ELECTRICAL NOTES (GENERAL)

. THE ELECTRICAL INSTALLATION, EQUIPMENT, MATERIALS, AND WORKMANSHIP SHALL, AS A MINIMUM, BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC), OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA), ALL APPLICABLE FEDERAL, STATE, COUNTY, AND LOCAL CODES, LAWS, AND ORDINANCES, AND RULINGS OF THE INSPECTION AUTHORITIES HAVING JURISDICTION. ALL FEES, PERMITS, ETC., ASSOCIATED WITH THE ELECTRICAL WORK SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR.

2. THE DRAWINGS GENERALLY INDICATE THE WORK TO BE INSTALLED, BUT DO NOT SHOW ALL BENDS, BOXES, FITTINGS, AND SPECIALTIES WHICH MAY BE REQUIRED FOR A COMPLETE INSTALLATION. ALL SUCH ITEMS REQUIRED TO COMPLETE THE INSTALLATION ACCORDING TO INDUSTRY ACCEPTED PRACTICES SHALL BE INCLUDED IN THE BID.

- 3. ALL EQUIPMENT AND MATERIALS SHALL BE NEW AND LISTED AND LABELED BY UNDERWRITERS LABORATORIES, INC.
- 4. ALL PENETRATIONS OF FIRE WALLS SHALL BE SEALED WITH APPROVED SEALING MATERIALS TO MAINTAIN THE FIRE RATING OF THE WALLS.
- 5. THE CONTRACTOR SHALL VERIFY WIRE AND FUSE/CIRCUIT BREAKER SIZING FOR ALL MECHANICAL EQUIPMENT PRIOR TO PURCHASING MATERIALS
- 6. THE ELECTRICAL CONTRACTOR SHALL COORDINATE ALL WORK WITH OTHER TRADES TO AVOID INTERFERENCES AND CONFLICTS. APPARENT INTERFERENCES OR CONFLICTS SHALL BE REPORTED TO THE PRIME CONTRACTOR AND RESOLVED PRIOR TO PROCEEDING WITH THE WORK IN
- 7. THE ELECTRICAL CONTRACTOR SHALL CONNECT BRANCH CIRCUITS TO THE MAIN LINE TERMINALS OF EQUIPMENT FURNISHED BY OTHER CONTRACTORS. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND INSTALLING ANY NECESSARY SWITCHES, DISCONNECTS, OR OVERCURRENT PROTECTION AHEAD OF SUCH EQUIPMENT.
- 8. RACEWAYS ARE SHOWN SCHEMATICALLY AND MAY BE REROUTED IN THE FIELD. THEY SHALL BE INSTALLED AT RIGHT ANGLES TO OR PARALLEL WITH BUILDING LINES. THEY SHALL BE RUN CONCEALED WITHIN WALLS OR BUILDING STRUCTURES WHEREVER POSSIBLE.
- 9. ALL RACEWAYS, EQUIPMENT, ETC., ABOVE A SUSPENDED CEILING SHALL BE MOUNTED A MINIMUM OF 18" ABOVE THE CEILING SO AS NOT TO BLOCK ANY TILE OR FIXTURE ACCESS.
- 10. THE MINIMUM ALLOWABLE SIZE FOR ANY CONDUIT, IMC, OR EMT SHALL BE 1/2" AND MAY BE USED FOR 2#12 WIRE SWITCHLEGS ONLY.
- A SWITCHLEG SHALL BE DEFINED AS THE RUN OF CONDUIT FROM THE SWITCH OUTLET BOX TO THE FIRST OUTLET BEING SWITCHED. 11. FULL WEIGHT GALVANIZED RIGID STEEL CONDUIT SHALL BE USED IN THE FOLLOWING AREAS:
- A. ON THE EXTERIOR OF THE BUILDING OR ROOF,
- B. VERTICAL DROPS WHERE THE CONDUIT CANNOT BE ANCHORED TO WALLS OR OTHER SUPPORT STRUCTURES,
- C. WHERE SUBJECT TO MECHANICAL DAMAGE.
- 12. ALL WIRE AND CABLE SHALL BE COPPER AND HAVE 600 VOLT THHN-THWN INSULATION. ALUMINUM WIRING SHALL NOT BE PERMITTED.
- 13. THE MINIMUM WIRE SIZE SHALL BE #12 AWG EXCEPT FOR CONTROL WIRING, WHICH MAY BE #14 AWG. CONTROL WIRING SHALL USE STRANDED CONDUCTORS UNLESS OTHERWISE NOTED.
- 14. ALL METAL RACEWAY SYSTEMS SHALL BE MADE ELECTRICALLY CONTINUOUS. THE RACEWAY SYSTEM SHALL NOT BE THE SOLE GROUNDING METHOD. AN INSULATED COPPER GROUNDING CONDUCTOR SHALL BE INSTALLED FOR ALL FEEDERS AND BRANCH CIRCUITS. AT RECEPTACLES, A GREEN GROUND CONDUCTOR SHALL BE CONNECTED TO THE GROUND TERMINAL OF THE RECEPTACLE.
