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PANEL 'MDP' DEMAND LOADS

EXISTING LOADS	33.5 KVA
NEW LIGHTS (AT 125%)	1.4 KVA
RECEPTACLES & MISC.	10.9 KVA
ELEVATOR	5.3 KVA
PACKAGED A/C UNITS (INCLUDES 125% FACTOR FOR LARGEST MOTOR)	28.4 KVA
AIR HANDLING UNITS	45.8 KVA
HEAT PUMPS	28.2 KVA
FANS	0.2 KVA
TOTAL	153.7 KVA

426.6 AMPS @ 208V/3Ø

** DEMAND LOADS FOR EQUIPMENT AND FIXTURES NOTED AS EXISTING HAVE BEEN CALCULATED IN ACCORDANCE WITH THE APPLICABLE SECTIONS OF THE NEC INCLUDING SECTION 220. APPROPRIATE DEMAND FACTORS SUCH AS 125% FOR CONTINUOUS LOADS AND 125% FOR LARGEST MOTOR HAVE BEEN INCLUDED AS REQUIRED. THESE LOADS INCLUDE ALL KNOWN EXISTING EQUIPMENT AND FIXTURES AS WELL AS ALL KNOWN EQUIPMENT AND FIXTURES WHICH ARE BEING INSTALLED OR PLAN TO BE INSTALLED PRIOR TO THE COMPLETION OF THE WORK REPRESENTED ON THESE PLANS, AND AS SUCH ARE BELIEVED TO BE MORE COMPLETE AND ACCURATE THAN ANY HISTORIC METERING DATA WHICH MAY OR MAY NOT BE AVAILABLE.

Panel: PB — 150 AMP MAIN LUGS ONLY — Poles: 42 Voltage: 120/208 — Phase: 3 Wires: 4

LOAD SERVED	KVA	BRKR.		φ		BRKR.	KVA	LOAD SERVED
LIGHTS EXTERIOR	0.1	20/1	1	A	2	20/1	0.5	RECS. CLOSET, EXTERIOR
EX. LIGHTS	0.5	20/1	3	B	4	20/1	1.1	RECS. QUILTROOM, STORAGE, EXTER
EX. LIGHTS FELLOWSHIP HALL	0.4	20/1	5	C	6	30/1	1.1	EX. RECS., BASEMENT
EX. LIGHTS FELLOWSHIP HALL	0.6	20/1	7	A	8	30/1	0.9	EX. RECS., BASEMENT
EX. LIGHTS	0.8	20/1	9	B	10	40/2	8.0	EX. RANGE
LIGHTS ELEVATOR PIT	0.1	20/1	11	C	12		8.0	
ELEVATOR CAB LIGHTS	0.5	20/1	13	A	14	20/1	1.1	RECS. STORAGE, EXTERIOR
RECS. ELEVATOR PIT	0.5	20/1	15	B	16	30/1	0.4	EX. RECS. KITCHEN DISH CNTR.
SUMP PUMP CONTROL PANEL	0.2	20/1	17	C	18	30/1	0.5	EX. RECS. FELLOWSHIP HALL
EXH. FANS EF-1, EF-2	0.2	20/1	19	A	20	30/1	1.0	EX. REC. REFRIG. KITCHEN 019
EX. RECS. BASEMENT	0.8	20/1	21	B	22	30/1	1.0	EX. REC. REFRIG. KITCHEN 019
EX. RECS. BASEMENT	0.8	20/1	23	C	24	30/1	0.4	EX. RECS. KITCHEN DISH CNTR.
FACP	0.4	20/1&1	25	A	26	30/1	0.4	EX. RECS. KITCHEN DISH CNTR.
FA POWER EXTENDER	0.4	20/1&1	27	B	28	30/1	0.5	EX. RECS. KITCHEN DISH CNTR.
SPACE		SPACE	29	C	30	20/1	0.1	CONDENSATE PUMP
DOMESTIC WATER HOTBOX	3.5	20/1	31	A	32	30/1	0.1	CONDENSATE PUMP
SPACE		SPACE	33	B	34	30/1	0.1	CONDENSATE PUMP
SPACE		SPACE	35	C	36	SPACE		SPACE
SPACE		SPACE	37	A	38	SPACE		SPACE
SPACE		SPACE	39	B	40	SPACE		SPACE
SPACE		SPACE	41	C	42	SPACE		SPACE

