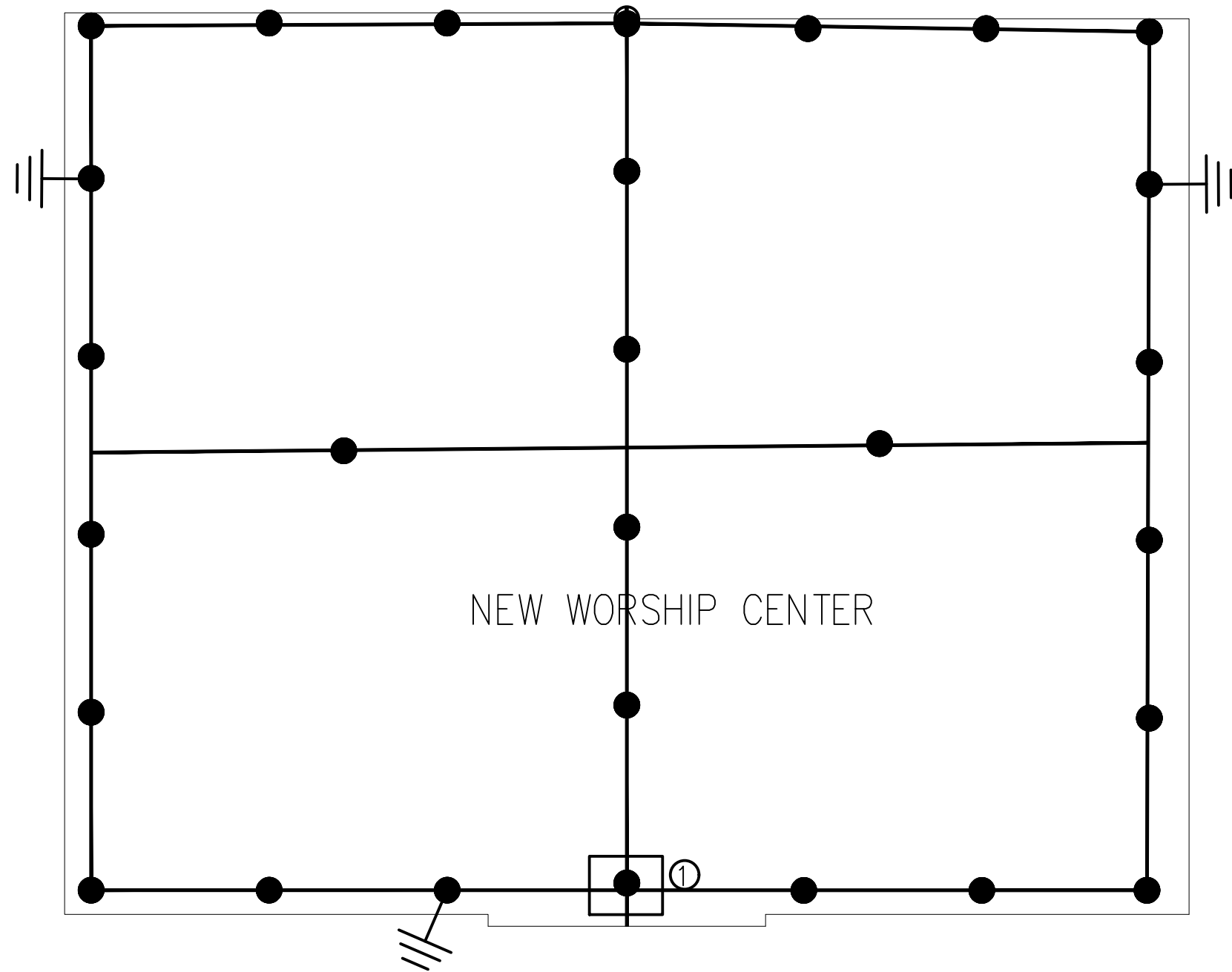





LIGHTNING PROTECTION PLAN - EDUCATION BUILDING- PHASE TWO
SCALE: 1/16" = 1'-0"



LIGHTNING PROTECTION PLAN - WORSHIP CENTER - PHASE ONE
SCALE: 1/16" = 1'-0"

LIGHTNING PROTECTION LEGEND

-  AIR TERMINAL
-  DOWN CONDUCTOR & GROUNDING ELECTRODE
-  CONDUCTOR

PLAN NOTES

- ① PROVIDE TERMINAL FOR STEEPLE 1AW STEEPLE MANUFACTURER'S INSTRUCTIONS AND NFPA 780. SEE ARCHITECTURAL DRAWINGS FOR APPROXIMATE HEIGHT.
- ② CONNECT TO EXISTING AIR TERMINAL (PHASE ONE).

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E1

SHEET 1 OF 20

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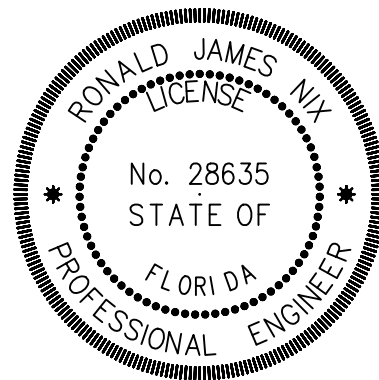
ISSUE DATE
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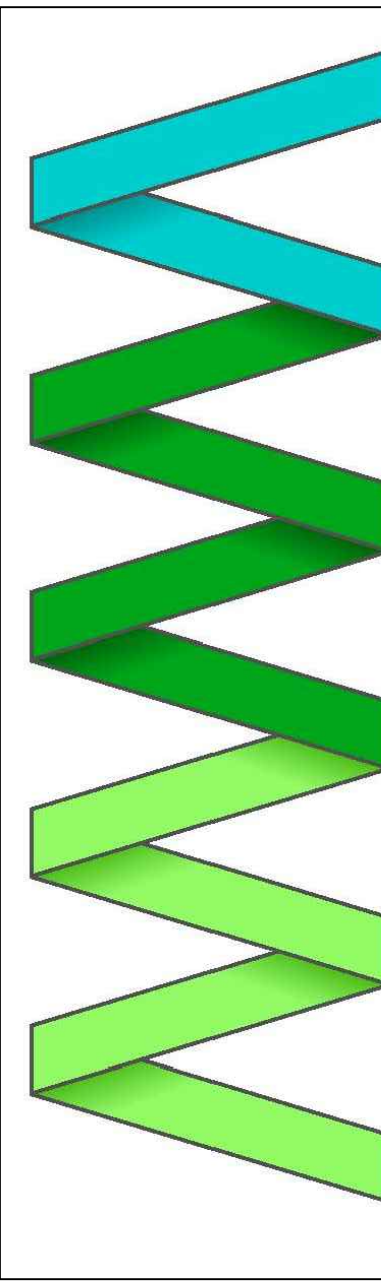
SCALE
1/16"=1'

PROJECT NO.
2236

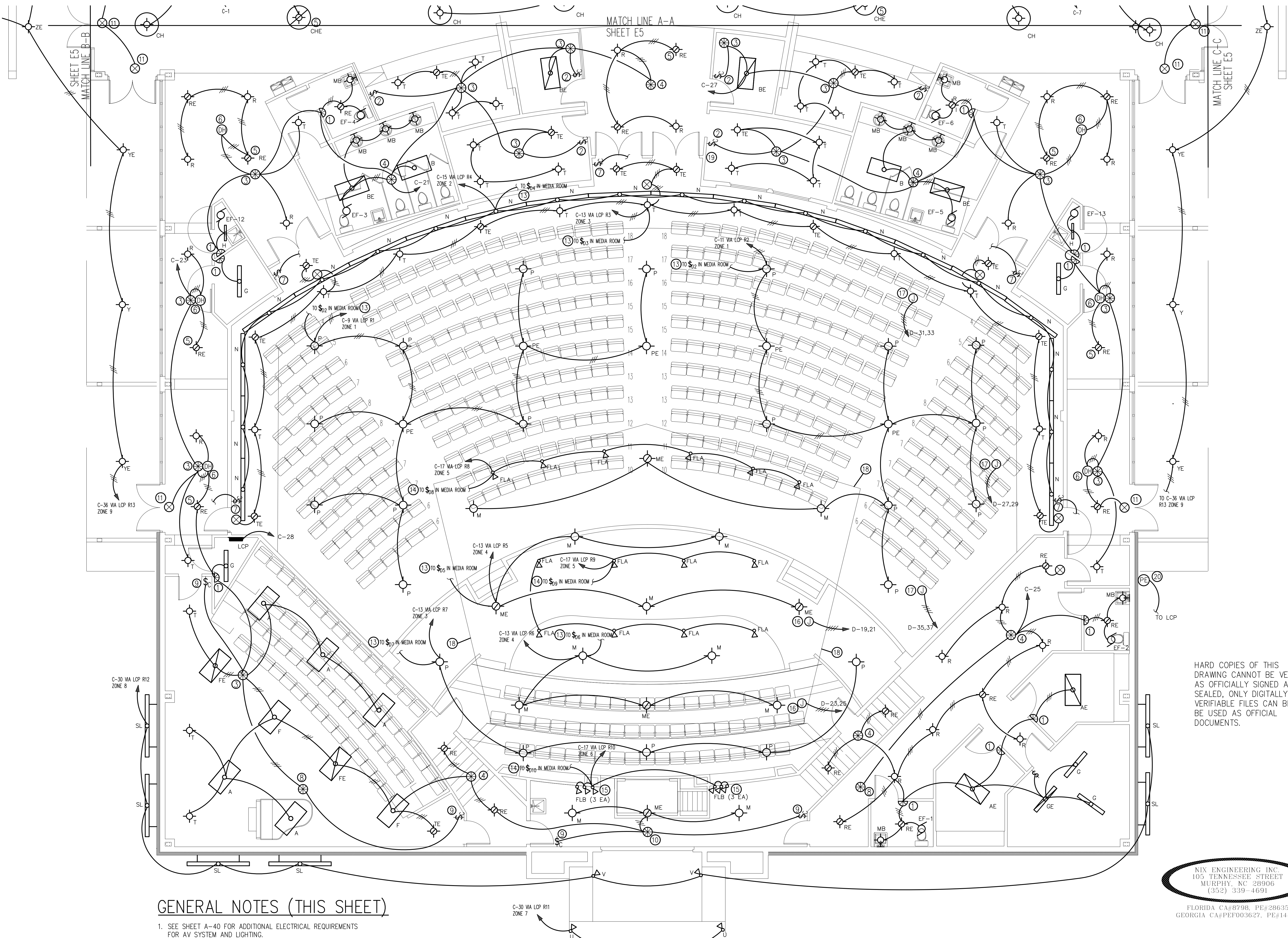
LIGHTNING PROTECTION PLAN

CARLISLE BAPTIST CHURCH
IRUEB UUILD
835 BERTHE AVENUE
PANAMA CITY, FLORIDA





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GENERAL NOTES (THIS SHEET)

1. SEE SHEET A-40 FOR ADDITIONAL ELECTRICAL REQUIREMENTS FOR AV SYSTEM AND LIGHTING.
2. BYPASS LIGHTING CONTROLS WITH UNSWITCHED LEG FOR ALL EMERGENCY AND EXIT LIGHTS.
3. SEE SHEET E6 FOR PLAN NOTES
4. SEE SHEET E5 FOR MATCH LINE PLANS

LIGHTING PLAN - WORSHIP CENTER - PHASE ONE
SCALE: 3/16" = 1'-0"

E2

SHEET 2 OF 20

PROJECT NO. 2236

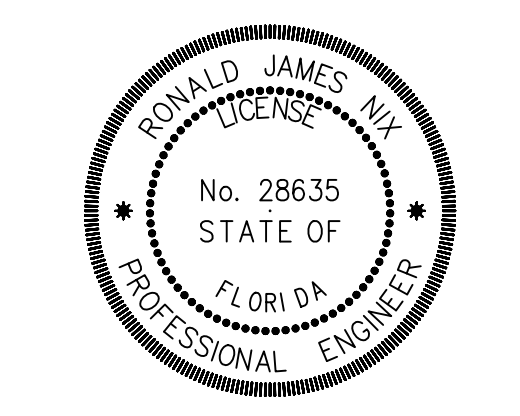
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ISSUE DATE
05/06/2024

SCALE
3/16"=1'

CARLISLE BAPTIST CHURCH
IRIEBUILOID
835 BERTHE AVENUE
PANAMA CITY, FLORIDA

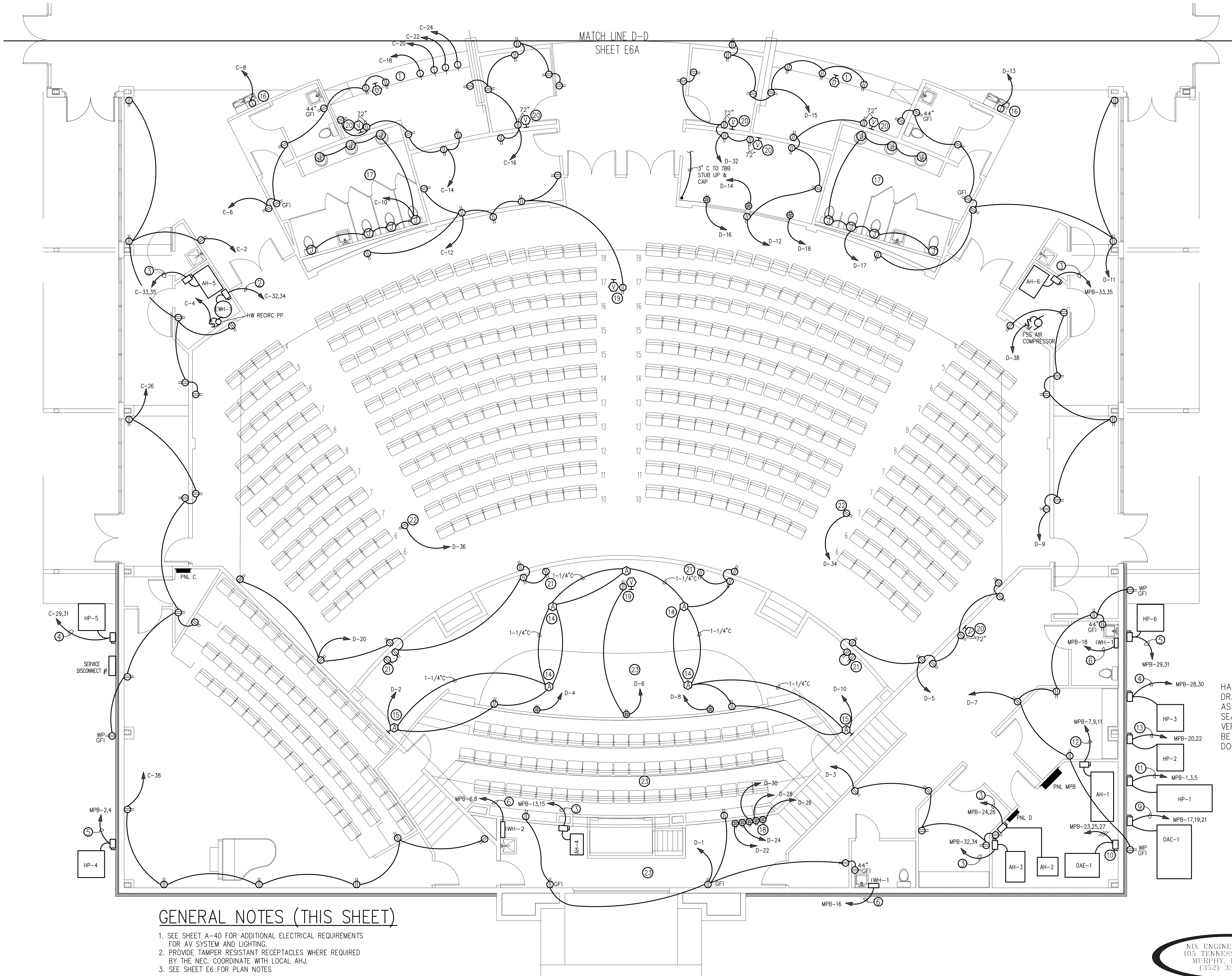


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(352) 339-4691

FLORIDA CA#8798, PE#28635
GEORGIA CA#PEF003627, PE#14888



GENERAL NOTES (THIS SHEET)

1. SEE SHEET A-40 FOR ADDITIONAL ELECTRICAL REQUIREMENTS FOR AV SYSTEM AND LIGHTING.
2. PROVIDE TAMPER RESISTANT RECEPTACLES WHERE REQUIRED BY THE NEC, COORDINATE WITH LOCAL AHJ.
3. SEE SHEET E6 FOR PLAN NOTES

POWER PLAN - WORSHIP CENTER - PHASE ONE

SCALE: 3/16" = 1'-0"

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E3

SHEET 3 OF 20

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SCALE

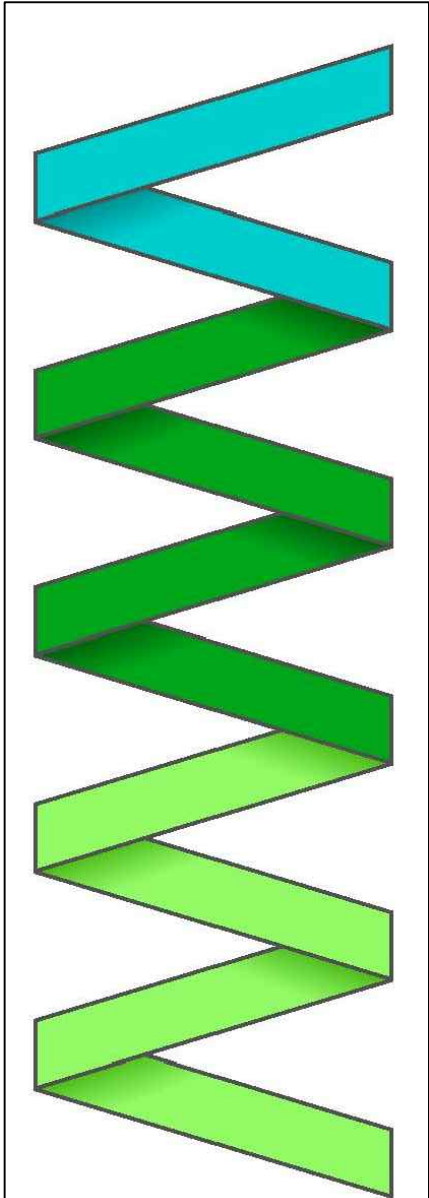
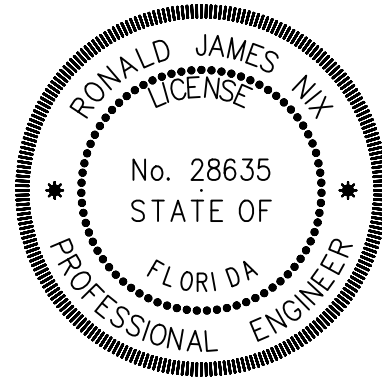
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CARLISLE BAPTIST CHURCH

IRJEIBUILD

835 BERTHE AVENUE

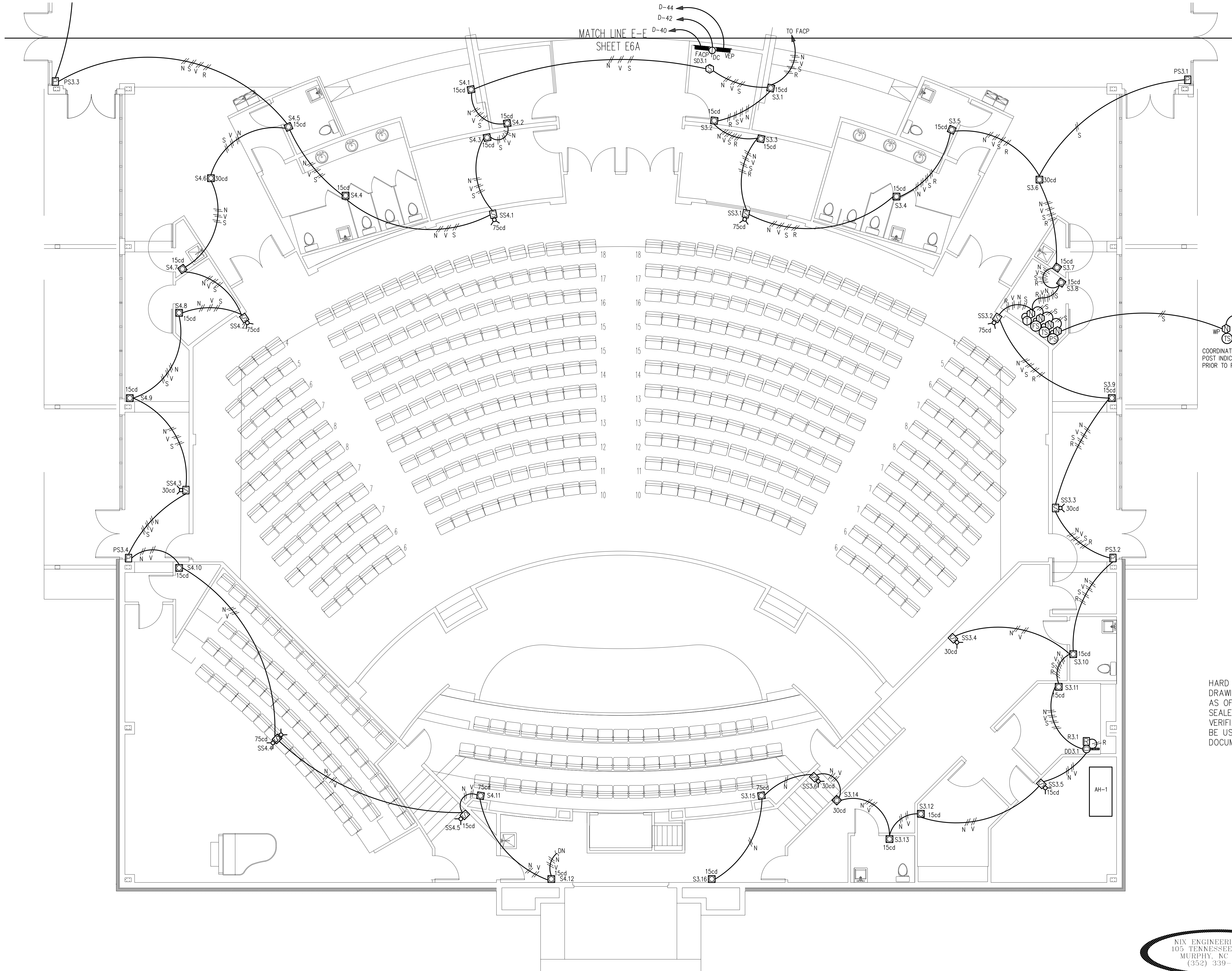
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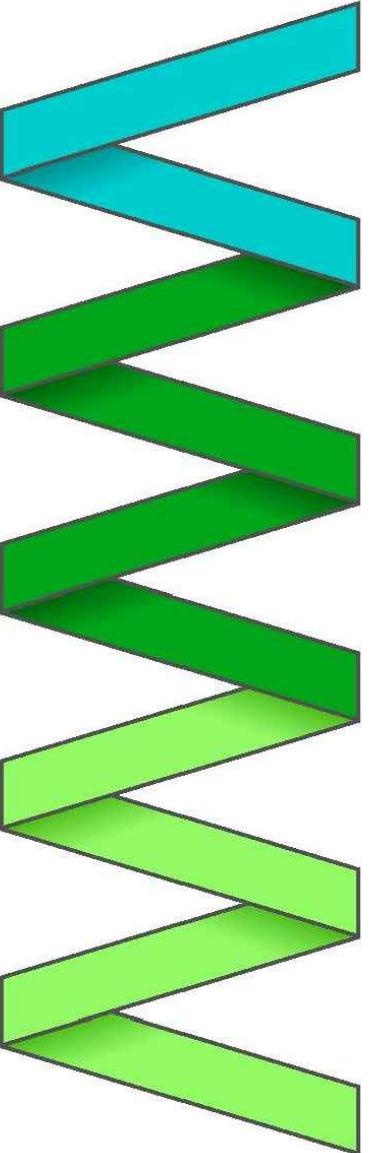
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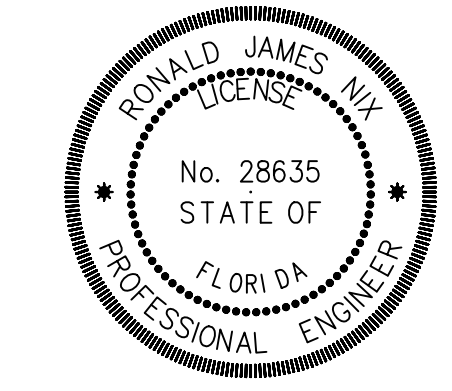
FIRE ALARM PLAN - WORSHIP CENTER - PHASE ONE
SCALE: 3/16" = 1'-0"

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(352) 339-4691

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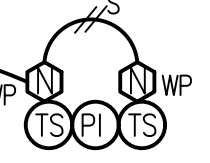


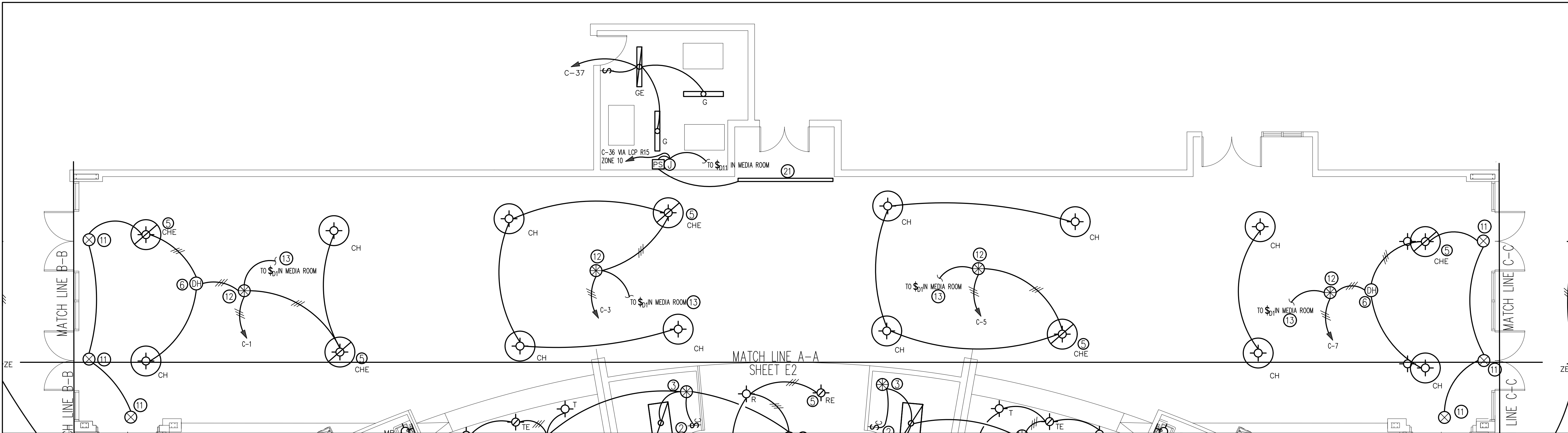
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FIRE ALARM PLAN - WORSHIP CENTER			PROJECT NO. 2236