- 15. THE ELECTRICAL CONTRACTOR SHALL COORDINATE FUSE AND DISCONNECT SWITCH SIZES WITH THE MECHANICAL EQUIPMENT SUPPLIER PRIOR TO PURCHASE AND INSTALLATION OF BRANCH CIRCUIT EQUIPMENT. IF EQUIPMENT SIZING CHANGES FROM DESIGN SIZES, CIRCUITS SHALL BE
- 16. LIGHT FIXTURES FOR INSTALLATION IN A SUSPENDED CEILING SHALL BE SECURELY FASTENED TO THE CEILING SUSPENSION SYSTEM IN A MANNER TO PREVENT FIXTURES FROM FALLING. IN ADDITION, 16 GAGE WIRE HANGERS SHALL BE FASTENED TO THE FOUR CORNERS OF THE
- 17. CONNECTIONS TO FIXTURES INSTALLED IN SUSPENDED CEILINGS SHALL BE MADE WITH FLEXIBLE METAL CONDUIT TO ALLOW THE FIXTURE TO BE LIFTED OUT OF THE GRID AND MOVED TO AN ADJACENT GRID LOCATION.
- 18. BREAKERS SUPPLYING HVAC OR REFRIGERATION EQUIPMENT SHALL BE HACR TYPE.
- 19. 3/4" CONDUIT IS MINIMUM ALLOWABLE SIZE EXCEPT AS INDICATED IN #10. CONDUIT FILL NOT TO EXCEED 40% AS PERMITTED BY THE NATIONAL ELECTRIC CODE.
- 20. ALL CONDUCTORS TO BE INSTALLED IN CONDUIT (EXCEPT WHERE ROMEX IS INSTALLED). EMT FITTINGS TO BE COMPRESSION TYPE, INSULATED 21. NOT USED
- 22. DATA, SECURITY, THEATRICAL, AND VIDEO SYSTEMS TO BE PROVIDED BY OWNER. ROUGH-IN OF OUTLETS AND CONDUIT WILL BE BY CONTRACTOR AS SHOWN ON DRAWINGS.
- 24. NO. 10 CU AWG CONDUCTORS SHALL BE USED FOR 20 AMP BRANCH CIRCUIT HOMERUNS EXCEEDING 50 FT. TO THE JUNCTION POINT.
- 20 AMP BRANCH CIRCUIT WIRING SHALL BE NO. 10 CU AWG THROUGHOUT IF THE CIRCUIT IS LONGER THAN 100 FEET TOTAL LENGTH. 20 AMP BRANCH CIRCUIT WIRING SHALL BE NO. 8 CU AWG THROUGHOUT IF THE CIRCUIT IS LONGER THAN 200 FEET TOTAL LENGTH. 20 AMP BRANCH CIRCUIT WIRING SHALL BE NO. 6 CU AWG THROUGHOUT IF THE CIRCUIT IS LONGER THAN 400 FEET TOTAL LENGTH.
- 20 AMP BRANCH CIRCUIT SHALL BE NOT EXCEED 500' FEET IN TOTAL LENGTH. (UNLESS MARKED OTHERWISE)
- 25. CONDUCTORS SHALL BE CONTINUOUS FROM OUTLET TO OUTLET. SPLICES WILL NOT BE MADE EXCEPT WITHIN ACCESSIBLE OUTLET OR JUNCTION BOXES, TROUGHS, OR GUTTERS.
- 26. MAKE CONDUCTOR LENGTHS FOR PARALLEL CIRCUITS EQUAL.
- 27. INSTALL TELEPHONE OUTLETS WITH 3/4" EMPTY CONDUIT AND PULL CORD. STUB OUT ABOVE CEILING. PHONE SYSTEM INSTALLED BY OWNER. 28. ALL CONDUIT WITHOUT CONDUCTORS SHALL HAVE NYLON PULLCORDS INSTALLED.
- 29. THE CONTRACTOR SHALL MAKE A COMPLETE REVIEW OF THE PLANS, SCHEDULES, AND DETAILS PRIOR TO INSTALLATION, AND REVIEW ANY CONFLICTS THAT ARE NOTED WITH THE ENGINEER.
- 30. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL FEES FOR PERMITS AND INSPECTIONS. THE CONTRACTOR WILL ALSO BE RESPONSIBLE FOR ELECTRIC UTILITY CONNECTION FEES AND LINE EXTENSION FEES.
- 31. ELECTRICAL CONNECTIONS TO EQUIPMENT SUBJECT TO VIBRATION WHICH DEVELOPS OBJECTIONABLE NOISES SHALL BE MADE FROM THE CONDUIT
- SYSTEM WITH SHORT LENGTHS OF FLEXIBLE "LIQUID-TITE" CONDUIT. 32. ALL WIRE TERMINATIONS AND EQUIPMENT TO BE RATED FOR 75° C MINIMUM.
- 33. ELECTRICAL CONTRACTOR TO MAINTAIN 2' OF SEPARATION ON RECEPTACLES ON OPPOSITE SIDES OF ANY FIRE RATED WALL PER 2021
- 34. WIRING TO DISCONNECT SWITCH AND DISCONNECT SWITCH SHALL BE FURNISHED BY THE ELECTRICAL CONTRACTOR. WIRING FROM THE DISCONNECT TO THE EQUIPMENT SHALL BE BY THE MECHANICAL CONTRACTOR.