Demand Load Summary:

Lighting:	2.4 KVA	@ 125%	1.0 KVA	Phase A:	6.4 KVA	53.7	Amps
Largest Motor:	0.0 KVA	@ 125%	0.0 KVA	Phase B:	9.4 KVA	79.0	Amps
Gen Receptacles:	9.9 KVA	NOTE 2	9.9 KVA	Phase C:	6.7 KVA	56.1	Amps
All Other:	9.6 KVA	@ 100%	9.6 KVA	Total Panel Load:	22.5 KVA	62.6	Amps

- [X] GROUND BAR
- [X] SEPARATE NEUTRAL BAR
- [ ] U.L. S.E. RATED
- [X] SURFACE MOUNTED
- [ ] NEMA 3R
- [ ] FEED THRU LUGS
- [ ] EXISTING PANEL

1. ALL BREAKERS SHALL BE RATED AT 42,000 A/C.
2. FIRST 10 KVA AT 100%, REST AT 50%.

Panel: H — 400 AMP MAIN LUGS ONLY — Poles: 42 Voltage: 120/208 — Phase: 3 Wires: 4

LOAD SERVED	KVA	BRKR.		φ		BRKR.	KVA	LOAD SERVED
AHU-3	2.8	30/2	1	A	2	100/2	9.8	AHU-2
	2.8		3	B	4		9.8	
AHU-1	9.8	100/2	5	C	6	50/2	8.4	HP-2
	9.8		7	A	8		8.8	
HP-1	3.3	50/2	9	B	10	25/2	2.8	HP-6/ AHU-6A / AHU-6B
	3.4		11	C	12		2.8	
HP-3	1.4	25/1	13	A	14	30/1	0.5	RECS. LOBBY
	1.5		15	B	16	30/1		SPACE
HP-5 / AHU-5	0.9	15/1	17	C	18	30/1	0.1	CONDENSATE PUMP
	1.0		19	A	20	30/1	0.4	RECS. EXTERIOR
HP-7 / AHU-7A / AHU-7B	2.3	25/2	21	B	22	SPACE		SPACE
	2.3		23	C	24	SPACE		SPACE
SPACE		SPACE	25	A	26	SPACE		SPACE
SPACE		SPACE	27	B	28	SPACE		SPACE
SPACE		SPACE	29	C	30	SPACE		SPACE
SPACE		SPACE	31	A	32	SPACE		SPACE
SPACE		SPACE	33	B	34	SPACE		SPACE
SPACE		SPACE	35	C	36	SPACE		SPACE
	4.2		37	A	38	4.2		
PAC-1	4.2	50/3	39	B	40	50/3	4.2	PAC-2
	4.3		41	C	42		4.3	

Demand Load Summary:

Lighting:	0.0 KVA	@ 125%	0.0 KVA	Phase A:	37.4 KVA	311.7	Amps
Largest Motor:	0.0 KVA	@ 125%	0.0 KVA	Phase B:	30.4 KVA	253.3	Amps
Gen Receptacles:	0.0 KVA	NOTE 2	0.0 KVA	Phase C:	30.6 KVA	255.0	Amps
All Other:	97.5 KVA	@ 100%	97.5 KVA	Total Panel Load:	98.4 KVA	273.1	Amps