E4
SHEET 4 OF 20

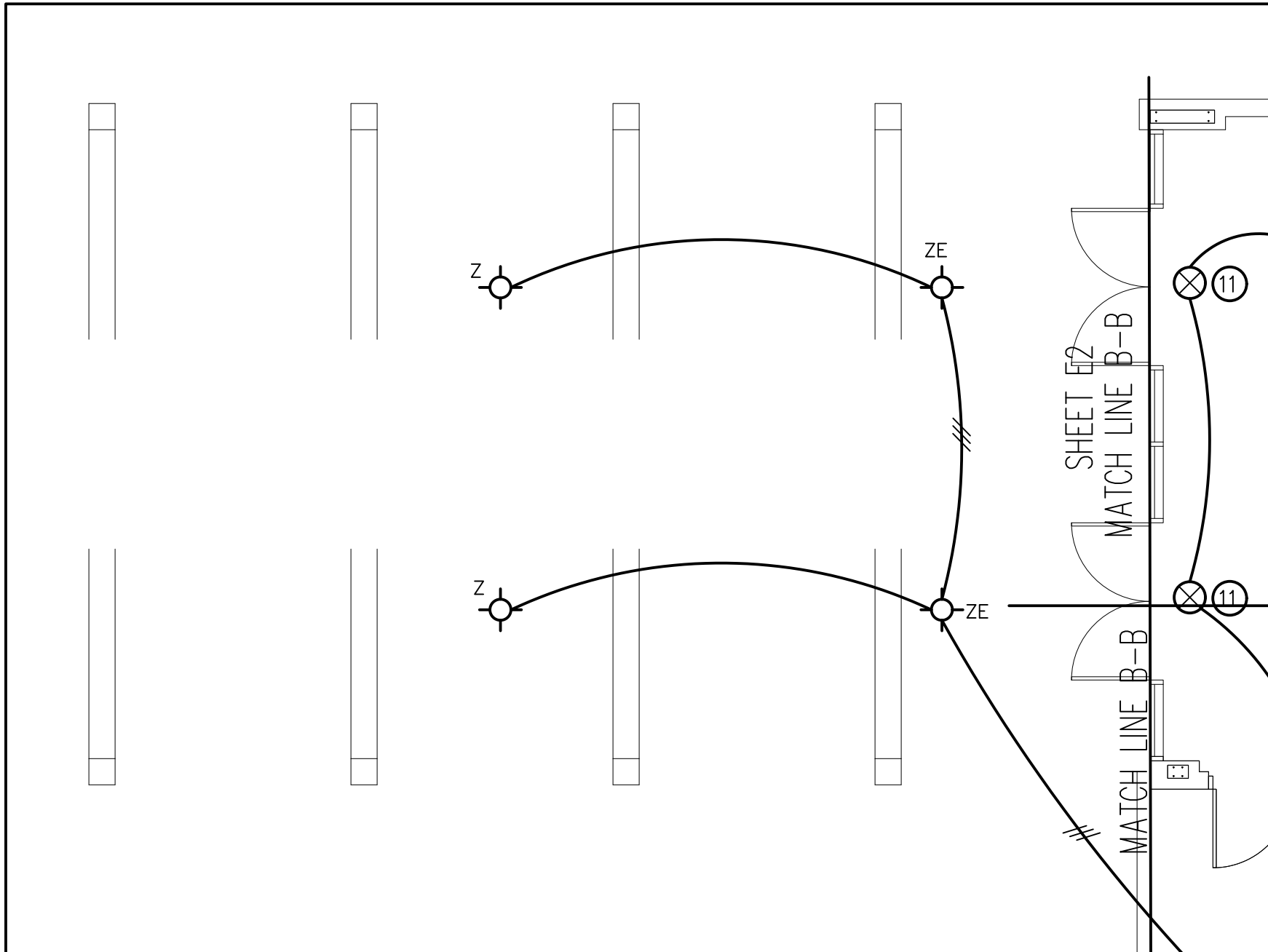
COORDINATE LOCATION OF
POST INDICATOR VALVE
PRIOR TO ROUGH-IN





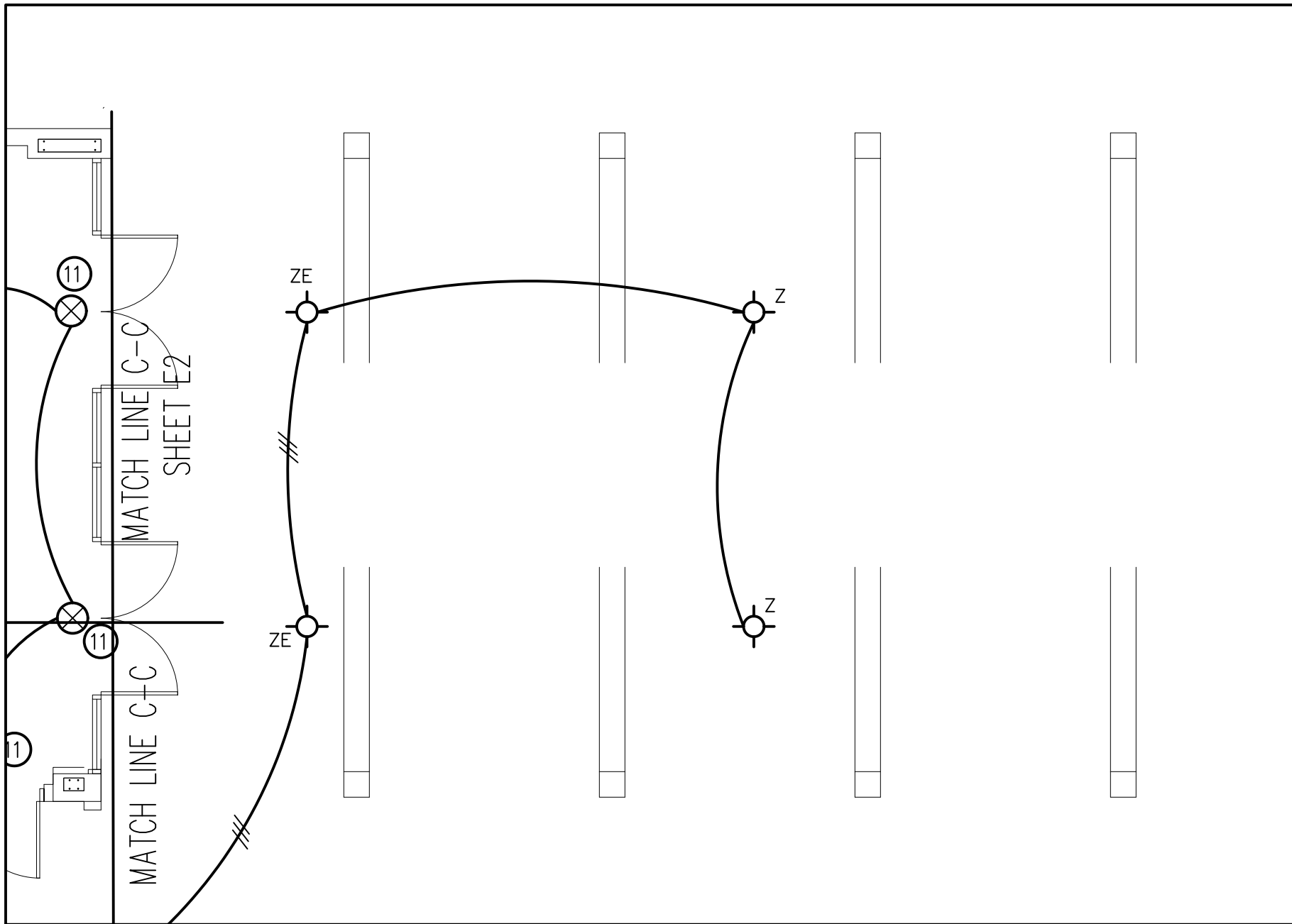
CONCOURSE LIGHTING PLAN - WORSHIP CENTER - PHASE ONE

SCALE: 3/16" = 1'-0"



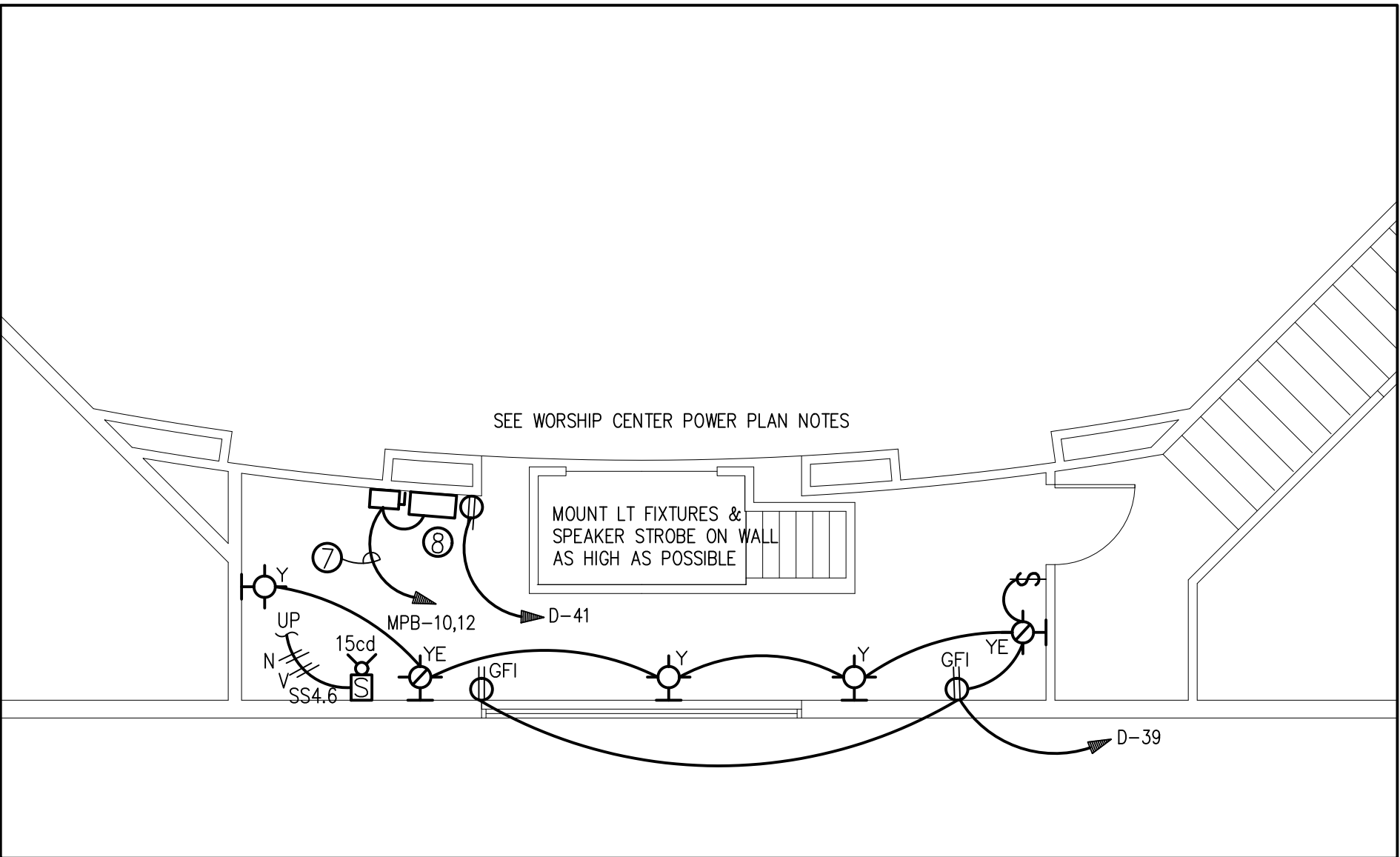
WEST CANOPY LIGHTING PLAN - WORSHIP CENTER - PHASE ONE

SCALE: 3/16" = 1'-0"



EAST CANOPY LIGHTING PLAN - WORSHIP CENTER - PHASE ONE

SCALE: 3/16" = 1'-0"



BAPTISTRY ELECTRICAL PLAN - WORSHIP CENTER - PHASE ONE

SCALE: 3/16" = 1'-0"

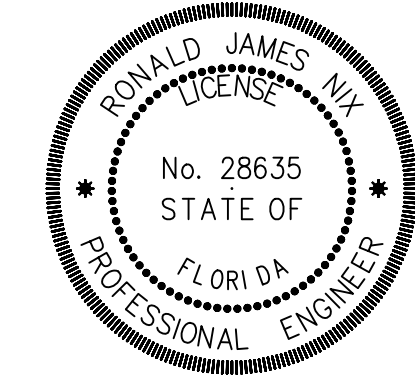
GENERAL NOTE

SEE SHEET E6 FOR PLAN NOTES.

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835 BERTHE AVENUE
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CONCOURSE & CANOPY LIGHTING PLANS, BAPTISTRY ELECTRICAL PLAN - WORSHIP CENTER	

E5
SHEET 5 OF 20
PROJECT NO. 2236

POWER PLAN NOTES
WORSHIP CENTER

- ① MOUNT RECEPTACLE BELOW COUNTER TOP WITH BUSHED ACCESS OPENING, OR FLUSH MOUNTED IN BACK-SPLASH. – COORDINATE WITH MILLWORK. AND ARCHITECT.
- ② TWO 8 AWG THWN CU AND ONE 10 AWG CU GND IN ¾"C. PROVIDE 60A/2P DISCONNECT AND CONNECT WATER HEATER. PROVIDE MOTOR RATED TOGGLE SWITCH FOR RECIRC PUMP DISCONNECT.
- ③ TWO 8 AWG THWN CU AND ONE 10 AWG CU GND IN ¾"C. PROVIDE 60A/2P DISCONNECT AND CONNECT AIR HANDLER.
- ④ TWO 8 AWG THWN CU AND ONE 10 AWG CU GND IN ¾"C. PROVIDE 60A/2P NEMA 3R DISCONNECT AND CONNECT HEAT PUMP.
- ⑤ TWO 10 AWG THWN CU AND ONE 10 AWG CU GND IN ¾/4"C. PROVIDE 60A/2P NEMA 3R DISCONNECT AND CONNECT HEAT PUMP.
- ⑥ TWO 10 AWG THWN CU AND ONE 10 AWG CU GND IN ¾/4"C. CONNECT INSTANTANEOUS WATER HEATER. PROVIDE CIRCUIT BREAKER LOCK-OFF DEVICE FOR DISCONNECT.
- ⑦ THREE 4 AWG THWN CU AND ONE 8 AWG CU GND IN 1–1/4"C. PROVIDE 100A/2P DISCONNECT WITH NEUTRAL KIT AND GROUND LUG. CONNECT BAPTISTRY HEATER
- ⑧ COORDINATE LOCATION OF BAPTISTRY HEATER AND PUMP RECEPTACLE PRIOR TO ROUGH-IN.
- ⑨ THREE 3 AWG THWN CU AND ONE 8 CU GND IN 1–1/4"C. PROVIDE 100A/3P NEMA 3R DISCONNECT AND CONNECT UNIT.
- ⑩ PROVIDE 30A/3P DISCONNECT AND CONNECT INDOOR UNIT.
- ⑪ THREE 2 AWG THWN CU AND ONE 6 CU GND IN 1–1/2"C. PROVIDE 200A/3P NEMA 3R DISCONNECT AND CONNECT UNIT.
- ⑫ THREE 2 AWG THWN CU AND ONE 8 CU GND IN 1–1/2"C. PROVIDE 100A/3P DISCONNECT AND CONNECT UNIT
- ⑬ PROVIDE 30A/2P NEMA 3R DISCONNECT AND CONNECT UNIT.
- ⑭ PROVIDE AUDIO STAGE POCKET FLOOR BOX WITH DUPLEX RECEPTACLE AND UP TO SIX AUDIO CONNECTORS. COORDINATE WITH OWNER'S REPRESENTATIVE PRIOR TO ROUGH-IN AND ORDER.
- ⑮ PROVIDE AUDIO STAGE POCKET WALL BOX WITH DUPLEX RECEPTACLE AND UP TO SIX AUDIO CONNECTORS. COORDINATE WITH OWNER'S REPRESENTATIVE PRIOR TO ORDER. STUB UP 1–1/4"C TO ROOF STRUCTURE WITH ELL AND BUSHING.
- ⑯ COORDINATE WATER COOLER OUTLET LOCATION PRIOR TO ROUGH-IN.
- ⑰ COORDINATE ELECTRIC VALVES CONNECTIONS WITH PLUMBING CONTRACTOR PRIOR TO ROUGH-IN. EC TO INSTALL TRANSFORMERS SUPPLIED BY PLUMBING CONTRACTOR AND MAKE FINAL CONNECTION TO VALVES IAW MANUFACTURER'S INSTRUCTIONS.
- ⑱ LOCATE RECEPTACLES FOR AV EQUIPMENT. COORDINATE WITH OWNER'S REPRESENTATIVE PRIOR TO ROUGH-IN. MAINTAIN SIX FEET CLEAR FROM EDGE OF BAPTISTRY.
- ⑲ LOCATE FOR SUSPENDED TV. COORDINATE LOCATION WITH OWNER'S REPRESENTATIVE PRIOR TO ROUGH-IN.
- ⑳ PROVIDE SINGLE GANG BOX WITH 1" CONDUIT STUBBED ABOVE CEILING WITH PULL STRING, ELL, AND BUSHING FOR TV.
- ㉑ PROVIDE RECEPTACLE UNDER STAGE FOR FILL SPEAKER. COORDINATE PRIOR TO ROUGH-IN.
- ㉒ LOCATE FOR VIDEO PROJECTOR. COORDINATE PRIOR TO ROUGH-IN.
- ㉓ MOUNTING HEIGHTS OF WALL MOUNTED OUTLETS IN THIS AREA TO BE MEASURED FROM TOP OF PLATFORM. SEE ARCHITECTURAL DRAWINGS.
- ㉔ THREE 6 AWG THWN CU AND ONE 10 CU GND IN 1"C. PROVIDE 60A/3P DISCONNECT AND CONNECT UNIT
- ㉕ THREE 6 AWG THWN CU AND ONE 8 CU GND IN 1"C. PROVIDE 100A/3P NEMA 3R DISCONNECT AND CONNECT UNIT. MOUNT DISCONNECT ON 6"x6"x72" PRESSURE TREATED POST WITH 36" BELOW GRADE AND MOUNT TOP OF DISCONNECT FLUSH WITH TOP OF POST.

LCP – 16 RELAY DIGITAL LIGHTING CONTROL PANEL											
BELOW IS A LIST OF RELAYS, CONNECTED CIRCUITS, AND CONNECTED LOADS.											
RELAY		HOURS OF OPERATION*		BREAKER	BREAKER	HOURS OF OPERATION*		DESCRIPTION		RELAY	
		START	END			START	END				
R1	SANCTUARY (ZONE 1)		AM PM		C–9		AM PM		SANCTUARY (ZONE 1)	R2	
R3	PERIMETER DNLTs (ZONE 3)		AM PM		C–13		AM PM		COVE UPLTS (ZONE 2)	R4	
R5	ROSTRUM DOWNLTs (ZONE 4)		AM PM		C–13		AM PM		CHOIR DOWNLTs (ZONE 4)	R6	
R7	FRONT WALL PENDANTS (ZONE 4)		AM PM		C–13		AM PM		RSOTRUM FLOODS (ZONE 5)	R8	
R9	ORCH/CHOIR FLOODS (ZONE 5)		AM PM		C–17		AM PM	PHOTO CELL	CROSS INTERIOR FLOODS (ZONE 6)	R10	
R11	CROSS EXTERIOR FLOODS (ZONE 7)	PHOTO CELL	AM PM		C–30		AM PM	PHOTO CELL	STEEPLE AND SIGN LTS (ZONE 8)	R12	
R13	WALKWAY LTS (ZONE 9)	PHOTO CELL	AM PM		C–36		AM PM		PARKING LOT LIGHTS (ZONE 11)	R14	
R15	STAINED GLASS "JESUS WITH CHILDREN" (ZONE 10)		AM PM		C–36		AM PM		PARKING LOT LIGHTS (ZONE 11)	R16	

LIGHTING PLAN NOTES
WORSHIP CENTER

- ① DUAL TECHNOLOGY WALL MOUNT OCCUPANCY SENSOR.
- ② LIGHTING CONTROL STATION WITH MANUAL ON AND OFF AND 0–10 VOLT DIMMING. 0–10V DIMMING SHALL BE COMPATIBLE WITH LIGHT FIXTURE PROVIDED. INTERCONNECT ALL FIXTURES CONTROLLED WITH 18/2 CONTROL CABLE. DO NOT RUN CONTROLS IN POWER CONDUIT.
- ③ DUAL TECHNOLOGY OCCUPANCY SENSOR WITH POWER PACK. WIRE TO TURN ON MANUALLY AND TURN OFF AUTOMATICALLY.
- ④ DUAL TECHNOLOGY OCCUPANCY SENSOR WITH POWER PACK. WIRE TO TURN ON AND OFF AUTOMATICALLY
- ⑤ LIGHT FIXTURE TO DIM TO 20%+/- OUTPUT DURING UNOCCUPIED PERIODS (SCHEDULED OR SENSOR CONTROLLED).
- ⑥ DAYLIGHT HARVESTING SENSOR WITH POWER PACK. CONNECT IN SERIES WITH OCCUPANCY CONTROLS. CALIBRATE TO MAINTAIN LIGHT LEVEL AT 45 FOOTCANDLES AND TO TURN OFF ASSOCIATED LIGHT FIXTURES WHEN DAYLIGHT LEVEL EXCEEDS 50 FOOTCANDLES. BYPASS LIGHTING CONTROLS WITH UNSWITCHED LEG FOR EMERGENCY LIGHTING.
- ⑦ EIGHT BUTTON DIGITAL SWITCH COMPATIBLE WITH LIGHTING CONTROL PANEL. CONNECT TO LIGHTING CONTROL PANEL PER MANUFACTURER'S INSTRUCTIONS. ENGRAVE BUTTONS: SANCTUARY, COVE UP LTS, COVE DOWN LTS, STAGE DOWN LTS, STAGE FLOODS, ALL ON, ALL OFF. COORDINATE ENGRAVING WITH OWNER'S REPRESENTATIVE.
- ⑧ OCCUPANCY SENSOR SLAVE
- ⑨ LIGHTING CONTROL STATION AS IN NOTE 2 ABOVE EXCEPT CAPABLE OF CONTROL FROM MULTIPLE LOCATIONS.
- ⑩ HIGH BAY OCCUPANCY SENSOR WITH POWER PACK. WIRE TO TURN ON MANUALLY AND TURN OFF AUTOMATICALLY.
- ⑪ COORDINATE INSTALLATION OF EXIT LIGHTS ON STORE FRONT WITH ARCHITECT PRIOR TO ROUGH-IN. AS A MINIMUM PENDANT MOUNT TO REQUIRED HEIGHT AND ATTACH TO STORE FRONT PER ARCHITECT'S INSTRUCTIONS.
- ⑫ HIGH BAY OCCUPANCY SENSOR WITH POWER PACK. WIRE TO TURN ON AND OFF AUTOMATICALLY.
- ⑬ PROVIDE 0–10V DIMMER COMPATIBLE WITH LIGHT FIXTURES PROVIDED. PROVIDE ENGRAVED PLATE. COORDINATE LOCATION AND PLATE ENGRAVING WITH OWNER'S REPRESENTATIVE. INTERCONNECT ALL FIXTURES ON THIS CIRCUIT WITH 18/2 CONTROL CABLE. DO NOT RUN CONTROLS IN POWER CONDUIT.
- ⑭ PROVIDE ELV DIMMER COMPATIBLE WITH LIGHT FIXTURES PROVIDED. PROVIDE ENGRAVED PLATE. COORDINATE LOCATION AND PLATE ENGRAVING WITH OWNER'S REPRESENTATIVE.
- ⑮ MOUNT THREE FIXTURES VERTICALLY ON WALL EVEN WITH QUARTER POINTS OF THE CROSS.
- ⑯ LOCATE FOR STAGE LIGHTING. COORDINATE PRIOR TO ROUGH-IN.
- ⑰ LOCATE FOR ALTERNATE HOUSE LIGHTING BY OTHERS. COORDINATE PRIOR TO BID AND ROUGH-IN.
- ⑱ FLOATING CEILING. SEE ARCHITECTURAL DETAILS.
- ⑲ DIMMING SWITCHES LOCATION. PROVIDE SCENE CONTROLLER FOR PRESET LIGHTING SCENES. COORDINATE CIRCUITS ON SCENE CONTROLLER WITH OWNER'S REPRESENTATIVE.
- ㉑ PROVIDE DIGITAL PHOTO CELL COMPATIBLE WITH LIGHTING CONTROL PANEL. MOUNT 12FT +/- AFF AND AIM NORTHEAST.
- ㉒ PROVIDE BACKLIGHT PANEL FOR 10FT WIDE X 14FT HIGH STAINED GLASS. PANEL TO BE BY GLOWBACKLED OR EQUAL AND SHALL BE 4000 DEGREE KELVIN WITH 0–10V POWER SUPPLIES. PROVIDE 0–10V DIMMER SWITCH IN MEDIA ROOM AS IN NOTE 13 ABOVE. MOUNT POWER SUPPLIES IN EDUCATION BUILDING SECOND FLOOR MECHANICAL ROOM. COORDINATE INSTALLATION WITH ARCHITECT.

