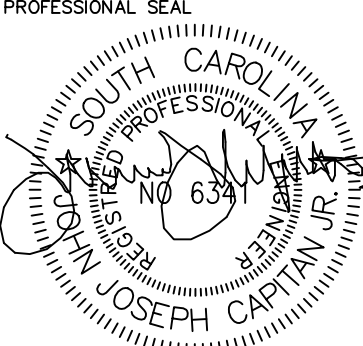
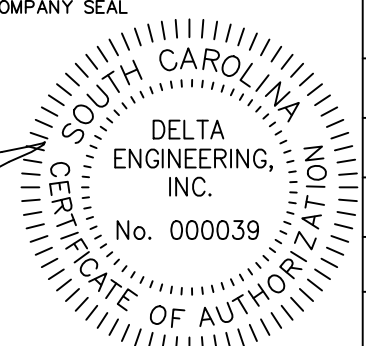



2019 - 2020 MECHANICAL HVAC UPGRADES TO FLAT ROCK & RUGBY MIDDLE SCHOOLS

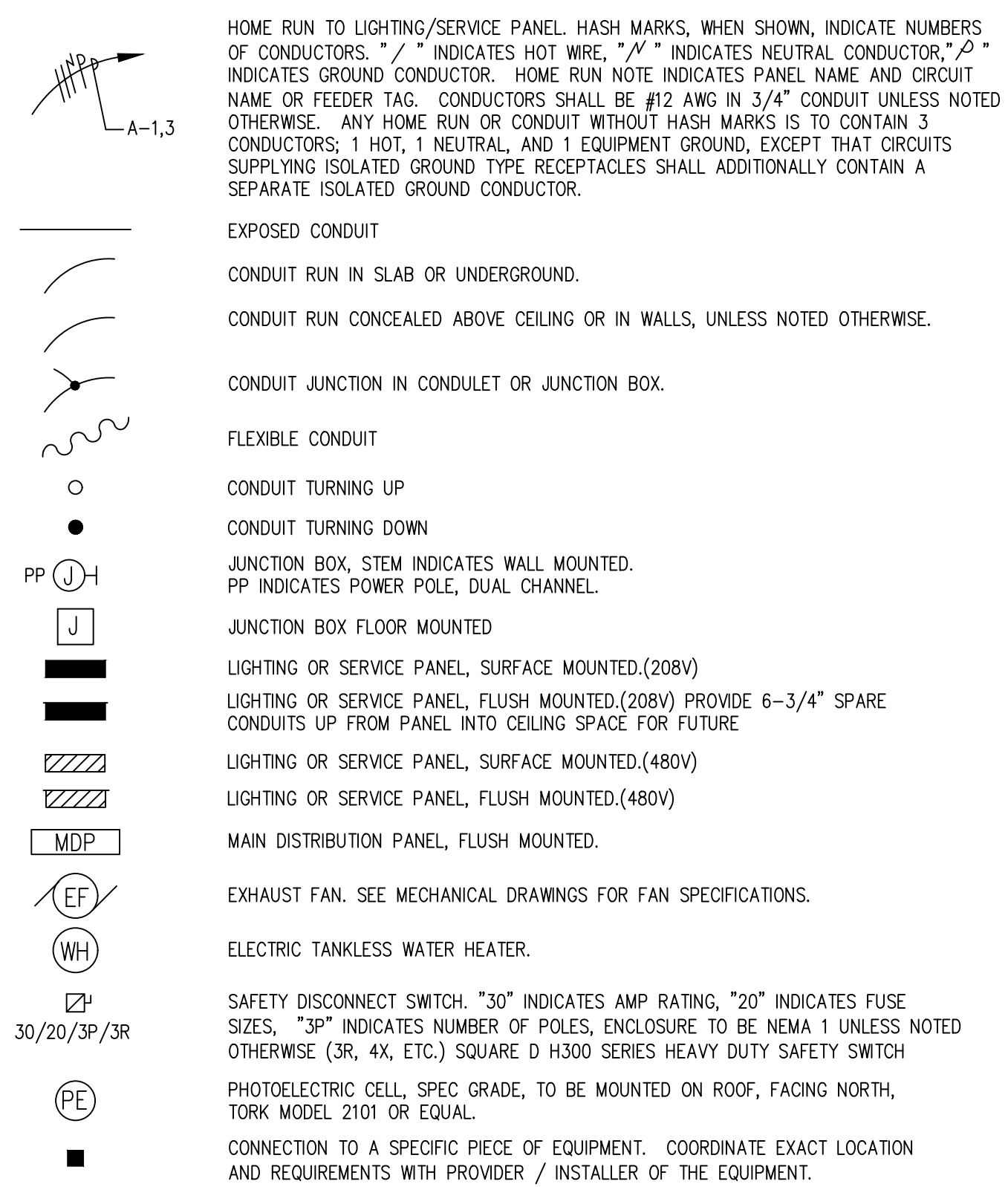
FOR
HENDERSON COUNTY SCHOOLS
HENDERSON COUNTY, NORTH CAROLINA
HENDERSONVILLE, NORTH CAROLINA 28792

TITLE SHEET & LIST OF DRAWINGS

DWG. NO.	SHEET NO.	DWG. DATE	DRAWING TITLE
TS-1	1 OF 3	MAY 28, 2015	PROJECT TITLE SHEET AND DRAWING LIST
MECHANICAL DRAWINGS			
MO1.1	1 OF 3	MAY 28, 2015	MECHANICAL LEGEND AND ABBREVIATIONS
M1.0	2 OF 3	MAY 28, 2015	EXISTING & NEW HVAC PLANS AT EXISTING SERVER ROOM NO. 86A

REVISIONS					DESIGNED BY: NAME DRAWN BY: NAME CHECKED BY: NAME DATE: MONTH-DAY-YEAR SCALE: AS NOTED JOB NO.: DEI JOB NO. 19005	DESIGN & ENGINEERING ENERGY SYSTEMS INFRASTRUCTURE UTILITIES SYSTEMS ANALYSIS COMMISSIONING REVIEW		THIS DRAWING IS THE PROPERTY AND COPYRIGHT OF DELTA ENGINEERING, INC. AND SHALL NOT BE USED OR COPIED WITHOUT WRITTEN PERMISSION. COPYRIGHT ©	TITLE SHEET & LIST OF DRAWINGS	PROJECT: 2019 - 2020 HVAC UPGRADES TO FLAT ROCK & RUGBY MIDDLE SCHOOLS HENDERSON COUNTY PUBLIC SCHOOLS 414 - 4TH STREET, HENDERSONVILLE, HENDERSON COUNTY, NORTH CAROLINA 29621	DRAWING: TS - 1 SHEET: 1 OF REV. NO.: 0
NO.	DATE	DESCRIPTION			BY	APRIL 29, 2016 APRIL 29, 2016					
-	0	TEXT HERE	JJC								