- [X] GROUND BAR
- [X] SEPARATE NEUTRAL BAR
- [ ] U.L. S.E. RATED
- [X] SURFACE MOUNTED
- [ ] NEMA 3R
- [ ] FEED THRU LUGS
- [ ] EXISTING PANEL

1. ALL BREAKERS SHALL BE RATED AT 22,000 A/C AND SERIES RATED TO 42,000 A/C BREAKER FEEDING THIS PANEL.

Panel: A — 150 AMP MAIN LUGS ONLY — Poles: 42 Voltage: 120/208 — Phase: 3 Wires: 4

LOAD SERVED	KVA	BRKR.		φ		BRKR.	KVA	LOAD SERVED
LIGHTS NEW ADDITION	**0.6**	**20/1**	1	A	22	-		BLANK
LIGHTS NARTHEX 109	**0.4**	**20/1**	2	B	24	-		BLANK
EX. NITE LIGHTS	1.1	20/1	3	C	26	20/2		SPARE
EX. YARD LIGHTS (SIGN)	1.0	20/1	4	A	25			
EX. CEILING FANS	0.3	20/1	5	B	26	20/1	0.7	EX. LTS. FURNACE ROOM
EX. RECS. NAVE STAGE, ADULT 1	0.8	20/1	6	C	27	20/1	0.8	EX. LIGHTS NAVE
EX. YARD LIGHTS (SIGN)	1.0	20/1	7	A	28	20/1	0.8	EX. LIGHTS NAVE
EX. YARD LIGHTS (SIGN)	1.0	20/1	8	B	29	20/1	0.7	EX. LIGHTS ADULT 1, CLASS 3 & 4
EX. LIGHTS NAVE	0.6	20/1	9	C	30	20/1	0.7	EX. LIGHTS GR 5 & NURSERY
EX. MOTORIZED DAMPER	0.7	20/1	10	A	31	20/1	0.8	EX. LIGHTS NAVE COVE
EX. MOTORIZED DAMPER	0.7	20/1	11	B	32	20/1	0.8	EX. LIGHTS NAVE COVE
EX. LIGHTS NAVE	1.0	20/1	12	C	33	20/1	0.7	EX. LIGHTS NAVE COVE
EX. LIGHTS NAVE	1.0	20/1	13	A	34	20/1	0.8	EX. LIGHTS NAVE COVE
EX. LIGHTS NAVE	1.0	20/1	14	B	35	20/1	0.8	EX. REC. EWC SACRISTY
EX. LIGHTS CLASS JR. & SR.	0.5	20/1	15	C	36	20/1	0.7	EX. LIGHTS KINDERGARDEN 1, 2
EX. LIGHTS ADULT 1, CLASS 3 & 4	0.8	20/1	16	A	37	20/1	0.8	EX. LTS MEN'S BATH, NARTHEX STAIR
EX. LIGHTS CLASS 1 & 2, 5 & 6	0.8	20/1	17	B	38	20/1	0.8	EX. LIGHTS NAVE COVE
EX. RECS. CLASS 1&2, 5&6, HALL	1.0	20/1	18	C	39	20/1	0.6	EX. LIGHTS UTIL.
RECS., ADULT 1, CLASS 3 & 4	0.8	20/1	19	A	40		0.8	
EX. RECS. CLASS 1 & 2, 3 & 4	1.0	20/1	20	B	41	15/3	0.8	EX. FAN HEAT & A/C
EX. LIGHTS HALL	0.7	20/1	21	C	42		0.8	

Demand Load Summary:

Lighting:	19.5 KVA	@ 125%	24.3 KVA	Phase A:	31.3 KVA	93.9	Amps
Largest Motor:	0.0 KVA	@ 125%	0.0 KVA	Phase B:	30.8 KVA	90.3	Amps
Gen Receptacles:	5.1 KVA	NOTE 2	5.1 KVA	Phase C:	31.4 KVA	95.2	Amps
All Other:	4.1 KVA	@ 100%	4.1 KVA	Total Panel Load:	33.5 KVA	93.1	Amps