LIGHTING FIXTURE SCHEDULE						
TYPE	MANUFACTURER	CATALOG No.	LAMPS		MOUNTING	REMARKS
			No.	TYPE		
A	LSI LIGHTING	LPEC24 113768 LED 60L UNV DIM1 35	1	47 WATT 6,133 LUMEN LED ARRAY	CEILING RECESSED	
B	LSI LIGHTING	SFP24 424 LED 50 UE DIM 35	1	50 WATT 5052 LUMEN LED ARRAY	CEILING RECESSED	
C	LSI LIGHTING	SFP22 424 LED 30 UE DIM 35	1	30 WATT 2953 LUMEN LED ARRAY	CEILING RECESSED	
CH	LIGHTSMITH	PD–9611–WHA–SBB–120–77 CUSTOM–DIM–L623	4 6	23 WATT LED 23 WATT LED DNLT	PENDANT TO 18 FT AFF	
D	LSI LIGHTING	LPEC22 113768 LED 32L UNV DIM1 35	1	26 WATT 3367 LUMEN LED ARRAY	CEILING RECESSED	
E	LSI LIGHTING	SFP24 424 LED FS 35W UNV DIM 35	1	35 WATT 3926 LUMEN LED ARRAY	CEILING RECESSED	
F	LSI LIGHTING	LPEC24 113768 LED 48L UNV DIM1 35	1	37 WATT 4908 LUMEN LED ARRAY	CEILING RECESSED	
FLA	JESCO LIGHTING	CM–208–L562L–3590–24D–WH	1	36 WATT 2700 LUMEN LED ARRAY	CEILING CANOPY MOUNT	
FLB	JESCO LIGHTING	CM–208–L562L–3590–38D–WH	1	36 WATT 2700 LUMEN LED ARRAY	CEILING CANOPY MOUNT	
G	LSI LIGHTING	SDL4 424 LED 50L FL UNV DIM1 35 80CRI	1	38 WATT 5017 LUMEN LED ARRAY	CEILING SURFACE	
H	LSI LIGHTING	SDL2 424 LED 30L FL UNV DIM1 35 80CRI	1	24 WATT 3077 LUMEN LED ARRAY	CEILING SURFACE	
J	LSI LIGHTING	W444 113768 LED SS NW UE EM	1	35 WATT 3770 LUMEN LED ARRAY	WALL @ 8'–0" ABOVE NEAREST STEP OR LANDING	NO PART OF FIXTURE TO BE CLOSER THAN 96" ABOVE ANY STEP OR LANDING
K	WF HARRIS	100–18–LED–4K4–LSS–3	1	40 WATT 4400 LUMEN LED ARRAY	WALL @ 18" BELOW ELEVATOR STOP	
L	LSI LIGHTING	LAD6–424–LED–25L–UNV– DIM1–35–WF–TR6R–SF HAZ & 786277 EM BATT	1	22 WATT 2333 LUMEN LED ARRAY	CEILING RECESSED	REMOTE EMERGENCY BATTERY
M	JESCO	RLET 8150 SW3 35K 50W HZWH 208 & RLH 8150–A	1	50 WATT 5000 LUMEN LED ARRAY	CEILING RECESSED	
MB	LUM–TECH	LT32170 315 24"	1	24 WATT 1700 LUMEN LED ARRAY	WALL @ 6'–8" ABOVE MIRROR	
N	LSI	SDL8 424 LED 80L FL UNV DIM1 35 80CRI	1	62 WATT 8212 LUMEN LED ARRAY	COVE	
P	LIGHTRSMITH	PD 10003 MOD8W–MOD16H SBP ACC48 010V ACC W 77	1	80 WATT 7500 LUMEN LED ARRAY	AIRCRAFT CABLE TO 25'–6" AFF	**FIELD DETERMINE – LENGTH VARIES WITH LOCATION
R	JESCO	RLET–8150–208 SW3–35K–40W– HZWH & RLH–8150–A	1	42 WATT 4300 LUMEN LED ARRAY	CEILING RECESSED	
S	JESCO	RLH 208 60 12 JB NIC 3080 WHWH	1	12.5 WATT 910 LUMEN LED ARRAY	CEILING RECESSED	
SL	LSI	LAW2 424 W 8 15L 830 FA N 1 UNV BRZ	1	96 WATT 11,800 LUMEN LED ARRAY	WALL ABOVE SIGN	PROVIDE STAINLESS STEEL FASTENERS. COORDINATE W/MFGR
T	JESCO	RLET–6130–SW3–35K–23W–HZWH 208 & RLH–6130–A	1	23 WATT 2500 LUMEN LED ARRAY	CEILING RECESSED	
U	LSI	XFLM 113768 VF LED 49 HO NW UNV BRZ/BKA XFLM SMC BRZ	1	64 WATT 5197 LUMEN LED ARRAY	STANCHION MOUNT APPROX 18" AFF. PROVIDE 12" DIA X 18"D CONCRETE BASE 4" AFG	AIM TO BEST ILLUMINATE CROSS
V	LSI	XFLM 113768 VF LED 28 HO NW UNV BRZ YM	1	36 WATT 3155 LUMEN LED ARRAY	YOKE MOUNT ON ROOF PER ARCHITECT AND ROOFER INSTRUCTIONS	AIM TO BEST ILLUMINATE STEEPLE
W	LSI LIGHTING	XWS 424 LED 5L SL FT UNV DIM 40 70CRI PCI120 BRZ SP1	1	39 WATT 5383 LUMEN LED ARRAY	WALL APPROX 20 FT AFF	
Y	WF HARRIS	300–18–LED–1K–OW–HB–C4	1	10 WATT 1200 LUMEN LED ARRAY	CEILING OF CANOPY. PROVIDE MOUNTING STRUT FOR CONDUIT AND FIXTURE	
Z	WF HARRIS	1200–18–LED–4K–HB–C4–18	1	40 WATT 4000 LUMEN LED ARRAY	CEILING OF CANOPY. PROVIDE MOUNTING STRUT FOR CONDUIT AND FIXTURE	
⊗	TELESIS	TLX–2206–EM–RU–W–SD1	1	2W LED ARRAY	WALL OR CEILING APPROX 12" ABOVE DOOR	

NOTE: SUFFIX 'E' TO FIXTURE TYPE DENOTES EMERGENCY BATTERY PACK INSTALLED AND CONNECTED AHEAD OF ALL SWITCHING

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SHEET 6 OF 20

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2236

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NIX

REVIEWED BY
RN

ISSUE DATE
05/06/2024

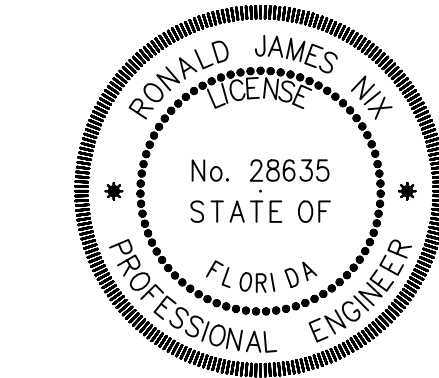
SCALE
3/16"=1'

CARLENE BAPTIST CHURCH

IRIE BUILD

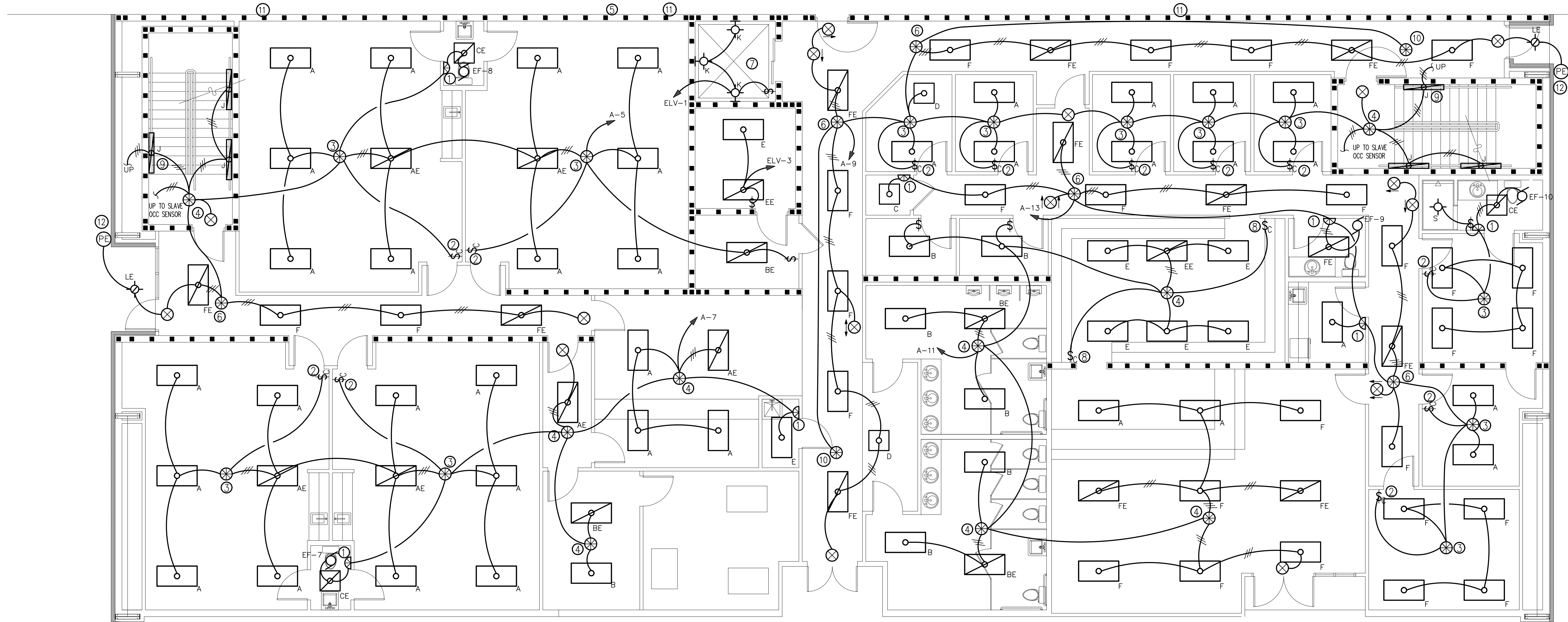
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PANAMA CITY, FLORIDA



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FIRST FLOOR LIGHTING PLAN - EDUCATION BUILDING - PHASE TWO
SCALE: 3/16" = 1'-0"

PLAN NOTES

- ① DUAL TECHNOLOGY WALL MOUNT.OCCUPANCY SENSOR.
- ② LIGHTING CONTROL STATION WITH MANUAL ON AND OFF AND 0-10 VOLT DIMMING. 0-10V DIMMING SHALL BE COMPATIBLE WITH LIGHT FIXTURE PROVIDED. INTERCONNECT ALL FIXTURES CONTROLLED WITH 18/2 CONTROL CABLE. DO NOT RUN CONTROLS IN POWER CONDUIT.
- ③ DUAL TECHNOLOGY OCCUPANCY SENSOR EQUAL TO WITH POWER PACK. WIRE TO TURN ON MANUALLY AND TURN OFF AUTOMATICALLY.
- ④ DUAL TECHNOLOGY OCCUPANCY SENSOR WITH POWER PACK. WIRE TO TURN ON AND OFF AUTOMATICALLY
- ⑤ TWO VERTICAL CONDUITS ON EXTERIOR OF EXISTING BUILDING TO BE REROUTED TO INTERIOR OF EXISTING BUILDING. ALL WORK IN EXISTING BUILDING TO BE CONCEALED. COORDINATE WITH ARCHITECT. CONTRACTOR TO FIELD VERIFY EXISTING CONDITIONS PRIOR TO BID.
- ⑥ OCCUPANCY SENSOR WITH POWER PACK AND HALLWAY COVERAGE PATTERN (10FT X 90 FT). WIRE TO TURN ON AND OFF AUTOMATICALLY.

- ⑦ MOUNT LIGHTS AND RECEPTACLE IN ELEVATOR PIT 18" BELOW ELEVATOR STOP. MOUNT SWITCH 42" ABOVE THE SEAL PLATE ADJACENT TO THE LADDER. FIELD COORDINATE.
- ⑧ LIGHTING CONTROL STATION AS IN NOTE 2 ABOVE EXCEPT CAPABLE OF CONTROL FROM MULTIPLE LOCATIONS.
- ⑨ MOUNT AS HIGH AS POSSIBLE BELOW STAIR RISER.
- ⑩ OCCUPANCY SENSOR SLAVE WITH HALLWAY COVERAGE.
- ⑪ EXISTING SECURITY LIGHT FIXTURE APPROXIMATELY 20FT AFG ON EXISTING BUILDING TO BE REMOVED. REMOVE CONDUCTORS TO FIRST OUTLET REMAINING IN SERVICE. EXTEND CIRCUIT AS REQUIRED TO MAINTAIN EXISTING OUTLETS TO REMAIN IN SERVICE. ALL WORK IN EXISTING BUILDING TO BE CONCEALED. COORDINATE WITH ARCHITECT. CONTRACTOR TO FIELD VERIFY EXISTING CONDITIONS PRIOR TO BID.
- ⑫ PHOTOCELL EQUAL TO TORK 2100 SERIES. MOUNT APPROXIMATELY 10FT AFF. PROVIDE WEATHERPROOF INSTALLATION AND AIM NORTH.

GENERAL NOTES

- 1. BYPASS LIGHTING CONTROLS WITH UNSWITCHED LEG FOR ALL EMERGENCY AND EXIT LIGHTS.

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(352) 339-4691
FLORIDA CA#8798, PE#28635
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E8

SHEET 8 OF 20

PROJECT NO. 2236

PREPARED BY NIX

REVIEWED BY RN

ISSUE DATE 05/06/2024

SCALE 3/16"=1'

CARLISE BAPTIST CHURCH

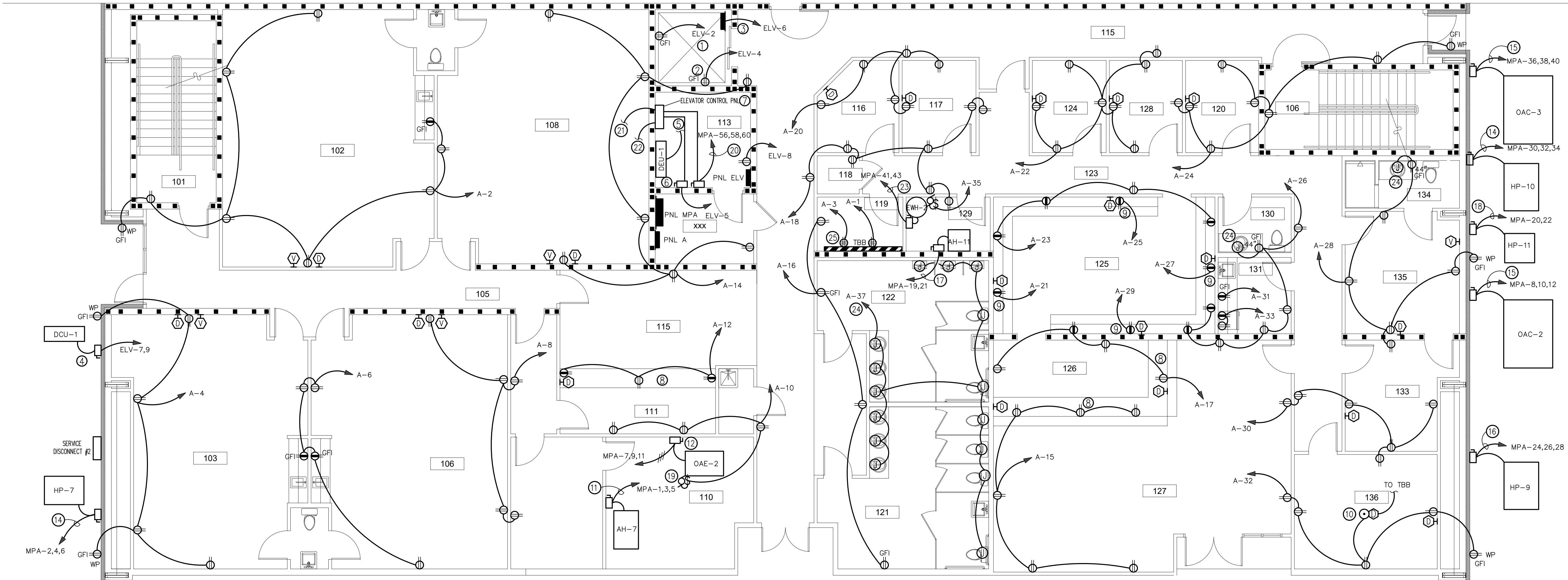
IRJEIBUILD

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FIRST FLOOR POWER PLAN - EDUCATION BUILDING - PHASE TWO
SCALE: 3/16" = 1'-0"

PLAN NOTES (THIS SHEET)

- RECEPTACLES TO BE MOUNTED 18" BELOW ELEVATOR STOP.
- LOCATE RECEPTACLE FOR SUMP PUMP.
- CONNECT OIL DETECTION ALARM SYSTEM.
- PROVIDE 30A/2P NEMA 3R DISCONNECT AND CONNECT CONDENSING UNIT.
- CONNECT INDOOR UNIT TO OUTDOOR UNIT PER MANUFACTURER'S INSTRUCTIONS.
- PROVIDE 30A/2P HD DISCONNECT WITH DOOR INTERLOCK FOR CAB LIGHTS. CONNECT TO ELEVATOR CONTROL PANEL.
- COORDINATE LOCATION WITH ELEVATOR INSTALLATION PRIOR TO ROUGH-IN.
- MOUNT RECEPTACLE BELOW COUNTER TOP WITH BUSHED ACCESS OPENING, OR FLUSH MOUNTED IN BACK-SPLASH. COORDINATE WITH MILLWORK AND ARCHITECT.
- PROVIDE ENGRAVED PLATE: "DEDICATED CIRCUIT"
- PROVIDE FLOOR BOX EQUAL TO LEGRAND RFB2-OG WITH BLANK FLANGED COVER ASSEMBLY, DUPLEX RECEPTACLE AND TWO CAT 6 DATA JACKS. RUN TWO CAT 6 DATA CABLES TO DATA EQUIPMENT RACK IN 3/4" PVC.

- THREE 3 AWG THWN CU AND ONE 8 AWG CU GND IN 1-1/4"C. PROVIDE 100A/3P DISCONNECT AND CONNECT AIR HANDLER.
- PROVIDE 30A/3P DISCONNECT AND CONNECT INDOOR UNIT.
- NOT USED
- THREE 8 AWG THWN CU AND ONE 10 AWG CU GND IN 3/4"C. PROVIDE 60A/3P NEMA 3R DISCONNECT AND CONNECT HEAT PUMP.
- THREE 6 AWG THWN CU AND ONE 10 AWG CU GND IN 1"C. PROVIDE 60A/3P NEMA 3R DISCONNECT AND CONNECT OUTSIDE AIR UNIT.
- THREE 6 AWG THWN CU AND ONE 10 AWG CU GND IN 1"C. PROVIDE 100A/3P NEMA 3R DISCONNECT AND CONNECT HEAT PUMP.
- TWO 8 AWG THWN CU AND ONE 10 AWG CU GND IN 3/4"C. PROVIDE 60A/2P DISCONNECT AND CONNECT AIR HANDLER.
- TWO 8 AWG THWN CU AND ONE 10 AWG CU GND IN 3/4"C. PROVIDE 60A/2P NEMA 3R DISCONNECT AND CONNECT HEAT PUMP.

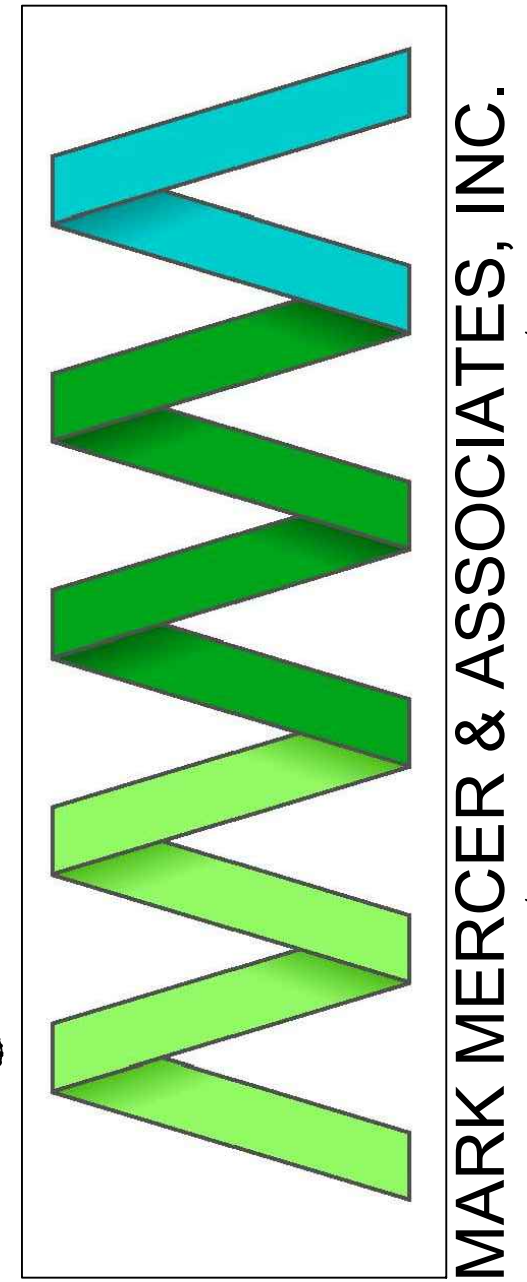
- PROVIDE TOGGLE SWITCH FOR DAMPER MOTOR DISCONNECT AND CONNECT DAMPER MOTOR.
- THREE 4 AWG THWN CU AND ONE 8 AWG CU GND IN 1-1/2"C. PROVIDE 100A/3P HD DISCONNECT FUSED AT 90 AMPS RK-5. PROVIDE DOOR INTERLOCK AND AUXILIARY CONTACT. CONNECT CONTACT TO ELEVATOR CONTROL PANEL WITH TWO 14 AWG STRANDED COPPER AND ONE 14 AWG CU GND IN 1/2"C. COORDINATE ELECTRICAL REQUIREMENTS PRIOR TO ROUGH-IN AS NO VENDOR DRAWINGS WERE AVAILABLE AT TIME OF DESIGN.
- CAT 5 CABLE IN 3/4"C TO TBB.
- FOUR 14 AWG THWN CU IN 3/4"C TO FCP. COORDINATE WITH FIRE ALARM SYSTEM.
- TWO 8 AWG THWN CU AND ONE 10 AWG CU GND IN 3/4"C. PROVIDE 60A/2P DISCONNECT AND CONNECT WATER HEATER. PROVIDE MOTOR RATED TOGGLE SWITCH FOR RECIRC PUMP DISCONNECT.
- COORDINATE ELECTRIC VALVES CONNECTIONS WITH PLUMBING CONTRACTOR PRIOR TO ROUGH-IN. EC TO INSTALL TRANSFORMERS SUPPLIED BY PLUMBING CONTRACTOR AND MAKE FINAL CONNECTION TO VALVES IAW MANUFACTURER'S INSTRUCTIONS.
- PROVIDE 72 PORT CAT 6 PATCH PANEL WITH CABLE MANAGEMENT. PROVIDE CABLE TERMINATION AND TESTING

GENERAL NOTES

- PROVIDE TAMPER RESISTANT RECEPTACLES WHERE REQUIRED BY THE NEC. COORDINATE WITH LOCAL AHJ.

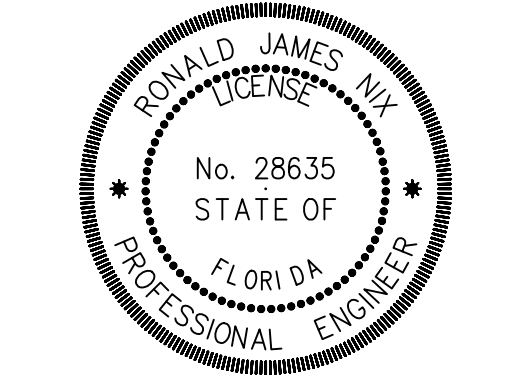
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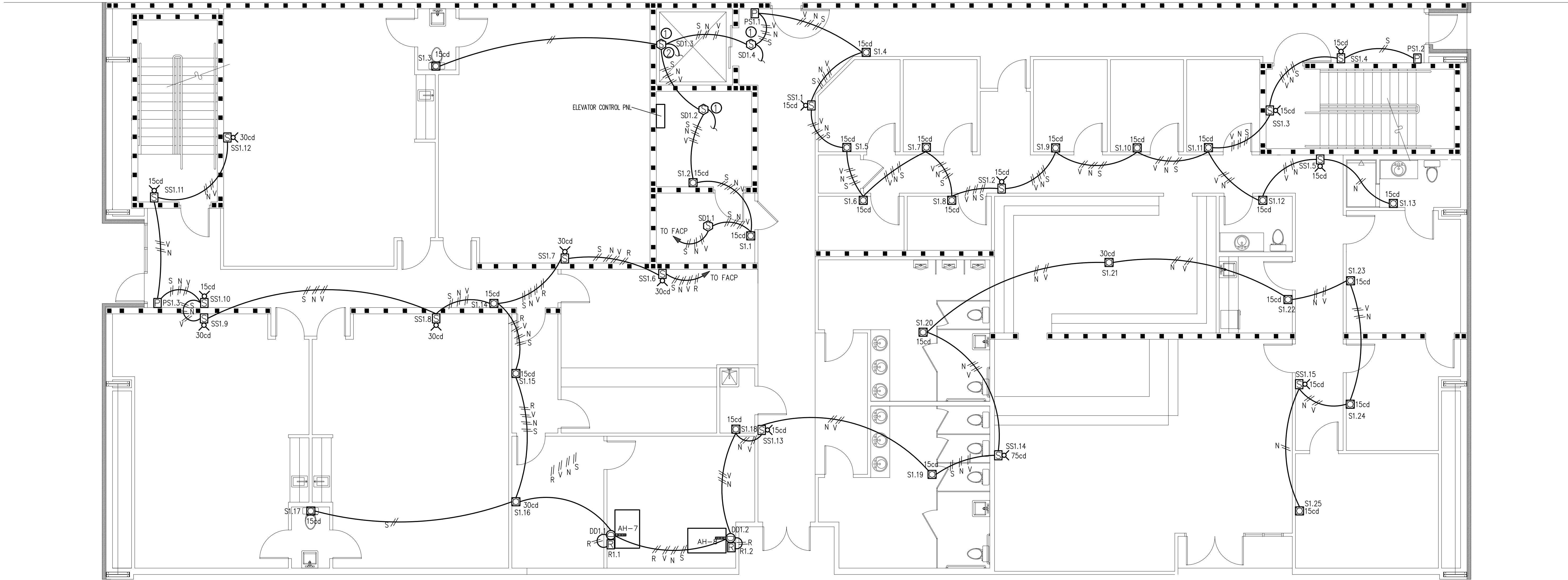


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CARLISLE BAPTIST CHURCH
IRJE BUILD
835 BERTHE AVENUE
PANAMA CITY, FLORIDA



PREPARED BY NIX	REVIEWED BY RN	ISSUE DATE 05/06/2024	SCALE 3/16"=1'
E9		SHEET 9 OF 20	
PROJECT NO. 2236		FIRST FLOOR POWER PLAN - EDUCATION BUILDING	

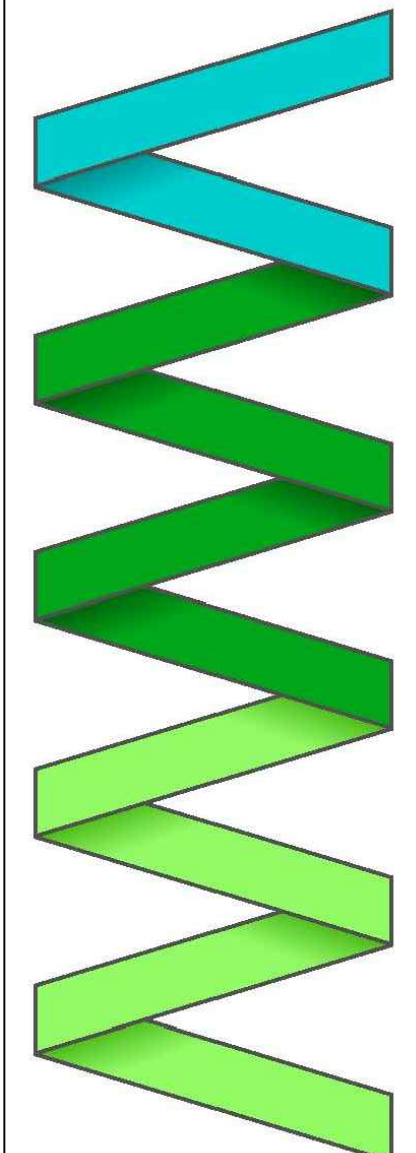


FIRST FLOOR FIRE ALARM PLAN - EDUCATION BUILDING - PHASE TWO
SCALE: 3/16" = 1'-0"

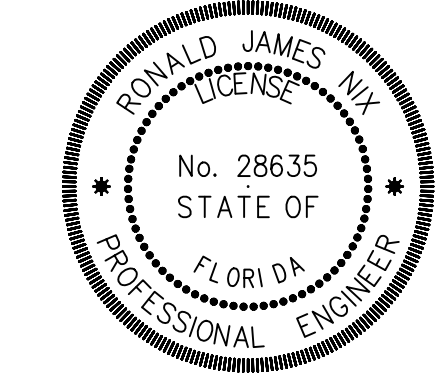
PLAN NOTES

- ① PROVIDE SMOKE DETECTOR WITH AUXILIARY CONTACT. CONNECT CONTACT TO ELEVATOR CONTROL PANEL WITH TWO 14 AWG THWN STRANDED COPPER CONDUCTORS IN 1/2" C.
- ② WALL MOUNT 18" BELOW ELEVATOR STOP