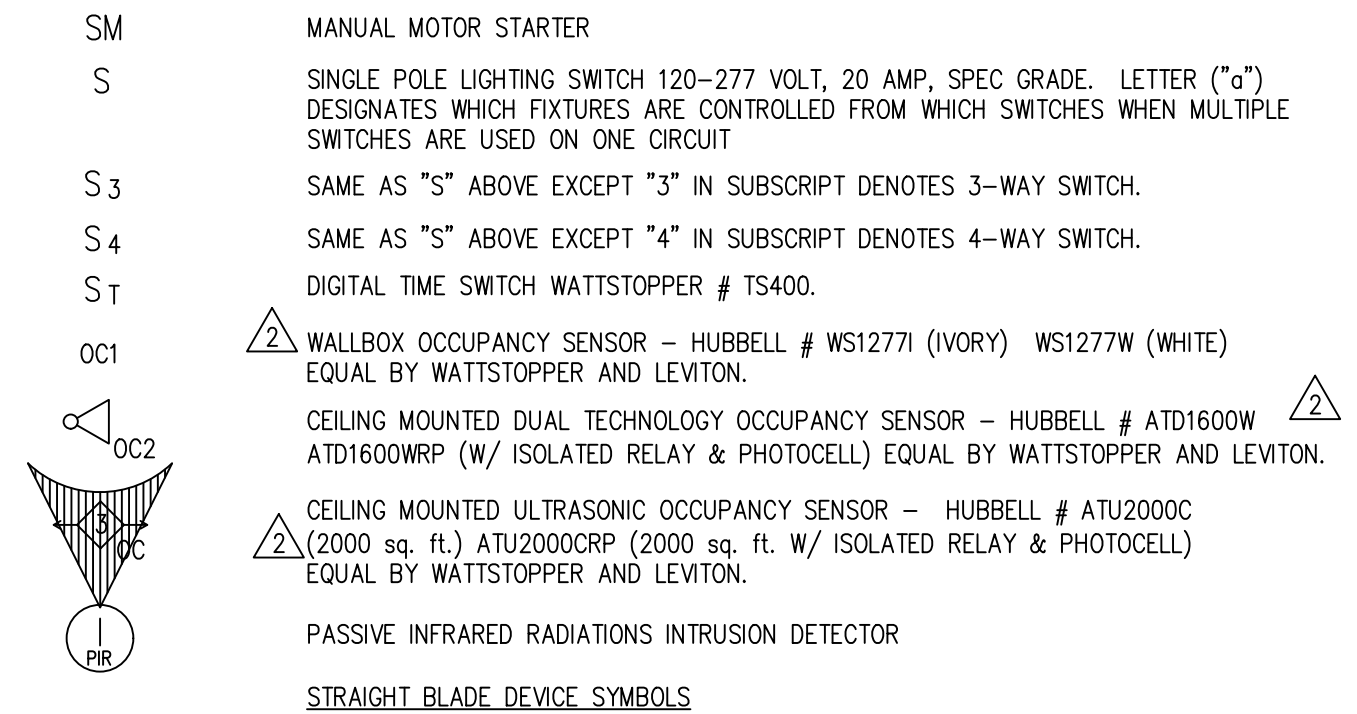
ELECTRICAL SYMBOLS



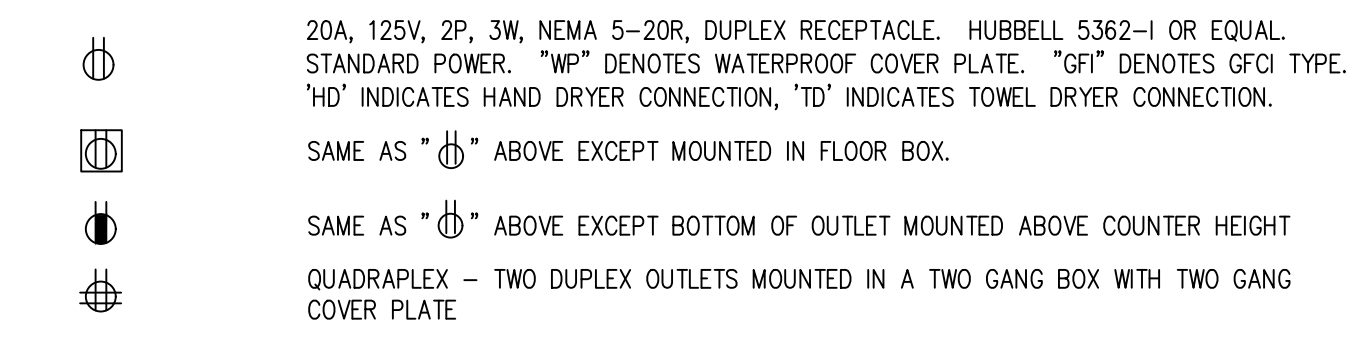
WIRING DEVICES

NOTE: ALL WIRING DEVICES TO BE IVORY, WITH #302 STAINLESS STEEL COVERPLATE (FLUSH MOUNTED) UNLESS NOTED OTHERWISE ON THE DRAWING OR SPECIFICATIONS.

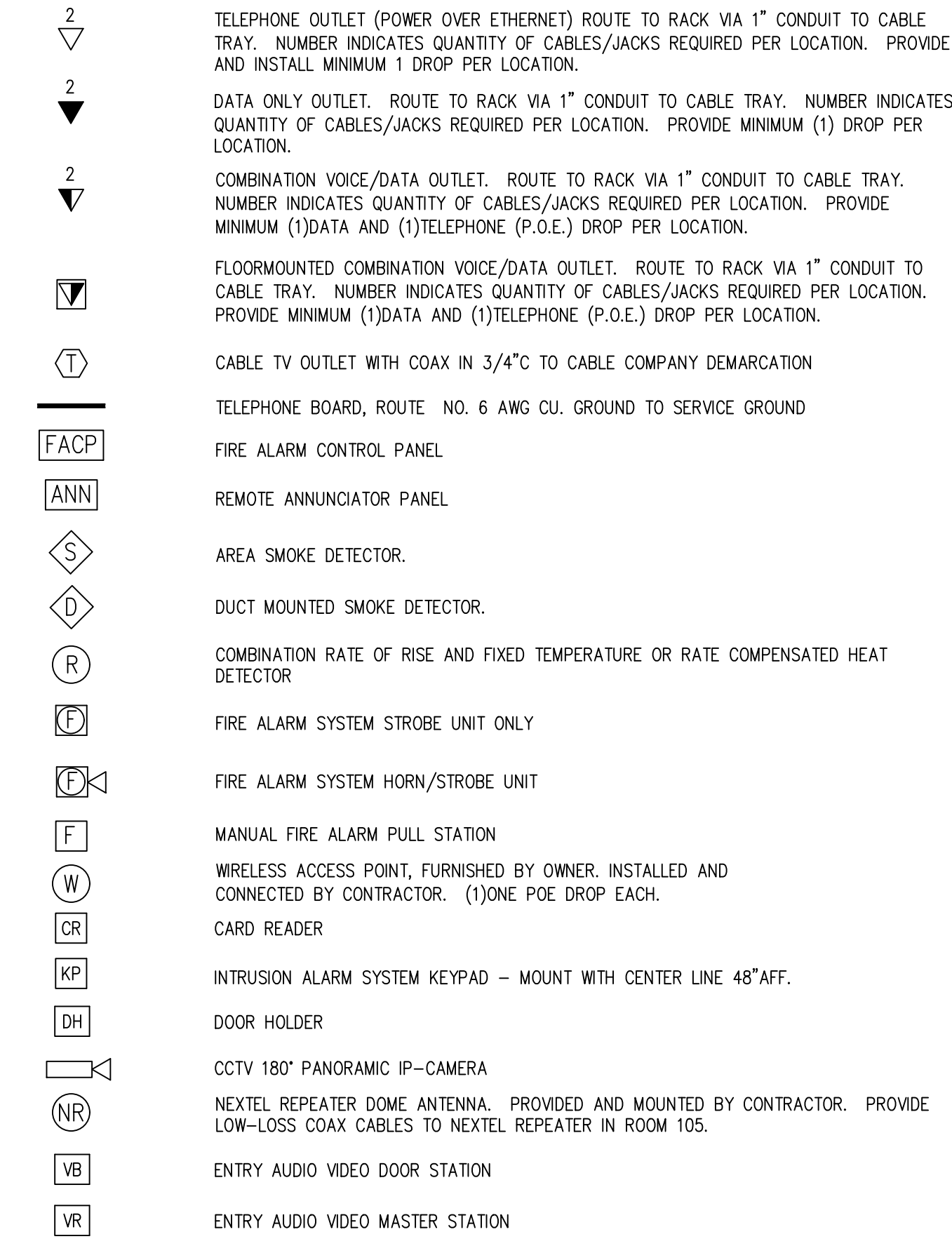
SWITCH SYMBOLS



STRAIGHT BLADE DEVICE SYMBOLS



FIRE ALARM, COMMUNICATIONS AND CONTROLS



ELECTRICAL ABBREVIATIONS

AFF	ABOVE FINISH FLOOR	LTG	LIGHTING (L)
AFG	ABOVE FINISHED GRADE	MLO	MAIN LUGS ONLY
ACH	ABOVE COUNTER HEIGHT	MCB	MAIN CIRCUIT BREAKER
AL	ALUMINUM	MFR	MANUFACTURER
BKR	BREAKER	MDP	MAIN DISTRIBUTION PANEL
CU	COPPER	MSB	MAIN SWITCHBOARD
CKT	CIRCUIT	NTS	NOT TO SCALE
D	DEDICATED OUTLET	PH	PHASE
DWG	DRAWING	PNL	PANEL
EC	ELECTRICAL CONTRACTOR	POE	POWER OVER ETHERNET
EWC	ELECTRIC WATER COOLER	RECP	RECEPTACLE (R)
EX	EXISTING	REQD	REQUIRED
FTL	FEED THRU LUGS	SW	SWITCH
FU	FUSE	TD	ELECTRIC TOWEL DISPENSER
FWE	FURNISHED WITH EQUIPMENT	UGND	UNDERGROUND
GFI	GROUND FAULT INTERRUPTER DEVICE	W/	WITH
HD	ELECTRIC HAND DRYER	WH	WATER HEATER
HH	HAND HOLE	WP	WEATHER PROOF
IG	ISOLATED GROUND	XFMR	TRANSFORMER

GENERAL NOTES - (AS ARE APPLICABLE TO THE PROJECT WORK - - ALSO SEE ELECETRICAL PLAN NOTES)

