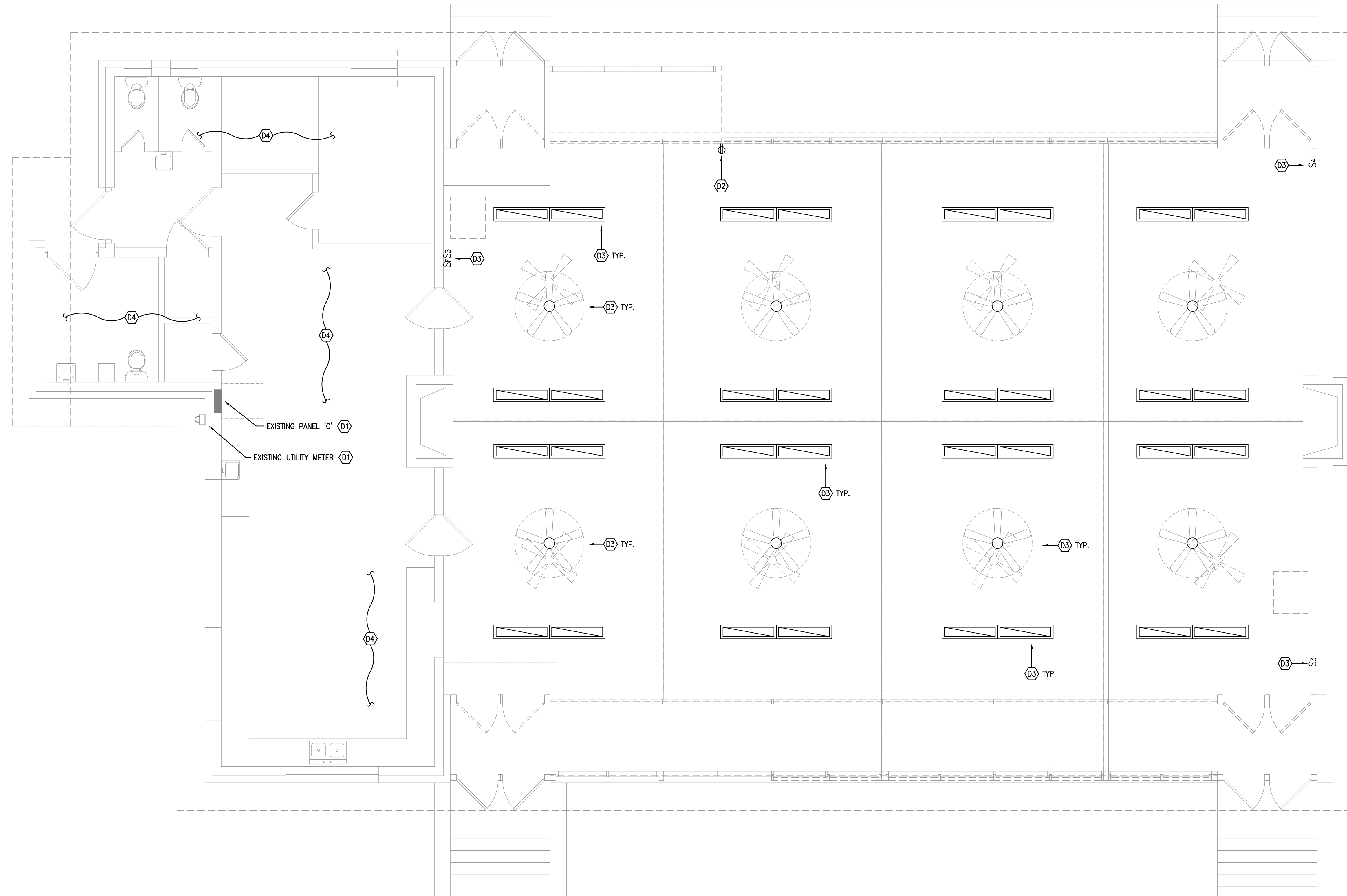


DEMOLITION REFERENCE NOTES: (X)

- (D1) EXISTING ELECTRICAL PANEL AND SERVICE EQUIPMENT EQUIPMENT TO REMAIN AND BE REUSED AS REQUIRED. REFER TO RENOVATION PLAN AND POWER RISER DIAGRAMS FOR ADDITIONAL INFORMATION.
- (D2) EXISTING RECEPTACLES SHOWN DARK/SOLID SHALL BE DISCONNECTED AND REMOVED UNLESS NOTED OTHERWISE. MAINTAIN ANY DOWN STREAM BRANCH CIRCUIT WIRING AS REQUIRED.
- (D3) EXISTING LIGHT FIXTURES AND SWITCHES SHOWN DARK/SOLID SHALL BE DISCONNECTED AND REMOVED UNLESS NOTED OTHERWISE. MAINTAIN ANY DOWN STREAM BRANCH CIRCUIT WIRING AS REQUIRED.
- (D4) ALL EXISTING ELECTRICAL IN THIS AREA TO REMAIN UNLESS NOTED OTHERWISE.

GENERAL DEMOLITION NOTES:

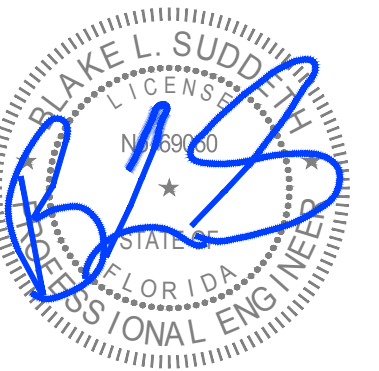
- DA ALL ELECTRICAL DEVICES INDICATED IN DARK LINETYPE ON DRAWING SHALL BE REMOVED OR RELOCATED UNLESS NOTED OTHERWISE. REROUTING/RELOCATION OF EXISTING ELECTRICAL SYSTEMS MAY BE REQUIRED AT NEW OPENINGS IN EXISTING CONSTRUCTION OR DUE TO INTERFERENCE WITH OTHER NEW WORK AS DESCRIBED IN THE FOLLOWING NOTES.
- DB DRAWINGS INDICATE SPECIFIC ITEMS TO BE REMOVED, REROUTED, AND/OR RELOCATED IN ORDER TO INDICATE GENERAL SCOPE. ADDITIONAL ITEMS NOT INDICATED BUT NECESSARY FOR PROJECT RENOVATIONS SHALL BE REMOVED, REROUTED, OR RELOCATED AS REQUIRED. ASSUME WITHIN THE BASE BID A NOMINAL AMOUNT OF BRANCH CIRCUITS, FIXTURES, DEVICES, AND SYSTEMS WIRING WITHIN WALLS OR OPENINGS BEING REMOVED OR RELOCATED AS REQUIRED TO ACCOMMODATE THE NEW CONSTRUCTION.
- DC FOR ITEMS INDICATED TO BE DEMOLISHED, REMOVE WIRING AND CONDUIT BACK TO THE SOURCE PANELBOARD UNLESS NOTED OTHERWISE. MAINTAIN CIRCUIT CONTINUITY TO REMAINING ITEMS ON CIRCUITS REQUIRED TO REMAIN. RELOCATE ANY CIRCUITS TO REMAIN TO AVOID CONFLICT WITH NEW CONSTRUCTION AS REQUIRED. PROPERLY TERMINATE ALL WIRING.
- DD MAINTAIN CIRCUIT CONTINUITY TO ALL REMAINING ELECTRICAL SYSTEMS UNAFFECTED BY BUT PASSING THROUGH RENOVATED SPACES OR WHERE ONLY A PORTION OF A CIRCUIT IS REMOVED. ANY EXISTING ELECTRICAL DEVICES LEFT WITHOUT POWER DUE TO THIS RENOVATION SHALL BE RECONNECTED TO SAME SIZE CIRCUIT(S) AS PRESENTLY SERVED. NO ELECTRICAL DEVICES SHALL BE LEFT WITHOUT POWER.
- DE REFER TO ARCHITECTURAL DEMOLITION DRAWINGS AND NOTES FOR COORDINATION. PATCH AND REPAIR ALL SURFACES CONTAINING DEMOLITION. COORDINATE WITH ARCHITECTURAL DRAWINGS. MATERIALS AND FINISHES SHALL MATCH EXISTING.
- DF VISIT THE SITE TO DETERMINE THE EXACT EXTENT OF ELECTRICAL WORK REQUIRED TO COMPLETE THE PROJECT. EXISTING CONDITIONS INDICATED ON THESE DRAWINGS ARE TAKEN FROM EXISTING BUILDING DOCUMENTS AND FIELD OBSERVATION. OTHER ELECTRICAL ITEMS MAY EXIST FOR WHICH THE ELECTRICAL CONTRACTOR IS RESPONSIBLE WHICH MAY NOT BE SPECIFICALLY ADDRESSED IN THESE DRAWINGS.
- DG PROPERLY DISPOSE OF ALL ITEMS BEING REMOVED AS PART OF THIS PROJECT. THE OWNER SHALL HAVE THE RIGHT TO RETAIN ANY ITEMS BEING REMOVED. COORDINATE ITEMS TO BE RETAINED WITH OWNER.
- DH CONDUCTORS IN RENOVATED AREA SHALL BE NEW. DO NOT REUSE EXISTING WIRING UNLESS NOTED OTHERWISE. EXISTING CONDUIT IN THE RENOVATED AREA MAY BE REUSED IF IT COMPLIES WITH ALL REQUIREMENTS OF THE NEC AND SPECIFICATIONS, IF NEW DEVICE OR EQUIPMENT LOCATION COINCIDES WITH EXISTING LOCATION, AND IF PRACTICAL. CONDUIT NOT INTENDED TO BE REUSED SHALL BE REMOVED IF POSSIBLE (I.E., NOT EMBEDDED IN CONCRETE FLOOR, ETC.).