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MURPHY, NC 28906
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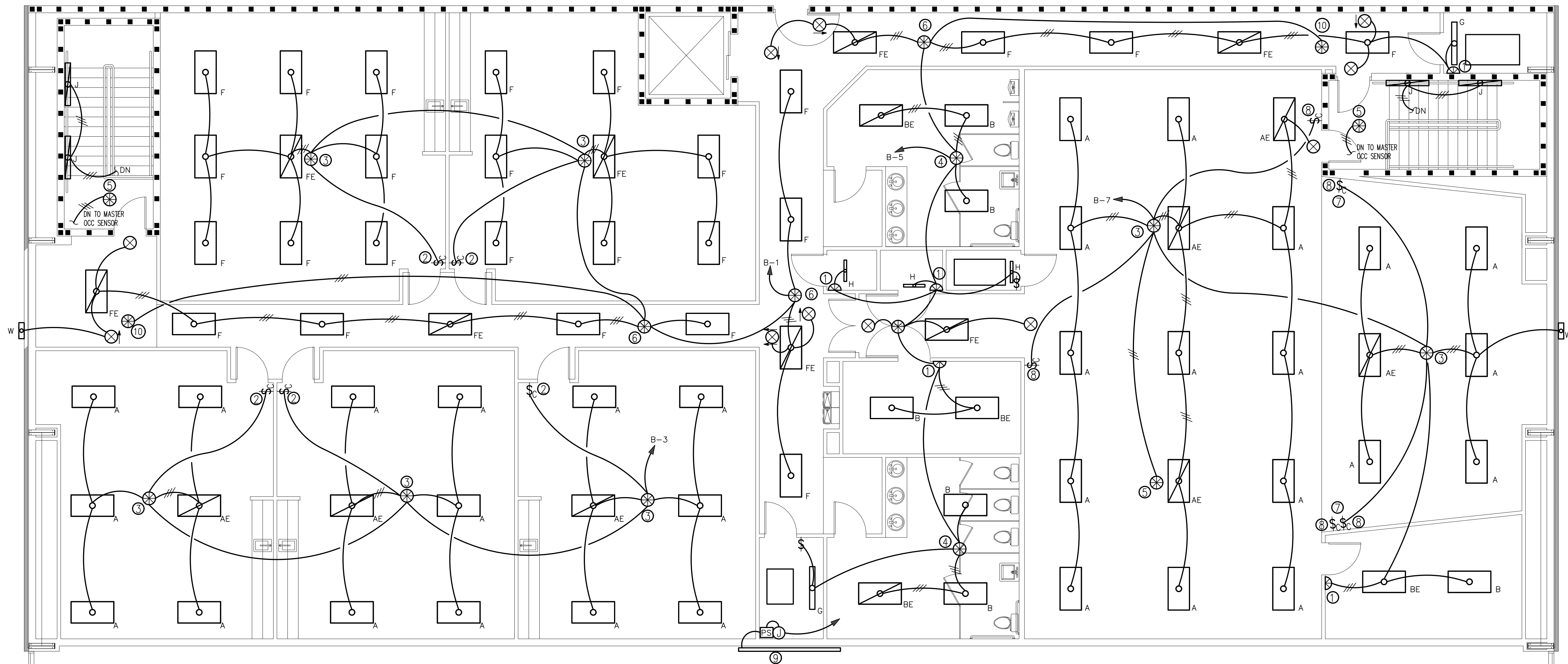


CARLISLE BAPTIST CHURCH
REBUILD
835 BERTHE AVENUE
PANAMA CITY, FLORIDA

PREPARED BY NIX	REVIEWED BY RN	ISSUE DATE 05/06/2024	SCALE 3/16"=1'
PROJECT NO. 2236			FIRST FLOOR FIRE ALARM PLAN - EDUCATION BUILDING

E10

SHEET 10 OF 20



SECOND FLOOR LIGHTING PLAN - EDUCATION BUILDING - PHASE TWO
SCALE: 3/16" = 1'-0"

PLAN NOTES

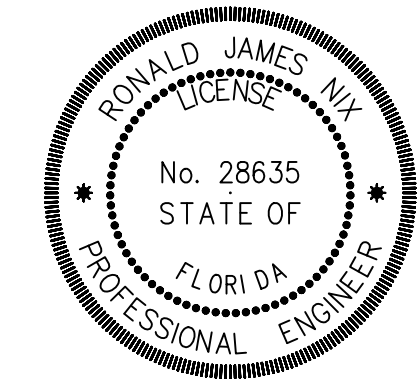
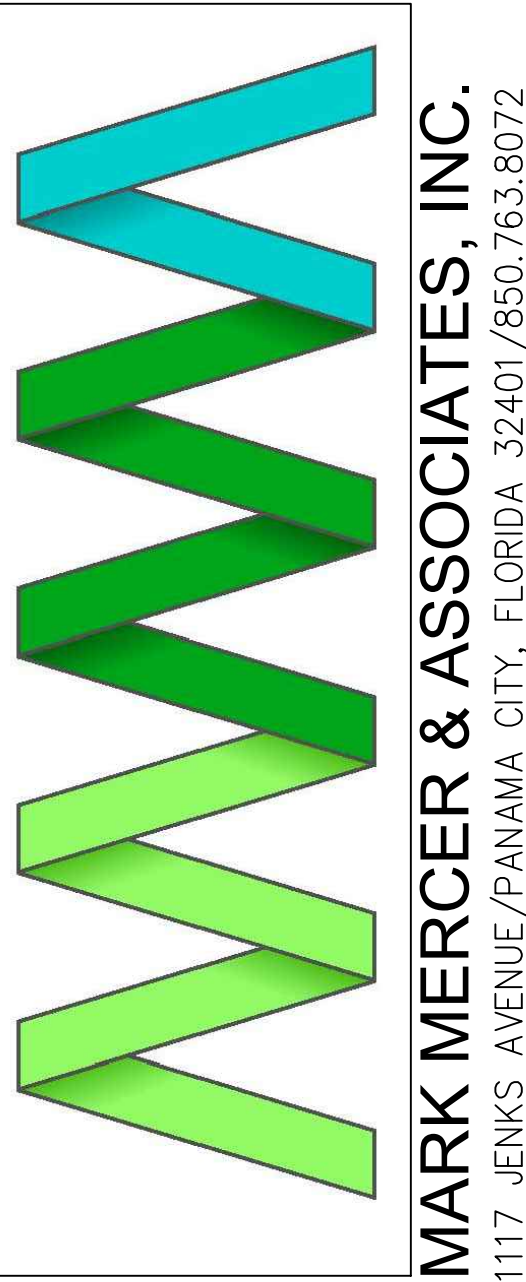
- ① DUAL TECHNOLOGY WALL MOUNT OCCUPANCY SENSOR.
- ② LIGHTING CONTROL STATION WITH MANUAL ON AND OFF AND 0-10 VOLT DIMMING. 0-10V DIMMING SHALL BE COMPATIBLE WITH LIGHT FIXTURE PROVIDED. INTERCONNECT ALL FIXTURES CONTROLLED WITH 18/2 CONTROL CABLE. DO NOT RUN CONTROLS IN POWER CONDUIT.
- ③ DUAL TECHNOLOGY OCCUPANCY SENSOR EQUAL TO WITH POWER PACK. WIRE TO TURN ON MANUALLY AND TURN OFF AUTOMATICALLY.
- ④ DUAL TECHNOLOGY OCCUPANCY SENSOR WITH POWER PACK. WIRE TO TURN ON AND OFF AUTOMATICALLY
- ⑤ OCCUPANCY SENSOR SLAVE
- ⑥ OCCUPANCY SENSOR WITH POWER PACK AND HALLWAY COVERAGE PATTERN (10FT X 90 FT). WIRE TO TURN ON AND OFF AUTOMATICALLY.
- ⑦ MOUNTING HEIGHTS OF WALL MOUNTED OUTLETS IN THIS AREA TO BE MEASURED FROM TOP OF PLATFORM. SEE ARCHITECTURAL DRAWINGS.
- ⑧ LIGHTING CONTROL STATION AS IN NOTE 2 ABOVE EXCEPT CAPABLE OF CONTROL FROM MULTIPLE LOCATIONS.
- ⑨ BACKLIGHT PANEL AND POWER SUPPLY. SEE SHEET E5.
- ⑩ OCCUPANCY SENSOR SLAVE WITH HALLWAY COVERAGE.

GENERAL NOTES

1. BYPASS LIGHTING CONTROLS WITH UNSWITCHED LEG FOR ALL EMERGENCY AND EXIT LIGHTS.

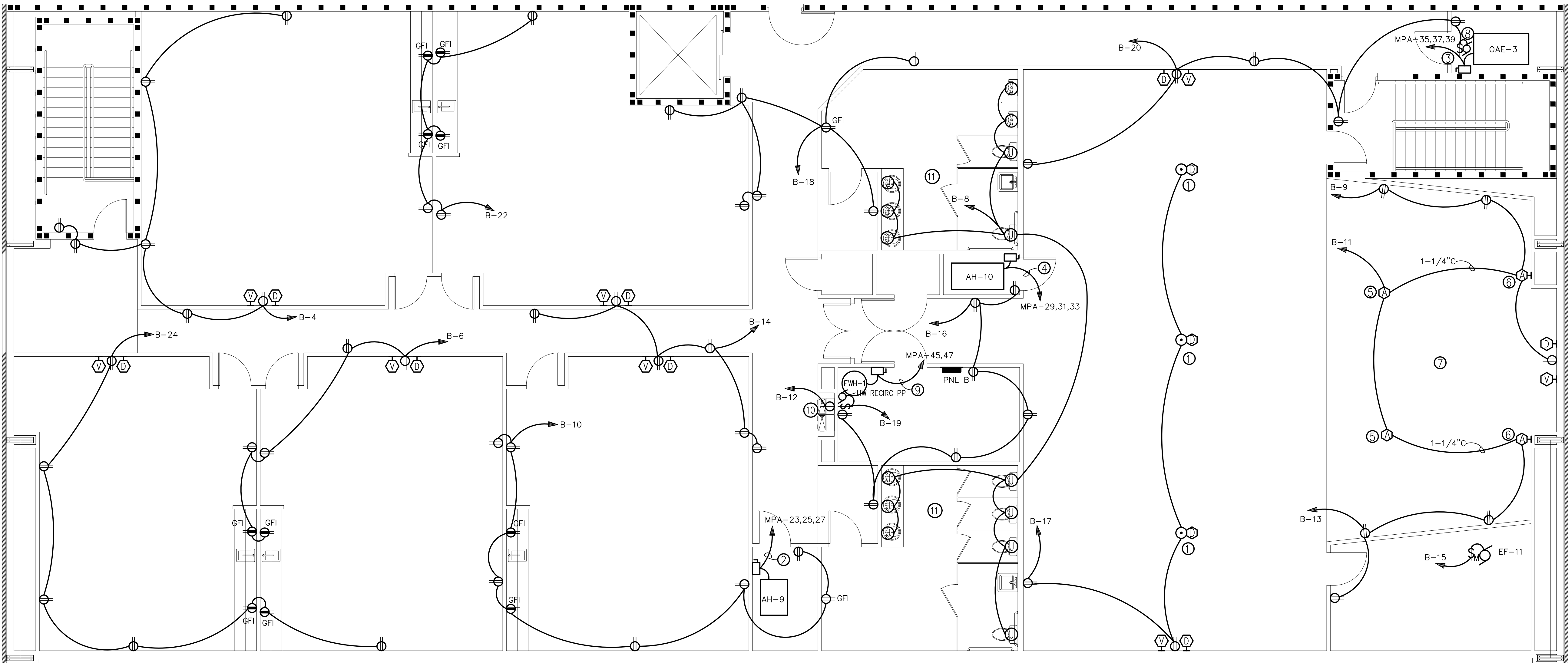
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CARLISLE BAPTIST CHURCH
IRIEB UJULID
855 BERTHE AVENUE
PANAMA CITY, FLORIDA

E11
SHEET 11 OF 20
PROJECT NO. 2236
SECOND FLOOR LIGHTING PLAN - EDUCATION BUILDING



SECOND FLOOR POWER PLAN - EDUCATION BUILDING - PHASE TWO

SCALE: 3/16" = 1'-0"

PLAN NOTES (THIS SHEET)

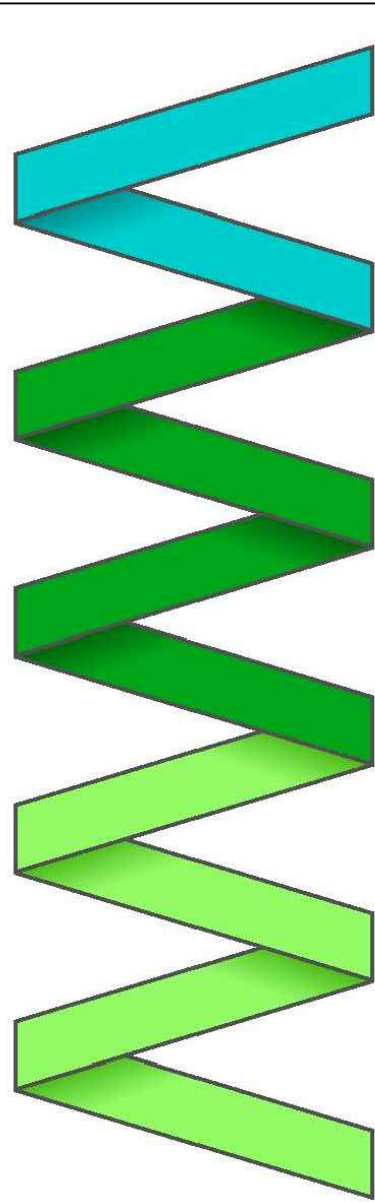
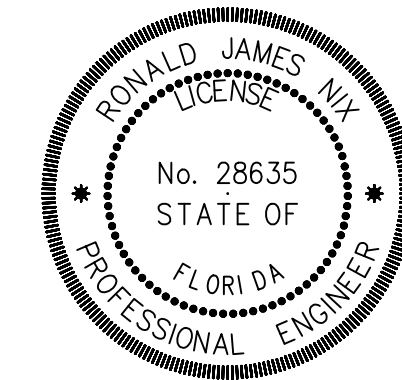
- ① PROVIDE FLOOR BOX EQUAL TO LEGRAND RFB2-SS WITH BLANK FLANGED COVER ASSEMBLY, DUPLEX RECEPTACLE AND TWO CAT 6 DATA JACKS. RUN TWO CAT 6 DATA CABLES TO DATA EQUIPMENT RACK IN 3/4" PVC.
- ② THREE 3 AWG THWN CU AND ONE 8 AWG CU GND IN 1-1/4"C. PROVIDE 100A/3P DISCONNECT AND CONNECT AIR HANDLER.
- ③ PROVIDE 30A/3P DISCONNECT AND CONNECT INDOOR UNIT.
- ④ THREE 6 AWG THWN CU AND ONE 10 AWG CU GND IN 1"C. PROVIDE 60A/3P DISCONNECT AND CONNECT AIR HANDLER.
- ⑤ PROVIDE AUDIO STAGE POCKET FLOOR BOX WITH DUPLEX RECEPTACLE AND UP TO SIX AUDIO CONNECTORS. COORDINATE WITH OWNER'S REPRESENTATIVE PRIOR TO ORDER.
- ⑥ PROVIDE AUDIO STAGE POCKET WALL BOX WITH DUPLEX RECEPTACLE AND UP TO SIX AUDIO CONNECTORS. COORDINATE WITH OWNER'S REPRESENTATIVE PRIOR TO ORDER. STUB OUT 1-1/4"C TO ABOVE CEILING WITH ELL AND BUSHING.
- ⑦ MOUNTING HEIGHTS OF WALL MOUNTED OUTLETS IN THIS AREA TO BE MEASURED FROM TOP OF PLATFORM. SEE ARCHITECTURAL DRAWINGS.
- ⑧ PROVIDE TOGGLE SWITCH FOR DAMPER MOTOR DISCONNECT AND CONNECT DAMPER MOTOR.
- ⑨ TWO 8 AWG THWN CU AND ONE 10 AWG CU GND IN 3/4"C. PROVIDE 60A/2P DISCONNECT AND CONNECT WATER HEATER. PROVIDE MOTOR RATED TOGGLE SWITCH FOR RECIRC PUMP DISCONNECT.
- ⑩ COORDINATE WATER COOLER OUTLET LOCATION PRIOR TO ROUGH-IN.
- ⑪ COORDINATE ELECTRIC VALVES CONNECTIONS WITH PLUMBING CONTRACTOR PRIOR TO ROUGH-IN. EC TO INSTALL TRANSFORMERS SUPPLIED BY PLUMBING CONTRACTOR AND MAKE FINAL CONNECTION TO VALVES IAW MANUFACTURER'S INSTRUCTIONS.

GENERAL NOTES

1. PROVIDE TAMPER RESISTANT RECEPTACLES WHERE REQUIRED BY THE NEC. COORDINATE WITH LOCAL AHJ.

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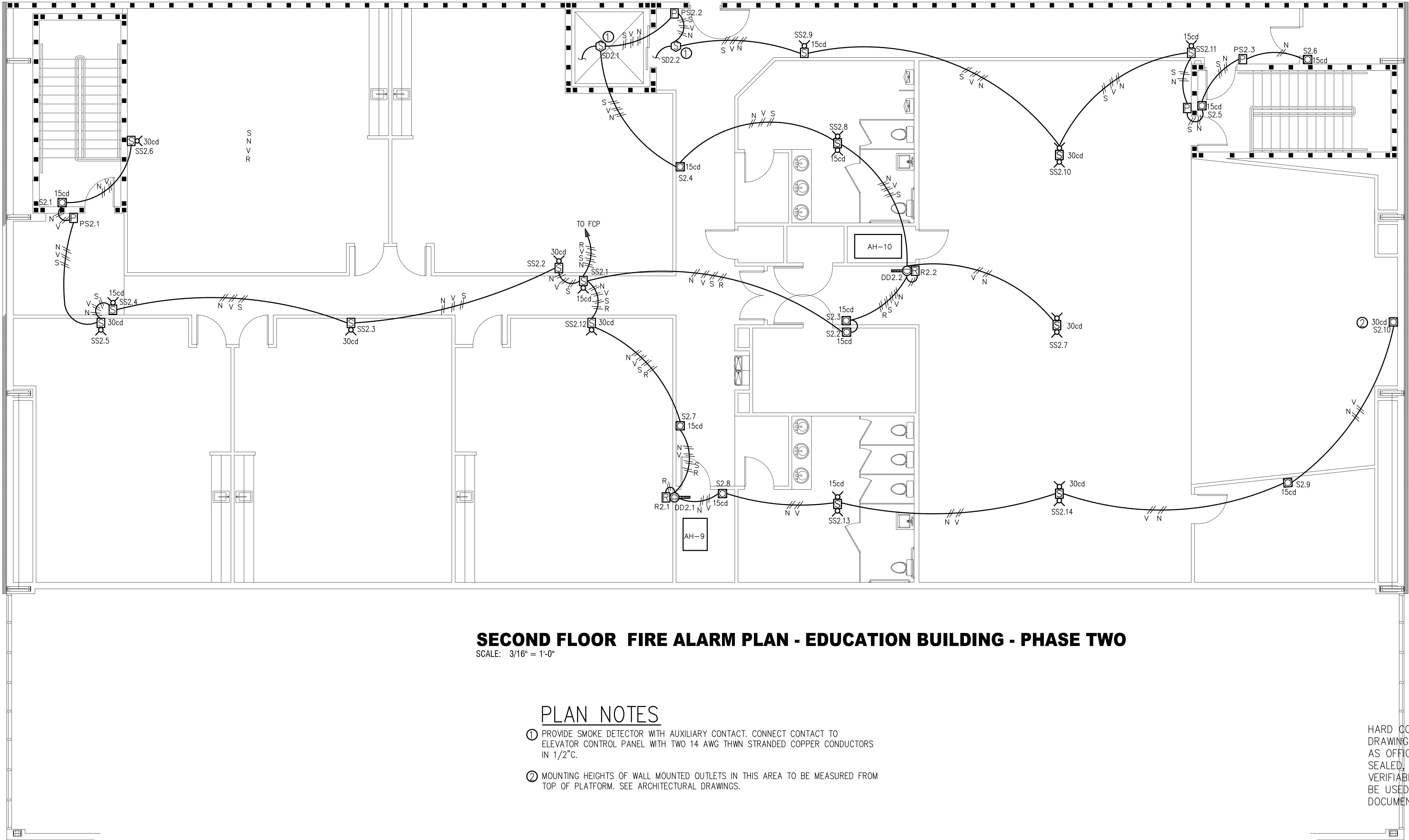
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NIX	RN
ISSUE DATE	SCALE
05/06/2024	3/16"=1'

SECOND FLOOR POWER PLAN - EDUCATION BUILDING

PROJECT NO.
2236

E12

SHEET 12 OF 20



SECOND FLOOR FIRE ALARM PLAN - EDUCATION BUILDING - PHASE TWO
SCALE: 3/16" = 1'-0"

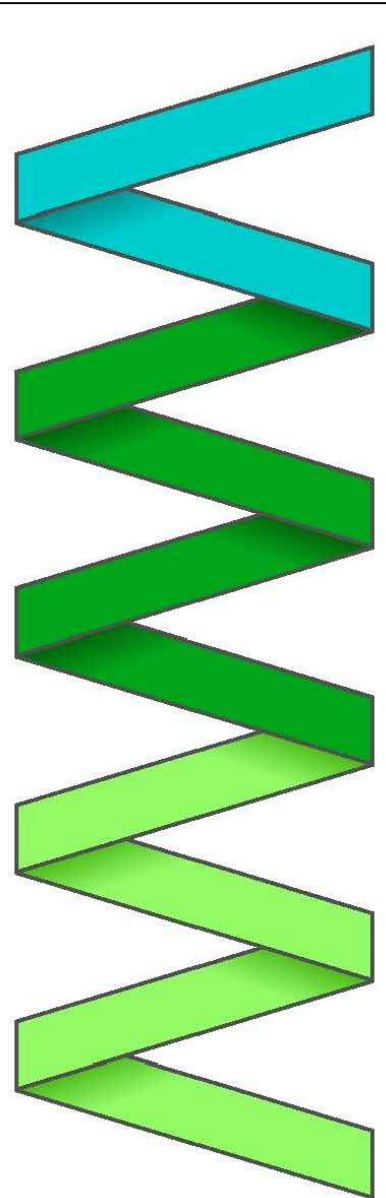
PLAN NOTES

- ① PROVIDE SMOKE DETECTOR WITH AUXILIARY CONTACT. CONNECT CONTACT TO ELEVATOR CONTROL PANEL WITH TWO 14 AWG THWN STRANDED COPPER CONDUCTORS IN 1/2" C.
- ② MOUNTING HEIGHTS OF WALL MOUNTED OUTLETS IN THIS AREA TO BE MEASURED FROM TOP OF PLATFORM. SEE ARCHITECTURAL DRAWINGS.

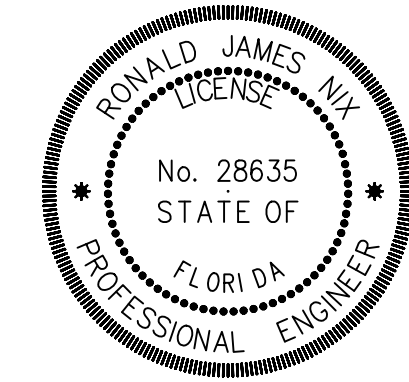
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CARLISLE BAPTIST CHURCH
REBUILD
835 BERTHE AVENUE
PANAMA CITY, FLORIDA

PREPARED BY	REVIEWED BY
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ISSUE DATE	SCALE
05/06/2024	3/16"=1'

SECOND FLOOR FIRE ALARM PLAN
EDUCATION BUILDING

E13
SHEET 13 OF 20
PROJECT NO.
2236

ELECTRICAL LEGEND

- \$ A.C. TOGGLE SWITCH, SINGLE POLE, 120–277VAC, 20A. SPECIFICATION GRADE, 48" AFF
- ⌚ LOW VOLTAGE LIGHTING CONTROL STATION OR DIGITAL SWITCH, SEE PLAN NOTES. MT 48" AFF
- ☉ PHOTOCELL EQUAL TO TORK 2100 SERIES OR DIGITAL PHOTOCELL IF NOTED. MOUNT ON WEATHERPROOF BOX
- \$M MANUAL MOTOR STARTING TOGGLE SWITCH WITH OVERLOAD PROTECTION. MOUNT ADJACENT TO MOTOR.
- ⊗ CEILING MOUNTED VACANCY/OCCUPANCY SENSOR WITH POWER PACK AND RELAY KIT. SEE PLAN NOTES SET TIME DELAY FOR TWENTY MINUTES.
- ⊖ WALL MOUNTED VACANCY/OCCUPANCY SENSOR. SEE PLAN NOTES. SET TIME DELAY FOR TWENTY MINUTES.
- ⊕H DAYLIGHT HARVESTING SENSOR WITH POWER PACK MOUNTED ON CEILING.
- A
○ LED LIGHT FIXTURE. CAPITAL LETTER INDICATES FIXTURE TYPE (SEE FIXTURE SCHEDULE).
- ⊕ CEILING MOUNTED LIGHT FIXTURE
- ⊖ WALL MOUNTED LIGHT FIXTURE
- ⊖ DUPLEX RECEPTACLE – 3 WIRE GROUNDING TYPE, 125V., 15A. OR 20A. AS REQUIRED, SPECIFICATION GRADE, 18" AFF
- ⊖ DUPLEX RECEPTACLE AS ABOVE, MOUNT HORIZONTALLY 4" ABOVE COUNTER BACKSPLASH TO CENTER LINE
- ⊖GFI DUPLEX RECEPTACLE WITH GROUND FAULT CIRCUIT INTERRUPTER
- ⊖ SINGLE RECEPTACLE, 3W GROUNDING TYPE, 125V., 20A. SPECIFICATION GRADE, COORDINATE MOUNTING HEIGHT WITH EQUIPMENT
- ⊖ QUAD RECEPTACLE– TWO DUPLEX RECEPTACLES UNDER ONE COVER
- ⊖ CAST FLOOR BOX WITH POWER OUTLET(S). SEE PLANS.
- ⊖D CAST FLOOR BOX WITH DATA AND POWER. SEE PLANS.
- ⊕H TELEVISION OUTLET WITH 1" CONDUIT TO ABOVE CEILING WITH ELL AND BUSHING.
- ⊖D DUPLEX CAT 6 DATA/COM OUTLET. 4" SQ BOX WITH DEVICE RING MT 18" AFF. PROVIDE 3/4"C WITH TWO CAT 6 CABLES TO DATA EQUIPMENT RACK. PROVIDE TERMINATIONS AND TESTING.
- /// BRANCH CIRCUIT CONCEALED ABOVE CEILING OR IN WALLS, NUMBER OF CROSS LINES INDICATES NUMBER OF #12 CONDUCTORS WHEN MORE THAN TWO. ARROW INDICATES HOMERUN TO PANEL AND CIRCUIT INDICATED.
- ⤵ BRANCH CIRCUIT CONCEALED IN SLAB OR BELOW SLAB ON GRADE.
- DISCONNECT SWITCH, SIZE AND ENCLOSURE TYPE SHOWN.
- POWER PANEL
- ▨ DATA/COM BACKBOARD, SEE RISER DIAGRAM
- ① JUNCTION BOX SIZED PER NEC WITH FLEXIBLE EQUIPMENT CONNECTION
- ⊗ MOTOR, HORSEPOWER INDICATED BY NUMBER INSIDE OR AS SCHEDULED.
- ⊖ GROUND AS REQUIRED BY NEC & LOCAL CODES & AS INDICATED AS A MINIMUM