- INSPECT SITE PRIOR TO SUBMITTING BID. DRAWINGS ARE INTENDED TO COVER THE REQUIRED ELECTRICAL SYSTEMS. DRAWINGS MAY NOT SHOW COMPLETE OR ACCURATE DETAILS OF THE BUILDING OR SYSTEM IN EVERY RESPECT. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN ANY ADDITIONAL INFORMATION AS REQUIRED.
- CONFORM TO THE NATIONAL ELECTRICAL CODE (2005), IBC (2006), APPLICABLE NEMA, ANSI AND IEEE PUBLICATIONS, UL AND ADA STANDARDS AND OSHA REQUIREMENTS. COMPLY WITH LOCAL, COUNTY, STATE AND NATIONAL CODES HAVING JURISDICTION.
- FURNISH AND INSTALL ALL MATERIALS IN A NEAT AND WORKMANLIKE FASHION. ALL MATERIALS SHALL BE NEW, WITH FIRST QUALITY AND UL LABEL.
- VERIFY ALL DIMENSIONS AND CLEARANCES PRIOR TO INSTALLATION OF EQUIPMENT AND RACEWAYS. CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF WORK WITH THAT OF ALL OTHER TRADES AS REQUIRED.
- CONDUIT SHALL BE EMT FOR BRANCH CIRCUIT WIRING AS ALLOWED BY NEC, EXCEPT THAT SET SCREW OR CRIMP FITTINGS ARE NOT ALLOWED. WHERE EXPOSED TO PHYSICAL DAMAGE CONDUITS SHALL BE RIGID GALVANIZED STEEL. MINIMUM CONDUIT SIZE SHALL BE 3/4". ALL CONDUCTORS SHALL BE TYPE THHN/THWN, 600V COPPER BUILDING WIRE. MINIMUM SIZE SHALL BE #12 AWG COPPER UNLESS NOTED. UNDERGROUND CONDUITS SHALL BE PVC SCHEDULE 40 WITH TRANSITION TO RIGID GALVANIZED STEEL FOR EXPOSED CONDUITS. MC CABLE IS ALLOWED TO BE RUN WITHIN THE POWER CABLE TRAY.
- PROVIDE GROUNDING FOR ALL EQUIPMENT IN ACCORDANCE WITH ARTICLE 250 OF THE NATIONAL ELECTRICAL CODE. GROUND SERVICE TO BUILDING STEEL, DRIVEN GROUND ROD AND COLD WATER PIPE.
- ALL ENCLOSURES SHALL BE OF THE NEMA TYPE WHICH IS SUITABLE FOR THE APPLICATION.
- SEAL ALL CONDUIT PENETRATIONS TO MATCH RATING OF WALL BEING PENETRATED.
- ALL WORK SHALL HAVE PROPER LABELING AND NAMEPLATES. ALL CIRCUITS SHALL BE LABELED AT PANELS AND BOXES AS INDICATED. ALL PANELS AND DISCONNECTS ARE TO BE PERMANENTLY MARKED WITH NAME OR EQUIPMENT SERVED. ALL PANELS ARE TO BE PROVIDED WITH TYPEWRITTEN PANEL SCHEDULES; USE ACTUAL ROOM NUMBERS FROM ARCHITECTURAL DRAWINGS.
- ALL BREAKERS ON CIRCUITS SUPPLYING HVAC EQUIPMENT SHALL BE TYPE HACR BREAKERS.
- COORDINATE WITH ELECTRICAL UTILITY AS REQUIRED FOR SERVICE ENTRY. INSTALL PAD, METER AND CONDUITS PER UTILITY REQUIREMENTS AND PAY ALL REQUIRED FEES OR CHARGES FOR SERVICES SHOWN.
- THOROUGHLY CLEAN ALL EQUIPMENT AND SYSTEMS BEFORE PLACING IN OPERATION. RESTORE FINISHED SURFACES IF DAMAGED AND DELIVER THE ENTIRE INSTALLATION IN AN APPROVED CONDITION. INSTRUCT THE OWNERS' PERSONNEL IN THE PROPER OPERATION AND MAINTENANCE OF THE SYSTEMS. FURNISH TO THE OWNER THREE SETS OF OPERATION AND MAINTENANCE MANUALS FOR EACH SYSTEM.
- GUARANTEE THE WORK INSTALLED FOR A PERIOD OF ONE YEAR AFTER DATE OF FINAL ACCEPTANCE. DEFECTS WHICH APPEAR AS A RESULT OF NORMAL USAGE SHALL BE REMEDIED BY THE CONTRACTOR TO THE COMPLETE SATISFACTION OF THE OWNER WITHOUT COST TO THE OWNER.
- CONTRACTOR SHALL KEEP CURRENT A SET OF PLANS FOR THE DURATION OF CONSTRUCTION WITH ALL CHANGES TO WORK NEATLY AND ACCURATELY MARKED IN RED AND SHALL TURN OVER TO OWNER AT COMPLETION OF PROJECT.
- ALL ELECTRICAL EQUIPMENT SHALL BE INSTALLED TO MEET SEISMIC REQUIREMENTS OF 2006 IBC AND SHALL BE SUBJECT TO SPECIAL INSPECTION REQUIREMENTS CHAPTER 17 OF 2006 IBC AS IT RELATES TO ELECTRICAL EQUIPMENT. CONTRACTOR SHALL PROVIDE DRAWINGS FOR ALL INSTALLATION METHODS AND MEET ALL REQUIREMENT PER AUTHORITY HAVING JURISDICTION. ALL DRAWINGS SHALL BE SEALED BY LICENSED DESIGN PROFESSIONAL REGISTERED IN THE STATE OF SOUTH CAROLINA.
- FLOORBOXES INSTALLED IN CONTACT WITH SLAB ON GRADE SHALL BE CAST TYPE. STAMPED STEEL BOXES ARE ACCEPTABLE ONLY IN ELEVATED SLABS. COORDINATE ALL OPENINGS IN SLAB WITH STRUCTURAL ENGINEER BEFORE OPENING.

REVISIONS			
NO.	DATE	DESCRIPTION	BY
-	0	TEXT HERE	JJC

PROFESSIONAL SEAL

COMPANY SEAL

DESIGNED BY: NAME

DRAWN BY: NAME

CHECKED BY: NAME

DATE: MONTH-DAY-YEAR

SCALE: AS NOTED

JOB NO.: DEI JOB NO. 19005

DESIGN & ENGINEERING ENERGY SYSTEMS INFRASTRUCTURE UTILITIES SYSTEMS ANALYSIS COMMISSIONING REVIEW

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DELTA ENGINEERING, INC. CONSULTING ENGINEERS
315 EAST BROAD STREET, GREENVILLE, SC 29601
GREENVILLE, SC TEL. NO. (864) 505-5358