ELECTRICAL SYSTEM AND EQUIPMENT METHOD OF COMPLIANCE:

ENERGY CODE:	PRESCRIPTIVE	\boxtimes	PERFORMANCE	
ASHRAE 90.1:	PRESCRIPTIVE		PERFORMANCE	

REFER TO DRAWINGS FOR RISER DIAGRAM AND PANEL SCHEDULES

LIGHTING SCHEDULE

LAMP TYPE REQUIRED IN FIXTURE:	SEE	SCHEDULE
NUMBER OF LAMPS IN FIXTURE:		

- BALLASTS TYPE USED IN FIXTURE:
- NUMBER OF BALLASTS IN FIXTURE:
- TOTAL WATTAGE PER FIXTURE:
- TOTAL INTERIOR WATTAGE SPECIFIED VS. ALLOWED:
- TOTAL EXTERIOR WATTAGE SPECIFIED VS. ALLOWED:

ADDITIONAL PRESCRIPTIVE COMPLIANCE

- 506.2.1 MORE EFFICIENT MECHANICAL EQUIPMENT 506.2.2 REDUCED LIGHTING POWER DENSITY
- 506.2.3 ENERGY RECOVERY VENTILATION SYSTEMS
- 506.2.4 HIGHER EFFICENCY SERVICE WATER HEATING 506.2.5 ON-SITE SUPPLY OF RENEWABLE ENERGY
- 506.2.6 AUTOMATIC DAYLIGHTING CONTROL SYSTEMS □

	FEEDER SCHEDULE								
UNIT	FEEDERS	FUSED DISCONNECT	CONDUIT						
AHU'S 1,2	2#8 CU, 1#10 CU GND	60	3/4"						
AHU'S 3,4	2#6 CU, 1#8 CU GND	60	3/4"						
HEAT PUMPS 1,2	2#10 CU, 1#12 CU GND	60	3/4"						
HEAT PUMPS 3,4	2#6 CU, 1#8 CU GND	60	3/4"						

FEEDER SCHEDULE								
UNIT	FEEDERS	FUSED DISCONNECT	CONDUIT					
AHU'S 1,2	2#8 CU, 1#10 CU GND	60	3/4"					
AHU'S 3,4	2#6 CU, 1#8 CU GND	60	3/4"					
HEAT PUMPS 1,2	2#10 CU, 1#12 CU GND	60	3/4"					
HEAT PUMPS 3,4	2#6 CU, 1#8 CU GND	60	3/4"					

ELECTRICAL LOAD CALCULATIONS 19700 SQUARE FEET	<u>VA</u>								
NONCONTINUOUS LOADS:									
11 RECEPTACLES @ 180 VA EA. 1ST 10000 REMAINDER @ 50% TOTAL	1980 1980 0 1980								
CONTINUOUS LOADS:									
GENERAL LIGHTING LOAD VA/SQ. FT. 19700 SQ. FT. 0.25 4925 x 1.25	4925 6157								
AIR HANDLER UNIT	30720								
HEAT PUMPS	21216								
EQUIPMENT:	600								
25% OF LARGEST MOTOR	1092								
GRAND TOTAL	61765								
257 AMPS @ 120/240V, 1ø, 60HZ	ر								

VERIFY AIC RATING & LUG SPACE WITH UTILITY COMPANY BEFORE ORDERING PANELS.