TBB – DATA/COM BACKBOARD

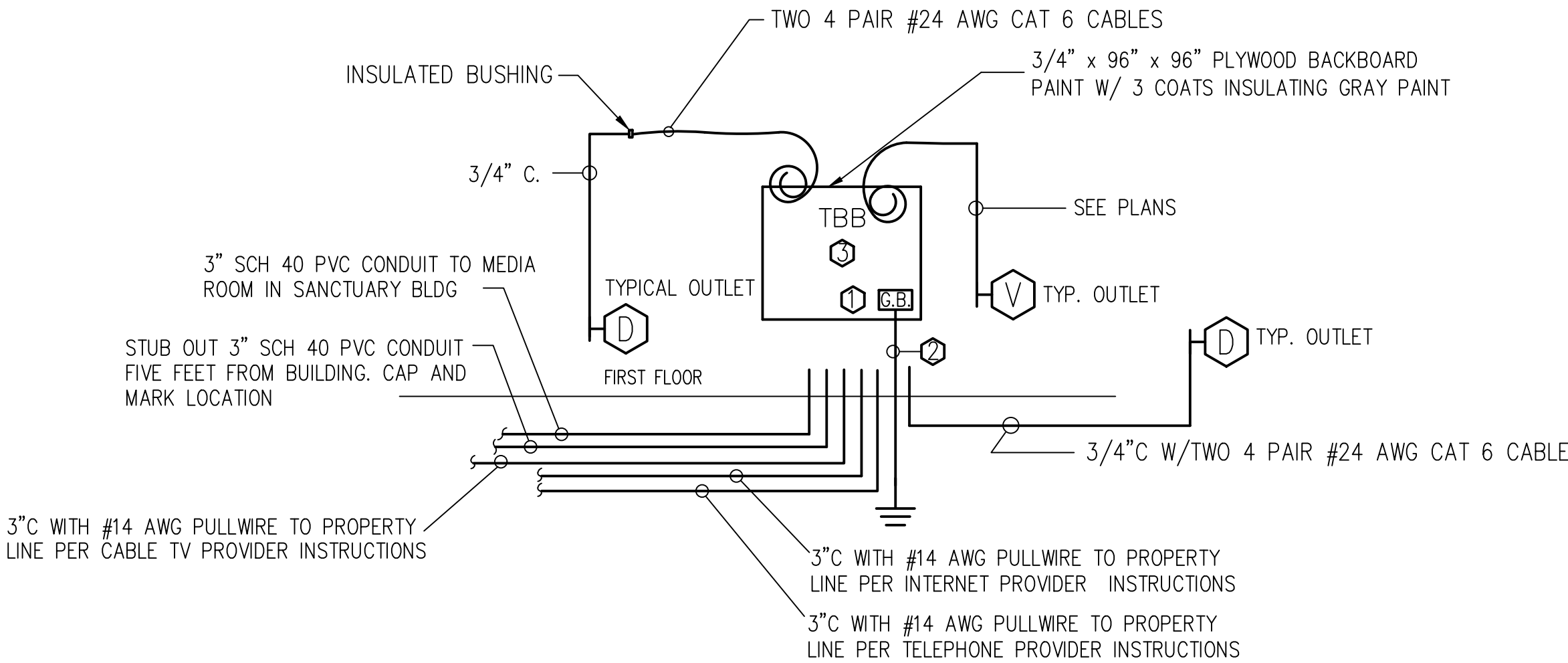
WP – WEATHERPROOF

AFF – ABOVE FINISHED FLOOR

AFG – ABOVE FINISHED GRADE

NEC – NATIONAL ELECTRICAL CODE

SPD – SURGE PROTECTION DEVICE

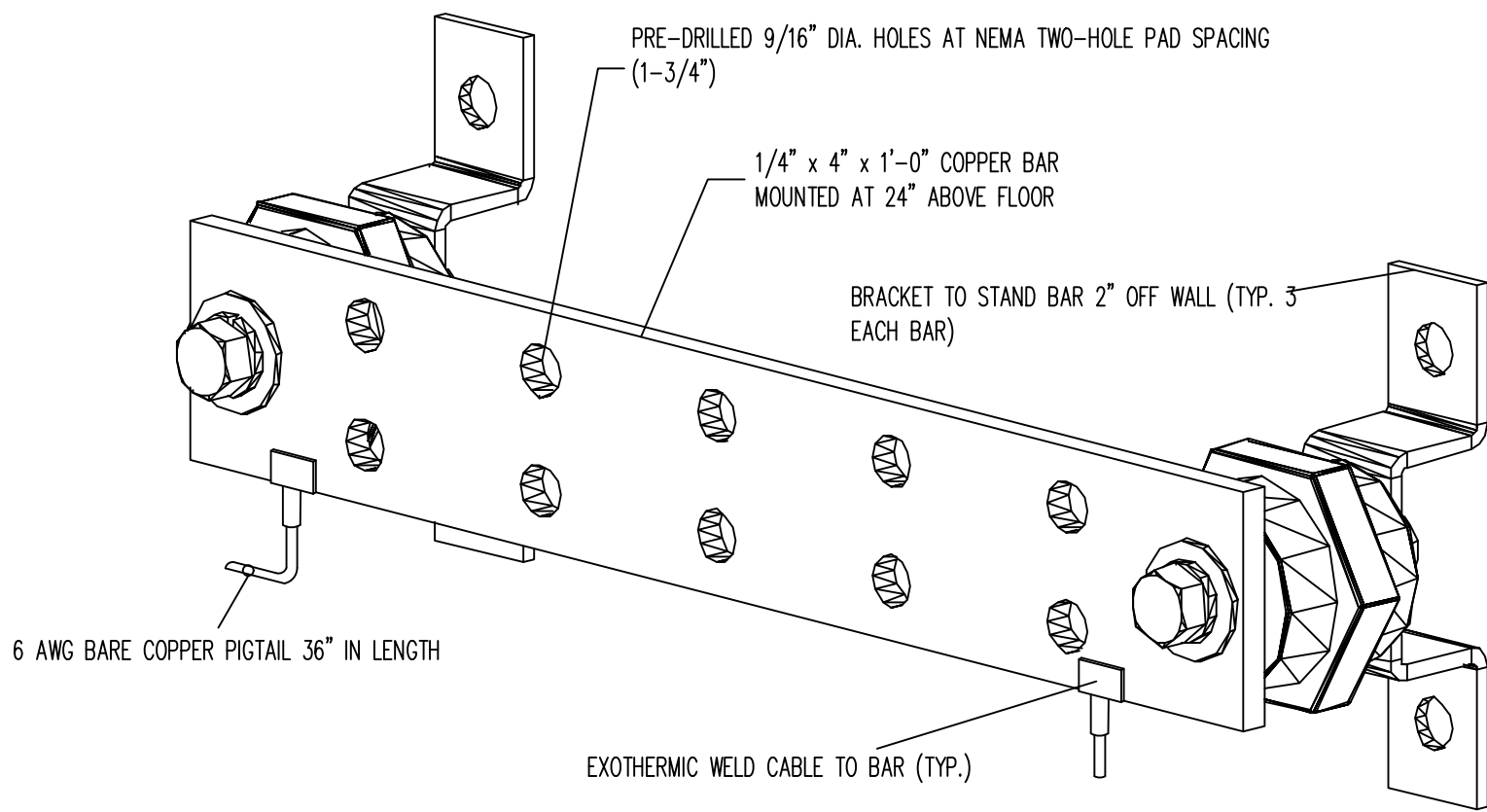


DATA/COMM RISER

NOT TO SCALE
NOTE: COORDINATE CONDUIT ROUTING WITH CIVIL SITE WORK AND SERVING UTILITIES. PROVIDE PULL BOX(ES) AS REQUIRED.

KEY TO DATA/COMM RISER

- ⊖ PROVIDE GROUNDING BUS BAR AT BACKBOARD, AND CONNECT TO BUILDING GROUNDING ELECTRODE SYSTEM. SEE GROUND BUS BAR DETAIL.
- ⊖ 6 AWG COPPER TO BUILDING GROUNDING ELECTRODE SYSTEM.
- ⊖ CONTRACTOR TO COORDINATE BACKBOARD SPACE ALLOCATION w/ TELEPHONE, INTERNET, AND CABLE TV PROVIDERS



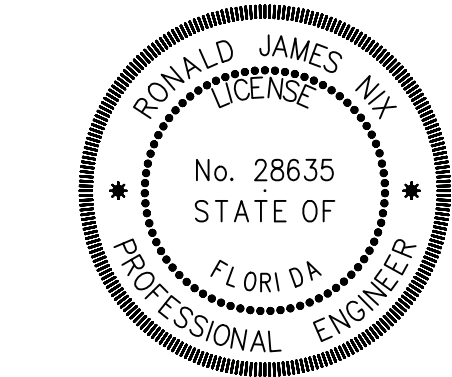
TYPICAL GROUND BAR DETAIL

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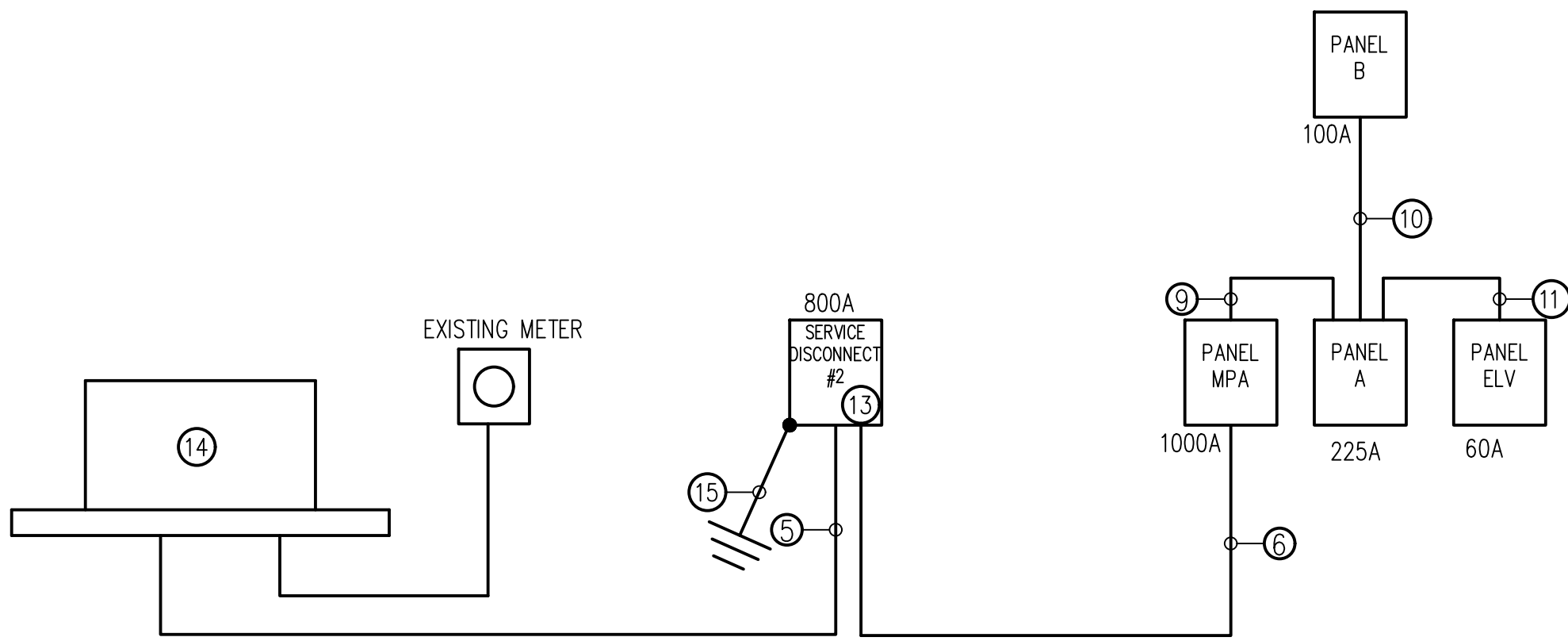
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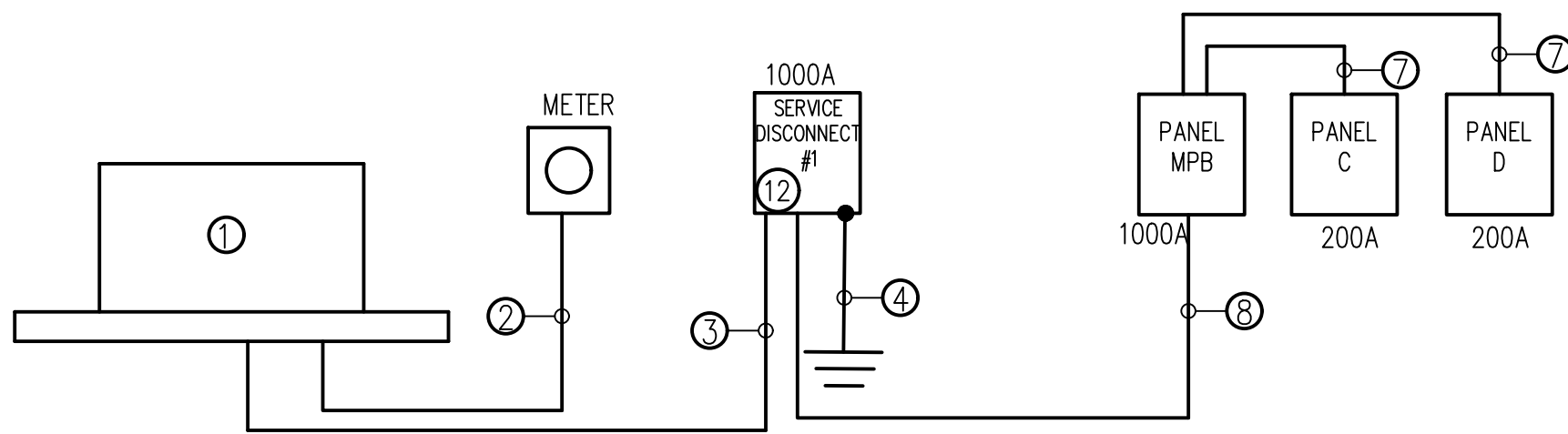


CARLISLE BAPTIST CHURCH
IRIE BUILDING
835 BERTHE AVENUE
PANAMA CITY, FLORIDA

PREPARED BY NIX	REVIEWED BY RN	ISSUE DATE 05/06/2024	SCALE N/A
ELECTRICAL LEGEND & DATA/COMM RISER			
E14			
SHEET 14 OF 20			
PROJECT NO. 2236			



PHASE TWO POWER RISER – EDUCATION BUILDING
NO SCALE



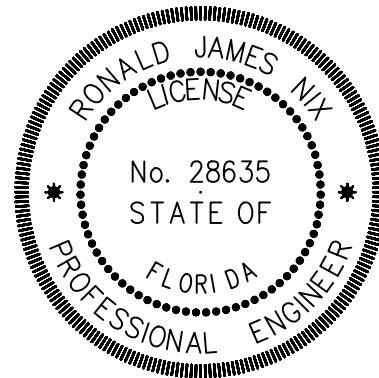
PHASE ONE POWER RISER – WORSHIP CENTER
NO SCALE

KEY NOTES TO POWER RISERS

- ① PAD MOUNTED TRANSFORMER BY UTILITY COMPANY. CONTRACTOR PROVIDE CONCRETE PAD AND GROUNDING PER UTILITY COMPANY SPECIFICATIONS. LEAVE SIX FT SLACK CONDUCTOR AT TRANSFORMER FOR UTILITY COMPANY CONNECTION. CONTRACTOR PAY ANY UNDERGROUND UTILITY CHARGES. SEE SITE UTILITY PLAN.
- ② 1-1/4" RGS CONDUIT TO METER ENCLOSURE ON PEDESTAL. PROVIDE PEDESTAL PER UTILITY COMPANY SPECIFICATIONS.
- ③ THREE 3-1/2" CONDUITS WITH FOUR 500 KCMIL THWN-2 CU IN EACH CONDUIT. LEAVE SIX FEET SLACK CONDUCTOR AT TRANSFORMER FOR UTILITY COMPANY CONNECTION.
- ④ #3/0 COPPER. CONNECT TO BUILDING STEEL, METAL WATER LINE, & TO CONCRETE ENCASED ELECTRODE PER NEC 250.50 & TO THREE 3/4" X 30FT SOLID COPPER GROUND RODS DRIVEN IN A TRIANGULAR PATTERN & SPACED 10FT ON CENTER.
- ⑤ THREE 3" CONDUITS WITH FOUR 350 KCMIL THWN-2 CU IN EACH CONDUIT. LEAVE SIX FEET SLACK CONDUCTOR AT TRANSFORMER FOR UTILITY COMPANY CONNECTION. N
- ⑥ THREE 3" CONDUITS WITH FOUR 350 KCMIL THWN-2 CU AND ONE 1/0 AWG COPPER GROUND IN EACH CONDUIT.
- ⑦ FOUR 3/0 AWG THWN-2 CU AND ONE 6 AWG CU GND IN 2-1/2"C.
- ⑧ THREE 3-1/2" CONDUITS WITH FOUR 500 KCMIL THWN-2 CU AND ONE 2/0 AWG COPPER GROUND IN EACH CONDUIT
- ⑨ FOUR 250 KCMIL AWG THWN-2 CU AND ONE 4 AWG COPPER GROUNDING CONDUCTOR IN 2-1/2"C.
- ⑩ FOUR 2 AWG THWN-2 CU AND ONE 8 AWG CU GND IN 1-1/2"C.
- ⑪ THREE 6 AWG THWN-2 CU AND ONE 10 AWG CU GND IN 1"C.
- ⑫ 1000A/3P 65KAIC CIRCUIT BREAKER IN NEMA 4X ENCLOSURE WITH NEUTRAL BUS, GROUND LUG, AND SERVICE ENTRANCE LABEL. PROVIDE 3"X 5" RED MICARTA LABEL ENGRAVED WITH 3/4" WHITE LETTERS: "SERVICE DISCONNECT #1 OF 2 AND ATTACH TO COVER WITH STAINLESS STEEL POP RIVETS
- ⑬ 800A/3P 65KAIC CIRCUIT BREAKER IN NEMA 4X ENCLOSURE WITH NEUTRAL BUS, GROUND LUG, AND SERVICE ENTRANCE LABEL. PROVIDE 3"X 5" RED MICARTA LABEL ENGRAVED WITH 3/4" WHITE LETTERS: "SERVICE DISCONNECT #2 OF 2". ATTACH TO COVER WITH STAINLESS STEEL POP RIVETS. PROVIDE PERMANENT WEATHERPROOF SERVICE DISCONNECT MAPS AT BOTH SERVICE DISCONNECT LOCATIONS AS REQUIRED BY THE NEC AND THE LOCAL AHJ.
- ⑭ EXISTING PAD MOUNTED TRANSFORMER. SEE NOTE #1 ABOVE.
- ⑮ 3/0 AWG COPPER IN 1" SCH 80 PVC CONDUIT TO EXISTING GROUNDING ELECTRODE SYSTEM. SEE NOTE 4 ABOVE.

E15		SHEET 15 OF 20		PROJECT NO. 2236	
PREPARED BY	REVIEWED BY	POWER RISERS			
NIX	RN				
ISSUE DATE	SCALE				
05/06/2024	N/A				

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IRIEBUIJULID
835 BERTHE AVENUE
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MARK MERCER & ASSOCIATES, INC.
1117 JENKS AVENUE/PANAMA CITY, FLORIDA 32401/850.763.8072

120/208V, 3PH, 4W, 800 AMP MLO, SURFACE MT PANELBOARD, 60 CKT, 65,000 MIN A.I.C.										
PANEL 'MPA'										
CKT	SERVING	LOAD VA	TRIP	POLE	PHASE A B C	TRIP	POLE	LOAD VA	SERVING	CKT
1	AH-7	6990	80	3		50	3	3380	HP-7	2
3		6990	-	-		-	-	3380		4
5		6990	-	-		-	-	3380		6
7	OAE-2	1200	20	3		60	3	5190	OAC-2	8
9		1200	-	-		-	-	5190		10
11		1200	-	-		-	-	5190		12
13	BUSSED SPACE		100	3		100	3		BUSSED SPACE	14
15			-	-		-	-			16
17			-	-		-	-			18
19	AH-11	4020	45	2		60	2	3330	HP-11	20
21		4020	-	-		-	-	3330		22
23	AH-9	7370	80	3		70	3	4560	HP-9	24
25		7370	-	-		-	-	4560		26
27		7370	-	-		-	-	4560		28
29	AH-10	4490	50	3		50	3	3380	HP-10	30
31		4490	-	-		-	-	3380		32
33		4490	-	-		-	-	3380		34
35	OAE-3	1200	20	3		60	3	5190	OAC-3	36
37		1200	-	-		-	-	5190		38
39		1200	-	-		-	-	5190		40
41	EW-2	2750	40	2		15	1	10	SHUNT TRIP	42
43		2750	-	-		225	3	19730	PANEL A	44
45	EW-1	2750	40	2		-	-	19640		46
47		2750	-	-		-	-	19150		48
49	BUSSED SPACE		225	3		225	3		BUSSED SPACE	50
51			-	-		-	-			52
53			-	-		-	-			54
55	SPD		30	3		100	3	7460	ELEVATOR	56
57			-	-		-	-	7460		58
59			-	-		-	-	7460		60

CONNECTED LOADS: PHASE A = 80240 VA + 1870
PHASE B = 80150 VA + 1870
PHASE C = 75070 VA + 1870
TOTAL = 241070 VA = 670 AMPS

ⓘ PROVIDE SHUNT TRIP AND AUXILIARY CONTACT. CONNECT TO ELEVATOR CONTROL PANEL WITH FOUR 14 AWG STRANDED COPPER AND ONE 14 AWG CU GND IN 1/2".

120/208V, 3PH, 4W, 225 AMP MLO SURFACE MT PANELBOARD, 60 CKT, 65,000 MIN A.I.C.										
PANEL 'A'										
CKT	SERVING	LOAD VA	TRIP	POLE	PHASE A B C	TRIP	POLE	LOAD VA	SERVING	CKT
1	TBB	400	20	1		20	1	1620	CL RM 102 RECEP	2
3	TBB	400	20	1		20	1	1080	CL RM 103 RECEP	4
5	LTS CR 108	1130	20	1		20	1	900	CL RM 106 RECEP	6
7	LTS CHLD DROP OFF	1120	20	1		20	1	900	CL RM 108 RECEP	8
9	LTS CORR 115	1170	20	1		20	1	600	DROP-OFF 111 RECEP	10
11	LTS MEN'S RR	1060	20	1		20	1	600	DROP-OFF COUNTER RECEP	12
13	LTS CORR 123	1030	20	1		20	1	1260	CL RM 108 RECEP	14
15	WAITING/RECEPTION RECEP	1080	20	1		20	1	720	RESTROOM RECEP	16
17	RECEPTION RECEP	720	20	1		20	1	1440	FIN/COUNSELOR RECEP	18
19	SPARE		20	1		20	1	1080	FIN/COUNSELOR RECEP	20
21	COPPER?	1200	20	1		20	1	1440	YOUTH/ASST PASTOR RECEP	22
23	COPY RECEP	720	20	1		20	1	1440	MUSIC MINISTER RECEP	24
25	COPPER?	1200	20	1		20	1	1260	TOILET, BREAK, COPY RECEP	26
27	COPPER?	1200	20	1		20	1	1260	PASTOR RECEP	28
29	COPPER?	1200	20	1		20	1	1080	SECRETARY RECEP	30
31	BREAK RM COUNTER RECEP	1500	20	1		20	1	1080	CONFERENCE RECEP	32
33	BREAK RM COUNTER RECEP	1500	20	1		20	1	400	FOP	34
35	HW RECIRC PP	250	15	1		20	1	400	DISTAL COMMUNICATOR	36
37	ELECTRIC VALVES	750	20	GF		20	1	400	VEP	38
39	PANEL ELV	1590	60	2		20	1		SPARE	40
41		2140	-	-		20	1		SPARE	42
43	SPARE		20	1		20	1		SPARE	44
45	SPARE		20	1		20	1		SPARE	46
47	SPARE		20	1		20	1		SPARE	48
49	SPARE		20	1		20	1		SPARE	50
51	SPARE		20	1		20	1		SPARE	52
53	SPARE		20	1		20	1		SPARE	54
55	SPD		30	3		100	3	6130	PANEL B	56
57			-	-		-	-	6000		58
59			-	-		-	-	6070		60

CONNECTED LOADS: PHASE A = 19730 VA
PHASE B = 19640 VA
PHASE C = 19150 VA
TOTAL = 58520 VA = 163 AMPS

ⓘ PROVIDE CIRCUIT BREAKER LOCK-ON DEVICE PAINTED RED AND VISIBLY MARKED "FIRE ALARM"

120/208V, 3PH, 4W, 225 AMP MLO, SURFACE MT PANELBOARD, 60 CKT, 65,000 MIN A.I.C.											
PANEL 'C'											
CKT	SERVING	LOAD VA	TRIP	POLE	PHASE A B C	TRIP	POLE	LOAD VA	SERVING	CKT	
1	CONCOURSE LTS	1020	20	1			1	1260	CORR 113 RECEP	2	
3	CONCOURSE LTS	1020	20	1			15	250	HW RECIRC PP	4	
5	CONCOURSE LTS	1020	20	1			20	1	1080	WOMEN RECEP	6
7	CONCOURSE LTS	1020	20	1		20	GF	1	500	EW	8
9	SANCTUARY LTS	1090	20	1			20	1	350	WOMEN ELECTRIC VALVES	10
11	SANCTUARY LTS	1070	20	1			20	1	1260	SENSORY RECEP	12
13	PERMETER AND FRONT LTS	1350	20	1			20	1	900	COFFEE RECEP	14
15	COVE LTS	1370	20	1			20	1	1440	NURSING RECEP	16
17	STAGE & CROSS LTS	800	20	1			20	1	1500	COFFEE URN	18
19	FLOODS	800	20	1			20	1	1500	COFFEE URN	20
21	WEST RM LTS	1200	20	1			20	1	1500	COFFEE URN	22
23	WEST CORR/CHOR	1040	20	1			20	1	1500	COFFEE URN	24
25	BAPTISM PREP LTS	1060	20	1			20	1	1260	VESTIBULE 116 RECEP	26
27	EAST RM LTS	1290	20	1			20	1	400	LCP	28
29	HP-5	3300	60	2			20	1	930	SIGN/STEEPLE/CROSS	30
31	↓	3300	-	-			40	2	2750	EMH-1	32
33	AH-5	4020	45	2			-	-	2750		34
35	↓	4020	-	-			20	1	750	CANOPY, BLDG LTS & STAIN GLASS BACKLT	36
37	MECH LTS	120	20	1			20	1	1080	CHOR RECEP	38
39	SPARE		20	1			20	1	1440	CONCOURSE RECEP	40
41	SPARE		20	1			20	1		SPARE	42
43	SPARE		20	1			20	1		SPARE	44
45	SPARE		20	1			20	1		SPARE	46
47	SPARE		20	1			20	1		SPARE	48
49	SPARE		20	1			20	1		SPARE	50
51	SPARE		20	1			20	1		SPARE	52
53	SPARE		20	1			20	1		SPARE	54
55	SPD		30	3			20	1		SPARE	56
57			-	-			20	1		SPARE	58
59			-	-			20	1		SPARE	60

CONNECTED LOADS:

PHASE A = 17920 VA
PHASE B = 18120 VA
PHASE C = 18270 VA
TOTAL = 54310 VA = 151 AMPS

ⓘ PROVIDE CIRCUIT BREAKER LOCK-OFF DEVICE FOR DISCONNECT

120/208V, 3PH, 4W, 1200 AMP MLO, SURFACE MT PANELBOARD, 60 CKT, 65,000 MIN A.I.C.											
PANEL 'MPB'											
CKT	SERVING	LOAD VA	TRIP	POLE	PHASE A B C	TRIP	POLE	LOAD VA	SERVING	CKT	
1	HP-1	9320	110	3		40	2	2380	HP-4	2	
3		9320	-	-		-	-	2380		4	
5		9320	-	-		30	2	3120	IWH-2	6	
7	AH-1	9100	100	3		-	-	3120		8	
9		9100	-	-		70	GF	2	5500	BAPTISTRY HEATER	10
11		9100	-	-		-	-	5500		12	
13	AH-4	3830	45	2	20	1		SPARE	14		
15		3830	-	-	30	1	3600	IWH-1	16		
17	OAC-1	7520	90	3	30	1	3600	IWH-1	18		
19		7520	-	-	25	2	1430	HP-2	20		
21		7520	-	-	-	-	1430		22		
23	OAE-1	1320	20	3	35	2	2780	AH-2	24		
25		1320	-	-	-	-	2780		26		
27		1320	-	-	60	2	3300	HP-3	28		
29	HP-6	2140	35	2	-	-	3300		30		
31		2140	-	-	45	2	4020	AH-3	32		
33	AH-6	3940	45	2	-	-	4020		34		
35		3940	-	-	20	1		SPARE	36		
37	PANEL C	17920	200	3	60	3	4880	AH-8	38		
39		18120	-	-	-	-	4880		40		
41		18270	-	-	-	-	4880		42		
43	PANEL D	14400	200	3	70	3	4560	HP-8	44		
45		12780	-	-	-	-	4560		46		
47		11530	-	-	-	-	4560		48		
49	BUSSED SPACE		225	3	225	3		BUSSED SPACE	50		
51			-	-	-	-			52		
53			-	-	-	-			54		
55	SPD		30	3	225	3		BUSSED SPACE	56		
57			-	-	-	-			58		
59			-	-	-	-			60		

CONNECTED LOADS:

PHASE A = 88720 VA

PHASE B = 96600 VA

PHASE C = 90880 VA

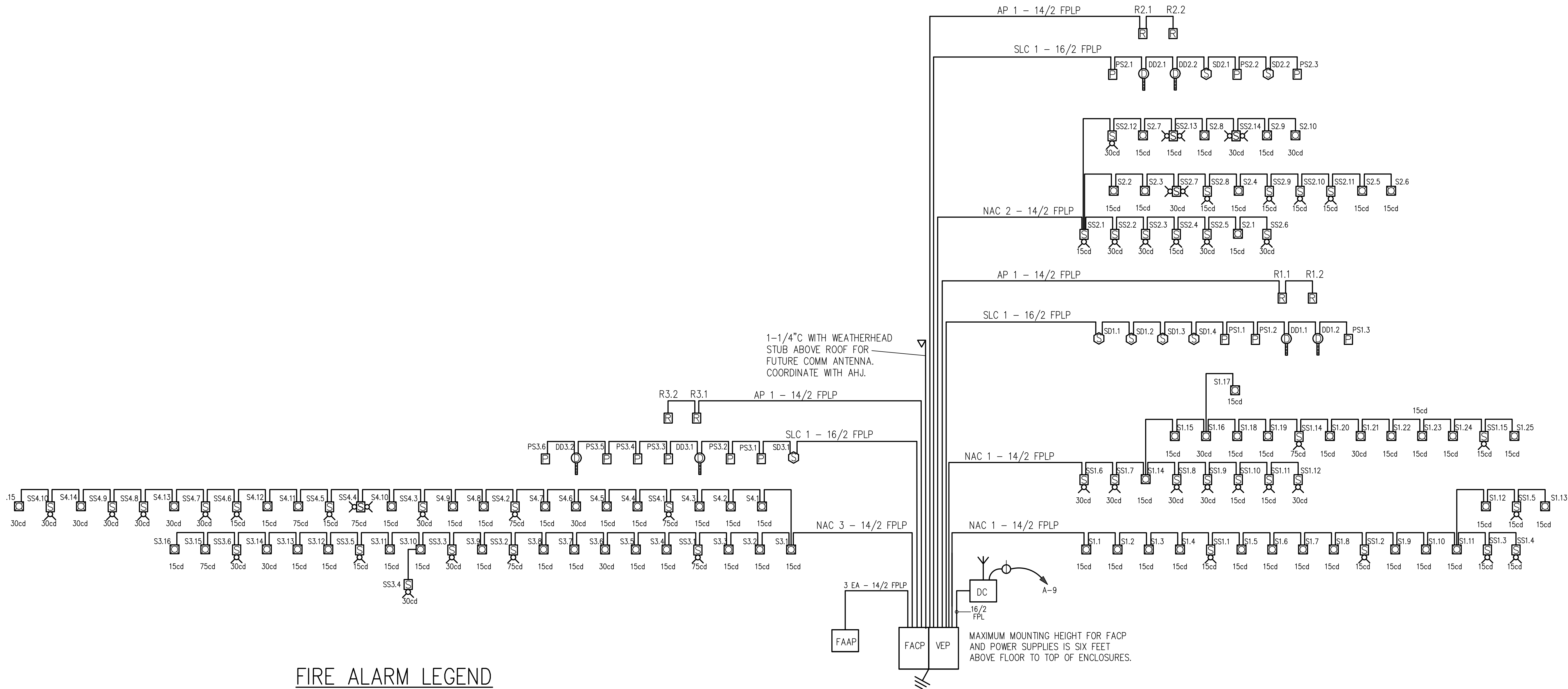
TOTAL = 275200 VA = 764 AMPS

PROVIDE CIRCUIT BREAKER LOCK-OFF DEVICE FOR DISCONNECT

120/208V, 3PH, 4W, 225 AMP MLO, SURFACE MT PANELBOARD, 42 CKT, 65,000 MIN A.I.C.											
PANEL 'B'											
CKT	SERVING	LOAD VA	TRIP	POLE	PHASE A B C	TRIP	POLE	LOAD VA	SERVING	CKT	
1	LTS CR 202,204, COOR 203	1100	20	1		20	1		SPARE	2	
3	LTS CR201, 205, 216,	930	20	1		20	1	1260	CR 202 RECEP	4	
5	LTS RESTROOMS	850	20	1		20	1	1080	CR 205 RECEP	6	
7	LTS CHILDREN'S CHURCH	1200	20	1		20	1	700	ELECTRIC VALVES	8	
9	PLATFORM RECEP	720	20	1		20	1	1620	CR 216 RECEP	10	
11	PLATFORM RECEP	400	20	1		20	GF	1	400	EWG	12
13	PLATFORM RECEP	720	20	1		20	1	1080	CORR RECEP 216	14	
15	EF-11	850	20	1		20	1	1260	SUPPLIES RECEP	16	
17	CHILDREN'S CHURCH RECEP	900	20	1		20	1	1260	CORR RECEP 204	18	
19	HW RECIRC PP	250	15	1		20	1	900	CORR RECEP 212	20	
21	SPARE		20	1		20	1	1260	CR 204 RECEP	22	
23	SPARE		20	1		20	1	1260	CR 201 RECEP	24	
25	SPARE		20	1		20	1		SPACE	26	
27	SPARE		20	1		20	1		SPACE	28	
29	SPARE		20	1		20	1		SPACE	30	
31	SPARE		20	1		20	1		SPACE	32	
33	SPARE		20	1		20	1		SPACE	34	
35	SPARE		20	1		20	1		SPACE	36	
37	SPD		30	3		20	1		SPACE	38	
39			-	-		20	1		SPACE	40	
41			-	-		20	1		SPACE	42	

CONNECTED LOADS:	PHASE A = 6130 VA	⚠ PROVIDE CIRCUIT BREAKER LOCK-OUT DEVICE FOR DISCONNECT
	PHASE B = 6000 VA	
	PHASE C = 6070 VA	
	TOTAL = 18200 VA = 51 AMPS	

PHASE ONE PHASE TWO



FIRE ALARM LEGEND

- FIRE ALARM SYSTEM ADDRESSABLE MANUAL PULL STATION. MT 48" AFF
- FIRE ALARM SYSTEM SPEAKER/STROBE (CANDELA RATING AS NOTED). WALL MT 80" AFF
- FIRE ALARM SYSTEM SPEAKER/STROBE (CANDELA RATING AS NOTED). CEILING MT
- FIRE ALARM VISIBLE STROBE SIGNAL (CANDELA RATING AS NOTED). WALL OR CEILING MT AS INDICATED
- FIRE ALARM SYSTEM ADDRESSABLE PHOTOELECTRIC TYPE SMOKE DETECTOR, CEILING MT.
- FIRE ALARM SYSTEM ADDRESSABLE RELAY MODULE
- FIRE ALARM SYSTEM ADDRESSABLE DUCT MOUNTED SMOKE DETECTOR
- FIRE SPRINKLER SYSTEM FLOW SWITCH
- FIRE SPRINKLER SYSTEM TAMPER SWITCH.
- FIRE ALARM SYSTEM ADDRESSABLE MONITOR MODULE.
- FIRE SPRINKLER SYSTEM PRESSURE SWITCH
- FIRE SPRINKLER ROOM TEMPERATURE MONITOR
- FIRE SPRINKLER SYSTEM POST INDICATOR VALVE
- FIRE ALARM SYSTEM SIGNAL LINE CIRCUIT - 16/2 FPLP TWISTED PAIR - PLENUM RATED
- FIRE ALARM SYSTEM NOTIFICATION APPLIANCE CIRCUIT - 14/2 FPLP TWISTED PAIR PLENUM RATED
- FIRE ALARM SYSTEM VOICE EVACUATION CIRCUIT - 16/2 FPLP TWISTED PAIR PLENUM RATED
- FIRE ALARM SYSTEM RELAY POWER CIRCUIT (AP, NAC) - 14/2 FPLP TWISTED PAIR PLENUM RATED
- SINGLE RECEPTACLE 120V, 15A, SPECIFICATION GRADE ON DEDICATED CIRCUIT FOR WIRELESS COMMUNICATOR. MOUNT ABOVE FACP
- FACP FIRE ALARM CONTROL PANEL (SURFACE MOUNTED ENCLOSURE, TOP @ 72" AFF MAX)
- FAAP FIRE ALARM ANNUNCIATOR PANEL (FLUSH MOUNTED ENCLOSURE, TOP @ 60" AFF)
- VEP FIRE ALARM VOICE EVACUATION PANEL WITH 75 WATT MINIMUM AMPLIFIER (SURFACE MOUNTED ENCLOSURE, TOP @ 72" AFF MAX)
- DC FIRE DIGITAL COMMUNICATOR (SURFACE MOUNTED ENCLOSURE)

FIRE ALARM RISER

NOT TO SCALE

FIRE ALARM RISER GENERAL NOTES

CLASS

- SLC - CLASS B
- NAC - CLASS B

CONDUCTORS

- NAC - 14/2 FPLP
- SLC - 16/2 FPLP

E17

SHEET 17 OF 20

PROJECT NO. 7236

PREPARED BY NIX

REVIEWED BY RN

ISSUE DATE 05/06/2024

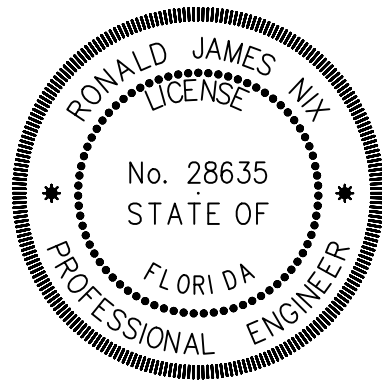
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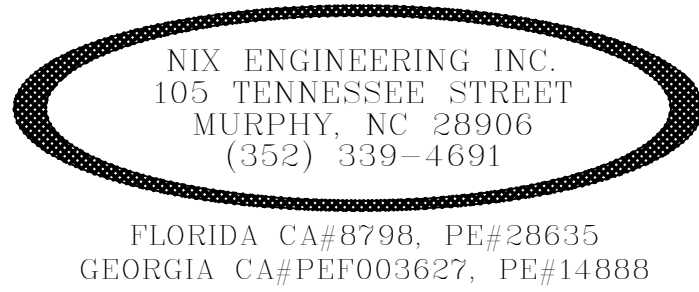
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835 BERTHE AVENUE

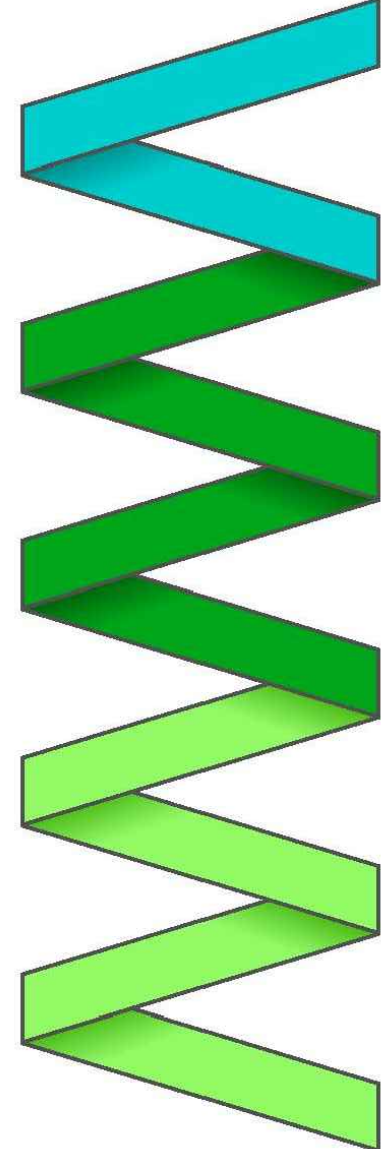
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MARK MERCER & ASSOCIATES, INC.
1117 JENKS AVENUE / PANAMA CITY, FLORIDA 32401 / 850.763.8072

SECTION 16050 – GENERAL ELECTRICAL

PART 1 GENERAL

The General and Supplementary Conditions, Sections 1 and 2 of these specifications, shall apply to and form a part of this section as if written in full herein.

1.01 SCOPE OF WORK:

A. The work covered by this section of the specifications shall include the furnishing of all labor, equipment, supplies, tools and materials, and the performance of all operations necessary for the installation of complete wiring systems, lighting, power connections to equipment specified in other sections, and electrical equipment in strict accordance with this section of the specifications and applicable drawings.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

Mechanical Division 15

1.03 DEFINITIONS Provide means to furnish and install.

1.04 WARRANTY

A. Contractor shall fully instruct Owner in operation and maintenance of electrical system.

B. Contractor shall assemble and bind manufacturers' operating and maintenance literature for inclusion in Maintenance Manual. Literature shall include record shop drawings, wiring diagrams, instruction sheets, replacement parts list, warranties, and guarantee for all equipment furnished under this section of the specifications. Three sets of such literature shall be provided.

C. Contractor shall warrant all work for a period of one year from date of substantial completion. Contractor shall rectify any defects due to faulty materials or workmanship and pay for any damage to other work resulting there from which occurs within said period. Work shall be performed by journeyman electrician or an electrician with 8,000 hours experience as an apprentice electrician and with new materials as approved by the Architect. The Owner will give notice of observed defects with reasonable promptness. The above warranty is in addition to any guarantee of equipment by a manufacturer.

D. Contractor shall furnish written warranty that all systems have been installed complete and are functioning properly and that all materials and workmanship are free from defects.

E. The General Conditions and Supplementary Conditions to the overall specifications are made a part of the electrical specifications where applicable.

1.05 DRAWINGS:

A. The drawings are schematic showing relative locations and connections and shall not be scaled for exact locations. Unless specified dimensions are shown, the structural, architectural and site conditions shall govern the exact locations.

B. Should any difficulty occur in the running of cables and/or conduits, setting of outlets or any other devices or connections at the points shown, provide necessary minor deviations there from as approved without additional cost.

C. Where conflicts occur between the requirements of the drawings, specifications, and applicable codes, the contractor shall provide an installation that conforms with the most stringent requirement.

1.06 AS-BUILT DRAWINGS AND RECORDS:

Maintain a complete set of electrical prints for indicating all changes. Use a colored pen or pencil to mark changes at the time of execution. Deliver the set to the Owner's representative upon completion. Elevations and dimensioned locations of underground work shall be indicated. Dimension to permanent references.

1.07 SUBMITTALS

The contractor shall submit a list of principal material items, giving manufacturers' names, catalog cuts and approval of the submittal data shall be obtained from the Architect before orders are placed. Submittals are required on the following: Panels, and circuit breakers, disconnect switches, light fixtures, wiring devices, device plates, conduit, fittings, boxes, and cables.

PART 2 PRODUCTS

2.01 MATERIALS

A. Materials and equipment shall be new, standard current products of manufacturers regularly engaged in the production of such equipment, and shall be the manufacturer's latest design.

B. All materials shall bear the label of the Underwriter's Laboratory for the intended use or shall be materials approved by the code enforcing authorities and the Architect/Engineer.

C. The contractor shall coordinate sizes indicated for electrical components such as circuit breakers, disconnects, feeders and starters with requirements for equipment actually provided and shall notify the Architect if any item is inadequate in size for equipment installed or proposed. Contractor shall install as a minimum the size indicated unless he receives in writing from the Architect directions to reduce the component in size.

D. When the equipment to be installed has a requirement which is greater than shown, the Contractor shall increase the size of the electrical component as work under the section of this specification which installs the equipment requiring the same. Modifications to the contract will not be issued for failure to coordinate with other trades or with the requirements of owner furnished equipment.

2.02 HARDWARE:

All hardware and accessory fittings shall be of a type designed, intended or appropriate for the use, and complement the items with which they are used, and shall have corrosion protection suitable for the atmosphere in which they are installed. All such hardware shall be U.S. Standard sizes.

2.03 EQUIPMENT

Equipment of a similar nature shall be identical. Example: All panelboards shall be of the same manufacturer and of the same style.

2.04 MATERIAL PROTECTION

Store and protect all materials from injury prior to installation. Materials shall not be stored directly on the ground or floor, and shall be kept as clean and dry as possible and free from damage or deteriorating elements. Damaged materials shall not be installed.

PART 3 EXECUTION

3.01 INSTALLATION:

A. All work will be installed in accordance with regulations of the National Electrical Code, the Life Safety Code, and ordinances of the state and local governments.

B. Contractor shall obtain all necessary permits and inspections as required and pay all charges for same, and shall turn over to the Architect Certificate of final inspection. Should any part of the design fail to comply with such requirements, discrepancy shall be called to the attention of the Architect prior to submission of bid.

C. Follow the installation directions and recommendations of the material and equipment manufacturers.

D. Materials damaged during installation shall be repaired to a new condition or shall be replaced. Finishes on equipment which have been scratched or marred shall be touched up to match finish or shall be completely refinished.

3.02 SCHEDULING OF WORK:

A. Electrical work shall be scheduled to correspond with the sequence of work necessary to construct new work.

B. Electrical work shall be scheduled to provide an orderly installation without causing any delays in the overall construction of the project.

C. Contractor shall coordinate and schedule all electrical service, telephone service, and cable television service disconnects and reconnects. Contractor shall pay any associated disconnect and reconnect charges.

3.03 IDENTIFICATION:

Use Brady markers on conductors. Use Manufacturer's nameplates and directories where available. Use of Dyno Labels will not be permitted. Use of uniform painted stencils will be permitted. Use of micarta nameplates will be permitted: 1/4" white letters on black background.

3.04 TEMPORARY SERVICE AND SUPERVISION:

A. Temporary power and construction lighting shall be provided as needed under this section of the specifications. Both shall be provided in a safe and sufficient manner for the orderly completion of the work. The cost of power shall be paid for by the general contractor.

B. All work shall be performed under the direct supervision of a journeyman electrician or an electrician with 8,000 hours experience as an electrician's apprentice.

END OF SECTION 16050

SECTION 16060 – GROUNDING

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS This section includes basic materials and methods for all of Division 16.

1.02 APPLICABLE REQUIREMENTS:

A. NEC Article 250

PART 2 PRODUCTS

2.01 CONDUCTORS

A. Equipment grounding conductors shall be copper with green colored insulation or bare in NM cables. For conductor sizes #8 and larger, green colored tape may be used to cover the exposed insulation of the equipment grounding conductor in all panels, junction boxes and equipment connection compartments.

B. The grounding electrode conductor shall be soft drawn bare copper. The grounding electrode conductor shall be sized in accordance with the drawings and requirements of section 250 of the NEC.

2.02 GROUND RODS

A. Ground rods shall be 3/4" diameter in ten foot sections with threaded end for screw couplings. Material for ground rods shall be solid copper.

PART 3 EXECUTION

3.01 EQUIPMENT GROUNDING

A. All exposed non-current carrying metallic parts of electrical equipment, metallic raceway systems, grounding conductor in non-metallic raceway systems and the neutral conductor of wiring systems shall be grounded.

B. A separate equipment grounding conductor shall be installed in all conduits and cables and shall be sized in accordance with NEC Table 250.122. The equipment grounding conductor shall be separate from the electrical system neutral conductor.

3.2. GROUNDING ELECTRODE SYSTEM

A. Test and inspect the existing grounding electrode system. The maximum resistance to ground of the grounding system shall not exceed twenty-five ohms under normal dry conditions. Where the resistance obtained exceeds twenty-five ohms, a change order may be issued by the owner to provide a new grounding electrode system in accordance with these specifications and the NEC. The cost of obtaining the required minimum resistance to ground of the ground system may be paid by the owner and shall not be the responsibility of the Engineer or the Contractor.

B. Ground connection shall be made in accordance with NEC 250.50 to a metal underground water pipe in direct contact with the earth for 10 ft or more and electrically continuous.

C. Supplement the metallic water service grounding system with an additional driven electrode system. The driven electrode system shall consist of three ground rods driven on 10 ft centers. Rods shall be connected together with the grounding electrode conductor.

D. Connections shall be made so that the contact between the grounding electrode and the grounding electrode conductor is maximized. Exothermic welding process or Burndy Hyground system is required.

E. Test the installed grounding system to assure continuity and that the resistance to ground is not excessive. Test each ground rod for resistance to ground before making any connections to the rod; then tie entire grounding system together and test for resistance to ground. Make resistance measurements in normally dry weather, not less than 48 hours after rainfall. Make ground resistance measurements with a ground resistance test meter equal to AEMC Model 6416 and calibrated within the last twelve months.

F. Test forms for each grounding electrode system shall be delivered to the Architect prior to substantial completion of project. Test form shall include test data, test meter model and manufacturer, calibration date, and signature of person performing the test.

END OF SECTION 16060

SECTION 16070 – ELECTRICAL SUPPORTING DEVICES

PART 1 ELECTRICAL SUPPORTING DEVICES

1.01 GENERAL REQUIREMENTS:

This Section includes basic materials and methods for all of Division 16.

1.02 SELECTION OF PRODUCTS:

A. Devices, including anchors, fasteners, hangers and supports, shall be of a type designed or fabricated for the purpose, and shall adequately and safely secure the material and equipment and present a neat appearance.

B. Make job fabricated hangers or supports from standard structural shapes and hardware.

C. All bolts, screws, nuts and other threaded devices shall have U.S. standard threads and head as appropriate.

D. All fasteners in exterior locations shall be stainless steel.

PART 2 EXECUTION

2.01 INSTALLATION:

A. Install equipment, including switches, and controllers such that removal or replacement may be readily accomplished without damage to equipment or fasteners.

B. Internal and external threads of parts that are screwed or bolted together shall be made of the same material including coatings and method of applying coatings. For example, if the threads of bolts or rods are hot dipped galvanized, the nuts must also be hot dipped galvanized. If they are electro-galvanized, the nuts must also be electro-galvanized. All threads shall be fully engaged. All parts so installed shall be made up tight using tools intended for the purpose.

2.02 FASTENERS:

A. Fasten all materials and equipment with approved devices. Generally fasteners shall be as follows:

1. Wood: fasten to wood with screws except nails may be used on wood partitions for outlet boxes, cables, and raceways up to 1" diameter.

2. Masonry: Fasten to masonry with threaded metal inserts, metal expansion screws, toggle bolts, or approved means.

3. Steel: Fasten to steel with machine screws, welded threaded studs, or spring tension clamps. Threaded C-clamps may be used on rigid steel conduit only, conduit or pipe straps shall not be welded to steel structure.

END OF SECTION 16070

SECTION 16120 – CONDUCTORS

PART 1 GENERAL REQUIREMENTS:

1.01 SCOPE

This section includes basic materials and methods for all of Division 16, electrical and related work.

1.02 APPLICABLE REQUIREMENTS:

A. NEC Articles 310 and 400

PART 2 PRODUCTS

2.01 CONDUCTORS

A. All conductors shall be copper, shall conform to applicable ASTM specifications as to conductivity, and shall be free from kinks and defects when installed. Minimum size conductor shall be #12 AWG. For home runs over 100 feet, minimum size conductor shall be #10 AWG.

B. Conductors #10 AWG and smaller shall be solid with color coded insulation.

C. Insulation for general building wiring and feeders shall be THW or THWN.

D. Insulation for wiring in the vicinity of heat producing equipment shall be type AF or other type suitable for the application.

E. Where permitted by the National Electrical Code, type MC cable may be used for interior wiring.

F. All cables must be protected in accordance with Article 300 of the NEC. Type MC cables must be supported within 12 inches of every box, cabinet, or fitting and at intervals not exceeding six feet.

2.02 SPLICES AND TERMINATIONS:

A. Connections shall comply with Federal Specification W-5-61b. Connectors for temperatures to 105 degrees C. shall be Ideal Wing Nut or 3M Scotchloc. Connectors for temperatures to 150 degrees C. for use in fixtures shall be Ideal Wire Nut.

B. Tape shall be Scotch 33 or equal. Voids shall be filled with rubber tape.

PART 3 EXECUTION

3.01 CONDUCTORS:

A. Conductors size #10 and smaller shall be copper and have insulation colored for phases A, B, C, and N respectively as follows for three phase systems: 120/208 Volts – black, red, blue, and white

B. Bonding conductors size #10 and smaller shall have a green covering and shall be the same size as the circuit conductors unless otherwise indicated. Bonding conductors shall be installed as required by the NEC.

C. Equipment grounding conductors shall have green colored insulation or shall be bare copper.

D. Installation of conductors shall be made only in completed raceway systems and all conductors in any conduit shall be pulled together.

E. Use wire pulling compounds or lubricants as listed by Underwriter's Laboratories.

F. Where type MC cable is used, the installations shall comply with Articles 300 and 330 of the National Electrical Code.

3.02 SPLICES AND TERMINATIONS:

A. Use solderless terminal lugs on all stranded conductors. Use approved solderless connectors for all splices. Keep splices to a minimum. Splices shall not be pulled in conduits. Use approved junction boxes.

B. Splice all neutrals prior to connection to wiring devices. Splices other than pre-insulated connectors shall be covered neatly with insulation tape equivalent in value to the conductor insulation. Use minimum of two layers of tape.

END OF SECTION 16120

SECTION 16130 – RACEWAYS AND BOXES

PART 1 GENERAL

1.01 This section includes basic materials and electrical methods for all of Division 16, electrical related work.

PART 2 PRODUCTS

2.01 RACEWAYS AND FITTINGS:

A. Rigid or Intermediate Grade Steel conduit shall be mild steel produced to ANSI C80.1 and Federal Specification WW-C-581 and shall be Underwriter's approved hot dipped galvanized, zinc metallized or sherardized inside and out. The threaded ends of the conduit shall be zinc coated. Conduit fittings shall be zinc coated and shall be threaded type. Fittings shall be all steel. "Erikson" couplings shall be used where necessary. Running threads are not allowed. Connections shall be made with double locknuts except at threaded hubs. Terminations shall utilize insulated bushings.

B. Thin wall conduit shall be Underwriter's approved galvanized electrical metallic tubing. Fittings for EMT shall be steel set screw or steel compression type. Connectors shall have insulated throats.

C. Flexible Metal Conduit (Greenfield) shall be galvanized and conform to Federal Specification WW-C-566 and fittings shall conform to Federal Specification W-F-406, Type 1, Class 1. Liquid tight flexible conduit shall conform to NEC Article 350 as manufactured by Anamet, Thomas & Betts, or Electri-Flex. Fittings shall be as manufactured by Appleton, EFCor, or Thomas & Betts and conform to Federal Specification W-F-406, Type 1, Class 3.

D. PVC conduit shall be schedule 40 or schedule 80, 90 degrees C UL listed, and UL listed for aboveground and underground uses. Conduit shall conform to NEMA TC-2 and UL-651 standards. All joints shall be solvent cemented in accordance with the recommendations of the manufacturer.

E. Wireways and Auxiliary Gutters: Galvanized steel with removable covers unless indicated as hinged. Components shall be as manufactured by Square "D", Hoffman, Arlington, or Cooper B-Line.

2.02 BOXES AND ACCESSORIES:

A. Sheet steel boxes and accessories shall conform to Federal Specification W-C-568; as manufactured by Appleton, Arlington, or Crouse-Hinds.

B. Pull boxes and junction boxes larger than 4-11/16" shall be constructed of galvanized steel in accordance with NFPA 70, Article 314. Boxes shall be as manufactured by Hoffman, Appleton, Arlington, or Crouse-Hinds.

C. Cast outlet boxes shall have threaded conduit entrances and gasketed covers. Boxes shall have a minimum of two hubs, except where noted otherwise.

PART 3 EXECUTION

3.01 RACEWAYS:

A. Rigid conduit shall be used in areas subject to physical damage, where run exposed, in damp or wet locations, in slabs and concrete and buried in earth.

B. Paint metal conduits in or below ground floor slab or in ground with 2 coats of asphaltum up to 2" above finished floor slab inside the building or 6" above finished grade outside the building.

C. Use flexible conduit for all connections to vibrating equipment such as motors, valves, and devices on piping and ductwork. Flexible conduit may be used for short connections to control devices, recessed fixtures, and similar items. The connection between structure and the first point of attachment to vibrating equipment shall be flexible. Machinery connections shall not exceed three feet. Fixture whips shall not exceed six feet and shall be supported from structure so as not to lay on ceiling tile.