- [X] GROUND BAR
- [X] SEPARATE NEUTRAL BAR
- [ ] U.L. S.E. RATED
- [X] SURFACE MOUNTED
- [ ] NEMA 3R
- [ ] FEED THRU LUGS
- [X] EXISTING PANEL

1. ALL BREAKERS SHALL MATCH EXISTING AIC RATINGS.

Panel: MDP — 600/3 MAIN BREAKER — Poles: 30 Voltage: 120/208 — Phase: 3 Wires: 4

LOAD SERVED	KVA	BRKR.		φ		BRKR.	KVA	LOAD SERVED
	5.2		1	A	2			SHUNT TRIP
PANEL 'P1F'	5.0	150/3	3	B	4	1.8		
	3.5		5	C	6	70/3	1.8	ELEVATOR
	37.4		7	A	8		1.8	
PANEL 'H'	30.4	400/3	9	B	10			SHUNT TRIP
	30.6		11	C	12			SPACE
			13	A	14	8.4		
SPACE		SPACE	15	B	16	150/3	8.3	EX. PANEL 'A'
			17	C	18		9.5	
			19	A	20			
SPACE		SPACE	21	B	22	SPACE		SPACE
			23	C	24			

- [X] GROUND BAR
- [X] SEPARATE NEUTRAL BAR
- [X] U.L. S.E. RATED
- [X] SURFACE MOUNTED
- [ ] NEMA 3R
- [ ] FEED THRU LUGS
- [ ] EXISTING PANEL

1. ALL BREAKERS SHALL BE RATED AT 42,000 A/C.

EQUIPMENT CONNECTION SCHEDULE

SYMBOL	REMARKS	FURN. BY	KVA	HP	VOLTS	FLA	MCA	DISC. SW. SIZE	DISC. SW. NEMA	DISC. SW. PROVIDE BY	CIR. BKR. OR FUSE SIZE	AWG SIZE	GND. WIRE SIZE	CONDUIT SIZE
PAC-1	PACKAGED A/C UNIT	MECHANICAL	12.6		208/3		35.0	60/3	3R	ELECTRICAL	50/3	4-#8	#10	3/4"
PAC-2	PACKAGED A/C UNIT	MECHANICAL	12.6		208/3		35.0	60/3	3R	ELECTRICAL	50/3	4-#8	#10	3/4"
HP-1	HEAT PUMP	MECHANICAL	6.7		208/1		32.0	60/2	3R	ELECTRICAL	50/2	3-#8	#10	3/4"
HP-2	HEAT PUMP	MECHANICAL	6.7		208/1		32.0	60/2	3R	ELECTRICAL	50/2	3-#8	#10	3/4"
HP-3	HEAT PUMP	MECHANICAL	3.7		208/1		18.0	30/2	3R	ELECTRICAL	30/2	3-#10	#10	3/4"
HP-5	HEAT PUMP	MECHANICAL	1.9		208/1		9.0	30/2	3R	ELECTRICAL	** 15/2	3-#12	#12	3/4"
HP-6	HEAT PUMP	MECHANICAL	4.6		208/1		22.1	30/2	3R	ELECTRICAL	** 25/2	3-#10	#10	3/4"
HP-7	HEAT PUMP	MECHANICAL	4.6		208/1		22.1	30/2	3R	ELECTRICAL	** 25/2	3-#10	#10	3/4"
AHU-1	AIR HANDLING UNIT	MECHANICAL	19.6		208/1		94.0	100/2	1	ELECTRICAL	100/2	3-#3	#8	1-1/4"
AHU-2	AIR HANDLING UNIT	MECHANICAL	19.6		208/1		94.0	100/2	1	ELECTRICAL	100/2	3-#3	#8	1-1/4"
AHU-3	AIR HANDLING UNIT	MECHANICAL	5.6		208/1		27.0	30/2	1	ELECTRICAL	30/2	3-#10	#10	3/4"
AHU-5	DUCTLESS AIR HANDLING UNIT	MECHANICAL	0.2		208/1		1.0	30/2	1	ELECTRICAL	** 15/2	3-#12	#12	3/4"
AHU-6A	DUCTLESS AIR HANDLING UNIT	MECHANICAL	0.2		208/1		1.0	30/2	1	ELECTRICAL	** 15/2	3-#12	#12	3/4"
AHU-6B	DUCTLESS AIR HANDLING UNIT	MECHANICAL	0.2		208/1		1.0	30/2	1	ELECTRICAL	** 15/2	3-#12	#12	3/4"
AHU-7A	DUCTLESS AIR HANDLING UNIT	MECHANICAL	0.2		208/1		1.0	30/2	1	ELECTRICAL	** 15/2	3-#12	#12	3/4"
AHU-7B	DUCTLESS AIR HANDLING UNIT	MECHANICAL	0.2		208/1		1.0	30/2	1	ELECTRICAL	** 15/2	3-#12	#12	3/4"
EF-1	EXHAUST FAN	MECHANICAL	0.1		120/1	0.5		$\frac{1}{4}$H	1	ELECTRICAL	15/1	2-#12	#12	3/4"
EF-2	EXHAUST FAN	MECHANICAL	0.1		120/1	0.5		$\frac{1}{4}$H	1	ELECTRICAL	15/1	2-#12	#12	3/4"
-	ELEVATOR	OTHERS	5.3		208/3		14.8	100/3	1	ELECTRICAL	## 70/3	4-#4	#8	1 1/4"
EH	GAS WATER HEATER	PLUMBING	0.3	-	120/1	2.5	-	$\frac{1}{4}$H	1	ELEC.	20/1	2-#12	#12	3/4"