3106 RIVERINE VIEW, CHARLESTON, SC 29414
CHARLESTON, SC TEL. NO. (864) 505-2976
Em: jecapitan@gmail.com

ELECTRICAL LEGENDS, ABBREVIATIONS, AND GENERAL NOTES

PROJECT: 2019 - 2020 HVAC UPGRADES TO FLAT ROCK & RUGBY MIDDLE SCHOOLS

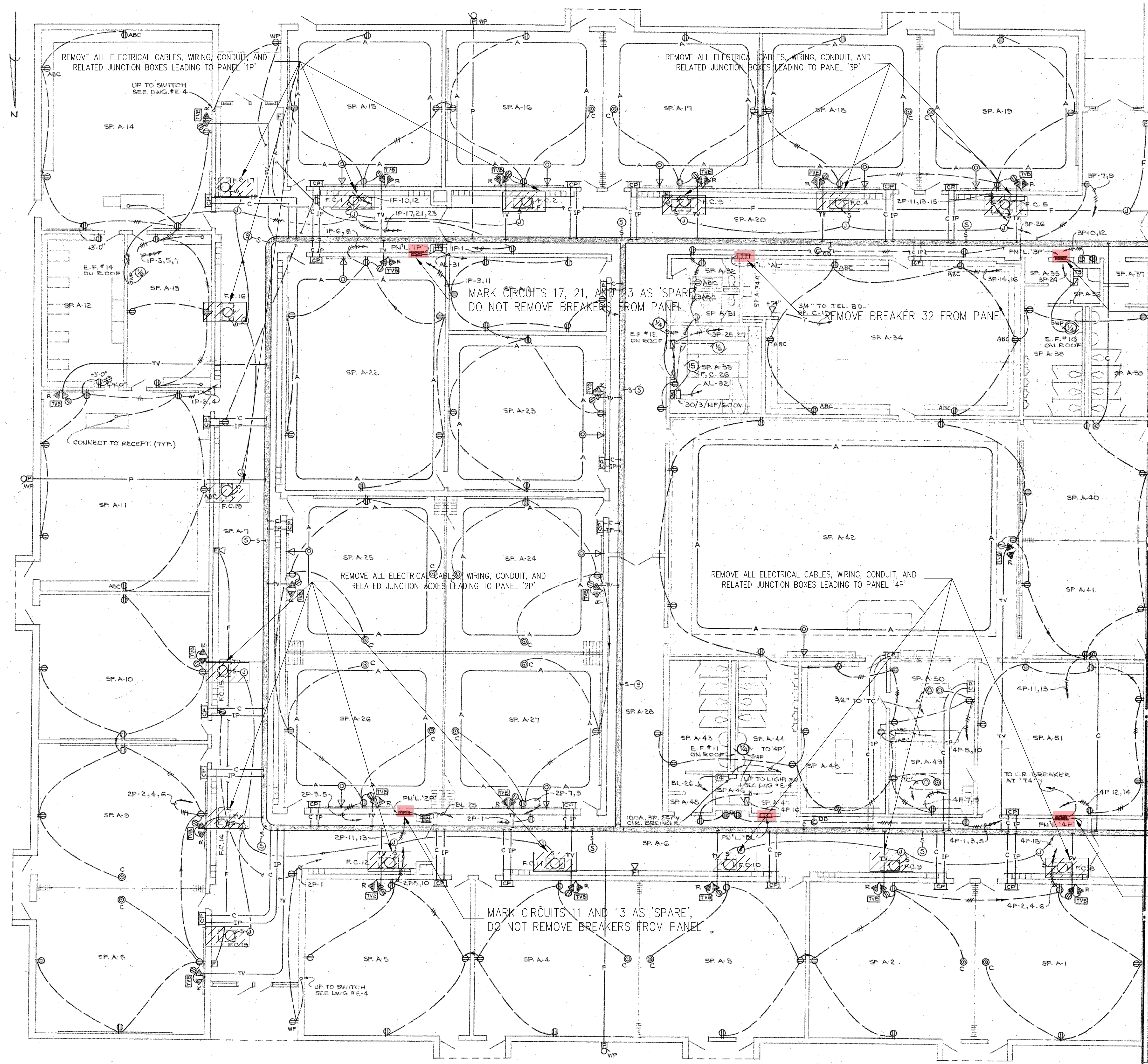
HENDERSON COUNTY PUBLIC SCHOOLS
414 - 4TH STREET, HENDERSONVILLE, HENDERSON COUNTY, NORTH CAROLINA 29621

DRAWING: E O - 1

SHEET: 1 OF 1
REV. NO.: IFOB

GENERAL NOTE: (TYPICAL) CONTRACTOR SHALL FIELD VERIFY W/OWNER FOR PHASED DEMO OF EXIST. ABOVE CEILING POWER CONDUIT AND WIRING FOR EXISTING FAN-COIL UNITS SERVING EXIST. ROOM SPACES. SEE MECHANICAL DRAWINGS FOR FURTHER DETAILS.

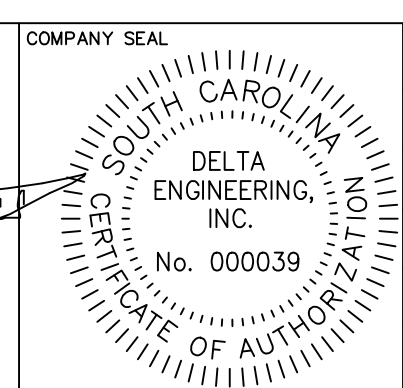
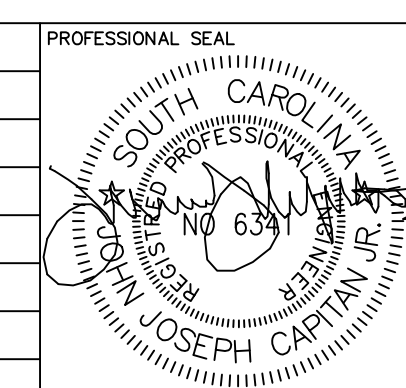
GENERAL NOTE: (TYPICAL) FIELD VERIFY ALL ELECTRICAL CONNECTIONS TO EXISTING FAN-COIL UNITS PRIOR TO DEMOLITION. ANY DISCREPANCIES TO BE REPORTED TO DOR BEFORE DEMOLITION.



**FLAT ROCK - HVAC UPGRADE ELECTRICAL DEMOLITION PART-A1 FLOOR PLAN
@ EXIST. MAIN FLOOR**

SCALE: 1/8"=1'-0" (EXIST REFERENCE FLOOR PLAN USED FOR DEMOLITION INFORMATION ONLY)

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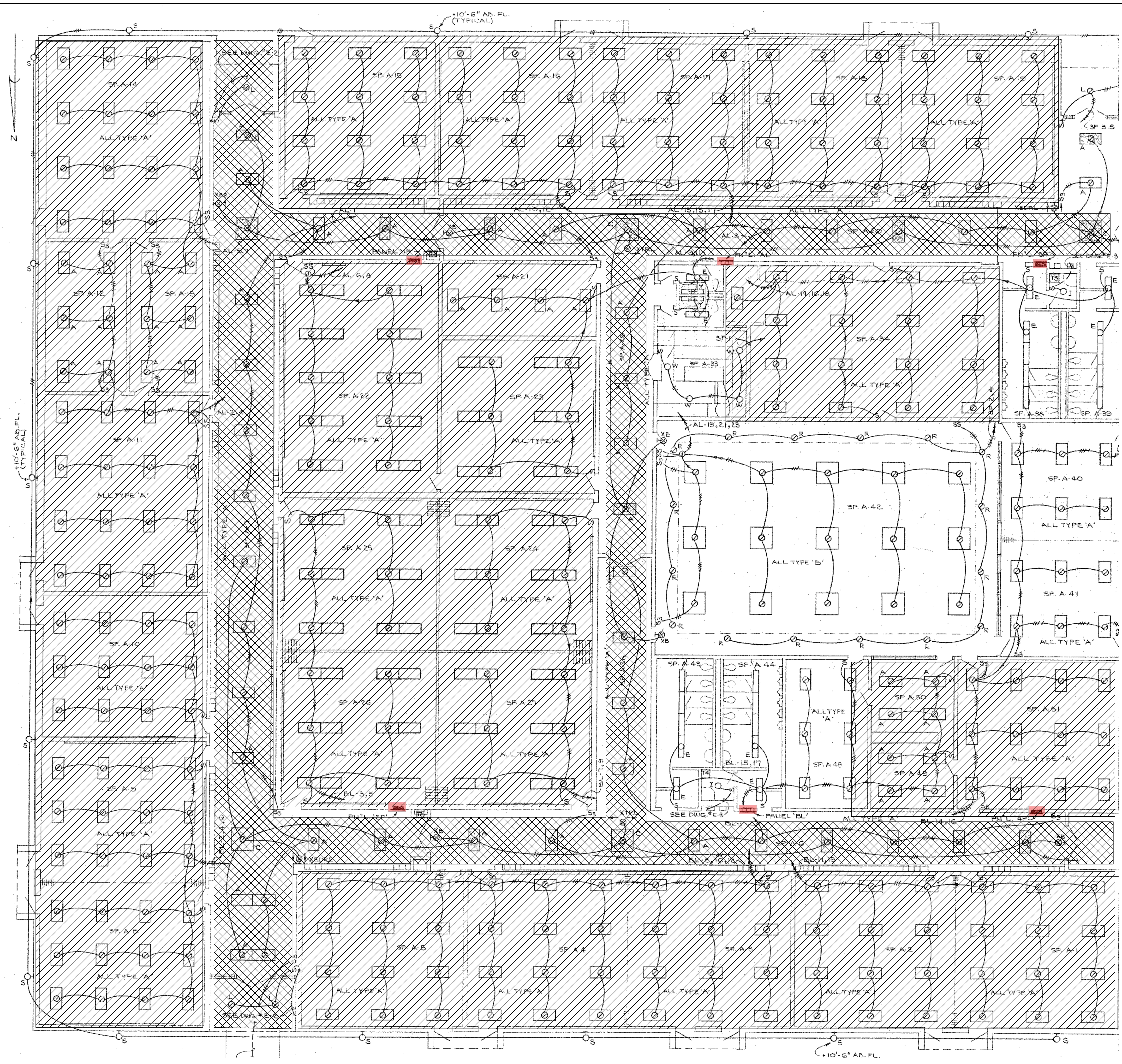
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**ELECTRICAL DEMOLITION PART-A1 FLOOR PLAN
@EXIST. MAIN FLOOR**

PROJECT: **2019 - 2020 HVAC UPGRADES TO FLAT ROCK & RUGBY MIDDLE SCHOOLS**
 HENDERSON COUNTY PUBLIC SCHOOLS
 414 - 4TH STREET, HENDERSONVILLE, HENDERSON COUNTY, NORTH CAROLINA 29621

DRAWING: **FRED-A1**
 SHEET: 1 OF 11
 REV. NO.: IFOB



GENERAL NOTE:
 LIGHTS IN SHADED AREAS WILL BE RE-USED. LIGHTS ARE TO BE SUSPENDED DURING DEMO AND REPLACED AS NEEDED. DO NOT DEMO FIXTURES, WIRING, CONDUIT, OR ASSOCIATED JUNCTION BOXES.