O'LENO STATE PARK
DINING HALL AIR CONDITIONING
High Springs, Florida

PROJECT LOCATION:
O'LENO STATE PARK
410 SE O'LENO PARK ROAD
HIGH SPRINGS, FLORIDA 32643

JLC24.0022.00



Blake L. Suddeth

OCTOBER 21, 2024

100% CONSTRUCTION DOCUMENTS

DEMO FLOOR PLAN
ELECTRICAL

E1.01

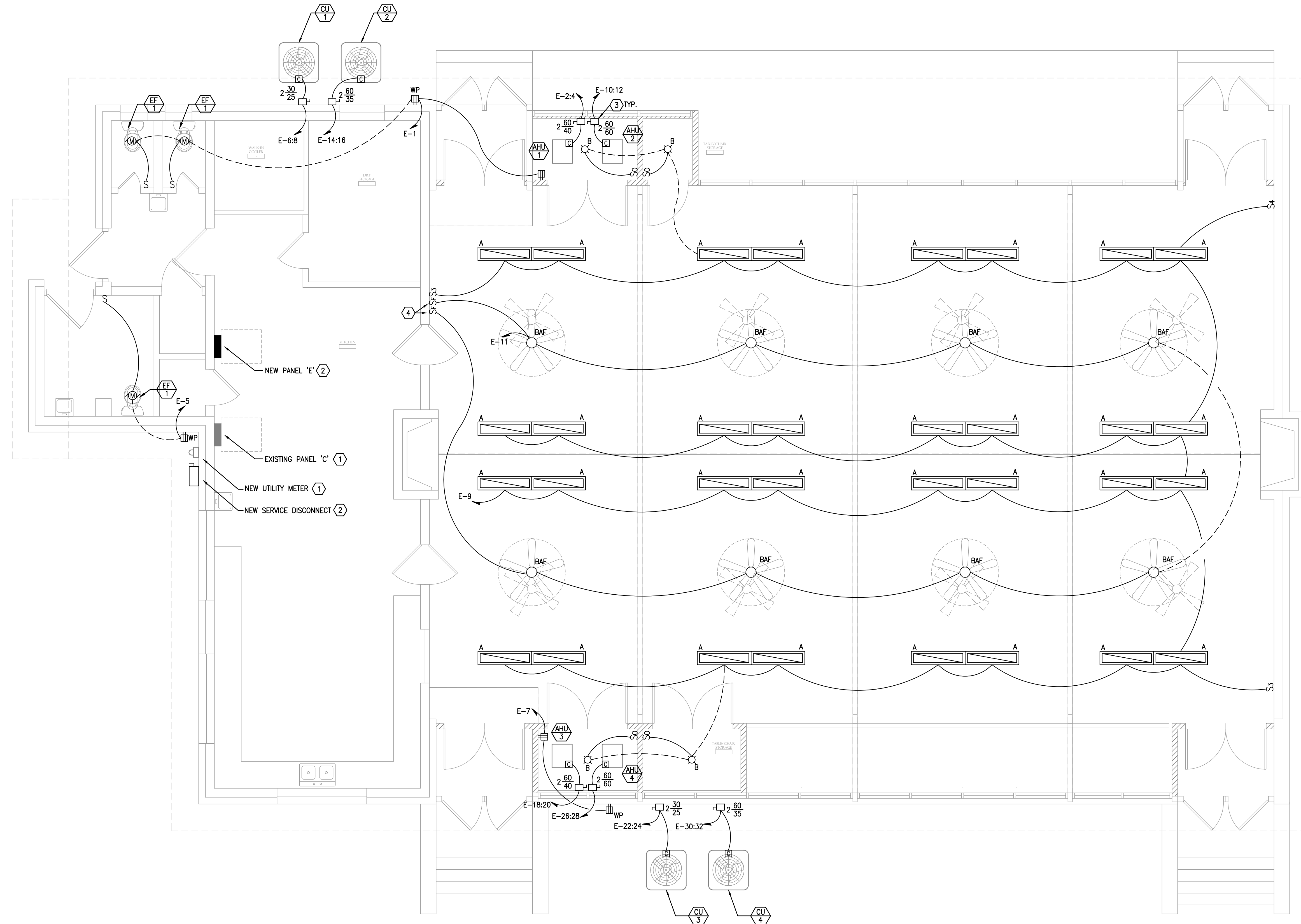
JL & Co
Joseph. Lawrence & Co
Consulting Engineers
1180 HARWOOD AVE., SUITE 3000
ALTA MONTE SPRINGS, FLORIDA 32714
TEL: 321.972.4466
WWW.JLCENG.COM
CA NO. 28730

REFERENCE NOTES: (X)

- 1 EXISTING ELECTRICAL SERVICE EQUIPMENT LOCATION. REFER TO PANEL SCHEDULES AND RISER DIAGRAM FOR ADDITIONAL INFORMATION.
- 2 COORDINATE ALL CONNECTION REQUIREMENTS OF NEW SERVICE WITH LOCAL UTILITY COMPANY PRIOR TO ROUGH-IN AND PROVIDE AS REQUIRED.
- 3 ELECTRICAL CONTRACTOR SHALL COORDINATE DISCONNECT AND FUSE REQUIREMENTS FOR MECHANICAL UNIT WITH MECHANICAL CONTRACTOR AND EQUIPMENT MANUFACTURER PRIOR TO ROUGH-IN AND PROVIDE AS REQUIRED. COORDINATE LOCATION OF DISCONNECT WITH OWNER AND MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN. LOCATE AS REQUIRED TO MAINTAIN NEC CLEARANCES.
- 4 PROVIDE WALL MOUNTED SWITCH FOR FAN. COORDINATE EXACT LOCATION AND INSTALLATION REQUIREMENTS WITH ARCHITECT/MANUFACTURER PRIOR TO ROUGH-IN.

GENERAL NOTES:

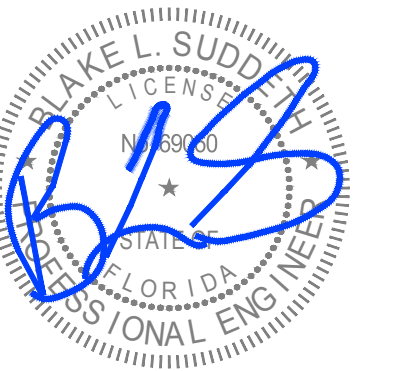
- A. DO NOT SCALE ELECTRICAL DRAWING FOR ANY DIMENSIONS.
- B. ALL WORK SHALL COMPLY WITH THE 2020 NATIONAL ELECTRICAL CODE, NATIONAL, STATE AND LOCAL CODES. PROVIDE GROUNDING AND BONDING PER NEC 250.
- C. SEE SINGLE LINE DIAGRAM FOR FEEDER WIRE AND CONDUIT SIZE. ALL CIRCUITS NOT SIZED ON DRAWING SHALL BE INSTALLED TO MEET MINIMUM SIZE REQUIRED BY NEC. ALL CONDUCTORS SHALL HAVE AN EQUIPMENT GROUND WIRE SIZED PER NEC.
- D. FIELD VERIFY EXACT LOCATION OF ALL DEVICES AND EQUIPMENT PRIOR TO ROUGH IN.
- E. FIELD VERIFY ALL EXISTING FIRE ALARM DEVICES. CONNECT NEW FIRE ALARM DEVICES TO EXISTING FIRE ALARM SYSTEM. COORDINATE ALL CONNECTION REQUIREMENTS WITH CONDITIONS IN FIELD AND MANUFACTURER'S RECOMMENDATIONS PRIOR TO ROUGH-IN.



O'LENO STATE PARK
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JLC24.0022.00



Blake L. Suddeth

OCTOBER 21, 2024

100% CONSTRUCTION DOCUMENTS

RENO FLOOR PLAN
POWER & SYSTEMS

E2.01

JL & Co
Joseph, Lawrence & Co
Consulting Engineers

1180 HARWOOD AVE., SUITE 3000
ALTA MONTE SPRINGS, FLORIDA 32714
TEL: 321.972.4466
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Donnelly Project #23061

GENERAL NOTES:

- A. DO NOT SCALE ELECTRICAL DRAWING FOR ANY DIMENSIONS.
- B. ALL WORK SHALL COMPLY WITH THE LATEST ADOPTED VERSION OF THE NATIONAL ELECTRICAL CODE AS WELL AS NATIONAL, STATE, AND LOCAL CODES. PROVIDE GROUNDING AND BONDING PER NEC 250.
- C. COORDINATE ALL WORK WITH LOCAL UTILITY COMPANY PRIOR TO ROUGH-IN.
- D. SEE SINGLE LINE DIAGRAM FOR FEEDER WIRE AND CONDUIT SIZE. ALL CIRCUITS NOT SIZED ON DRAWING SHALL BE INSTALLED TO MEET MINIMUM SIZE REQUIRED BY NEC. ALL CONDUCTORS SHALL HAVE AN EQUIPMENT GROUND WIRE SIZED PER NEC.
- E. FIELD VERIFY EXACT LOCATION OF ALL DEVICES AND EQUIPMENT PRIOR TO ROUGH-IN.
- F. FOR ALL EXISTING EQUIPMENT BEING RECONNECTED TO NEW PANELS AND EXISTING EQUIPMENT TO REMAIN, E.C. SHALL CONFIRM THAT BREAKER AND FEEDER SIZES ARE CORRECTLY MATCHED UP TO THE EQUIPMENT LOADS SHOWN ON THE EQUIPMENT NAMEPLATE.
- G. CONTRACTOR SHALL PROVIDE "ARC FLASH/SHOCK HAZARD" SIGNAGE FOR ALL PANELBOARDS AS REQUIRED PER ANSI, NEC, OSHA AND NFPA. INCLUDE ALL INFORMATION PER LATEST REQUIREMENTS INCLUDING REQUIRED LEVEL OF PPE, AVAILABLE FAULT CURRENT, APPROACH BOUNDARIES, ETC.
- H. PER NEC 110.24 SERVICE EQUIPMENT IN OTHER THAN DWELLING UNITS SHALL BE LEGIBLY MARKED IN THE FIELD WITH THE MAXIMUM AVAILABLE FAULT CURRENT. THE FIELD MARKING(S) SHALL INCLUDE THE DATE THE FAULT CURRENT CALCULATION WAS PERFORMED AND BE OF SUFFICIENT DURABILITY TO WITHSTAND THE ENVIRONMENT INVOLVED. WHEN MODIFICATIONS TO THE ELECTRICAL INSTALLATION OCCUR THAT AFFECT THE MAXIMUM AVAILABLE FAULT CURRENT AT THE SERVICE, THE MAXIMUM AVAILABLE FAULT CURRENT SHALL BE VERIFIED OR RECALCULATED AS NECESSARY TO ENSURE THE SERVICE EQUIPMENT RATINGS ARE SUFFICIENT FOR THE MAXIMUM AVAILABLE FAULT CURRENT AT THE LINE TERMINALS OF THE EQUIPMENT. THE REQUIRED FIELD MARKING(S) IN 110.24(A) SHALL BE ADJUSTED TO REFLECT THE NEW LEVEL OF MAXIMUM AVAILABLE FAULT CURRENT.