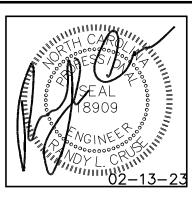
PANEL: *A* SCHEDULE:	MANUFACTURER: SQ. D.	NO. OF SPACES 42
VOLTS: <u>120/240</u> AMPS: <u>400</u>	TYPE: 'NQOD'	MOUNTING: SURFACE
ENCLOSURE: NEMA 3R ϕ : 1	SHORT CIRCUIT	RATING: <u>22,000</u>
MAIN∙ ⊠ MLO: □ TOP FEED: □ BOTTOM FEE	ED: 🗵 COPPER BUS: 🖾 GROUND	BAR KIT: 🗆 NEUTRAL BAR KIT: 🛚

		L												
		П	S				PH.	ASE			(A)	<u></u>		
L1	L2	CIRCUIT	POLES	TRIP	ASSIGNMEN	١T	コ	7	ASSIGNMENT	TRIP	POLES	CIRCUIT	L1	L
3.5	$\overline{}$	1	1	20	WALLPACKS		0		CORRIDOR #1 LTS. LEFT SIDE	20	1	2	4.9	\geq
	3.5	3	1	20	WALLPACKS			0	CORRIDOR #1 LTS. RIGHT SIDE	20	1	4	\times	5.5
3.0	\geq	5	1	20	HVAC UNITS #1 CONV.	RECS.	0		CORRIDOR #2 LIGHTING	20	1	6	7.8	\geq
	3.0	7	1	20	HVAC UNITS #2 CONV.	RECS.		0	CORRIDOR #3 LIGHTING	20	1	8	\geq	6.0
3.0	\geq	9	1	20	HVAC UNITS #3 CONV.	RECS.	0		CORRIDOR CONV. RECEPTS.	20	1	10	4.5	\geq
	3.0	11	1	20	HVAC UNITS #4 CONV.	RECS.		0	HP-1	35	2	12	\geq	17.
32.0	\geq	13	2	50	AHU-1		0					14	17.7	\geq
	32.0	15						0	AHU-2	50	2	16	\geq	32.
17.7	\geq	17	2	35	HP-2		0					18	32.0	\geq
	17.7	19						0	AHU-3	50	2	20	><	32.
26.5	\geq	21	2	50	HP-3		0					22	32.0	\geq
	26.5	23						0	AHU-4	50	2	24	\geq	32.
26.5	\geq	25	2	50	HP-4		0					26	32.0	\geq
	26.5	27						0	FRONT CORRIDOR LIGHTS	20	1	28	\geq	5.5
X	\geq	29	1	20	SPARE		0		SPARE	20	1	30	Х	\geq
	5.0	31	1	20	BUILDING SIGN			0	REAR CORRIDOR LIGHTING	20	1	32	><	4.9
×	\geq	33	1	20	SPARE		0		SPARE	20	1	34	Х	\geq
	Х	35	1	20	SPARE			0	SPARE	20	1	36		X
Х		37	1	20	SPARE		0		SPARE	20	1	38	Х	\geq
	X	39	1	20	SPARE			0	SPARE	20	1	40	\geq	X
Χ		41	1	20	SPARE		0		SPARE	20	1	42	Х	\geq
								- · -						

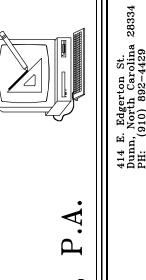
L1 = 243.1 AL2 = 247.8 A

400 AMP 2 SETS OF: METERBASE -(3) 4/0 CU PANEL "A" (1) 2-1/2" COND. 400 AMP 120/240V 1ø, 60HZ 120/240V NEMA 3R 1ø, 60HZ NEMA 3R UNDERGROUND ELECTRIC SERVICE GROUNDING PER NEC 250. 1/0 CU TO COLD WATER MAIN, BY ELECTRIC UTILITY COMPANY BUILDING STEEL, SPRINKLER MAIN AND CONCRETE ENCASED ELECTRODE. #6 AWG TO (2) DRIVEN GROUND RODS, MINIMUM OF 6' APART. BOND ALL SERVICE GROUNDING ELECTRODES PER NEC 250 WITH (1) 1/0 CU GND

ELECTRICAL RISER DIAGRAM



REVISIONS



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DATE 02-13-23 DRAWN BY BAM JOB NO. 22-15

SHEET NO. E-3 OF