ALTERNATE BID ITEM:

GENERAL NOTES:
 LIGHTING IN HIGHLIGHTED AREAS TO BE REPLACED BY LED TROFFERS. SEE LUMINAIRE SCHEDULE AND DETAILS ON SAME PAGE.

▨ INDICATES LIGHTING TO BE REPLACED IN CLASSROOMS

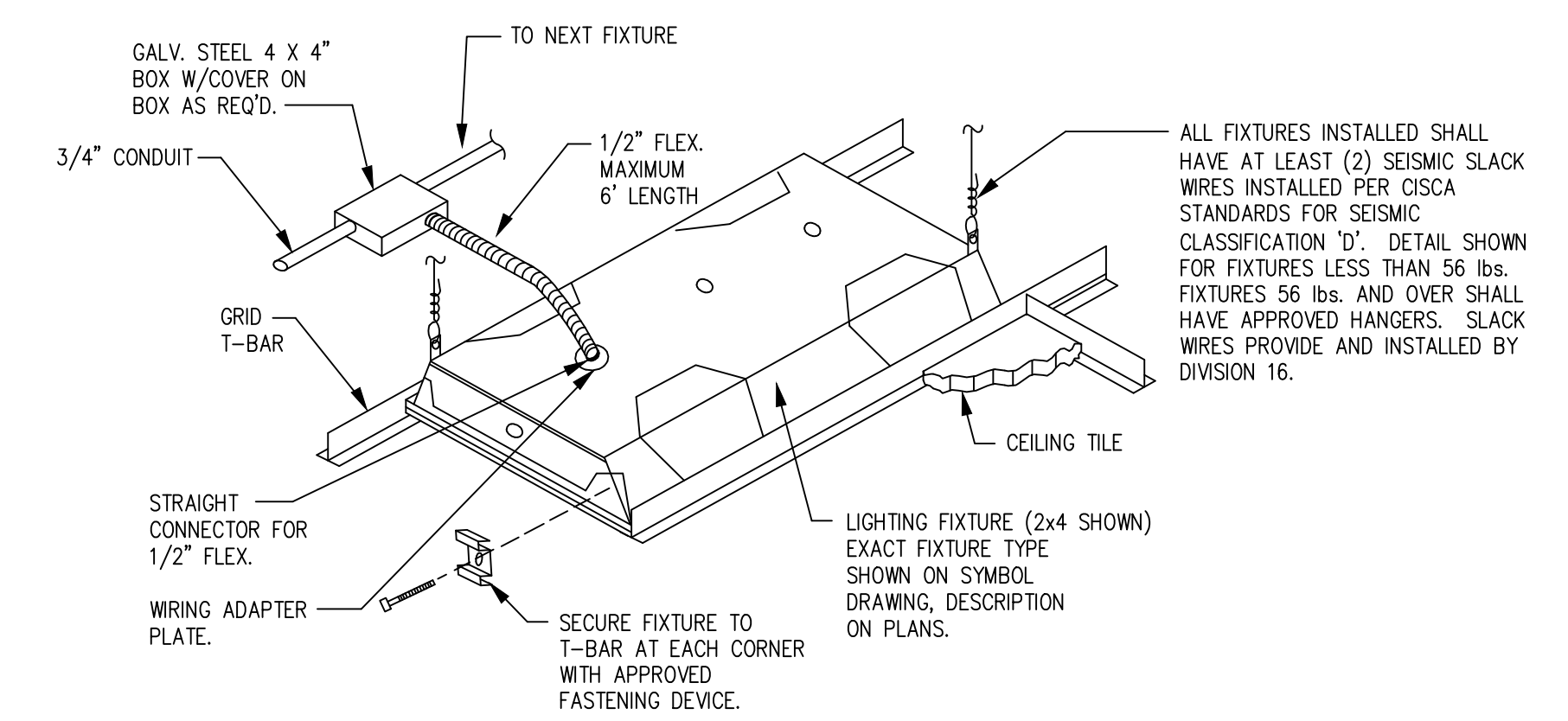
▩ INDICATES LIGHTING TO BE REPLACED IN HALLWAYS AND CORRIDORS

GENERAL LIGHTING NOTES FOR ALTERNATE BID:

- MANUFACTURERS & NUMBERS ARE LISTED TO ESTABLISH QUALITY ONLY AND NOT TO LIMIT COMPETITION. PRIOR TO BIDDING, SUBSTITUTIONS ARE ALLOWED SUBJECT TO SUBMITTAL DATA, PHOTOMETRICS & ENGINEERS APPROVAL AS REQUIRED BY SPECIFICATIONS.
- POLES FOR AREA FIXTURES ARE TO MATCH FIXTURE FINISH EXACTLY. PROVIDE MULTI-TAP BALLASTS. CONTRACTOR TO COORDINATE PRE-DRILLING OF POLES AS REQUIRED TO ACCEPT ARM MOUNTING. PROVIDE HAND HOLES AT POLE BASES.
- ALL FIXTURES TO BE U.L. LABELED. ALL EXTERIOR FIXTURES SHALL HAVE U.L. WET LABEL OR DAMP LABEL AS REQUIRED BY LOCATION. CONTRACTOR SHALL VERIFY BEFORE SUBMITTING FIXTURE.
- PROVIDE ALL MOUNTING ACCESSORIES, BAR HANGARS & HARDWARE REQUIRED.
- LIGHTING DESIGN IN CLASSROOMS TO MEET 500 LUX
- LIGHTING DESIGN IN HALLWAYS TO MEET 100 LUX
- ALL LIGHTING EQUIPMENT AND LEVELS TO CONFORM TO ANSI/ASHRAE/IES STANDARD 90.1-2016

LIGHTING FIXTURE SCHEDULE						
FIXTURE TYPE	FIXTURE DESCRIPTION	ACCEPTABLE MANUFACTURERS	MOUNTING HEIGHT	LAMPS	FIXTURE WATTAGE	VOLTAGE
A	LED TROFFER, 2' X 4', 3500K, 4200 LUMENS	PHILIPS # 516427		BY MANUFACTURER	32	120-277

**FLAT ROCK - LED LIGHTING UPGRADE ALTERNATE BID
 LUMINAIRE SCHEDULE AND NOTES**

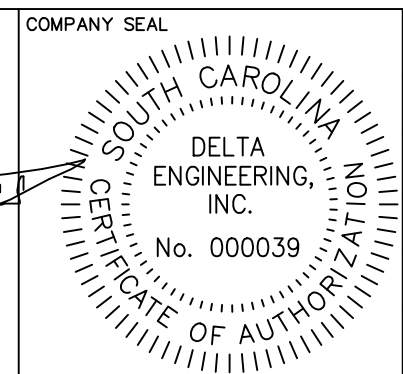
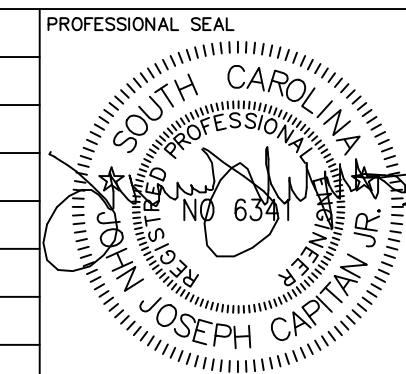


**FLAT ROCK - LED LIGHTING UPGRADE ALTERNATE BID
 LED TROFFER MOUNTING DETAIL**

**FLAT ROCK - HVAC UPGRADE ELECTRICAL DEMOLITION REFLECTED CEILING PLAN
 PART-A1 @ EXIST. MAIN FLOOR**

SCALE: 1/8"=1'-0" (EXIST REFERENCE FLOOR PLAN USED FOR DEMOLITION INFORMATION ONLY)