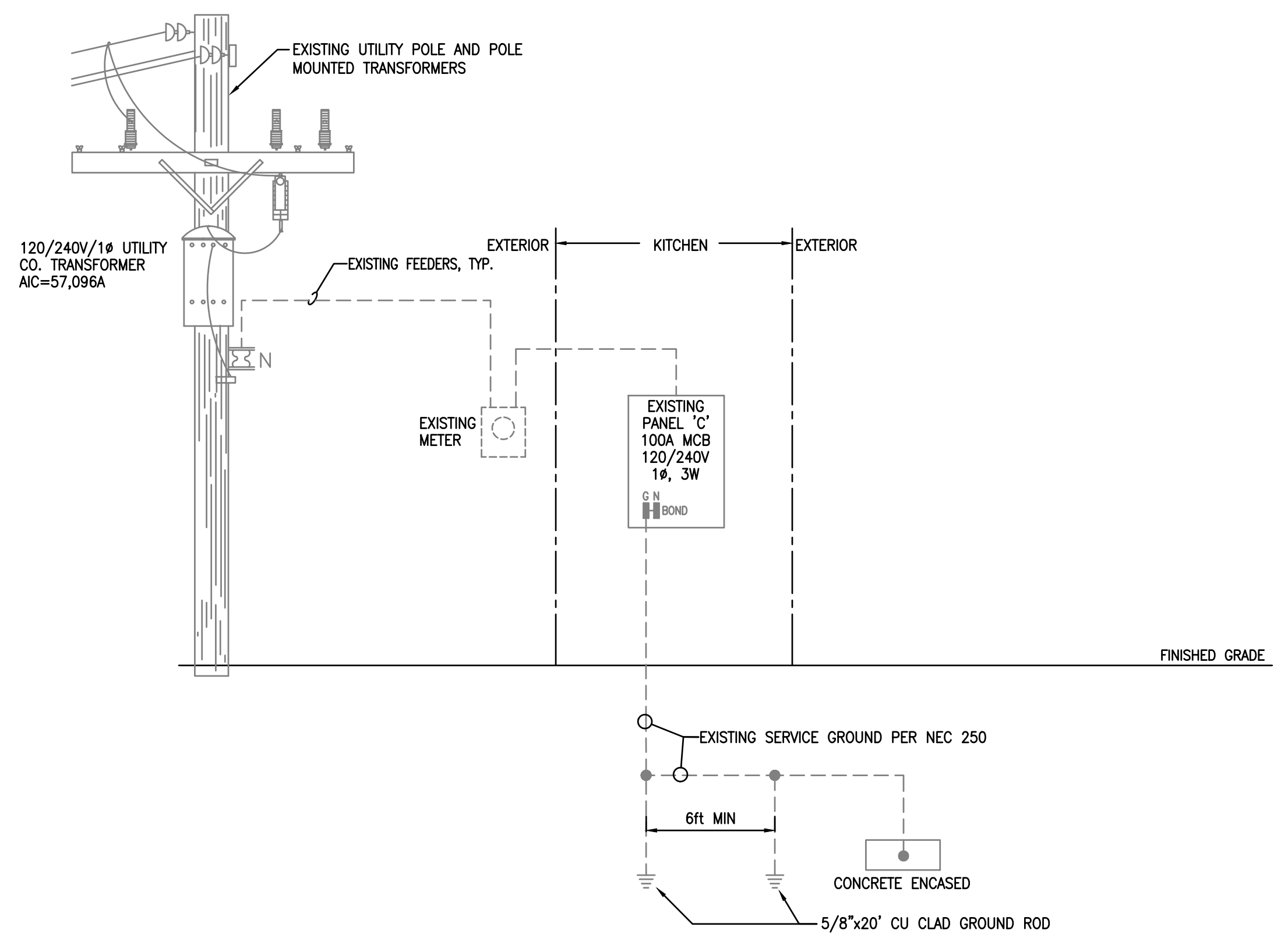
REFERENCE NOTES: (X)

- (1) COORDINATE ALL CONNECTION REQUIREMENTS OF NEW SERVICE WITH LOCAL UTILITY COMPANY PRIOR TO ROUGH-IN AND PROVIDE AS REQUIRED.
- (2) PROVIDE 400A, 250V, 1Ø, 3W, NEMA 3R, HEAVY DUTY, SERVICE ENTRANCE RATED DISCONNECT SWITCH FUSED AT 400AMPS. COORDINATE ALL REQUIREMENTS WITH UTILITY COMPANY PRIOR TO ROUGH-IN AND PROVIDE AS REQUIRED. PROVIDE PHENOLIC LABELING AT DISCONNECT FOR SERVICE AS REQUIRED BY NEC.
- (3) PROVIDE HARD WIRED SURGE PROTECTIVE DEVICE OF SAME MANUFACTURER AS PANELBOARD.

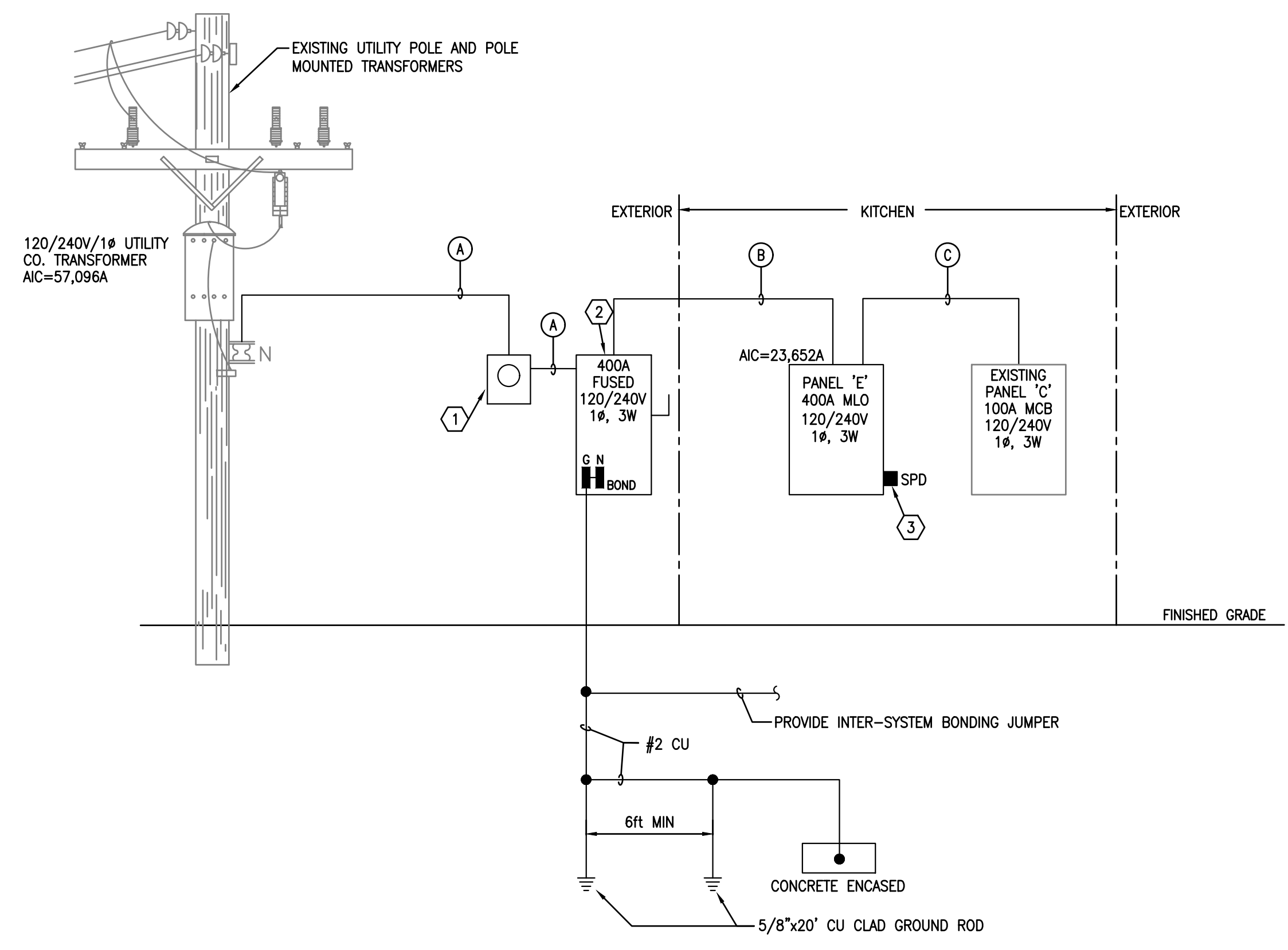
CONDUIT & CONDUCTOR SIZES: (X)

- (A) 2 SETS [(3)#250 kcmil AL. IN 2-1/2" C]
- (B) 2 SETS [(3)#250 kcmil AL. & (1)#1 AWG AL. GND. IN 2-1/2" C]
- (C) (3)#1 AWG. AL. & (1)#6 AWG AL. GND. IN 2" C.

NOTE:
PER (2023) FBCEC C405.6.3, 6th EDITION):
ALL CONDUCTORS FOR FEEDERS AND BRANCH CIRCUITS ARE DESIGNED FOR A MAXIMUM OF 5% VOLTAGE DROP TOTAL.



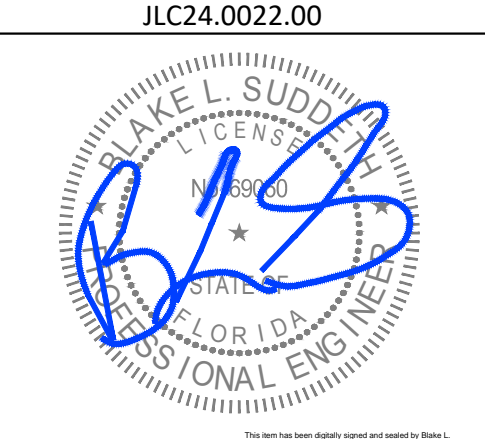
1 DEMO POWER RISER DIAGRAM BUILDING
No Scale



2 POWER RISER DIAGRAM BUILDING
No Scale

O'LENO STATE PARK
DINING HALL AIR CONDITIONING
High Springs, Florida

PROJECT LOCATION:
O'LENO STATE PARK
410 SE O'LENO PARK ROAD
HIGH SPRINGS, FLORIDA 32643



Blake L. Suddeth
OCTOBER 21, 2024

100% CONSTRUCTION DOCUMENTS

SCHEDULES ELECTRICAL

E4.01



EXISTING PANEL 'C'																
LOCATION: KITCHEN		VOLTAGE: 120/240V 1Ø 3W				MIN. AIC RATING: EXISTING				NOTES: PROVIDE TYPED WRITTEN DIRECTORY PROVIDE GROUND & NEUTRAL BUS						
TYPE: EXISTING		MANS: 100A <input type="checkbox"/> MLO <input checked="" type="checkbox"/> MCB				MOUNTING: EXISTING										
FED FROM: PANEL E		LUGS: <input type="checkbox"/> SUB-FEED <input type="checkbox"/> FEED-THRU				ENCLOSURE: EXISTING										
CIRCUIT DESCRIPTION	CIRCUIT #	BRANCH CIRCUIT			LOAD KVA	PHASE	LOAD KVA	BKR	BRANCH CIRCUIT			CIRCUIT DESCRIPTION	CIRCUIT #			
		#	NEUT	GND					COND	#	NEUT			GND	COND	
1 REC. IN WH CLOSET		EX	EX	EX	EX	20/2	0.80	A	1.50	50/2	EX	EX	EX	EX	DISHWASHER	2
3 -		EX	-	-	-	0.80	B	1.50	-	-	EX	-	-	-	-	4
5 KITCHEN FANS		EX	EX	EX	EX	20/1	0.30	A	0.36	20/1	EX	EX	EX	EX	EAST DH REC	6
7 AREA POLE		EX	EX	EX	EX	30/2	0.50	B	0.36	20/1	EX	EX	EX	EX	SOUTH DH REC	8
9 -		EX	-	-	-	0.50	A	-	-	-	-	-	-	-	SPARE	10
11 STORAGE CLOSET		EX	EX	EX	EX	20/1	0.36	B	-	-	-	-	-	-	SPARE	12
13 SPACE ONLY		-	-	-	-	-	A	0.54	20/1	EX	EX	EX	EX	EX	EAST WALL REC	14
15 NORTH HOOD FAN		EX	EX	EX	EX	20/1	0.50	B	0.54	20/1	EX	EX	EX	EX	KITCHEN REC	16
17 ICE MACHINE		EX	EX	EX	EX	30/2	1.00	A	1.00	50/2	EX	EX	EX	EX	WALK-IN COOLER	18
19 -		EX	-	-	-	1.00	B	1.00	-	-	EX	-	-	-	WALK-IN COOLER	20
21 SPARE		EX	EX	EX	EX	20/1	-	A	0.72	20/1	EX	EX	EX	EX	DH WALL REC	22
23 HC BATH		EX	EX	EX	EX	20/1	0.54	B	0.50	20/1	EX	EX	EX	EX	COOLER LIGHTS	24
25 SPARE		-	-	-	-	20/1	-	A	0.50	20/1	EX	EX	EX	EX	KITCHEN LIGHTS	26
27 SPARE		-	-	-	-	20/1	-	B	-	20/1	-	-	-	-	SPARE	28
29 ADA GFCI		EX	EX	EX	EX	20/1	0.54	A	0.50	20/1	EX	EX	EX	EX	EXIT & HOOD LIGHTS	30
31 EXISTING EQUIPMENT		EX	EX	EX	EX	50/2	2.00	B	0.80	20/1	EX	EX	EX	EX	HEATER	32
33 -		EX	-	-	-	2.00	A	0.30	20/1	EX	EX	EX	EX	EX	PORCH LIGHTS	34
35 EXISTING EQUIPMENT		EX	EX	EX	EX	50/2	2.00	B	0.50	20/1	EX	EX	EX	EX	EXIT & KITCHEN LIGHTS	36
37 -		EX	-	-	-	2.00	A	0.30	20/1	EX	EX	EX	EX	EX	EXIT & SW OUTSIDE LIGHT	38
39 SPARE		-	-	-	-	20/1	-	B	0.50	20/1	EX	EX	EX	EX	KITCHEN LIGHTS	40
EQUIPMENT SERVED		CONN. LOAD				L.F.	D.F.	DEMAND LOAD								
LIGHTING		4.40 KVA					125%	5.50 KVA								
RECEPTACLES - GENERAL		3.96 KVA					100%	3.96 KVA								
EQUIPMENT		17.90 KVA					100%	17.90 KVA								
NOTES:								TOTAL DEMAND LOAD: 27.36 KVA								
								TOTAL DEMAND AMPS: 114.00 AMPS								