D. Use liquid-tight flexible conduit connections to all equipment in damp or wet locations.

E. Electrical metallic tubing may be used for branch circuit wiring in areas above grade and within the building except in wet areas, slabs and as indicated otherwise.

F. Install exposed conduit parallel with or at right angles to the building lines. Conduit in concrete shall be located so as not to affect the structural strength of the slabs as determined by the Architect. Conceal conduits in walls, above ceilings, in or under slabs or in furring, except in mechanical and electrical rooms and where indicated as exposed on existing walls. In areas with exposed structure and no finished ceiling, conduits shall be run as high as possible and held tight to walls or underside of roof.

G. Changes in direction of runs shall be made with symmetrical bends or cast metal fittings. Field made bends and offsets shall be made with an approved conduit bending device. Damaged or deformed conduits shall not be installed. No bend shall exceed 90 degrees. Proper offsets shall be used to prevent strain on connectors at conduit termination points. All raceway runs shall be capped during the course of construction to prevent accumulation of dirt and debris. All conduits shall be cleared of all dirt and water before conductors may be pulled in.

H. Schedule 40, PVC will be permitted where allowed by applicable codes and as outlined below. PVC may be used only in concrete and in earth, and may not be used in wall or ceiling spaces. Exposed conduit in exterior locations shall be schedule 80. PVC may be used for service laterals if encased in a minimum of two inches of 3000 psi concrete. All bends in PVC larger than 1" nominal trade size shall be made with rigid metal conduit. Penetrations through concrete slabs shall be made with rigid galvanized steel conduit.

I. Aluminum conduit is not permitted in the ground or in slabs.

J. ENT is not permitted.

K. All raceway shall be supported at code required intervals with brackets and/or clamps as manufactured for conduit supports. Tie wire is not an acceptable means of support.

3.02 BOXES AND ACCESSORIES:

A. Use cast metal outlets with gasketed covers for all exterior and for all damp locations, and for all exposed outlets. Material for boxes in exterior locations shall be aluminum, fiberglass, PVC, or stainless steel.

B. Boxes over two inches in width installed in stud walls shall be supported from two sides.

C. All boxes shall be rigidly supported.

D. Gangable type boxes shall not be used.

E. Use masonry boxes in all block walls. At the individual cell where each box is located, fill the cell entirely with mortar. Switch boxes are not permitted in block walls.

3.03 MISCELLANEOUS:

A. Provide approved fire stopping materials at all chases to prevent drafts.

B. Provide expansion fittings in conduit runs crossing expansion joints in the structure.

C. Fire Rating: Restore Fire Rating where piercing occurs through fire rated ceilings or between fire rated walls. Firestop material shall be as manufactured by 3M Company and UL listed for use in the construction assembly in which it is to be used. See architectural plans for locations of fire rated walls and ceilings.

D. Provide 230 pound tensile strength polyolefin pull line in all empty conduits ½" to 1". Provide #14 gauge pullwire in all empty conduits over 1".

END OF SECTION 16130

SECTION 16140 – WIRING DEVICES

PART 1 WIRING DEVICES PRODUCTS

1.01 WIRING DEVICES

A. All receptacles shall be the grounding type with ground connection made through an extra pole which shall be permanently connected to the raceway system.

B. Receptacles for 120 volt circuits shall be rated for 15 or 20 Amperes as required and shall be tamper proof. A 20 amp receptacle is required when a single receptacle is connected to a 20 amp circuit breaker. Specification grade is required.

C. Special receptacles shall be rated for amperage, voltage and have NEMA configuration as indicated or scheduled or shall be selected to meet the particular requirements. Coordinate selection with shop drawings and equipment to be furnished by the Owner.

D. Toggle switches shall be heavy duty quiet type rated at 20 amperes 120/277 V AC only. Interior plates shall be stainless steel.

Cover plates for damp location application shall have spring hinged covers to close automatically when not in use. Cover shall be of lexan or heavy duty die cast zinc or plated aluminum. Cover plates for wet location application shall have spring hinged covers and shall be listed as weatherproof while in use. Cover shall be of heavy duty die cast metal.

E. Device colors shall be selected by owner's representative from standard colors.

PART 3 EXECUTION

3.01 OUTLETS:

A. Install plates and covers on all outlets. Install all devices uniformly in each area.

3.02 MOUNTING:

A. Mounting heights (to center line of box): Generally mount outlets at 18" above finished floor unless noted otherwise. Mount switches at 48" above finished floor.

B. Test each socket of each outlet with a device intended for the purpose.

C. Devices shall be pulled up tight to outlet box. Device shall not be supported by cover plate.

D. Outlet boxes recessed behind finished surfaces shall meet code requirements for maximum allowable distance between front of box and finished surface.

E. Outlets mounted above counters shall be mounted horizontally 4" above the back splash to the center of the device.

F. Outlets shall be installed plumb within 1/16" from top to bottom.

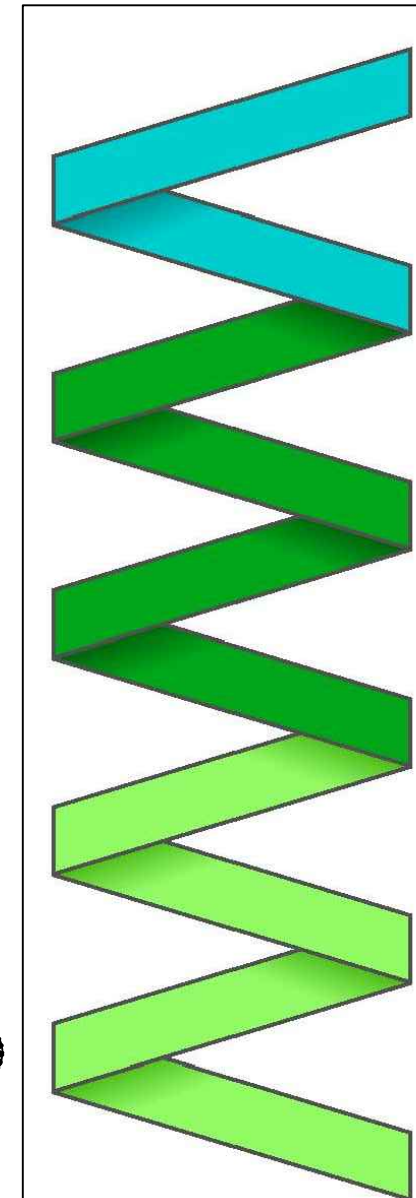
G. Outlets in block walls shall be cut into one block only.

H. Outlets shall be entirely in or entirely out of wainscoting.

END OF SECTION 16140

NIX ENGINEERING INC.
105 TENNESSEE STREET
MURPHY, NC 28906
(352) 339-4691

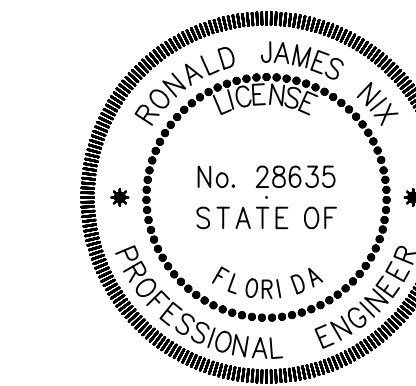
FLORIDA CA#8798, PE#28635
GEORGIA CA#PEF003627, PE#14888



MARK MERCER & ASSOCIATES, INC.

1117 JENKS AVENUE/PANAMA CITY, FLORIDA 32401/850.763.8072

CARLISE BAPTIST CHURCH
TRIBEJULIJD
835 BERTHE AVENUE
PANAMA CITY, FLORIDA



PREPARED BY NIX	REVIEWED BY RN	SCALE N/A	PROJECT NO. 2236
ISSUE DATE 05/06/2024	SHEET 18 OF 20	E18	
ELECTRICAL SPECIFICATIONS			

SECTION 16410 – SAFETY SWITCHES AND CIRCUIT BREAKERS

PART 1 _ GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE:

Panelboards.....SECTION 16440

1.02 SUBMITTALS:

Submit shop drawings for approval including catalog cuts showing sizes types, and characteristics of all products.

PART 2 _ PRODUCTS

2.01 SAFETY SWITCHES:

A. Safety Switches shall be general-duty type unless specifically noted on the drawings. Fusible switches shall be provided with one-time cartridge or ferrule-type fuses of capacities shown on drawings. An extra set of fuses of each size shall be provided and turned over to the Owner. Fusible switches shall be 240 volt rated for the 208 volt system and shall be provided with general purpose enclosures unless noted otherwise. All switches for motors shall be horse-power rated. Fusible switches for motors shall be furnished with dual element fuses of the recommended size for the particular motor installed to provide motor running over current protection. Switches shall be labeled with black micarta tags engraved with white letters identifying component protected and power source. Tags shall be attached with machine screws or rivets.

2.02 CIRCUIT BREAKERS, MOLDED CASE:

A. Circuit breakers shall be of the ampere rating, voltage rating, number of poles and class or interrupting capacity (I.C.) as indicated. Contractor shall coordinate interrupting capacity with the serving utility company and the characteristics of their distribution system. Interrupting ratings are given in root mean square (RMS), symmetrical amperes based on NEMA test procedures. Lugs and terminals shall be UL approved for copper-aluminum.

B. Each circuit breaker shall have a trip unit for each pole with elements providing inverse time delay under overload conditions and instantaneous magnetic trip for short circuit protection unless indicated as non-automatic. Trip elements shall operate a common trip bar to open all elements.

C. Circuit breakers shall be bolt-on type or equal to Square D I-Line plug on type.

D. The Service Disconnect shall be a molded case circuit breaker of the frame as indicated and/or service entrance rated, heavy duty, fused disconnect switch with fuses and enclosure type as indicated. Circuit breaker overload trip rating shall be as indicated. Each pole of the breaker shall provide inverse time delay and instantaneous circuit protection. Breaker operator shall be a toggle handle to provide quick-make and quick-break operation. Handle shall be trip free.

E. All main switches rated 1000 amps or more for any service voltage shall be equipped with a ground fault sensing unit to trip the switch upon the system fault to ground. Trip rating of the ground fault system shall be set at not more than 40% of the normal rating or 800 amps whichever is smaller. Time delay shall be adjustable from 0.1 to 0.5 seconds. Manufacturer shall provide all settings to the contractor and provide field support as required to ensure proper adjustment and operation of the ground fault equipment.

F. See Drawings for breaker sizes and interrupting ratings.

G. Use HACR labeled breakers for heating and air conditioning loads.

H. All breakers used on lighting circuits shall be switching duty rated.

I. All breakers and safety switches shall have a 75 deg. C rating.

PART 3 EXECUTION

3.01 INSTALLATION:

A. Mount grouped switches, disconnects and controls on backboards or unistrut.

B. Generally, mount switches and disconnects between 4' and 5' up, readily accessible.

END OF SECTION 16410

ELECTRICAL

SECTION 16440 – PANELBOARDS

PART 1 _ GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE:

A. SAFETY SWITCHES AND CIRCUIT BREAKERS.....SECTION 16410

1.2 SUBMITTALS:

A. Submit shop drawings for approval on each panelboard indicating cabinet dimensions, component arrangements, characteristics, and sizes.

PART 2 _ PRODUCTS

2.1 PANELBOARDS FOR LIGHTING AND POWER:

A. Panels shall be standard dead front circuit breaker panels with main circuit breaker or main lugs as shown. Bus shall be copper or aluminum of ampere rating as shown arranged for voltage, phase and number of wires called for by the drawings. Front shall be complete with door and flush chrome plated lock and catch. Panels shall be flush or surface mounted as indicated. Proper trim shall be furnished for each panel. Branch circuit breakers shall be toggle type, quick make, quick break, thermal magnetic trip. All multi-pole breakers shall be single handle, common trip type. Minimum AIC of circuit breakers shall be as indicated on the drawings.

B. Directory shall be neatly typed and enclosed in plastic envelope on inside of panel door. The directory shall indicate the owner's room number or room name. Coordinate with final room identification plaques. Circuit breakers on large panelboards without doors shall be identified with permanently applied micarta labels.

C. Circuit breakers shall be arranged as indicated on the panel schedules on the drawings. Deviations shall be approved by the engineer and shall be documented on the as-built drawings.

D. Panels shall be constructed of code gauge steel. Box shall be treated with a rust inhibitor, front shall have gray finish over a rust inhibitor. Indoor units shall be NEMA 1 enclosure. Outdoor units shall be in weatherproof enclosure. All cabinet panels, closures, doors, structural frames and fasteners shall be coated, plated, and fabricated from rust resisting materials which will stand up under interior damp locations, or where outside will resist the elements of the weather and protect the interior parts.

E. Locks on all panelboards shall be keyed alike. Provide a minimum of six keys to the owner's representative.

F. Panelboards shall be factory assembled and tested. Circuit breaker panelboards shall be as manufactured by Square D, General Electric, Siemens, or Cutler-Hammer. Provide grounding terminal bus. Service equipment shall have Service Entrance Label.

G. Where panels are placed in areas which may be used for storage, mark a rectangle on the floor in front of the panels with 3" wide yellow paint corresponding to the clearance required by the National Electrical Code. Fill the interior of the rectangle with diagonal 3" yellow stripes on 8" centers. Mark the interior of the rectangle with 3" black letters: "NO STORAGE". Coordinate with the Architect prior to painting any floor finish.

H. Contractor shall coordinate with all trades to insure space required by NEC 110.26 is maintained for all panelboards. The dedicated space extends from the floor to six feet above the equipment or to the structural ceiling (not a suspended ceiling) with a width and depth that of the equipment. No piping, ducts, or equipment foreign to the electrical equipment or architectural appurtenances shall be permitted to be installed in, enter, or pass through such spaces.

I. All service entrance equipment and sub panels shall have UL 1449 fourth edition listed Surge Protection Devices (SPD's). UL voltage protection rating shall be as low as 600 volts for 120/208 volt panels. Response time shall be less than 1.0 nanosecond. Main panel protection shall be equal to ASCO 430120YP20ACAJ20. Sub-panel protection shall be equal to ASCO 430120YP10ACAJ20. Provide flush mount trim for SPD units at flush mounted panelboards. Provide NEMA 4X enclosures for SPD units in exterior locations. Provide a separate thirty amp three pole circuit breaker in each panel for SPD connection. Provide SPD with integral disconnect for exterior service entrance disconnects where no branch circuit breaker is available. Leads between the SPD and circuit breaker shall be less than fifteen inches total length with no sharp bends and no bend over ninety degrees.

J. All lugs and breaker terminals shall be rated at 75 degrees C.

END OF SECTION 16440

SECTION 16500 LUMINAIRES

PART 1 _ GENERAL

1.1 SCOPE:

A. This Section includes the lighting fixtures, lamps, trim, ballasts, and accessories.

1.2 QUALIFICATIONS

A. Photometric data of independent, nationally recognized testing agencies will be accepted.

B. Photometric data of testing laboratories of fixture manufacturers may be accepted if certified and approved by the Engineer.

1.3 SUBMITTALS:

A. Submit Shop Drawings for each fixture assembly consisting of catalog cuts, photometric data, dimensions, ballasts data, voltage, materials, finishes and installation data. Submittals shall be bound in a manual, indexed and identified in accordance with schedules.

1.4 LUMINAIRES, GENERAL REQUIREMENTS:

A. Light fixtures shall be furnished complete with lamps and all necessary mounting hardware and trim and installed as shown on the drawings.

B. Light fixtures shall be neatly and firmly mounted, using standard supports for outlets and fixtures. Suitable support members shall be provided for all fixtures, outlet boxes and hangers under this section of specification.

C. Except as indicated or specified otherwise, the metal parts of light fixtures shall be of corrosion resistant metal or shall be suitably finished to resist corrosion; metal portions of fixtures which will be visible after installation shall have an unblemished finish.

D. Lens frames shall be supported so as to avoid sagging, and shall be readily removable with suitable hinges and latches. Removable frames shall have adequate retention for use when servicing.

E. Plastic lens shall be made of heat resistant acrylic. Minimum thickness shall be 0.125 inch.

F. Emergency battery units shall have a five year unconditional warranty.

G. Emergency lighting ballasts shall be sealed nickel cadmium battery units. The battery shall be maintenance free with special cell construction to withstand high temperatures. The inverter shall be a highly efficient solid state inaudible high-frequency unit which will operate the fixture in the emergency mode at approximately 10 watts. The unit shall automatically disconnect the normal fixture source and instantly energize the fixture load upon power failure of the AC supply. Minimum emergency illumination time shall be 90 minutes. The emergency battery unit shall be provided with self-testing electronic circuitry and shall automatically test emergency lighting for a minimum of 30 seconds every 30 days, and 90 minutes once a year. An embedded micro controller will continually monitor the battery charging current and voltage. An audible alarm and light-emitting diode shall be provided to indicate test results and status conditions.

PART 3 EXECUTION

3.1 INSTALLATION:

A. Adjust directional fixtures to obtain the most uniform distribution. Orient all similar fixtures consistently. Coordinate fixtures with air grilles, pipes and ductwork.

B. Fixture bottoms, edges, and ends shall be even. Clean all fixtures of debris and fingerprints and adjust trim to fit surfaces snug.

C. Provide all necessary hangers and mounting accessories for a complete installation.

D. Locate the fixture in the equipment rooms to best illuminate the equipment installed. Use chains or rods to support below ducts and pipes as required. Install after pipes and ducts are in.

E. Test all fixtures, switches and controls for operation.

F. Fire rated suspended ceiling grid systems shall be supported with a vertical hanger from each corner of each Lay-in troffer or as required by the ceiling system UL listing.

G. Troffers shall be fastened to the ceiling grid members by approved methods per Section 410.16(C) of the NEC.

H. Recessed fixtures that are not IC rated, must have three inches of clear air space all around the fixture. In insulated ceilings, the contractor shall provide an insulation dam around the fixture to keep insulation at least three inches from the fixture.

I. For installation of lay-in troffers provide as a minimum two hanger wires on opposite corners of the troffer and secured to the structure.

END OF SECTION 16500

SECTION 16710 – TELEPHONE AND CABLE TV RACEWAY AND WIRING SYSTEMS

PART 1 GENERAL

1.01 SCOPE: This section includes conduit and wiring systems including backboards, cabinets, outlets and plates as required.

PART 2 PRODUCTS

2.01 PLATES

A. Match adjacent wiring devices.

2.02 WIRING

A. Telephone and cable television outlets shall be pre-wired by the electrical contractor for a modular type system.

B. Telephone wiring shall consist of four pair 24 AWG UTP category 5 cables.

C. Television system cable shall be type RG-6 as manufactured by Belden or West Penn Wire, or as required by the local cable service provider. Contractor shall install cables and provide a plate per cable service provider directions. Cable service provider shall install jacks and terminate cables on each end. Contractor shall leave three feet slack conductor at each outlet and ten feet of slack at the backboard.

2.03 OUTLETS

A. Telephone outlets shall be flush mounted modular type duplex RJ-45 jacks.

B. Cable television jacks shall be furnished and installed by the cable service provider.

PART 3 EXECUTION

3.01 INSTALLATION:

A. Minimum size outlet box shall be as required by the wiring devices.

B. Provide outlets and plates to match adjacent outlet covers.

C. Provide bushings on the ends of cut conduits. Conduits may be PVC underground as allowed by section 16130.

D. Conform to Telephone Company and cable service provider requirements.

E. Provide a #6 ground to all backboards and terminals boxes from the building grounding electrode system. Ground wire need not be in a raceway.

F. Provide #14 TW pull wire or 230 lb. test Polyolefin pull line in all empty conduits.

G. Install backboards and cabinets as shown on the drawings. Unless shown otherwise on the drawings, the minimum size backboard shall be 3/4" x 96" x 96" plywood. Paint backboard with three coats insulating gray paint on both sides. Provide surge protected punch down blocks.

H. Provide as a minimum one 3" PVC conduit from the telephone backboard to the property line at a location indicated by the local telephone company. See telephone riser diagram for additional conduit requirements for the telephone service entrance.

I. Provide as a minimum one 3" PVC conduit from the telephone backboard to the property line at a location indicated by the local cable service provider. See telephone riser diagram for additional conduit requirements for the cable television service entrance.

END OF SECTION 16710

SECTION 16610 – FIRE ALARM SYSTEM

PART 1 _ GENERAL

1.01 APPLICABLE DOCUMENTS:

NFPA_72 NFPA-101 National Fire Alarm Code Life Safety Code

1.02 REQUIREMENTS:

A. The installation shall conform to the referenced editions of the National Fire Protective Association Standards #72 and #101 as listed above.

B. The system shall not require manual intervention upon actuation of any sending station or detector.

1.03 SUBMITTALS:

A. Submit Shop Drawings of all equipment for approval including a system wiring diagram. Submit manuals for approval.

B. Submit evidence that fire alarm control units, equipment, and components are of a type listed and/or approved for the purpose intended as determined by a nationally recognized agency such as Underwriters Laboratories Inc., or Factory Mutual Research Corporation.

1.04 TYPE OF SYSTEM:

A. Provide and install electrically supervised, non-coded, continuous ringing, remote alarm system with voice evacuation. The system shall include but shall not be limited to all detection devices, initiating devices, audible and visual alarm signaling devices, conduit, wire, fittings and all accessories required to provide a complete operating Fire Alarm System.

B. Trouble and alarm signals shall be transmitted wirelessly to a remote station receiving station located at a fire department, answering service, or other locations which are manned 24 hours a day and capable of response upon receipt of signal via digital communicator. The contractor shall be responsible for all installation charges. Owner shall be responsible for lease and/or service payments as required by the system. System shall meet the approval of the local and state fire marshal.

1.05 INSTALLATION CONTRACTOR REQUIREMENTS

A. Submit a company resume showing years in business, certification stating that he is an authorized representative for the manufacturer of the equipment he is submitting for approval and that he maintains a fully equipped and stocked service shop and shall respond to service calls within twelve normal working hours, list of key personnel, copies of appropriate licenses and list of recently completed jobs during the normal prior approval period.

B. Qualifications: Systems Contractor responsible for furnishing and installing systems specified herein to meet the following minimum requirements:

1. Contractor to be a manufacturer authorized dealer/representative for products furnished.

2. Contractor shall have been in the business of furnishing, installing and maintaining systems specified herein for a minimum of five consecutive years.

3. Contractor shall have successfully completed a minimum of five projects of size and complexity equal to work required under this contract. Contractor shall submit, as part of shop drawing phase, a list of these projects.

4. Contractor shall maintain a fully staffed and equipped service office within 100 miles of project site. Office shall have been in existence for a minimum of five years.

C. The Contractor shall plan on one visit to the site for training.

D. Emergency Service: The Systems Contractor shall guarantee the owner that, when emergency service is requested by owner, that a qualified manufacturer trained and properly equipped service technician will be on site within four hours of notice of an emergency.

PART 2 _ PRODUCTS

2.01 SENDING STATIONS:

A. The addressable manual fire alarm pull station shall incorporate a custom microprocessor based integrated circuit which shall provide communication with its compatible control panel.

B. The addressable manual fire alarm pull station shall be constructed of durable molded polycarbonate material which is matte finished in red with raised white lettering. The housing shall accommodate a pull down lever, which when operated locks in position after releasing a spring loaded switch. To indicate the fire alarm box has been activated, the pull down lever shall be reset only by opening the hinged housing cover with an allen key and then closing and locking the cover.

C. The addressable manual fire alarm box shall be UL listed.

D. The addressable manual fire alarm box shall be dynamically supervised and uniquely identifiable by the control panel.

E. The addressable manual fire alarm box's address shall be programmed with the use of a portable programming accessory. The portable programmer shall be menu driven. Once the desired address is entered, the programmer shall set and verify the address. The programming accessory shall also be capable of testing the device's functionality. The manual fire alarm box shall be compatible with all other detectors and interface modules on the same circuit.

2.02 ALARM SIGNALING DEVICES

A. Alarms shall be audible and/or visual flush and/or surface mount types as indicated.

B. Visual signals shall be xenon strobe type UL 1971 listed at 75 candela polar output that meets ADA requirements for regular lighted public areas. Strobe mounting plate shall completely cover the electrical box and shall provide adjustment for out of plumb electrical boxes. Basis of requirement is Gentex GEC/WR series.

C. Speakers and speaker-strobes shall be UL listed for use on fire alarm systems. Minimum output shall be 87 db at ten feet. The maximum output shall be approximately 100 db at ten feet with a maximum tap setting

2.03 IONIZATION SMOKE DETECTORS

A. Provide where indicated on the plans dual chamber, addressable ionization smoke detectors. The addressable ionization detector shall incorporate a custom microprocessor based integrated circuit which shall provide communication with its compatible control panel. All of the detector's communication circuits shall be contained within the detector. No communication electronics or address identification mechanisms shall be contained within the detector's base. The detector shall be a plug-in unit which mounts to a twist-lock base. The detector shall operate on a two wire circuit and shall contain an LED which shall blink to signal alarm actuation. The detector shall be UL listed.

B. The detector shall contain two ionization chambers and an LED alarm indicator. The reference chamber and the microcomputer chip's software shall compensate against sensitivity changes caused by environmental factors such as temperature, humidity, and barometric pressure.

C. The detector's address shall be programmed with the use of a portable programming accessory. The portable programmer shall be menu driven. Once the desired address is entered, the programmer shall set and verify the address. The programming accessory shall also be capable of testing the detector's functionality.

D. The detector shall be capable of bi-directional communication with the control panel.

E. The detector shall be dynamically supervised and uniquely identifiable by the control panel. The control panel shall be capable of analyzing the signal of the detector's analog value for calibration, identification and sensitivity. These values can be displayed by the control panel and monitored for processing according to control panel instructions. The detector's sensitivity shall be individually adjustable from the control panel. Should the detector sensitivity voltage shift beyond an acceptable level and stay there for a predetermined length of time, a discrete detector trouble signal shall be annunciated at the control panel.

F. The detector shall be compatible with all other manual stations and interface modules on the same circuit.

G. The detector shall be capable of operating one remote alarm indicator, auxiliary relay, or audible base. The relay or remote alarm indicator, or audible base is normally actuated by the associated detector. The system shall be capable of being programmed to operate the relay or remote alarm indicator, or audible base independently of the associated detector. All detectors and/or relays connected to the circuit can be in alarm or activated simultaneously.

H. The addressable ionization detectors shall insert into a standard base, a relay base, or an audible base. The base assembly in which the detector is installed shall be of the twist-lock design with screw-clamp terminals. The base shall use self-wiping contacts and shall accept other compatible detectors.

2.04 PHOTOELECTRIC SMOKE DETECTORS

A. Provide where indicated on the plans addressable photoelectric smoke detectors. The addressable photoelectric detector shall have a plug-in head unit which mounts to a twist-lock base. The detector head shall incorporate microprocessor based circuitry which shall perform all detection and communication functions. No communication electronics or address identification mechanisms shall be contained within the detector's base. The detector shall operate on a two wire circuit and shall contain an LED which will flash to signal an alarm condition. The detector shall be UL listed.

B. The photoelectric detector shall utilize a light emitting diode (LED), mirror and light sensing photodiode assembled in a fixed array so that under normal conditions, light transmitted by the LED is directed away from the photodiode and scattered throughout the smoke chamber in a controlled pattern. The smoke chamber design should effectively manage light dissipation and extraneous reflections from dust particles or other airborne contaminants in such a way as to maintain stable, consistent detector operation.

C. The detector's address shall be programmed with the use of a portable programming accessory. The portable programmer shall be menu driven. Once the desired address is entered, the programmer shall set and verify the address. The programming accessory shall also be capable of testing the detector's functionality.

D. The detector shall be capable of bidirectional communications with the control panel and shall be dynamically supervised and uniquely identifiable by the control panel. The control panel shall be capable of analyzing the signal of the detector's analog value for calibration, identification and sensitivity. These values can be displayed by the control panel and monitored for processing according to control panel instructions. The detector's sensitivity shall be individually adjustable from the control panel. Should the detector sensitivity voltage shift beyond an acceptable level and stay there for a predetermined length of time, a discrete detector trouble signal shall be annunciated at the control panel.