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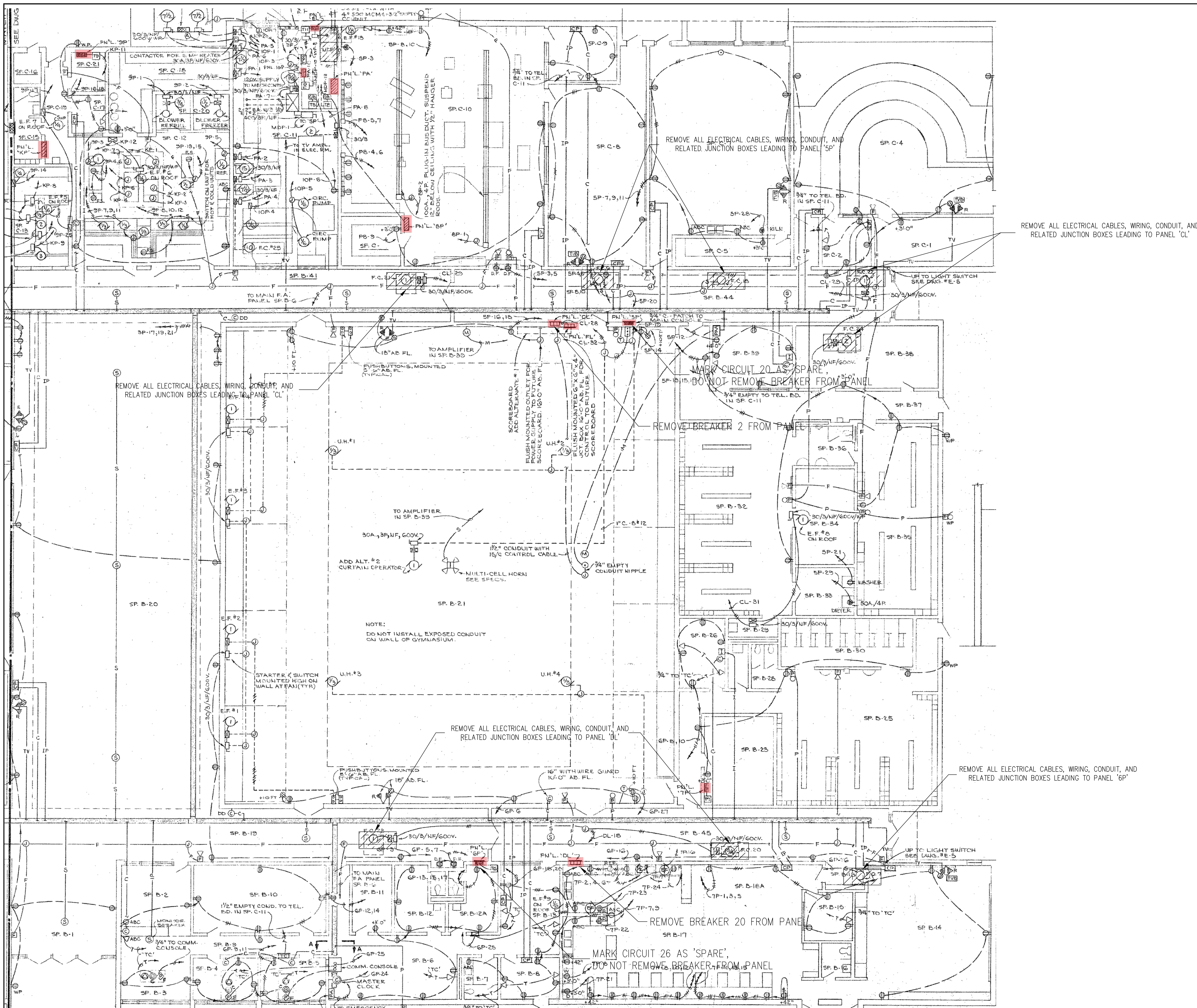
**ELECTRICAL DEMOLITION
 REFLECTED CEILING PLAN
 PART-A1 @ EXIST. MAIN FLOOR**

PROJECT:
**2019 - 2020 HVAC UPGRADES TO
 FLAT ROCK & RUGBY MIDDLE SCHOOLS**
 HENDERSON COUNTY PUBLIC SCHOOLS
 414 - 4TH STREET, HENDERSONVILLE, HENDERSON COUNTY, NORTH CAROLINA 29621

DRAWING:
FRED-A2
 SHEET: 2 OF 11
 REV. NO.: IFOB

APRIL 29, 2016

APRIL 29, 2016



GENERAL NOTE: (TYPICAL) CONTRACTOR SHALL FIELD VERIFY w/OWNER FOR PHASED DEMO OF EXIST. ABOVE CEILING POWER CONDUIT AND WIRING FOR EXISTING FAN-COIL UNITS SERVING EXIST. ROOM SPACES. SEE MECHANICAL DRAWINGS FOR FURTHER DETAILS.

GENERAL NOTE: (TYPICAL) FIELD VERIFY ALL ELECTRICAL CONNECTIONS TO EXISTING FAN-COIL UNITS PRIOR TO DEMOLITION. ANY DISCREPANCIES TO BE REPORTED TO DOR BEFORE DEMOLITION.

**FLAT ROCK - HVAC UPGRADE ELECTRICAL DEMOLITION PART - B1 FLOOR PLAN
@ EXIST. MAIN FLOOR**

SCALE: 1/8"=1'-0" (EXIST REFERENCE PLAN USED ONLY FOR DEMOLITION INFORMATION)

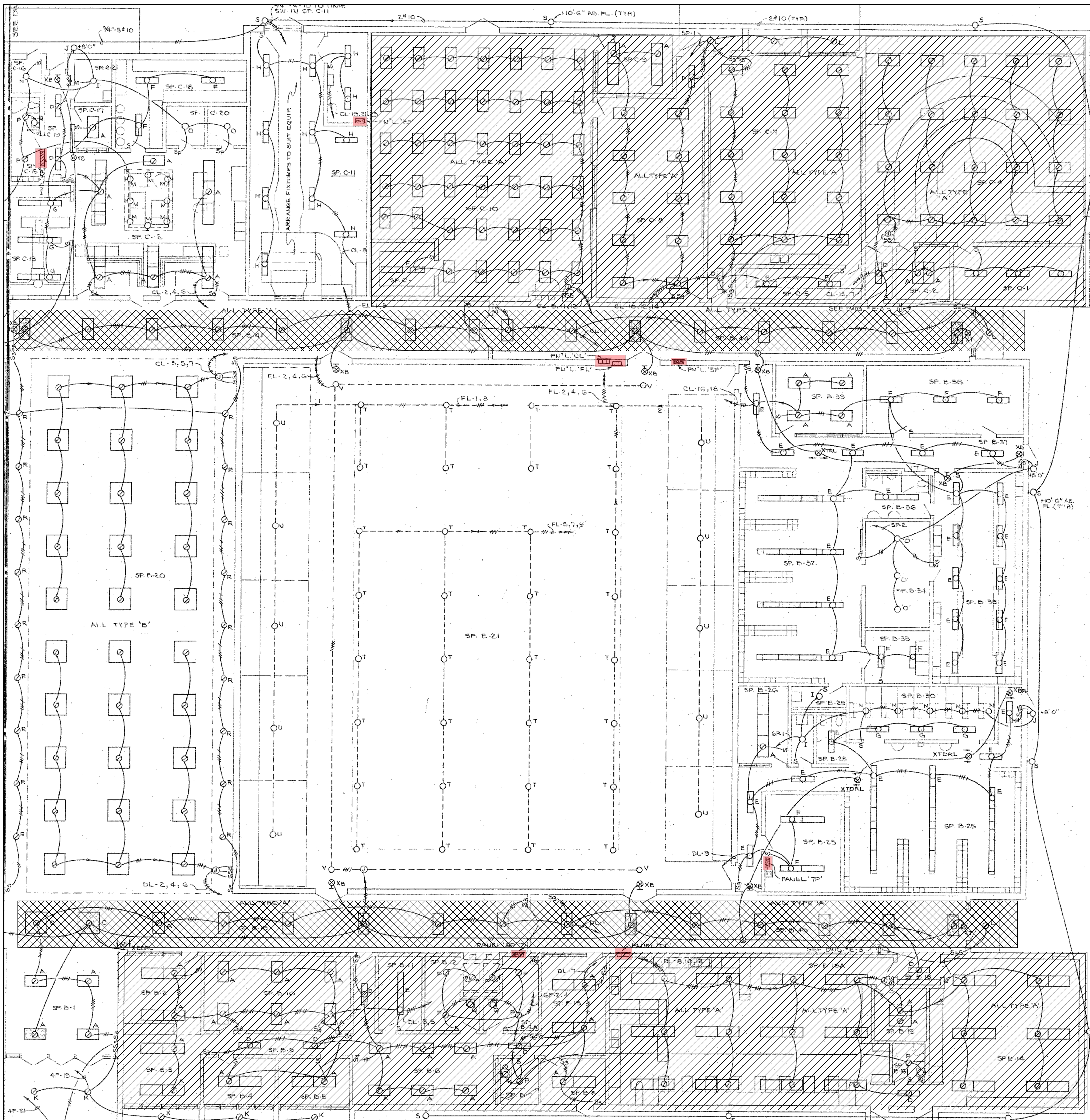
REVISIONS		
NO.	DATE	DESCRIPTION

		DESIGNED BY: NAME DRAWN BY: NAME CHECKED BY: NAME DATE: MONTH-DAY-YEAR SCALE: AS NOTED JOB NO.: DEI JOB NO. 19005
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**ELECTRICAL DEMOLITION PART -
B1 FLOOR PLAN
@EXIST. MAIN FLOOR**