PANEL 'E'																	
LOCATION: ELEC. ROOM		VOLTAGE: 240/120V 1Ø 3W				MIN. AIC RATING: 42K AIC				NOTES: PROVIDE TYPED WRITTEN DIRECTORY PROVIDE GROUND & NEUTRAL BUS							
TYPE: SQUARE 'D' - TYPE NQ		MANS: 400A <input checked="" type="checkbox"/> MLO <input type="checkbox"/> MCB				MOUNTING: SURFACE											
FED FROM: SERVICE DISCONNECT		LUGS: <input type="checkbox"/> SUB-FEED <input checked="" type="checkbox"/> FEED-THRU				ENCLOSURE: NEMA 1											
CIRCUIT DESCRIPTION	CIRCUIT #	BRANCH CIRCUIT			LOAD KVA	PHASE	LOAD KVA	BKR	BRANCH CIRCUIT			CIRCUIT DESCRIPTION	CIRCUIT #				
		#	NEUT	GND					COND	#	NEUT			GND	COND		
1 RECEPTS - EXTERIOR/HVAC CLOSET		12	12	12	1/2"	20/1	0.40	A	3.74	40/2	8	8	10	3/4"	AHU-1	2	
3 RECEPTS - HVAC CLOSET		12	12	12	1/2"	20/1	0.18	B	3.74	-	8	-	-	-	-	4	
5 RECEPTS - EXTERIOR		12	12	12	1/2"	20/1	0.18	A	1.76	25/2	10	10	10	3/4"	1	CU-1	6
7 RECEPTS - EXTERIOR/HVAC CLOSET		12	12	12	1/2"	20/1	0.36	B	1.76	-	10	-	-	-	-	8	
9 LIGHTS - DINING HALL		12	12	12	1/2"	20/1	1.05	A	5.00	60/2	6	6	10	1.25"	AHU-2	10	
11 FANS DINING HALL		12	12	12	1/2"	20/1	0.35	B	5.00	-	6	-	-	-	-	12	
13 SPARE		-	-	-	-	20/1	-	A	2.64	35/2	8	8	10	3/4"	1	CU-2	14
15 SPARE		-	-	-	-	20/1	-	B	2.64	-	8	-	-	-	-	16	
17 SPARE		-	-	-	-	20/1	-	A	3.74	40/2	8	8	10	3/4"	AHU-3	18	
19 SPARE		-	-	-	-	20/1	-	B	3.74	-	8	-	-	-	-	20	
21 SPARE		-	-	-	-	20/1	-	A	1.76	25/2	10	10	10	3/4"	1	CU-3	22
23 SPARE		-	-	-	-	20/1	-	B	1.76	-	10	-	-	-	-	24	
25 SPARE		-	-	-	-	20/1	-	A	5.00	60/2	6	6	10	1.25"	AHU-4	26	
27 SPARE		-	-	-	-	20/1	-	B	5.00	-	6	-	-	-	-	28	
29 SPARE		-	-	-	-	20/1	-	A	2.64	35/2	8	8	10	3/4"	1	CU-4	30
31 SPACE ONLY		-	-	-	-	-	-	B	2.64	-	8	-	-	-	-	32	
33 SPACE ONLY		-	-	-	-	-	-	A	-	-	-	-	-	-	SPACE ONLY	34	
35 SPACE ONLY		-	-	-	-	-	-	B	-	-	-	-	-	-	SPACE ONLY	36	
37 SPACE ONLY		-	-	-	-	-	-	A	-	-	-	-	-	-	SPACE ONLY	38	
39 PANEL 'C'		1	-	-	-	100/2	13.68	B	-	30/2	10	10	10	1/2"	SURGE PROTECTIVE DEVICE (SPD)	40	
41 -		-	-	-	-	-	-	A	-	-	10	-	-	-	-	42	
EQUIPMENT SERVED		CONN. LOAD				L.F.	D.F.	DEMAND LOAD									
LIGHTING		1.40 KVA					125%	1.75 KVA									
RECEPTACLES - GENERAL		1.12 KVA					100%	1.12 KVA									
EQUIPMENT		34.96 KVA					100%	34.96 KVA									
PANELS 'C'		27.36 KVA					100%	27.36 KVA									
NOTES:								TOTAL DEMAND LOAD: 65.19 KVA									
								TOTAL DEMAND AMPS: 271.63 AMPS									

LIGHTING FIXTURE SCHEDULE								
MARK	DESCRIPTION	MANUFACTURER	MODEL	VOLTS	LAMP QTY	LAMP WATTS	LAMP MODEL	FIXTURE WATTS
A	1'x4' LED WRAPAROUND FIXTURE WITH BAKED WHITE FINISH, FROSTED ACRYLIC LENS, DAMP LOCATED RATED	PHILLIPS	FSW-4-30L-835-UNV-DIM	120	1	31	LED	31
B	7" ROUND LED SLIM SURFACE MOUNTED FIXTURE ALUMINUM FINISH, UL LISTED, ENERGY STAR CERTIFIED, DAMP LOCATION RATED	PHILLIPS	S7R835K10AL	120	-	14.4	LED	14.4
BAF	60" INTERIOR CEILING FAN	BAF	MK-i61-05-18-06-A728-i24	120	1	36	LED	36
NOTES: 1. DIVISION 16 CONTRACTOR SHALL VERIFY ALL FIXTURE TYPES AND FINISHES WITH OWNER PRIOR TO ORDERING.								

ELECTRICAL SPECIFICATIONS

I. GENERAL REQUIREMENTS:

A. DO ALL WORK IN COMPLIANCE WITH THE LATEST ADOPED EDITION OF THE FLORIDA BUILDING CODE (FBC-2023), NFPA 70 (NEC-2020) AND NFPA 101 (LIFE SAFETY CODE-2024), AND THE REGULATIONS OF THE LOCAL UTILITY TELEPHONE, CABLE TELEVISION AND POWER UTILITY COMPANIES. OBTAIN AND PAY FOR ANY AND ALL REQUIRED PERMITS, INSPECTIONS, CERTIFICATES OF INSPECTIONS AND APPROVAL, AND THE LIKE, AND DELIVER SUCH CERTIFICATES TO THE ENGINEER.

B. THE CONTRACTOR SHALL FURNISH, PERFORM, OR OTHERWISE PROVIDE ALL LABOR (INCLUDING, BUT NOT LIMITED TO, ALL PLANNING, PURCHASING, PAINTING, TRANSPORTING, RIGGING, HOISTING, STORING, INSTALLING, TESTING, CHASING, CHANNELING, CUTTING, TRENCHING, EXCAVATING AND BACKFILLING), COORDINATION, FIELD VERIFICATION, EQUIPMENT INSTALLATION, SUPPORT, AND SAFETY SUPPLIES, AND MATERIALS NECESSARY FOR THE CORRECT INSTALLATION OF COMPLETE AND FUNCTIONAL ELECTRICAL SYSTEMS (AS DESCRIBED OR IMPLIED BY THESE SPECIFICATIONS AND THE APPLICABLE DRAWINGS).

C. ALL DRAWINGS AND SPECIFICATIONS ON THE PROJECT ARE COMPLEMENTARY, EACH TO ALL OTHER SETS, AND THEY SHALL BE USED IN COMBINATION FOR THE EXECUTION OF THIS WORK. DIVISION 16 WORK SHOWN ON ANY ONE SET OF DRAWINGS, INCLUDING ALL ARCHITECTURAL DRAWINGS, MECHANICAL, PLUMBING AND FIRE PROTECTION DRAWINGS FOR GENERAL WORK AND EQUIPMENT, AND DIVISION 16 WORK CALLED FOR UNDER ANY SECTION OF THE PROJECT SPECIFICATIONS, SHALL BE CONSIDERED AS INCLUDED IN THIS WORK UNLESS SPECIFICALLY EXCLUDED BY INCLUSION IN SOME OTHER BRANCH OF THE WORK. THIS SHALL INCLUDE ROUGH-IN FOR CONNECTIONS AND EQUIPMENT AS CALLED FOR OR INFERRED. THE CONTRACTOR SHALL CHECK ALL DRAWINGS AND SPECIFICATIONS FOR THE PROJECT AND SHALL BE RESPONSIBLE FOR THE INSTALLATION OF ALL DIVISION 16 WORK.

D. THE CONTRACTOR SHALL CAREFULLY CHECK THE DRAWINGS AND SPECIFICATIONS OF ALL OTHER TRADES AND DIVISIONS BEFORE INSTALLING ANY OF HIS WORK. HE SHALL, IN ALL CASES, CONSIDER THE WORK OF ALL OTHER TRADES, AND SHALL COORDINATE HIS WORK WITH THEM SO THAT THE BEST ARRANGEMENTS OF ALL EQUIPMENT, PIPING, CONDUIT, DUCTS, ROUGH-IN, ETC., CAN BE OBTAINED.

E. LOCATIONS DESIGNATED FOR OUTLETS, SWITCHES, DEVICES, EQUIPMENT, ETC., ARE APPROXIMATE AND FINAL LOCATIONS SHALL BE VERIFIED IN THE FIELD. CONTRACTOR SHALL LOCATE ALL DEVICES UP TO 5 FEET IN ANY DIRECTION AS DIRECTED BY OWNER AND PER CODE. WHERE INSTRUCTIONS OR NOTES ARE INSUFFICIENT TO CONVEY THE INTENT OF THE DESIGN, CONSULT THE OWNER PRIOR TO BIDDING AND INSTALLATION.

F. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING AND COORDINATING THE LOCATIONS OF DEVICES TO BE USED AND COORDINATING THE FINAL LOCATIONS OF ELECTRICAL EQUIPMENT WITH MILLWORK, SINKS, BENCHES, COUNTERS AND SHELVING PRIOR TO BIDDING AND INSTALLATION. ALL DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER.

G. DIVISION 16 CONTRACTOR SHALL HAVE HAD EXPERIENCE OF AT LEAST THE SAME SIZE AND SCOPE AS THIS PROJECT, ON AT LEAST TWO OTHER PROJECTS WITHIN THE LAST FIVE YEARS IN ORDER TO BE QUALIFIED TO BID THIS PROJECT.

H. CONTRACTOR SHALL AND DOES HEREBY WARRANT ALL MATERIALS AND EQUIPMENT FURNISHED UNDER THIS SECTION OF THE SPECIFICATIONS TO BE FREE FROM DEFECTS AND TO FUNCTION OR OPERATE, SATISFACTORILY FOR ONE YEAR AFTER FINAL ACCEPTANCE OF THE WORK, AND THAT ANY ITEMS NOT MEETING THIS REQUIREMENT WILL BE MADE GOOD BY HIM WITHOUT COST TO THE OWNER, PROVIDED SUCH DEFECTS OR FAILURES ARE NOT DUE TO ABUSE, NEGLIGENCE, OR LACK OF REASONABLE AND ORDINARY MAINTENANCE.

I. ALL WORK SHALL BE EXECUTED IN A WORKMANSHIP MANNER DISPLAYING A NEAT MECHANICAL APPEARANCE UPON COMPLETION.

J. BALANCE TOTAL PHASE LOADS IN EACH ELECTRICAL PANEL TO A VALUE WITHIN 10% OF EACH OTHER.

K. THE CONTRACTOR SHALL PROVIDE ADEQUATE PROTECTION, WHEREVER WORK IS TO BE PERFORMED IN FINISHED/OCCUPIED SPACES, TO PREVENT DAMAGE TO ADJACENT AREAS, EQUIPMENT, OR FURNISHINGS; TO PREVENT ACCIDENTAL INJURY TO BUILDING OCCUPANTS AND THE PUBLIC; TO PREVENT THE SPREADING OF DUST, DEBRIS, AND MOISTURE FROM THE AREA WHERE WORK IS BEING PERFORMED; AND TO PREVENT DUST, DIRT, DEBRIS, AND MOISTURE FROM GETTING ON OR IN THE BUILDING OCCUPANT'S FURNISHINGS OR EQUIPMENT.

L. THE CONTRACTOR SHALL REPAIR, AT NO COST TO THE OWNER, ANY DAMAGE DONE BY HIMSELF OR HIS EMPLOYEES. HE SHALL ALSO BE RESPONSIBLE FOR ALL CUTTING AND PATCHING REQUIRED TO PROPERLY INSTALL HIS WORK. THIS SHALL ALSO INCLUDE THE PATCHING OF EXISTING CEILING, WALLS, PARTITIONS, PARKING AREAS, SIDEWALKS, WALLS, STAIRS, MECHANICAL WORK, CURBS, GUTTERS, ETC., CUT TO INSTALL WORK PROVIDED BY THE CONTRACTOR. PATCH WORK SHALL COMPLY WITH THE APPLICABLE SECTIONS OF THESE SPECIFICATIONS AND SHALL MATCH THE EXISTING FINISHES.

M. UPON COMPLETION OF WORK, THE ENTIRE WIRING SYSTEM SHALL BE TESTED, AND SHALL BE SHOWN TO BE IN PROPER WORKING CONDITION IN ACCORDANCE WITH INTENT OF SPECIFICATIONS AND DRAWINGS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE ALL SYSTEMS READY FOR OPERATION AND TO HAVE AN ELECTRICIAN AVAILABLE TO OPERATE SAME IN ACCORDANCE WITH AND UNDER THE SUPERVISION OF THE INSPECTION REPRESENTATIVE OF THE ENGINEER. THE CONTRACTOR SHALL BE AVAILABLE TO ASSIST IN REMOVAL OF PANEL FRONTS, ETC., TO PERMIT INSPECTION AS REQUIRED.

N. IN ACCORDANCE WITH DIVISION 1 AND THE CONDITIONS OF THE CONTRACT, THE CONTRACTOR SHALL PROVIDE AND KEEP UP TO DATE A COMPLETE RECORD SET OF CONSTRUCTION "AS-BUILTS" INCLUDING PRINTS WHICH SHALL BE CORRECTED DAILY AND SHALL SHOW EVERY CHANGE FROM THE ORIGINAL CONTRACT DRAWINGS, INCLUDING ADDENDA AND CHANGE ORDERS IN ACCORDANCE WITH GENERAL REQUIREMENTS AND SPECIAL CONDITIONS. THIS SET OF PRINTS SHALL BE KEPT ON THE JOB SITE, AND SHALL BE USED ONLY AS A RECORD SET. THIS SHALL NOT BE CONSTRUED AS AUTHORIZATION FOR THE CONTRACTORS TO MAKE CHANGES IN THE LAYOUT WITHOUT DEFERRED INSTRUCTION IN EACH CASE.

II. ELECTRICAL SCOPE:

A. FURNISHING AND INSTALLATION OF POWER SYSTEMS, AND AUXILIARY SYSTEMS AS SHOWN OR HEREIN SPECIFIED.

B. CONNECTION OF ALL EQUIPMENT REQUIRING ELECTRICAL CONNECTION, MENTIONED IN THIS DIVISION OR SHOWN ON DRAWINGS, WHETHER FURNISHED BY DIVISION 16 OR UNDER OTHER DIVISIONS, OR FURNISHED BY OWNER.

C. FURNISHING AND INSTALLATION OF OUTLET BOXES, CONDUIT RACEWAYS, FOR A TELEPHONE AND DATA RACEWAY DISTRIBUTION SYSTEM. (TELEPHONE AND DATA HARDWARE, AS WELL AS WIRING AND SOFTWARE IS NOT INCLUDED.)

D. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR CONTACTING THE OFFICES OF ALL LOCAL AND/OR STATE AUTHORITIES HAVING JURISDICTION OVER THIS PROJECT IN ORDER TO SCHEDULE ALL REQUIRED INSPECTIONS AND OBTAIN ALL NECESSARY PERMITS, ETC. THE CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER OF ALL SCHEDULED INSPECTIONS AT LEAST TWO WEEKS IN ADVANCE OF THE SCHEDULED DATE.

E. THE CONTRACTOR SHALL REPLACE ANY DEFECTIVE MATERIALS, EQUIPMENT, OR WORKMANSHIP WITHOUT COST TO THE OWNER WITHIN THE STIPULATED GUARANTEED PERIOD.

F. IT SHALL BE THE RESPONSIBILITY OF THE DIVISION 16 CONTRACTOR TO HAVE ALL SYSTEMS READY FOR OPERATION AND TO HAVE AN ELECTRICIAN AVAILABLE FOR ALL INSPECTIONS. THE CONTRACTOR SHALL PROVIDE PERSONNEL TO ASSIST IN REMOVAL OF PANEL FRONTS, ETC. TO PERMIT INSPECTION AS REQUIRED.

G. SUBMIT TO THE ARCHITECT/ENGINEER PROMPTLY AFTER AWARD OF CONTRACT AND PRIOR TO PURCHASING, SIX COPIES OF MANUFACTURER'S SHOP DRAWINGS IN ACCORDANCE WITH DIVISION 1, SECTION 01300 - SUBMITTALS FOR THE FOLLOWING ITEMS. ALL SHOP DRAWINGS OF A SPECIFIC ITEM OR SYSTEM SHALL BE MADE IN ONE SUBMITTAL AND WITHIN TEN DAYS AFTER AWARD OF CONTRACT.

1. PANELBOARDS
2. SUPPORTS
3. WIRING DEVICES
4. DISCONNECT SWITCHES
5. CONDUIT
6. WIRE

H. COMPLETED WIRING SYSTEMS SHALL BE FREE FROM SHORT CIRCUITS AND AFTER COMPLETION, PERFORM TESTS FOR INSULATION RESISTANCE IN ACCORDANCE WITH THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE. ALL WIRING SYSTEMS SHALL BE COMPLETELY AND TOTALLY "SAFE" DURING CONSTRUCTION. ONLY QUALIFIED PERSONNEL SHALL HANDLE ELECTRICAL SYSTEMS.

I. BEFORE ROUGH-IN OF CIRCUITRY OR CONNECTING TO EQUIPMENT, FURNISHED UNDER THIS DIVISION, ANY OTHER DIVISION, OR BY THE OWNER, THE CONTRACTOR SHALL VERIFY THE ELECTRICAL CHARACTERISTICS AND REQUIREMENTS OF THE EQUIPMENT BEING FURNISHED AND FOR THAT SPECIFIED AND SHOWN ON THE DRAWINGS AND PROVIDE FOR PROPER ROUGH-IN AND CONNECTION.

J. THE ELECTRICAL CIRCUITS, COMPONENTS, AND CONTROLS FOR ALL EQUIPMENT ARE SELECTED AND SIZED, BASED ON THE EQUIPMENT SPECIFIED. IF SUBSTITUTIONS AND/OR EQUIVALENT EQUIPMENT ARE FURNISHED, IT SHALL BE THE RESPONSIBILITY OF ALL PARTIES CONCERNED, INVOLVED IN, AND FURNISHING THE SUBSTITUTE AND/OR EQUIVALENT EQUIPMENT TO VERIFY AND COMPARE THE ELECTRICAL CHARACTERISTICS AND REQUIREMENTS OF THAT FURNISHED TO THAT SPECIFIED AND/OR SHOWN. IF GREATER CAPACITY OR MORE MATERIALS OR LABOR IS REQUIRED FOR THE ROUGH-IN, CIRCUITRY OR CONNECTIONS THAN FOR THE ITEM SPECIFIED AND PROVIDED FOR, THEN IT SHALL BE THE RESPONSIBILITY OF THE PARTIES INVOLVED IN PROVIDING THE SUBSTITUTE AND/OR EQUIVALENT ITEMS OF EQUIPMENT TO PROVIDE ALL COMPENSATION FOR ADDITIONAL CHARGES MADE FOR THE PROPER ROUGH-IN, CIRCUITRY AND CONNECTIONS FOR THE EQUIPMENT FURNISHED. NO ADDITIONAL CHARGES ABOVE THE BASE BID SHALL BE ALLOWED FOR SUCH REVISIONS.

K. EXCAVATION FOR UNDERGROUND ELECTRICAL STRUCTURES: CONFORM TO ELEVATIONS AND DIMENSIONS SHOWN WITHIN A TOLERANCE OF PLUS OR MINUS 0.10"; PLUS A SUFFICIENT DISTANCE TO PERMIT PLACING AND REMOVAL OF CONCRETE FORMWORK, INSTALLATION OF SERVICES, OTHER CONSTRUCTION, AND FOR INSPECTION.