NOTES:

** OUTDOOR UNIT POWERS INDOOR UNIT. CONNECT REMOTE 208V CONDENATE PUMP TO CIRCUIT SERVING RELATED INDOOR UNIT.

PROVIDE SHUNT TRIP CIRCUIT BREAKER CONNECTED TO FIRE ALARM SYSTEM.

1. BREAKER SIZES FOR ALL EQUIPMENT SIZED AT MOCP WHERE APPLICABLE.
2. ALL DISCONNECTS FOR EQUIPMENT SHALL BE OF FUSIBLE TYPE AND SHALL BE FUSED AS INDICATED.

PANEL SCHEDULE NOTES (FOR ALL PANELS):

1. VALUES FOR DEMAND LOADS INCLUDE ALL CODE FACTORS SUCH AS 125% FOR CONTINUOUS LOADS, 125% LARGEST MOTOR, ETC.
2. BREAKER SIZES SHOWN FOR NEW EQUIPMENT IN PANEL SCHEDULES ARE FOR REFERENCE ONLY, SEE EQUIPMENT CONNECTION SCHEDULE(S) FOR ADDITIONAL INFORMATION. WHERE BREAKER / FUSE SIZE BETWEEN SCHEDULES CONFLICT, THE EQUIPMENT CONNECTION SCHEDULE SHALL TAKE PRECEDENCE.
3. ALL PANEL DIRECTORIES SHALL BE COMPLETED IN ACCORDANCE WITH NEC 408.4.
4. CONTRACTOR SHALL PROVIDE MULTIPOLE BREAKERS IN LIEU OF ALL SINGLE POLE BREAKERS SHOWN WHEN MULTIWIRE BRANCH CIRCUITS ARE INSTALLED PER NEC 210.7.
5. CONTRACTOR SHALL LABEL ALL BREAKERS FEEDING EMERGENCY AND EXIT LIGHTING PER NEC 700.10(A).
6. PROVIDE ARC FLASH HAZARD WARNING LABELS AS REQUIRED ON ALL PANELS AFFECTED BY THIS WORK. COMPLY WITH NEC 110.16.
7. CONTRACTOR SHALL PROVIDE IDENTIFICATION FOR NEW FEEDERS AND ANY NEW BRANCH CIRCUITS PER NEC 210.6, 210.5, AND 215.12.
8. WHERE CIRCUIT BREAKERS OR FUSES ARE NOTED TO BE SERIES RATED, THE EQUIPMENT SHALL BE MARKED PER NEC 110.22 AS APPLICABLE. FOR TESTED SERIES COMBINATION SYSTEMS, THE MARKING SHALL STATE THE FOLLOWING "CAUTION – SERIES COMBINATION SYSTEM RATED _____ AMPERES. IDENTIFIED REPLACEMENT COMPONENTS REQUIRED." FOR ENGINEERED SERIES COMBINATION SYSTEMS, SEE NEC 110.22(B) FOR MARKING LANGUAGE.