E. The detector shall be capable of operating one remote alarm indicator or auxiliary relay or audible base. The relay or remote alarm indicator, or audible base is normally actuated by the associated detector. The system shall be capable of being programmed to operate the relay or remote alarm indicator, or audible base independently of the associated detector. All detectors, remote alarm indicators, audible bases and or relays connected to the initiating circuit can be in alarm or activated simultaneously.

F. The addressable photoelectric detectors shall insert into a standard base, a relay base, or an audible base. The base assembly in which the detector is installed shall be of the twist-lock design with screw-clamp terminals. The base shall use self-wiping contacts and shall accept other compatible detectors.

2.05 DUCT DETECTOR HOUSING

A. The air duct housing shall incorporate the use of the photoelectric smoke detector specified above.

B. The air duct housing unit shall be designed for detection of combustion products and/or smoke in air conditioning and ventilation system ducts in compliance with NFPA standard 80A. The assembly shall consist of a housing to accommodate sampling tubes which extend into and across the duct of the ventilation system.

C. While the fans are operating, a continuous cross-sectional sampling of air from the duct shall flow through the selected photoelectric detector, after which the sampled air shall be returned to the duct.

D. Air handling equipment shall be shut down by a signal from the fire detection system control equipment. When the air duct housing incorporates the optional relay, the shut down of air handling devices may be accomplished by a signal directly from the detector.

E. The air duct housing shall utilize a plug-in detector head located in the air sampling chamber. The detector shall be photoelectric. There shall be provisions to check the detector sensitivity in place under actual air flow conditions.

F. The air duct housing shall be mounted directly outside of the air duct by means of four bolts (supplied). A template shall be provided for making necessary cut-outs and holes. Complete instructions shall be supplied with the unit.

2.06 ADDRESSABLE INTERFACE MODULE

A. The addressable interface module shall incorporate a custom microprocessor based integrated circuit that shall provide communication with its compatible control panel.

B. The intelligent interface modules shall provide the means of interfacing direct shorting devices to the control panel's addressable circuits. The intelligent interface modules shall be available in configurations to monitor a single normally open or normally closed dry contact and report the contact's status to the control panel; incorporate an addressable Form C relay and the relay and device input shall be controlled as a separate function at the same address by the control panel; provide a dual input module designed to supervise and monitor two sets of dry contacts which shall require two address settings. Only one trouble message per device shall be annunciated. This trouble message shall be annunciated using the lower numerical assigned address message. The addressable interface module shall be UL listed.

C. The addressable interface module shall be dynamically supervised and uniquely identifiable by the control panel.

D. The addressable interface module's address shall be programmed with the use of a portable programming accessory. The portable programmer shall be menu driven. Once the desired address is entered the programmer shall set and verify the address. The programming accessory shall also be capable of testing the interface's functionality.

E. The interface module shall be compatible with other intelligent detectors, addressable interfaces, addressable manual stations or any other addressable intelligent module.

NIX ENGINEERING INC.
105 TENNESSEE STREET
MURPHY, NC 28906
(352) 339-4691

FLORIDA CA#B798, PE#2B635
GEORGIA CA#PEF003627, PE#14888

E19

SHEET 19 OF 20

PROJECT NO. 2236

PREPARED BY
NIX

REVIEWED BY
RN

SCALE
N/A

ISSUE DATE
05/06/2024

PREPARED BY
NIX

REVIEWED BY
RN

SCALE
N/A

ISSUE DATE
05/06/2024

PREPARED BY
NIX

REVIEWED BY
RN

SCALE
N/A

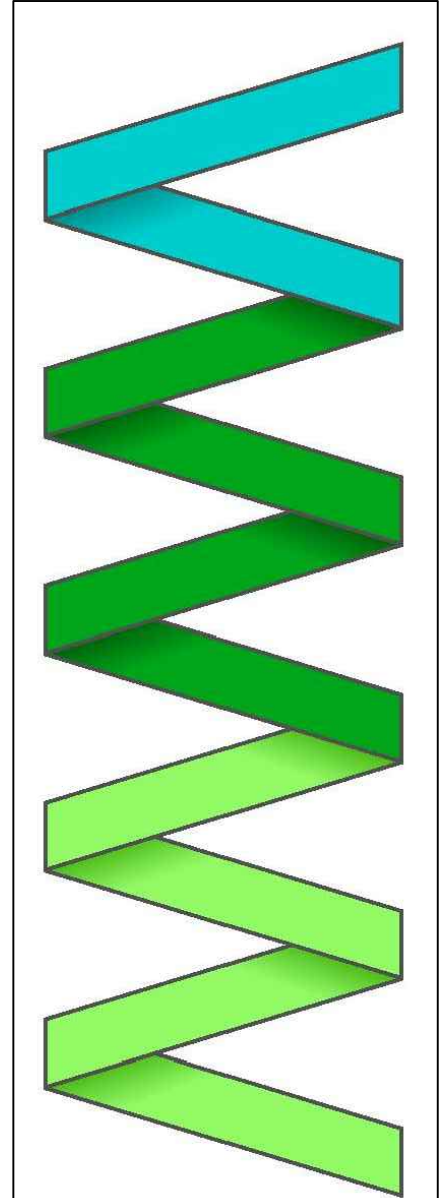
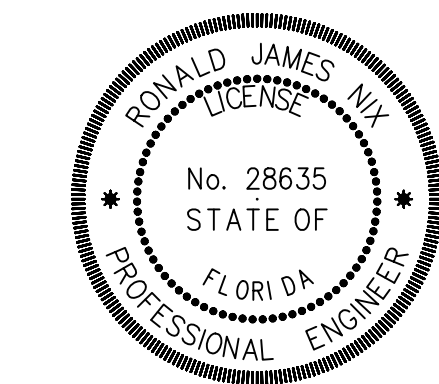
ISSUE DATE
05/06/2024

CARLISLE BAPTIST CHURCH

TRIEBUNALD

835 BERTHE AVENUE

PANAMA CITY, FLORIDA



MARK MERCER & ASSOCIATES, INC.
1117 JENKS AVENUE/PANAMA CITY, FLORIDA 32401/850.763.8072

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2.07 FIRE ALARM CONTROL PANEL: The Fire Alarm Control Panel shall have the following features:

- A. Automatic Environmental Compensation for Smoke Detectors.
- B. Capacity for up to 198 intelligent analog devices.
- C. Dynamic Supervision of Intelligent Devices.
- D. Security Device Monitoring.
- E. Sprinkler Supervision.
- F. Intelligent/Analog Detection Circuits, Style 6 (Class A) or Style 4 (Class B).
- G. Detector Sensitivity Readout/Printout per NFPA 72 Chapter 7.
- H. Style D (Class A) or Style B (Class B) Conventional Initiating Circuits.
- I. Style Z (Class A) or Style Y (Class B) Notification Appliance Circuits.
- J. Degrade Mode Operation.
- K. Distributed Processing.
- L. 80 Character Backlit Alphanumeric Display.
- M. Supervised Remote Printer.
- N. 32 Character Device Custom Messages.
- O. Multiple Command Stations.
- P. Compare System Software.
- Q. Fully Field Programmable Via Laptop Computer
- R. Menu Driven Operator Commands.
- S. Central Architecture.
- T. 800 Event History Logging With On Line & Off Line Reports.
- U. User Help Screens.
- V. Multiple Levels of Password Protection.
- W. One Person Walk Test by Zone or System.
- X. Alarm Verification by Device or Zone.
- Y. Logic Controlled Output Functions.
- Z. Time Base Controlled Output Functions.
- AA. Holiday Schedule.
- BB. City Tie/Lease Line.
- CC. Coded Outputs.
- DD. Supervised Serial Annunciator Driver/Input Interface.
- EE. Interactive VDT – Monochrome & Color.
- FF. Color Graphics Option.
- GG. Complies with NFPA 72.
- HH. NEC 760 Power Limited Circuits (UL 864 Compliant).
- II. 16 Gauge Steel Enclosure.
- JJ. UL Listed 864 and 1076.
- KK. Pre-action Releasing and Deluge (NFPA 13).
- LL. FM Approved for Sprinkler and Deluge.
- MM. Pre-alarm Operation.
- NN. Intelligent Link to Air Sampling Detection System.
- OO. Multi-Language Display.
- PP. Intelligent Interface to Building Management Systems.
- QQ. Operates as an Interactive Peer with other similar Fire Alarm Control Panels in a Network.
- RR. Command Center Monitoring.

2.08 BATTERY STANDBY POWER

- A. Battery standby power shall be provided with internal nickel cadmium or gel type batteries.
- B. Provide battery standby calculations showing total standby power needed to meet the system requirements. Provide a complete list of current drain requirements during normal supervisory conditions, trouble conditions, and alarm conditions.
- C. Batteries shall provide power for the entire system upon loss of 120 VAC power. Batteries shall be capable of supplying power for a period of twenty-four (24) hours with five (5) minutes of alarm signaling at the end of this 24 hour period as required by NFPA 72.

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- A. Battery standby power shall be provided with internal nickel cadmium or gel type batteries.
- B. Provide battery standby calculations showing total standby power needed to meet the system requirements. Provide a complete list of current drain requirements during normal supervisory conditions, trouble conditions, and alarm conditions.
- C. shall provide power for the entire system upon loss of 120 VAC power. Batteries shall be capable of supplying power for a period of twenty-four (24) hours with five (5) minutes of alarm signaling at the end of this 24 hour period as required by NFPA 72.

2.09 VOICE EVACUATION SYSTEM

- A. The system shall contain a voice evacuation system with a pre-recorded evacuation message chip. The voice evacuation section shall be furnished with a one hundred watt minimum amplifier module, pre-recorded evacuation message chip, supervised speaker line, signal generator, and amplifier.
- B. A message repeater package shall repeat the evacuation message for a duration as prescribed by the Authority Having Jurisdiction (AHJ) and then sound a slow whoop alarm signal for a duration prescribed by the AHJ. At the end of this duration, the above sequence continues to repeat until the alarm panel is reset

PART 3 _ EXECUTION

3.01 WIRING AND INSTALLATION

- A. Provide in accordance with manufacturer's instructions and requirements of these specifications, all wiring, conduit, boxes etc., required for the erection of a complete system as described herein and as shown on the drawings. All wires shall be color coded and tagged at all junction points and shall test free from opens, grounds or crosses between conductors. Wiring and cable shall be in accordance with manufacturer's specifications. System shall be installed in accordance with all city, county and state codes.
- B. Work shall be executed in a neat and workmanlike manner by experienced and capable electricians so as to present a neat installation upon completion.
- C. Do all cutting, sleeving, excavation and backfilling necessary for installation of equipment and patching thereafter but do not cut other work without consent of the Architect/Engineer.
- D. A factory-trained representative shall supervise the final testing of the system and it shall be subject to the approval and acceptance of the responsible engineer. Upon completion of the acceptance tests, the owner or his representative shall be instructed in the proper operation and testing of the system.
- E. The equipment manufacturer shall be represented by a local service organization and the name of this organization shall be furnished to the architect, engineer and the owner.

3.02 GUARANTEE

- A. A written guarantee shall be submitted to Owner that all workmanship and material executed under this contract shall be free from defects for a period of one year after final acceptance of the job. There will be no additional cost to Owner to repair or replace any such work which is found to be defective within guarantee period.

END OF SECTION 16610

SECTION 16800 – COMMUNICATIONS STRUCTURED CABLING SYSTEM

1.0 GENERAL

1.1 CONTRACTOR QUALIFICATIONS

The Structured Cabling System Contractor shall be an experienced firm regularly engaged in the layout and installation of structured cabling systems of similar size and complexity as required for this installation. The Structure Cabling Contractor, under the same company name, shall have successfully completed the layout, installation, testing and warranty of not less than five Structured Cabling Systems of the scope of the largest system on this project for a minimum period of three years prior to the bid date, and shall have been regularly engaged in the business of Structure Cabling System contracting continuously since. The Contractor shall have an existing permanent office located within 200 miles of the job site from which installation and warranty service operations will be performed.

Structure Cabling System Contractor shall present, with his bid, the name and certification number of a BICSI certified Registered Communications Distribution Designer (RCDD) who will be a consultant to the Contractor. The RCDD shall have overall responsibility for certifying that the installed structured cabling system conforms to these contract documents and to the referenced EIA/TIA, IEEE, BICSI, and UL standards. Specific requirements for the RCDD are:

1.1.1 The RCDD shall be, in the judgment of the Engineer, thoroughly experienced in the design, layout, and installation of structured cabling systems of similar size and complexity as required for this installation. The RCDD shall submit evidence of these qualifications to the Engineer upon request.

1.1.2 The RCDD shall affix his stamp to the Contractor's pre-installation submittal drawings, indicating that he has reviewed and approved the drawings for conformance to the contract documents and to the referenced codes and standards.

1.1.3 The RCDD shall periodically visit the site and inspect the work in progress.

1.1.4 The RCDD shall sign off on all cable test results, indicating that he was in responsible charge of all cable testing procedures and that all cables were tested in compliance with the contract documents and met or exceeded the requirements stated therein.

1.1.5 The RCDD shall affix his stamp to the Contractor's as-built drawings, indicating that he has reviewed and approved the drawings as being complete, accurate, and representative of the system as actually installed.

1.2 BID REQUIREMENTS

The Structure Cabling System Contractor shall provide the following documentation, to be presented with the bid, as evidence that the requirements for Structure Cabling System Contractor qualifications listed above are satisfied.

If the bidder does not meet the requirements of this specification section for structured cabling system work, he shall provide the following documentation, to be presented with the bid, as evidence that the requirements listed above are satisfied by the Structure Cabling System Contractor he proposes to use as a subcontractor to perform work under this section. In either case, all work under this section shall be performed by permanent employees of the Structure Cabling System Contractor listed on the bid form, and shall not be performed by another subcontractor, employees of another company, or by temporary employees.

1.2.1 A list of not less than five (5) references for jobs of similar size and complexity including project name, location, contact person and phone number.

1.2.2 RCDD name, BICSI certification number, and qualifications.

1.2.3 Location of office from which installation and warranty work will be performed.

1.3 RELATED REQUIREMENTS

Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this section.

Section 16010, "Electrical General", applies to this section, with the additions and modifications specified herein and on the drawings.

Conduit and raceways shall be provided under Division 16. The contractor shall be responsible for coordination with the electrical contractor for specific locations and requirements.

1.4 DESCRIPTION OF WORK

The work consists of all labor, materials, equipment and services necessary to provide, install, test and certify a new structured cabling system as described in the contract documents.

1.5 QUALITY ASSURANCE

Materials shall be new and shall be the best of their respective kinds. All work shall be accomplished in a workmanlike manner in keeping with the best practices and highest standards of the telecommunications industry.

Protect materials and equipment from physical or environmental damage during shipping, storage and installation. Equipment and materials shall be received at the site in new condition and shall be maintained in new condition throughout the installation process. Damaged or deteriorated equipment and materials will not be acceptable. The Contractor shall be responsible for the safety and condition of all materials and equipment, whether stored or installed, until final acceptance by the Engineer and the Owner. All materials and equipment shall be UL listed for the intended application.

2.0 PRODUCTS

2.1 MATERIALS AND EQUIPMENT, GENERAL

All materials, equipment, and devices shall, as a minimum, meet the requirements of UL where UL standards are established for those items, and the requirements of NFPA 70.

All like items of material or equipment shall be the same product of the same manufacturer.

All materials and equipment shall be a standard catalogued products of a manufacturer regularly engaged in the manufacture of similar products.

2.2 PRODUCT SPECIFICATIONS

See contract drawings for all product requirements not indicated in these specifications.

3.0 EXECUTION

3.1 INSTALLATION

3.1.1 General:

The installation shall be in strict accordance with all applicable codes and standards, the respective manufacturer's written recommendations, and the contract drawings and these specifications.

All materials, equipment, and devices shall be new and unused, of current manufacture and of the highest grade, free from defects. Workmanship shall be of the highest grade in accordance with modern practice. The installed system shall be neat, clean, and well organized in appearance.

3.1.2 Cabling Installation:

Route cabling in conduit and wireway as indicated. Do not pull cables in conduits until plastic insulating bushings have been installed. Cables installed in conduits without plastic insulating bushings shall be removed and replaced with new cables. All materials, equipment, and devices shall be new and unused, of current manufacture and of the highest grade, free from defects. Workmanship shall be of the highest grade in accordance with modern practice. The installed system shall be neat, clean, and well organized in appearance.

3.1.3 Identification:

All labels shall be produced using a laser printer and shall be easily readable from floor level when viewing a backboard, panel, or communications outlet from the front. Handwritten labels are not acceptable. Provide data sheets describing proposed labeling products for cable and conduit with pre-installation submittals. Label each cable at each end based on room number and destination telcom room number using write-on mylar wrap wire markers.

3.2 SYSTEM VERIFICATION AND ACCEPTANCE

3.2.1 Cable Testing – General:

The Contractor's RCDD shall be in responsible charge of all cable testing procedures and shall provide a letter to the Engineer at the completion of successful testing certifying that all cables have been tested in compliance with the contract documents and have met or exceed the requirement stated therein.

The requirement for this project is full compliance/zero tolerance. Cables which do not comply shall be removed and replaced. Partial use of cables by claiming good pairs or strands and abandoning others is not allowable.

Tests shall be performed in strict accordance with the test instrument manufacturer's printed instructions.

Technicians performing testing shall be thoroughly trained in the use of the test instruments employed. Factory certification of technicians is desirable. Test instruments shall meet the approval of the Engineer for accuracy, stability, and general suitability for the test performed. The Contractor shall provide evidence of training if requested. Test instruments shall meet the approval of the Engineer for accuracy, stability, and general suitability for the test performed. The Contractor shall be required to retest installed cables in the Engineer's presence to verify the Contractor's test documentation. The percentage of cables to be retested shall be determined by the Engineer based on compliance of the installation with the contract documents, quality of workmanship, and results of initial cable retests. Retesting shall be performed as required until all cables comply with the requirements of the contract documents.

3.2.2 Category 6 UTP Cable Testing:

After installation and termination of the Category 6 UTP cable, test each cable in accordance with TIA/EIA TSB 67. Test each conductor for end-to-end continuity and for correct termination on a pin-by-pin basis.

Test each cable from both ends with a Category 6 tester, Microtest Penta Scanner+ with Microtest 2-Way Injector+, to verify compliance with TIA/EIA specifications for Category 6 UTP, "Basic Link" configuration, Level II accuracy, with no allowable deviation. Test at the full range of frequencies indicated by TIA/EIA. Use the tester manufacturer's 2-way injector to measure near-end crosstalk (NEXT) and attenuation-to-crosstalk (ACR) from both ends of each cable. Make connections at each end using access cables provided by the tester manufacturer.

3.2.3 Multi-pair Telephone Cable Testing:

Test each conductor for end-to-end continuity. Test each cable for correct termination on a pin-by-pin basis. Document results of testing and submit to Engineer for review and approval. The test log shall include outlet identifiers as indicated on the drawings, the test date, the initials of the technician who tested the cable, and the test results.

3.3 WARRANTY

The installed structured cabling system shall be guaranteed against defects in materials and installation for a period of three years from the date of acceptance by the Engineer. The services of a qualified technician shall be available to make necessary warranty repairs in a timely manner during the warranty period.

END OF SECTION 16800

SECTION 16610 – LIGHTNING PROTECTION SYSTEM

PART 1 _ GENERAL

1.01 SCOPE OF WORK:

A. The work covered by this section of the specifications consists of furnishing all labor, materials and items of service required for the completion of a functional and unobtrusive lightning protection system in strict accordance with this section of the specifications and the applicable drawings.

B. The system shall consist of air terminals, interconnecting conductors, proper downleads to ground with their groundings and bonding of grounded metal objects on or within the building as necessary. The system shall be designed to appear as a part of the building. Conductor runs shall be concealed within the column, wall, and roof construction where possible and practical. Exposed roof conductors should be placed so as to require a minimum of displacement for future repair and maintenance of roofing.

C. The following specifications and standards of the latest issue form a part of this specification:

- 1. Lightning Protection Institute Installation Code LPI_175
- 2. NFPA 780

1.02 QUALITY ASSURANCE:

A. The lightning protection system shall comply with the specifications and standards of the current edition of the NFPA 780.

B. The system to be furnished under this specification shall be standard product of a manufacturer regularly engaged in the production of lightning protection systems and shall be the manufacturer's latest approved design. The equipment manufacturer shall also be a UL listed and approved manufacturer and a full certified manufacturer member in good standing of the Lightning Protection Institute.

1.03 SUBMITTALS:

A. The contractor shall submit to the Architect a complete shop drawing of the proposed system for approval before fabricating materials or starting the installation work. Submittal shall include catalog data with complete description of material components. Shop drawings are to include a layout of the roof system with air terminal locations, interconnecting circuits, locations for downleads and locations of metal equipment to be bonded.

B. Samples and pertinent catalog shall be submitted for approval upon request.

PART 2 _ PRODUCTS

2.01 STANDARD

A. The materials used shall be manufactured especially for Lightning Protection Systems by an accredited member of the Lightning Protection Institute. All materials shall be in strict compliance with the U.L. material Code #96.

2.02 EQUIPMENT

A. System components shall be of copper or aluminum complying with the requirements of L.P.I., U.L. and N.F.P.A. for Class II materials. Bare aluminum materials shall not be embedded in concrete or masonry and shall not come in contact with the soil. Copper materials are not recommended for installation on aluminum surfaces or in locations near aluminum where moisture can run off copper onto aluminum trim or surfaces.

2.02 EQUIPMENT

A. System components shall be of copper or aluminum complying with the requirements of L.P.I., U.L. and N.F.P.A. for Class II materials. Bare aluminum materials shall not be embedded in concrete or masonry and shall not come in contact with the soil. Copper materials are not recommended for installation on aluminum surfaces or in locations near aluminum where moisture can run off copper onto aluminum trim or surfaces.

B. Conductors of copper or aluminum of the size required by code shall interconnect all air terminals and provide a two-way path to ground from each air terminal. Conductors shall maintain a horizontal and/or downward path from the air terminals to ground without forming "U" or "V" pockets.

C. Air terminals may be of copper or aluminum and shall be mounted to extend a minimum of 12 inches above the object to be protected. Spacing of air terminals on ridges or edges of roofs shall not exceed 20 feet on centers nor be more than 24 inches from the ridge ends or roof edges. On flat or gently sloping roofs, additional air terminals shall be located at intervals not exceeding 50 feet on centers. Air terminals shall be installed on all prominent metal bodies made of metal less than 3/16" thick.

D. Each downlead from roof circuits shall terminate in a properly made ground connection below finished grade.

E. Fasteners shall be placed on each run of exposed conductor not more than three (3) feet apart. Concealed runs of conductor shall be anchored as necessary to maintain position and hold permanently in place.

F. Cable fasteners shall be substantial in construction, electrolytically compatible with the conductor and mounting surface and shall be spaced according to L.P.I. and NFPA Code Requirements.

G. Splices in main conductor runs and connections to branches shall be made with pressure type bolted or compression type connectors.

H. Underground connections shall be exothermic welded connectors.

I. All metal bodies permanently affixed to a structure that are subject to a direct lightning strike shall be provided with two-way paths to the lightning protection system using full size conductor.

All grounded metal bodies within a zone of protection shall be bonded if they are within the calculated bonding distance for the building. This bonding distance is to be determined according to code requirements regarding the length and number of downleads on the building.

All ungrounded metal bodies which from a short-circuit path between the lightning protection system and a grounded metal body causing the grounded metal body to be within the bonding distance calculated for the building may be bonded to the lightning protection system and to the grounded metal body. If the grounded metal body is connected directly to the lightning protection system, no connection to the ungrounded body is required.

PART 3 _ EXECUTION

3.01 INSTALLATION

A. All equipment shall be installed in a neat workmanlike manner in the most inconspicuous manner possible. The system shall consist of a complete cable network on the roof including all air terminals, splices and bonds with cable downleads routed in conduit to ground.

3.02 COORDINATION

A. The lightning protection installer will work with other trades to insure a correct, neat and unobtrusive installation.

B. It shall be the responsibility of the lightning protection installer to assure a sound bond to the main water service and to assure interconnection with other building ground systems, including both telephone and electrical and also to insure proper arresters have been installed on the power service.

3.03 COMPLETION

A. The installing contractor and a representative of the owner shall complete the Underwriters' Laboratories, Inc. application for inspection. The owner's representative will witness and sign for the concealed grounding portion of the system. The installer and owner's representative will sign the form to signify the information being submitted as correct and their authorization of a completed project inspection by a U.L. representative.

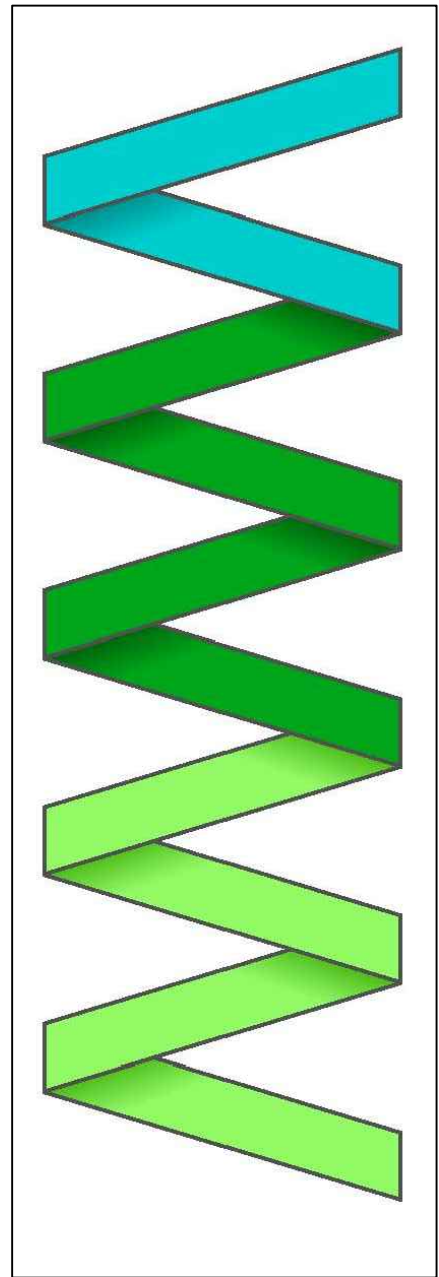
B. Any items of product, design or installation noted by the Underwriters' Laboratories, Inc. field inspector as not being in compliance with the current code requirements shall be corrected by the installer at no additional charge to the owner. The project shall not be considered complete until final approval is received from U.L.

C. The owner shall develop a program of inspection and maintenance in association with the installer and/or the material manufacturer to ensure the future integrity of the lightning protection system. As a minimum on the fifth anniversary of the original installation and at successive three-year intervals the system shall be re-inspected against defects by the original installation company or trained maintenance personnel of the owner. The inspection shall include a visual check of all exposed components of the lightning protection system along with continuity and ground testing as accessible to verify the concealed equipment. Any alteration to the exterior structure, such as a building addition, new process lines, venting equipment or re-roofing may necessitate additional items for incorporation into the lightning protection system. The system shall be maintained current to the requirements of NFPA 780.

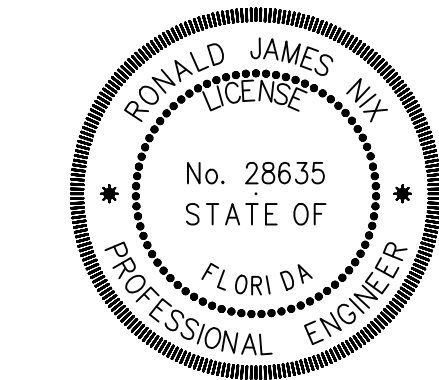
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NIX ENGINEERING INC.
103 TENNESSEE STREET
MURPHY, NC 28906
(352) 339-4691

FLORIDA CA#07998, PE#28635
GEORGIA CA#PEF003627, PE#14888



MARK MERCER & ASSOCIATES, INC.
1117 JENKS AVENUE/PANAMA CITY, FLORIDA 32401/850.763.8072



PREPARED BY NIX	REVIEWED BY RN	SCALE N/A	PROJECT NO. 7236
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