L. TRENCHING: EXCAVATE TRENCHES FOR ELECTRICAL INSTALLATIONS AS FOLLOWS:

1. EXCAVATE TRENCHES TO THE UNIFORM WIDTH, SUFFICIENTLY WIDE TO PROVIDE AMPLE WORKING ROOM AND A MINIMUM OF 6" TO 9" CLEARANCE ON BOTH SIDES OF RACEWAYS AND EQUIPMENT;
2. EXCAVATE TRENCHES TO DEPTH INDICATED OR REQUIRED;
3. LIMIT THE LENGTH OF OPEN TRENCH TO THAT IN WHICH INSTALLATIONS CAN BE MADE AND THE TRENCH BACKFILLED WITHIN THE SAME DAY;
4. WHERE ROCK IS ENCOUNTERED, CARRY EXCAVATION BELOW REQUIRED ELEVATION AND BACKFILL WITH A LAYER OF CRUSHED STONE OR GRAVEL PRIOR TO INSTALLATION OF RACEWAYS AND EQUIPMENT. PROVIDE A MINIMUM OF 6" OF STONE OR GRAVEL CUSHION BETWEEN ROCK BEARING SURFACE AND ELECTRICAL INSTALLATIONS.

M. THE CONTRACTOR SHALL PROVIDE ALL INSERTS FOR THE SUPPORT OF DIVISION 16 EQUIPMENT TO BE PLACED IN CONCRETE OR THROUGH CONCRETE SLABS AS CONSTRUCTION PROGRESSES. HE SHALL PROVIDE ALL MISCELLANEOUS HANGING AND SUPPORTING HARDWARE. ALL ELECTRICAL WORK IS TO BE CONCEALED IN OR BUILT INTO GENERAL CONSTRUCTION SHALL BE PLACED AS CONSTRUCTION PROGRESSES. FAILURE OF THE CONTRACTOR TO COORDINATE WORK WITH OTHER TRADES AND THE PROJECT CONSTRUCTION PROGRESS SHALL MAKE HIM RESPONSIBLE FOR ALL COST OF CUTTING AND PATCHING, AS REQUIRED TO INSTALL WORK. NO STRUCTURAL MEMBER, MASONRY CONSTRUCTION OR FINISHED WORK SHALL BE CUT OR ALTERED WITHOUT PRIOR WRITTEN APPROVAL BY THE ARCHITECT/ENGINEER. CONTRACTOR SHALL FIRE RATE ALL PENETRATIONS THROUGH ALL FIRE RATED SLABS OR WALLS PER THE INTENDED RATING.

N. THE CONTRACTOR SHALL SUPPLY AND SET INTO PLACE ALL WALL SLEEVES FOR CONDUITS AND CEILING INSERTS FOR HANGERS IN AREAS OF NEW CONSTRUCTION AS BUILDING CONSTRUCTION PROGRESSES. INSTALL EQUIPMENT NOTED TO BE CONCEALED IN WALLS BEFORE WALLS ARE CONSTRUCTED IN ORDER THAT WALLS MAY BE CONSTRUCTED AROUND CONDUITS, ENCLOSURES, ETC.

O. METALLIC MATERIALS SHALL BE PROTECTED AGAINST CORROSION. EQUIPMENT ENCLOSURES SHALL BE GIVEN RUST-INHIBITING TREATMENT AND STANDARD FINISH BY MANUFACTURER. ALUMINUM SHALL NOT BE USED ON CONTACT WITH EARTH, AND, WHERE CONNECTED TO DISSIMILAR METAL, SHALL BE PROTECTED BY SUITABLE FITTINGS AND TREATMENT. ALL FERROUS METALS SUCH AS ANCHORS, BOLTS, BRACES, BOXES, BODIES, CLAMPS, FITTINGS, GUARDS, NUTS, PINS, RODS, SHIMS, THIMBLES, WASHERS, AND MISCELLANEOUS PARTS, NOT OF STAINLESS STEEL OR NONFERROUS MATERIALS, SHALL BE HOT-DIPPED GALVANIZED.

P. ALL CONDUITS STUBBED OUT FOR FUTURE USE SHALL HAVE A PULL WIRE INSTALLED, A PLASTIC CAP INSTALLED AND BE IDENTIFIED AS TO THE CONDUIT ORIGIN.

Q. THE RESPONSIBILITY FOR ANY CUTTING OF CONSTRUCTION WHICH IS REQUIRED FOR THE INSTALLATION OF DIVISION 16 WORK, SHALL BE BY THE CONTRACTOR. THE CONTRACTOR SHALL COORDINATE WITH ALL OTHER TRADES AND THE OWNER BEFORE ANY CUTTING AND OBTAIN APPROVAL FROM THE ARCHITECT/ENGINEER PRIOR TO ANY CUTTING. ALL PATCHING AND FINISHING SHALL BE BY THE CONTRACTOR.

R. WHERE OPENINGS OR HOLES ARE CUT IN CONSTRUCTION AND THE CUTTING BREAKS ELECTRICAL CIRCUITRY OR CONTROL CIRCUITRY CONDUIT AND WIRING, THEN IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REROUTE THE CIRCUITRY CONDUIT AND REWIRING AND TO COMPLETE THE CIRCUITRY AS REQUIRED AND AS APPROVED BY THE ARCHITECT/ENGINEER. TEMPORARY COMPLETION SHALL BE PROVIDED WHERE NECESSARY BEFORE THE PERMANENT REROUTING AND COMPLETION WORK IS FINISHED.

S. ANY PENETRATIONS OF FIRE OR SMOKE RATED ASSEMBLIES MADE BY THIS CONTRACTOR IN VERTICAL OR HORIZONTAL CONSTRUCTION SHALL BE SEALED AND PROTECTED BY THIS CONTRACTOR IN ORDER TO MAINTAIN THE ESTABLISHED FIRE RATING WITH METHODS AS APPROVED BY THE AUTHORITY HAVING JURISDICTION.

III. IDENTIFICATION:

A. IDENTIFICATION NAMEPLATES SHALL BE LAMINATED PLASTIC, SECURED TO EQUIPMENT WITH TWO SCREWS.

B. EACH PANELBOARD AND SWITCHBOARD SHALL BE EQUIPPED WITH A PERMANENT PLASTIC NAMEPLATE WITH 1/2" MINIMUM LETTERS, SECURELY FASTENED TO THE DEVICE.

C. EACH INDIVIDUALLY MOUNTED CIRCUIT BREAKER, SWITCH, TRANSFER SWITCH, MOTOR STARTER, LIGHTING CONTACTOR, TRANSFORMER AND/OR ANY OTHER CONTROL OR PROTECTIVE DEVICE INCLUDING EQUIPMENT DISCONNECT SWITCHES SHALL BE EQUIPPED WITH A PERMANENT PLASTIC NAMEPLATE WITH 1/2" MINIMUM LETTERS.

D. PANELBOARDS SHALL HAVE TYPEWRITTEN DIRECTORIES. ALL CIRCUITS TO BE IDENTIFIED BY DEVICES SERVED AND ROOM NUMBERS (I.E., LIGHTING ROOM 216). HANDWRITTEN DIRECTORIES WILL NOT BE ALLOWED.

E. EACH JUNCTION BOX CABINET OR WIREWAY LARGER THAN 6" X 6" SHALL BE EQUIPPED WITH A PLASTIC NAMEPLATE WITH 1/2" MINIMUM LETTERS INDICATING THE SYSTEM ENCLOSED.

F. ALL SYSTEMS JUNCTION BOXES AND CONDUIT SHALL BE COLOR CODED INSIDE AND OUTSIDE OF THE BOX PRIOR TO THE INSTALLATION OF CONDUCTORS PER THE FOLLOWING:

1. CCTV SYSTEM: GREEN
2. TELEPHONE DATA SYSTEM: BLUE
3. FIRE ALARM SYSTEM: RED

G. ENTIRE BOX INSIDE AND OUT, INCLUDING COVER, SHALL BE PAINTED PRIOR TO INSTALLING CONDUITORS.

IV. WIRING DEVICES:

A. SWITCHES AND RECEPTACLES IN LOBBIES, CORRIDORS OR COMMERCIAL SPACES, UNFINISHED AND MECHANICAL SPACES SHALL BE 20 AMP COMMERCIAL GRADE 125 VAC. GRAY IN COLOR WITH STAINLESS STEEL COVERPLATES.

B. WEATHERPROOF RECEPTACLES SHALL BE GFCI TYPES WITH GASKETED STAINLESS STEEL KEY LOCKABLE FLIP COVER TYPE COVERPLATES. SURGE SUPPRESSION TYPE OUTLETS IN MDPS AND IDFS SHALL BE HUBBELL #3625 (BLUE) OR EQUAL.

C. RECEPTACLES PROVIDED FOR ATTACHMENT OF CORD AND PLUG EQUIPMENT SHALL BE HEAVY DUTY, SPECIFICATION GRADE, NON-INTERCHANGEABLE, FLUSH MOUNTED TYPES OF THE PROPER NEMA CONFIGURATION TO SERVE THE EQUIPMENT. NEMA CONFIGURATIONS SHALL BE VERIFIED PRIOR TO INSTALLATION OF CIRCUIT CONDUCTORS. CONTRACTOR TO PROVIDE ALL CONNECTION, WIRING, PIGTAILS FOR DISHWASHERS, COOKING RANGES, OVENS AND GARBAGE DISPOSALS.

D. ALL DEVICES SHALL HAVE PROPER PLATES, CARPET FLANGES, TRIMS, RINGS, ESCUTCHEONS, ETC., AS MANUFACTURED BY SAME MANUFACTURER AS DEVICES. ANY TELEPHONE OR OTHER OUTLET WHICH IS NOT EQUIPPED WITH A PLATE FURNISHED BY OTHERS SHALL HAVE ONE PROVIDED BY THIS CONTRACTOR. DEVICE PLATES SHALL BE COLOR AND TYPE AS SHOWN BELOW.

1. FINISHED SPACES DECORA LINE:
 - a. COORDINATE EXACT COLOR WITH OWNER/ARCHITECT.
2. UNFINISHED OR INDUSTRIAL OR COMMERCIAL TYPE SPACES:
 - a. GRAY DEVICES
 - b. STAINLESS STEEL OR STAMPED GALVANIZED STEEL ON SURFACE MOUNTED BOXES
 - c. STAINLESS STEEL PLATES ON FLUSH MOUNTED BOXES

F. MOUNTING HEIGHTS ARE APPROXIMATE. THE EXACT LOCATIONS AND MOUNTING HEIGHTS SHALL BE DETERMINED ON THE JOB AND IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE WITH ALL TRADES TO INSURE CORRECT INSTALLATION, I.E., OVER COUNTERS IN OR ABOVE BACK-SPLASHES, IN BLOCK WALLS, TILE, AND OTHER SPECIAL CONSTRUCTION FEATURES. LOCATION OF OUTLETS MOUNTED IN BUILT-INS, MILLWORK, AND CABINERY SHALL BE VERIFIED. OUTLETS MOUNTED IN KICK OR TOE SPACES SHALL BE MOUNTED HORIZONTALLY. OUTLET BOXES SHALL BE MOUNTED TO PREVENT DEVICE PLATE FROM OVERLAPPING BACKSPLASH, TRIM, TILE, ETC. LOCATE SO DEVICE PLATE WILL LAY FLAT AGAINST SURFACE COMPLETELY AROUND THE PERIMETER OF PLATE.

