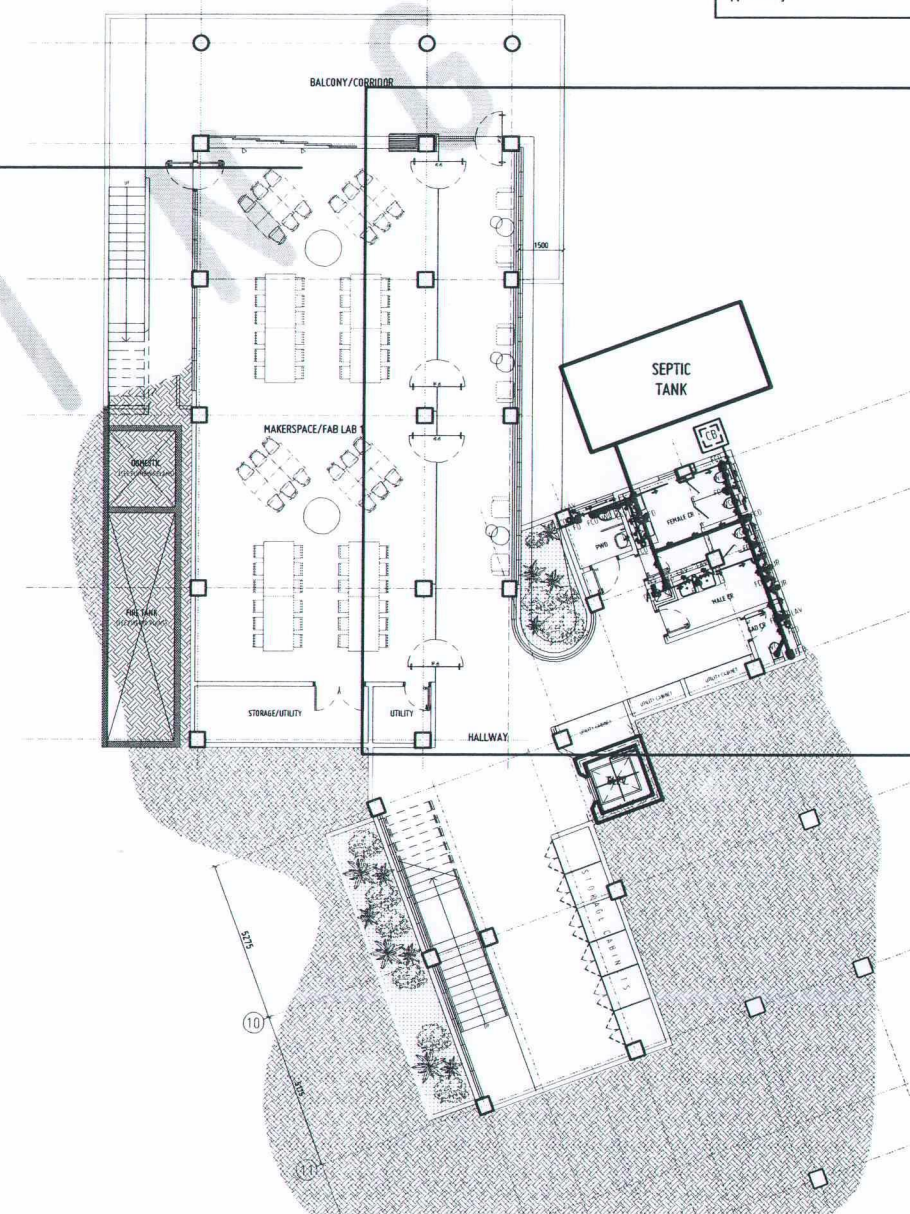
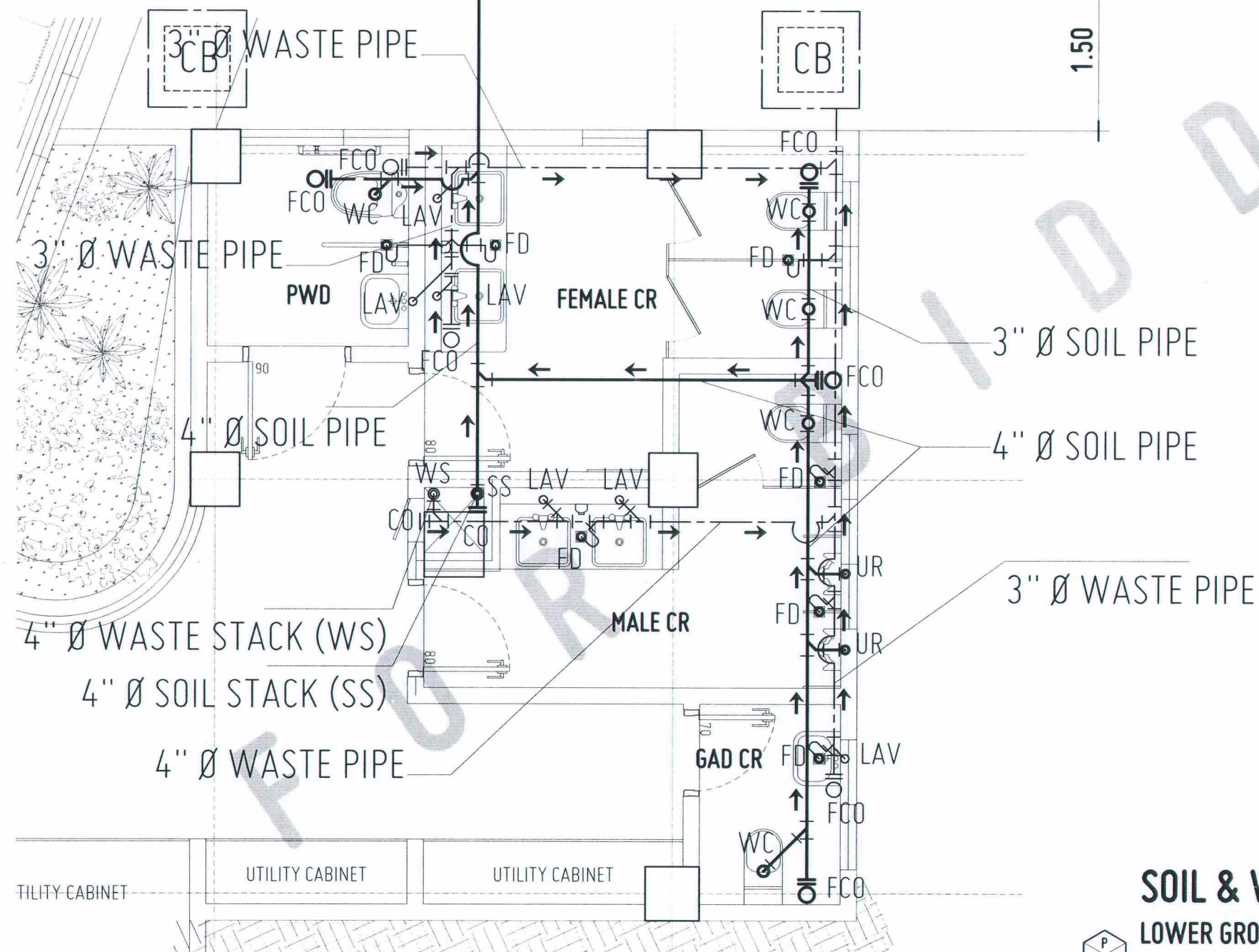
APPROVED BY:
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PRESIDENT, USTP SYSTEM

SHEET CONTENTS:
SHORT CIRCUIT ANALYSIS

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DATE DRAWN:
FNT:

E18

Approved by:



INDEX PLAN
GROUND FLOOR



SCALE: 1:250 MTS

SOIL & WASTE PIPING LAYOUT PLAN
LOWER GROUND LEVEL



SCALE: 1:50 MTS



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MASTER PLUMBER/SANITARY ENGINEER	
PRC NO.	PTR NO.
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TIN NO.	

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CONSTRUCTION OF INNOVATION AND COLLABORATION HUB PHASE II, ALUBUIJID (MAIN) CAMPUS	USTP AGILA S&T PARK, ALUBUIJID, MISAMIS ORIENTAL	UNIVERSITY OF SCIENCE & TECHNOLOGY OF SOUTHERN PHILIPPINES

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SHEET CONTENTS:
SOIL & WASTE LINE PIPING LAYOUT PLAN LOWER GROUND LEVEL

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MAXFER DATE DRAWN:
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P1