PROJECT: 2019 - 2020 HVAC UPGRADES TO FLAT ROCK & RUGBY MIDDLE SCHOOLS	DRAWING: FRED-B1
HENDERSON COUNTY PUBLIC SCHOOLS 414 - 4TH STREET, HENDERSONVILLE, HENDERSON COUNTY, NORTH CAROLINA 29621	SHEET: 3 OF 11 REV. NO.: IF08



GENERAL NOTE: LIGHTS IN SHADED AREAS WILL BE RE-USED. LIGHTS ARE TO BE SUSPENDED DURING DEMO AND REPLACED AS NEEDED. DO NOT DEMO FIXTURES, WIRING, CONDUIT, OR ASSOCIATED JUNCTION BOXES...

ALTERNATE BID ITEM:

LIGHTING IN HIGHLIGHTED AREAS TO BE REPLACED BY LED TROFFERS. SEE LUMINAIRE SCHEDULE AND DETAILS ON FRED-A2.

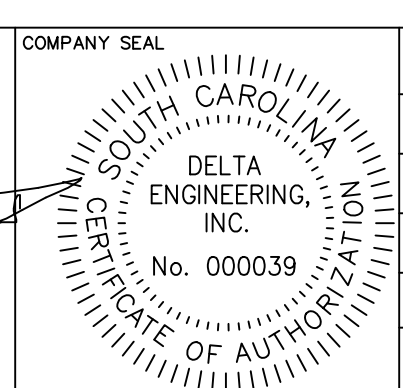
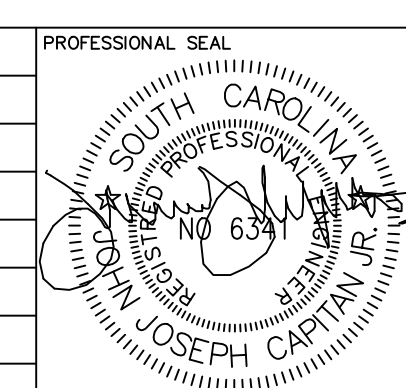
INDICATES LIGHTING TO BE REPLACED IN CLASSROOMS

INDICATES LIGHTING TO BE REPLACED IN HALLWAYS AND CORRIDORS

FLAT ROCK - HVAC UPGRADE ELECTRICAL DEMOLITION REFLECTED CEILING PLAN
PART-B2 FLOOR PLAN @ EXIST. MAIN FLOOR

SCALE: 1/8"=1'-0" (EXIST REFERENCE FLOOR PLAN USED FOR DEMOLITION INFORMATION ONLY)

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CHECKED BY: NAME
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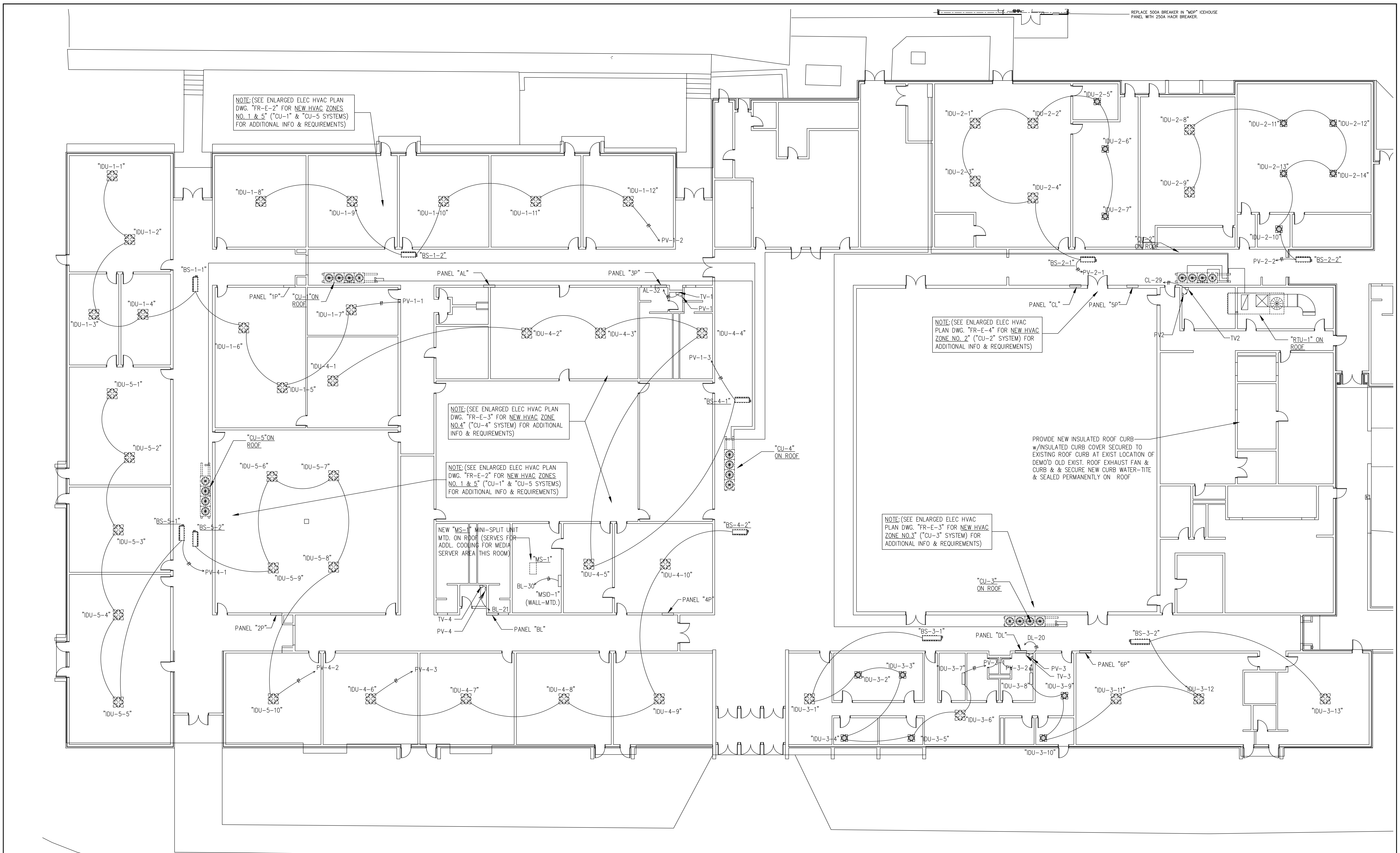
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ELECTRICAL DEMOLITION
REFLECTED CEILING PLAN
PART-B2 FLOOR PLAN @ EXIST.
MAIN FLOOR

PROJECT: 2019 - 2020 HVAC UPGRADES TO
FLAT ROCK & RUGBY MIDDLE SCHOOLS
HENDERSON COUNTY PUBLIC SCHOOLS
414 - 4TH STREET, HENDERSONVILLE, HENDERSON COUNTY, NORTH CAROLINA 29621

DRAWING: **FRED-B2**

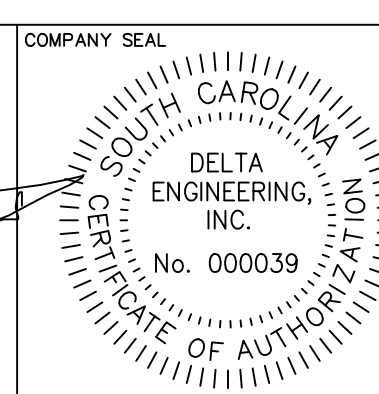
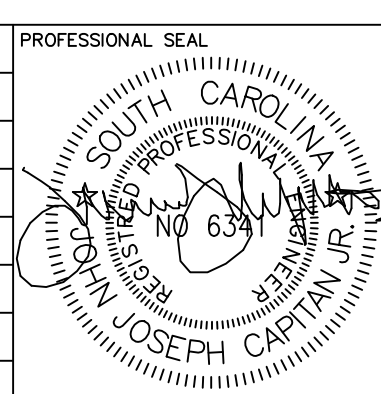
SHEET: 4 OF 11
REV. NO.: IF0B