G. OUTLETS, OTHER THAN THOSE COORDINATED WITH COUNTER TOPS, SHELVES, AND CABINETS, SHALL BE LOCATED WITH THE CENTER LINE OF OUTLET BOXES THE FOLLOWING DISTANCE ABOVE THE FINISHED FLOOR, UNLESS OTHERWISE INDICATED:

1. RECEPTACLES, GENERAL: 1'-6" AFF
2. TELEPHONE OUTLETS: 1'-6" AFF
3. SWITCHES, GENERAL: 4'-0" AFF

V. RACEWAYS

A. SHALL BE GALVANIZED OUTSIDE AND INSIDE BY HOT DIPPING. E.M.T. SHALL BE ELECTRO-GALVANIZED. CONDUITS SHALL BE AS MANUFACTURED BY REPUBLIC, PITTSBURGH STANDARD, WHEATLAND, TRIANGLE, ALLED, OR YOUNGSTOWN.

B. SHALL BE STANDARD THREADED TYPE, GALVANIZED OUTSIDE AND INSIDE BY HOT DIPPING. THREADED AND CLAMP TYPE NOT ACCEPTABLE. SHALL BE AS MANUFACTURED BY RACO, EFCOR, OR APLECTON.

C. SHALL BE STEEL THREADED COMPRESSION TYPE. ALL COUPLINGS AND CONNECTORS SHALL BE EFCOR OR RACO. PRESSURE INDENTED TYPE CONNECTORS OR CAST METAL WILL NOT BE APPROVED FOR ANY LOCATION.

D. CONNECTORS SHALL HAVE PLASTIC INSULATED THROAT INSERTS.

E. THE USE OF METAL CLAD CABLE IS ACCEPTABLE IN LOCATIONS AS ACCEPTED BY THE NEC AND ALL LOCAL JURISDICTIONAL CODES.

F. STEEL METAL CLAD CABLE, TYPE MC, EMPLOYING CIRCUIT CONDUCTORS #12 SOLID TO #2 AWG, SOLID OR STRANDED COPPER WITH THIN INSULATION, AN INSULATED GREEN GROUNDING CONDUCTOR AND GALVANIZED STEEL INTERLOCKED ARMOR CLADDING. THE CABLES SHALL BE SUITABLE FOR USE IN DRY LOCATIONS AT TEMPERATURES NOT EXCEEDING 90° C ON AD CIRCUITS UP TO 600 VOLTS IN ACCORDANCE WITH N.E.C., ARTICLE 330. THE CABLE SHALL BE ONE AND TWO HOUR FIRE RATED PER ANS/UL 1479 FOR USE IN WALL, CEILING AND FLOOR ASSEMBLIES.

G. FLEXIBLE METALLIC CONDUIT RACEWAYS MAY BE USED TO CONNECT HVAC UNITS LOCATED IN INTERIOR MECHANICAL AREAS. MINIMUM SIZE 3/4".

H. CONDUIT SHALL BE SIZED IN ACCORDANCE WITH THE LATEST NATIONAL ELECTRICAL CODE EXCEPT THAT NO CONDUIT SHALL BE SMALLER THAN 3/4" UNLESS OTHERWISE NOTED. CONDUIT SHALL BE SIZED LARGER THAN REQUIRED ABOVE WHEN SHOWN ON THE DRAWINGS OR WHEN REQUIRED BY LOCAL CODE.

I. ANY CONDUIT STUBBED OUT FOR FUTURE SHALL BE CAPPED WITH A PLASTIC CAP AND MARKED WITH A 2" MINIMUM RED METAL TAG WHICH IDENTIFIES CONDUIT ORIGIN. CONDUITS STUBBED UP ABOVE GRADE OR ROOF SHALL BE TAGGED ON THE CONDUIT. CONDUIT STUBBED OUT BELOW GRADE SHALL BE TAGGED ON NEAREST BUILDING WALL, CURB, ETC., DIRECTLY OVER THE CONDUIT RUN. ALL EMPTY CONDUITS SHALL HAVE PULL WIRES.

VI. SCHEDULE 40 RIGID PVC:

A. CONDUIT SHALL BE COMPOSED OF POLYVINYLCHLORIDE AND SHALL BE UL RATED TYPE 40 FOR USE WITH 90EC RATED CONDUCTORS. CONDUIT SHALL CONFORM TO NEMA STANDARDS AND APPLICABLE SECTIONS OF NEC.

B. INSTALLATION OF RIGID NON-METALLIC CONDUIT SHALL COMPLY WITH ARTICLE 352 OF THE NATIONAL ELECTRICAL CODE (NFPA 70) AND THESE SPECIFICATIONS.

C. PROVIDE A CONTINUOUS, INSULATED, GROUNDING CONDUCTOR IN EVERY RIGID, NON-METALLIC RACEWAY EVEN IF NOT SHOWN ON THE DRAWINGS. THE GROUNDING CONDUCTOR SHALL BE CONNECTED TO GROUND AT EACH END OF THE RACEWAY IN ACCORDANCE WITH ARTICLE 250 OF THE NATIONAL ELECTRICAL CODE (NFPA 70).

D. WHERE RIGID NON-METALLIC CONDUIT TRANSITIONS TO METALLIC CONDUIT, THE LOCATION OF THE TRANSITION SHALL BE UNDERGROUND.

E. NO PVC CONDUIT SHALL BE RUN EXPOSED, OR ABOVE GRADE.

VII. WIRE AND CABLE 600 VOLT:

A. CONDUCTORS SHALL HAVE CURRENT CARRYING CAPACITIES AS PER NEC AND WITH 600 VOLT INSULATION, #12 AVERAGE MINIMUM FOR 20 AMP CIRCUITS AND #14 FOR 15 AMP CIRCUITS EXCEPT FOR CONTROLS, AND FIXTURE WIRE. CONDUCTORS SHALL BE COPPER.

B. #12 AND #10 SHALL BE SOLID, TYPE THW/THWN INSULATION.

C. #8 AND LARGER, AND ANY SIZE TO MOTORS SHALL BE STRANDED TYPE THW.

D. SHALL BE MADE WITH T & B STA-KON WIRE JOINTS, PT SERIES, COMPLETE WITH INSULATING CAPS AND INSTALLED WITH WT161 TOOL OR WT2000 TOOL, IDEAL SUPER-NUTS (NOT WIRE NUTS), IDEAL WING NUTS, OR BUCHANAN ELEC. PRODUCTS B CAP OR SERIES 2000 PRESSURE CONNECTORS COMPLETE WITH NYLON SNAP-ON INSULATORS AND INSTALLED WITH C24 PRESSURE TOOL.

E. ALL JOINTS AND SPLICES IN WIRE SHALL BE MADE WITH APPROVED SOLDERLESS CONNECTORS, AND INSULATED SO THAT INSULATION IS OWNER APPROVED EQUAL TO CONDUCTOR INSULATION. SPLICES SHALL NOT BE PERMITTED IN CONTROL, SECURITY, FIRE ALARM, TELEVISION OR COMMUNICATIONS SYSTEMS, OR WHERE OTHERWISE NOTED. SPLICING OF WIRE OR CABLES WILL NOT BE ALLOWED BELOW GRADE, INCLUDING IN BOXES BELOW GRADE.

F. BOTH CONDUCTORS AND CONDUITS SHALL BE CONTINUOUS FROM OUTLET TO OUTLET.

G. IN INSTALLING THE MAIN ELECTRICAL SERVICE, ADDITIONAL SLACK CONDUCTORS SHALL BE PROVIDED AND TERMINATED AS REQUIRED BY ELECTRIC UTILITY FOR CONNECTION TO THEIR EQUIPMENT. FIELD COORDINATE WITH UTILITY PRIOR TO INSTALLING CONDUITORS.

H. IN INSTALLING PARALLEL CONDUCTORS IT IS MANDATORY THAT ALL CONDUCTORS MAKING UP THE FEEDER BE EXACTLY THE SAME LENGTH, THE SAME SIZE AND THE SAME TYPE OF CONDUCTOR WITH THE SAME INSULATION. FURTHER, EACH GROUP OF CONDUCTORS MAKING UP A PHASE OR NEUTRAL MUST BE BONDED AT BOTH ENDS IN AN APPROVED MANNER.

I. CONDUCTOR SIZES INDICATED ON CIRCUIT HOMERUNS OR IN PANELBOARD SCHEDULES SHALL BE INSTALLED OVER THE ENTIRE LENGTH OF THE CIRCUIT UNLESS NOTED OTHERWISE ON THE DRAWINGS.

J. CONDUCTORS SHALL BE CONTINUOUS AND UNSPLICED WHERE INSTALLED IN CONDUIT. SPLICES SHALL OCCUR ONLY WITHIN WIRING TROUGHS, WIREWAYS, JUNCTION BOXES, OUTLET BOXES, OR EQUIPMENT ENCLOSURES WHERE SUFFICIENT ADDITIONAL ROOM IS PROVIDED FOR ALL SPLICES.

K. EACH BRANCH CIRCUIT AND FEEDER CONDUCTOR SHALL BE COLOR CODED. FOR CONDUCTOR SIZES THRU NO. 6 AWG, THE INSULATION SHALL BE OF THE COLOR AS INDICATED BELOW. COLOR CODE SHALL BE STRICTLY ADHERED TO. FOR CONDUCTOR SIZES NO. 4 AWG AND LARGER, COLOR CODED PHASE TAPE MAY BE APPLIED COMPLETELY AROUND THE CONDUCTOR INSULATION WITHIN 8" OF EACH END OF THE CONDUCTOR AND IN EACH PULL OR JUNCTION BOX OR WHENEVER CONDUCTORS ARE PHYSICALLY EXPOSED TO VIEW. GROUNDING CONDUCTORS AND GROUNDED CONDUCTORS SHALL HAVE INSULATION COLOR AS INDICATED FOR SIZES THROUGH #6 AWG. 120/208 V, 3PHASE,4W

- | | |
|----------|--------------|
| PHASE A, | COLOR: BLACK |
| PHASE B, | COLOR: RED |
| PHASE C, | COLOR: BLUE |
| NEUTRAL, | COLOR: WHITE |
| GROUND, | COLOR: GREEN |

VIII. GROUNDING:

A. THIS SECTION DEALS WITH THE GROUNDING OF SERVICE EQUIPMENT, TRANSFORMERS, NON-CURRENT CARRYING CONDUCTIVE SURFACES OF EQUIPMENT, METAL BUILDING, STRUCTURES AND OTHER EQUIPMENT.

B. ALL GROUNDING CONNECTIONS SHALL BE INSTALLED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE AND ALL LOCAL CODES AND REQUIREMENTS. SUCH CODES SHALL BE CONSIDERED MINIMUM REQUIREMENTS AND THE INSTALLATION OF THE GROUNDING SYSTEM SHALL INSURE FREEDOM FROM DANGEROUS SHOCK EXPOSURE AND SHALL PROVIDE A LOW IMPEDANCE GROUND FAULT PATH TO PERMIT OPERATION OF OVERCURRENT AND GROUND FAULT PROTECTIVE DEVICES.