9. ALL SHUNT TRIP TYPE BREAKERS SHALL BE 120V SHUNT TRIP ACTUATED UNLESS NOTED OTHERWISE.
10. PER NEC 240.83(D), CIRCUIT BREAKERS USED AS SWITCHES FOR HIGH INTENSITY DISCHARGE LIGHTING SHALL BE LISTED AND MARKED "HID" AND CIRCUIT BREAKERS USED AS SWITCHES FOR FLUORESCENT LIGHTING SHALL BE LISTED AND MARKED "SWD" OR "HID". ANY CIRCUIT BREAKERS USED FOR SWITCHING LIGHTS SHALL BE LISTED FOR SWITCHING AND MARKED PER NEC 240.83(D). CIRCUIT BREAKERS USED FOR HVAC EQUIPMENT SHALL BE "HACR" TYPE. BREAKERS SERVING HOT BOXES OR HEAT TRACE SHALL HAVE GROUND-FAULT EQUIPMENT PROTECTION.
11. BREAKER NOTATIONS IN PARENTHESIS IN PANEL SCHEDULES INDICATE THAT THE FOLLOWING FUNCTIONS BE PROVIDED:
    - 11.1. (G) – GROUND FAULT CIRCUIT INTERRUPTER (GFCI, 5 mA).
    - 11.2. (L) – BREAKER HANDLE LOCK. BREAKER LOCK SHALL BE ACCESSIBLE FROM OUTSIDE OF PANEL AND SHALL NOT REQUIRE THE REMOVAL OF PANEL COVER IN ORDER TO RESET THE BREAKER.
12. BOLDED TEXT INDICATES A NEW OR CHANGED CIRCUIT ON AN EXISTING PANEL. BOLDED BREAKERS ARE NEW OR RELOCATED TO LOCATION SHOWN.
13. ENGINEER HAS SHOWN NEW CIRCUITS IN LOCATIONS DETERMINED TO BE SPARE OR SPACE BASED ON PANEL DIRECTORIES AND OTHER AVAILABLE INFORMATION. CONTRACTOR SHALL VERIFY THAT PLACEMENT SHOWN DOES NOT INTERFERE WITH EXISTING CIRCUITS TO REMAIN. VERIFY AVAILABLE CIRCUITS BASED ON NEW AND DEMO PLANS AND CONTACT ENGINEER WITH ANY CONFLICTS.

THESE DRAWINGS WILL BE AT THE SCALE INDICATED WHEN PLOTTED AT 39" X 60"

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043215 ELECTRICAL
8-9-23

CHRISTUS VICTOR LUTHERAN CHURCH ADDITION
1615 NC-54
DURHAM, NC 27713

No.	Description	Date
1	REVOT-CODE COMMENTS	08.09.2023

PROJECT #: 210029
DATE: 03-09-2023

ELECTRICAL DETAILS

E3.2

1/4" 1/2" 1" 2"

DIGITAL PRINT DATE: 2/23/2023 2:44:03 PM