C. ALL SERVICE AND EQUIPMENT GROUNDING CONDUCTORS, AND BONDING JUMPERS SHALL BE INSULATED COPPER, TYPE THHN, THWN, OR THW CONDUCTORS (UNLESS NOTED OTHERWISE) AND SHALL BE SIZED IN ACCORDANCE WITH THE APPLICABLE PORTIONS OF ARTICLES 250 AND 517 OF THE NATIONAL ELECTRICAL CODE. GROUNDING CONDUCTORS #6 AWG AND SMALLER SHALL HAVE A GREEN COLOR INSULATION. ALL GROUNDING CONDUCTORS #4 AWG AND LARGER SHALL BE ADEQUATELY IDENTIFIED WITH A GREEN TRACER AND/OR GREEN COLORED TAPE AT EACH END OF THE GROUNDING CONDUCTOR AND AT EACH PULLBOX OR OTHER ACCESSIBLE LOCATION.

D. THE MAIN SERVICE GROUNDING ELECTRODE SYSTEM SHALL CONSIST OF THE FOLLOWING ITEMS BONDED TOGETHER BY THE GROUNDING ELECTRODE CONDUCTORS IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE:

1. THE MAIN UNDERGROUND COLD WATER PIPE, IF METAL, NEC 250.104(A)
2. METAL FRAME OF BUILDING WHERE AVAILABLE, NEC 250.104(C)
3. CONCRETE ENCASED ELECTRODE, NEC 250.52(A)(3)
4. THE BUILDING LIGHTNING PROTECTION SYSTEM, NEC 250.106

E. THE NEUTRAL CONDUCTOR SHALL BE GROUNDED AT THE SERVICE ENTRANCE MAIN DISCONNECT, AND AT EACH SEPARATELY DERIVED SYSTEM ONLY PER NEC ARTICLE 250.

IX. PANELBOARDS:

A. PANELBOARDS SHALL BE DEAD FRONT TYPE AND SHALL BE IN ACCORDANCE WITH UNDERWRITERS' LABORATORIES, INC., STANDARD FOR PANELBOARDS AND ENCLOSING CABINETS AND SO LABELED.

B. PANELBOARDS SHALL BE FACTORY ASSEMBLED WITH BRANCH BREAKERS ARRANGED AS SHOWN IN SCHEDULES. BREAKERS SHALL BE NUMBERED VERTICALLY BEGINNING TOP LEFT. BREAKER NUMBERS SHALL BE PERMANENTLY ATTACHED TO TRIM. PANEL SHALL BE MINIMUM 20" WIDE OR 16" FOR RESIDENTIAL LOAD CENTERS, UNLESS SPECIFICALLY NOTED OTHERWISE.

C. ANY SPECIAL REQUIREMENTS ON THE DRAWINGS OR SCHEDULES, SUCH AS GROUND FAULT PROTECTION, ARC-FAULT CIRCUIT BREAKERS, INCREASED INTERRUPTING CAPACITY, SHUNT TRIP TYPE CIRCUIT BREAKER, FEED THRU PANELBOARDS, ETC., SHALL SUPERSEDE THESE SPECIFICATIONS, BUT ONLY INsofar AS THAT PARTICULAR REQUIREMENT IS CONCERNED AND AS INDICATED.

D. WIRING IN PANELBOARD GUTTERS SHALL BE DONE IN A NEAT AND WORKMANLIKE MANNER. WIRING SHALL BE GROUPOD INTO NEAT BUNDLES AND SECURED WITH NYLON TIE WRAPS.

E. PROVIDE TYPE WRITTEN DIRECTORIES FOR EACH PANELBOARD INDICATING THE LOAD SERVED.

X. LIGHTING FIXTURES:

A. LIGHTING FIXTURES SHALL BE FURNISHED AS SHOWN ON DRAWINGS AND IN THE LIGHTING FIXTURE SCHEDULE. IT SHALL SPECIFICALLY BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY EXACT TYPE CEILING AND RECESSING DEPTH OF ALL RECESSED FIXTURES AND TO FURNISH THE MOUNTING TRIMS AND ACCESSORIES OF THE SPECIFIED AND/OR APPROVED FIXTURES FOR THE CEILING TO BE INSTALLED. LIGHTING FIXTURES SHALL BE PROVIDED WITH JOINER PLATES, END CAPS, RETAINING CLIPS, PLASTER FRAMES, HOUSINGS, AND ALL OTHER ACCESSORIES REQUIRED FOR A COMPLETE INSTALLATION.

B. ALL FIXTURES SHALL BE EQUIPPED WITH LAMPS UNLESS OTHERWISE NOTED. LAMPS SHALL BE INSTALLED NEW, IMMEDIATELY PRIOR TO FINAL INSPECTION, AND SHALL NOT BE USED FOR CONSTRUCTION.

C. FIXTURE CATALOG NUMBER REPRESENTS BASIC LUMINARY SIZE, TYPE, QUALITY AND CONFIGURATION. ACCESSORIES SHALL BE FURNISHED WITH EACH UNIT AS REQUIRED FOR A COMPLETE FINISHED INSTALLATION. BASIC ACCESSORIES SHALL INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:

1. JOINING PLATES, END CAPS, RETAINING CLIPS, ETC.
2. TRIMS FOR RECESSED FIXTURES.
3. FIXTURE STEMS AND CANOPIES FINISHED TO MATCH FIXTURES.
4. SPECIAL MOUNTING BRACKETS, TENONS, SLIP FILTERS, CONCRETE BASES, POLES, ANCHOR BOLTS, JUNCTION BOXES, AND STANCHIONS FOR ALL EXTERIOR LIGHTING FIXTURES. PROVIDE ALL WEATHERPROOFING FOR ALL LIGHTING FIXTURES TO BE INSTALLED IN EXTERIOR LOCATIONS.

D. STRUCTURAL SUPPORT OF ALL FIXTURES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

E. THE SYSTEM GROUNDING CONDUCTOR SHALL BE SECURED TO EACH FIXTURE BODY BY MEANS OF A BONDING SCREW.

F. OWNER/DEVELOPER WILL HAVE RIGHT TO RELOCATE LIGHTING FIXTURES OR LIGHTING SWITCHES WITHIN 72" OF LOCATION SHOWN ON FIRST WALK-THROUGH AT NO ADDITIONAL EXPENSE. COORDINATE THE WALK-THROUGH PRIOR TO THE INSTALLATION OF THE WIRING.

XI. FIRE ALARM SYSTEMS

A. THIS SECTION INCLUDES AUTOMATIC ADDRESSABLE VOICE EVACUATION FIRE ALARM SYSTEMS, INCLUDING FIRE ALARM CONTROL PANEL, AND REMOTE ANNUNCIATOR, MANUAL PULL STATIONS, HEAT AND SMOKE DETECTORS, FIRE ALARM AUDIO, VISUAL, SIGNAL EQUIPMENT, CONTROLS, AND SURGE PROTECTION DEVICES. COORDINATE ALL WIRING AND DEVICE INTERFACES WITH OWNER'S REPRESENTATIVE. THE FIRE ALARM SYSTEM SHALL MEET THE LATEST ADOPTED EDITION OF NFPA 72 WITH ALL LOCAL AND STATE AMENDMENTS AND FEDERAL ADA REQUIREMENTS. ALL DEVICES SHALL BE WHITE IN COLOR WITH RED LETTERING.

B. GENERAL: COMPLETE, ZONED, NONCODED, ADDRESSABLE, MICROPROCESSOR-BASED FIRE DETECTION ALARM SYSTEM WITH MANUAL AND AUTOMATIC ALARM INITIATION SIGNALS FROM A SUPERVISED FIRE ALARM SOUND DISTRIBUTION SYSTEM. DEVICES LOCATED OUTDOORS SHALL BE SPECIFICALLY DESIGNED FOR EXTERIOR SERVICE. PROVIDE BATTERY BACK-UP BASED UPON TOTAL LOAD PER NFPA 72. ALARM SHALL ACHIEVE A MINIMUM OF 80 DB THROUGHOUT OCCUPABLE SPACES AND MEET ADA REQUIREMENTS.

C. TRANSMISSION TO REMOTE CENTRAL STATION: PROVIDE WIRING TO AUTOMATICALLY ROUTE AN ALARM, SUPERVISORY, AND TROUBLE SIGNALS TO THE CENTRAL STATION SERVICE TRANSMITTER LOCATED IN MAIN FIRE ALARM CONTROL PANEL USING LISTED AND APPROVED EQUIPMENT. PROVIDE ALL NECESSARY WIRING CONNECTION BY THIS CONTRACTOR.

D. GENERAL ALARM: A SYSTEM GENERAL ALARM INCLUDES:

1. INDICATING THE GENERAL ALARM CONDITION AT THE FACP AND THE INTEGRAL ANNUNCIATOR.
2. IDENTIFYING THE DEVICE THAT IS THE SOURCE OF THE ALARM AT THE FACP AND THE ANNUNCIATOR.
3. INITIATING AUDIBLE AND VISIBLE ALARM SIGNALS THROUGHOUT THE BUILDING.
4. STOPPING HVAC SUPPLY AND RETURN FANS.
5. INITIATING TRANSMISSION OF ALARM SIGNAL TO REMOTE CENTRAL STATION.
6. MANUAL STATION OPERATION INITIATES A GENERAL ALARM.
7. SMOKE OR HEAT DETECTION INITIATES A GENERAL ALARM.

E. INSTALLER QUALIFICATIONS: A CERTIFIED FACTORY-TRAINED TECHNICIAN IS TO PERFORM THE WORK OF THIS SECTION, MAKING UP ALL TERMINAL CABINETS, INSTALLING ALL SURGE SUPPRESSORS, AND INCLUDING LANDING AND TESTING EACH WIRE, MOUNTING AND CONNECTING ALL DEVICES. PROGRAMMING THE MAIN FACP, TROUBLE SHOOTING AND CERTIFYING THE FINAL SYSTEM. THE CONTRACTOR SHALL BE CURRENTLY LICENSED BY THE STATE OF FLORIDA FOR FIRE ALARM WORK, AND SHALL BE A CERTIFIED FACTORY-TRAINED TECHNICIAN. CONTRACTOR IS RESPONSIBLE FOR OBTAINING NECESSARY FIRE ALARM PERMITS FROM AUTHORITY HAVING JURISDICTION.

F. FIRE ALARM DEVICES AND EQUIPMENT TO BE INSTALLED OUTDOORS IN EXTERIOR LOCATIONS SHALL BE SPECIFICALLY DESIGNED AND U.L. LISTED AS WEATHER AND WATERPROOF. PROVIDE WEATHERPROOF NEOPRENE GASKETS BETWEEN WALL MOUNTING SURFACE AND FIRE ALARM DEVICE FOR ALL DEVICES MOUNTED OUTDOORS.

G. AVAILABLE MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS. ALL DEVICES SHALL BE PROVIDED FOR AND MANUFACTURED BY SIMPLEX, EST, NOTIFIER, OR PYROTRONICS.

H. DESCRIPTION: DOUBLE-ACTION NON-BREAK GLASS, ADDRESSABLE TYPE, FABRICATED OF METAL OR PLASTIC, AND FINISHED IN WHITE WITH MOLDED, RAISED-LETTER OPERATING IN