FLAT ROOF - NEW HVAC UPGRADE VRV SYSTEMS (ZONES NO. 1 - 5)
OVERALL FLOOR PLAN @ EXIST. MAIN FLOOR

SCALE: 3/32" = 1'-0"

REVISIONS			
NO.	DATE	DESCRIPTION	BY
-	0	TEXT HERE	JJC



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 CHECKED BY: NAME
 DATE: MONTH-DAY-YEAR
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 JOB NO.: DEI JOB NO. 19005

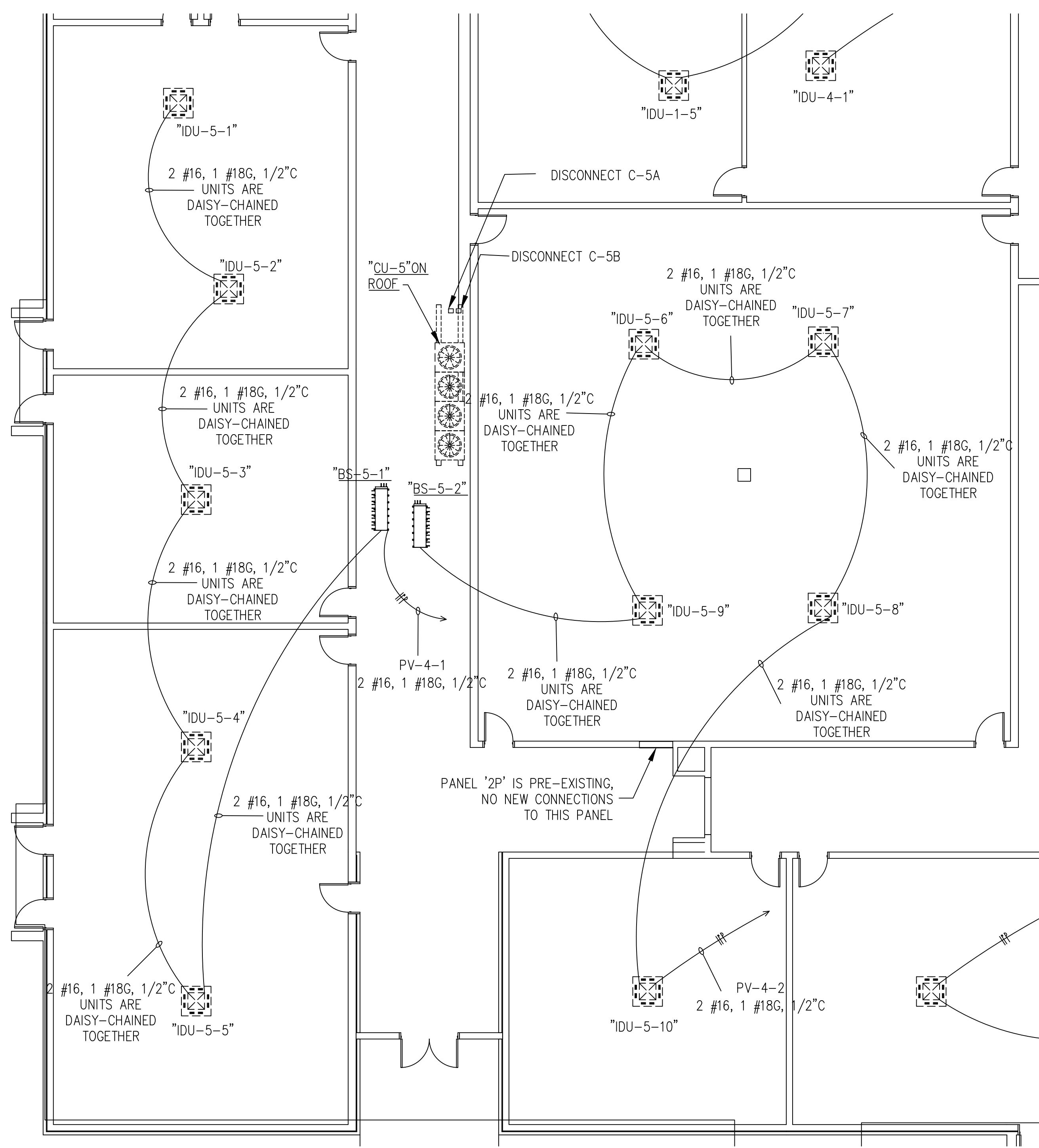
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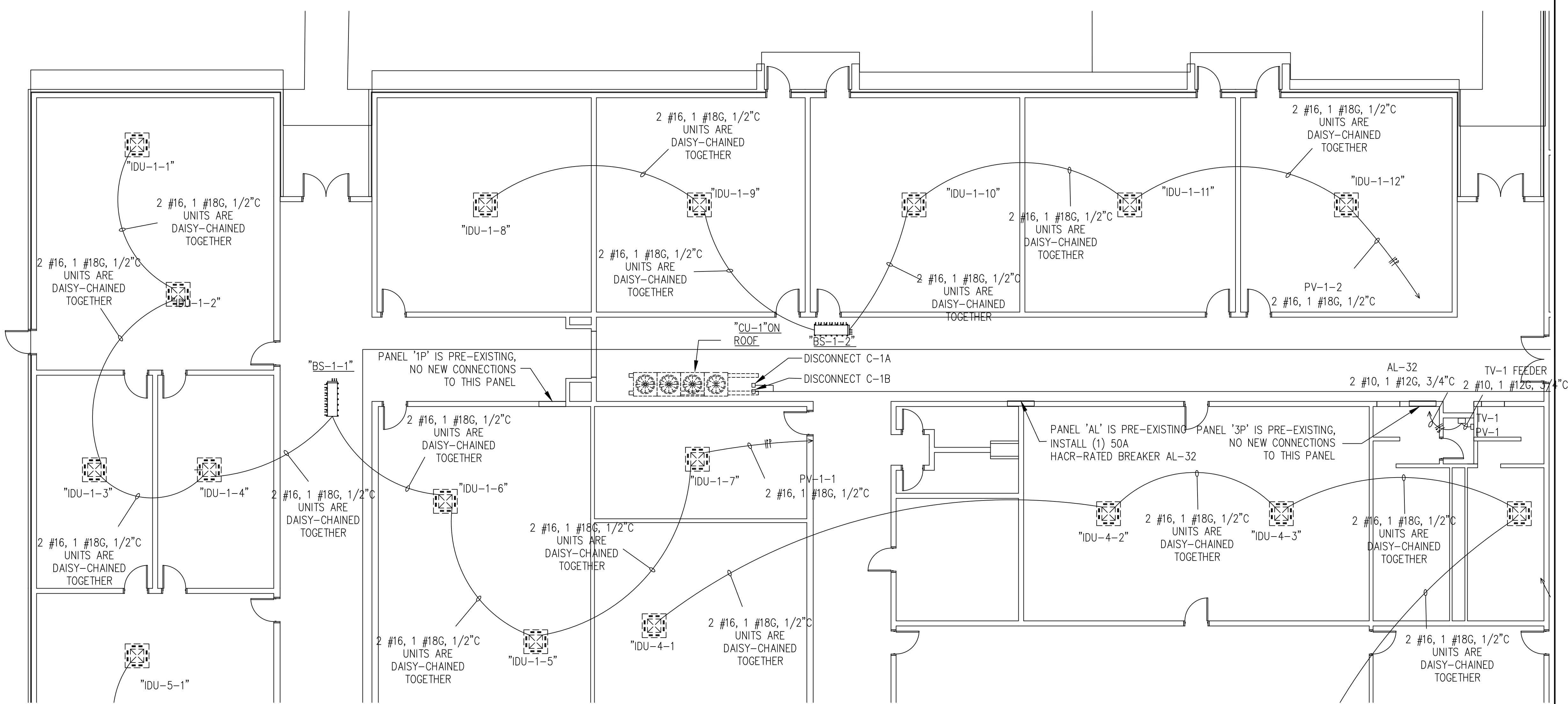
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SYSTEMS OVERALL FLOOR PLAN @ EXIST. MAIN FLOOR

PROJECT: **2019 - 2020 HVAC UPGRADES TO FLAT ROCK & RUGBY MIDDLE SCHOOLS** **FR-E - 1**
 HENDERSON COUNTY PUBLIC SCHOOLS
 414 - 4TH STREET, HENDERSONVILLE, HENDERSON COUNTY, NORTH CAROLINA 29621
 SHEET: 5 OF 11
 REV. NO.: IFOB

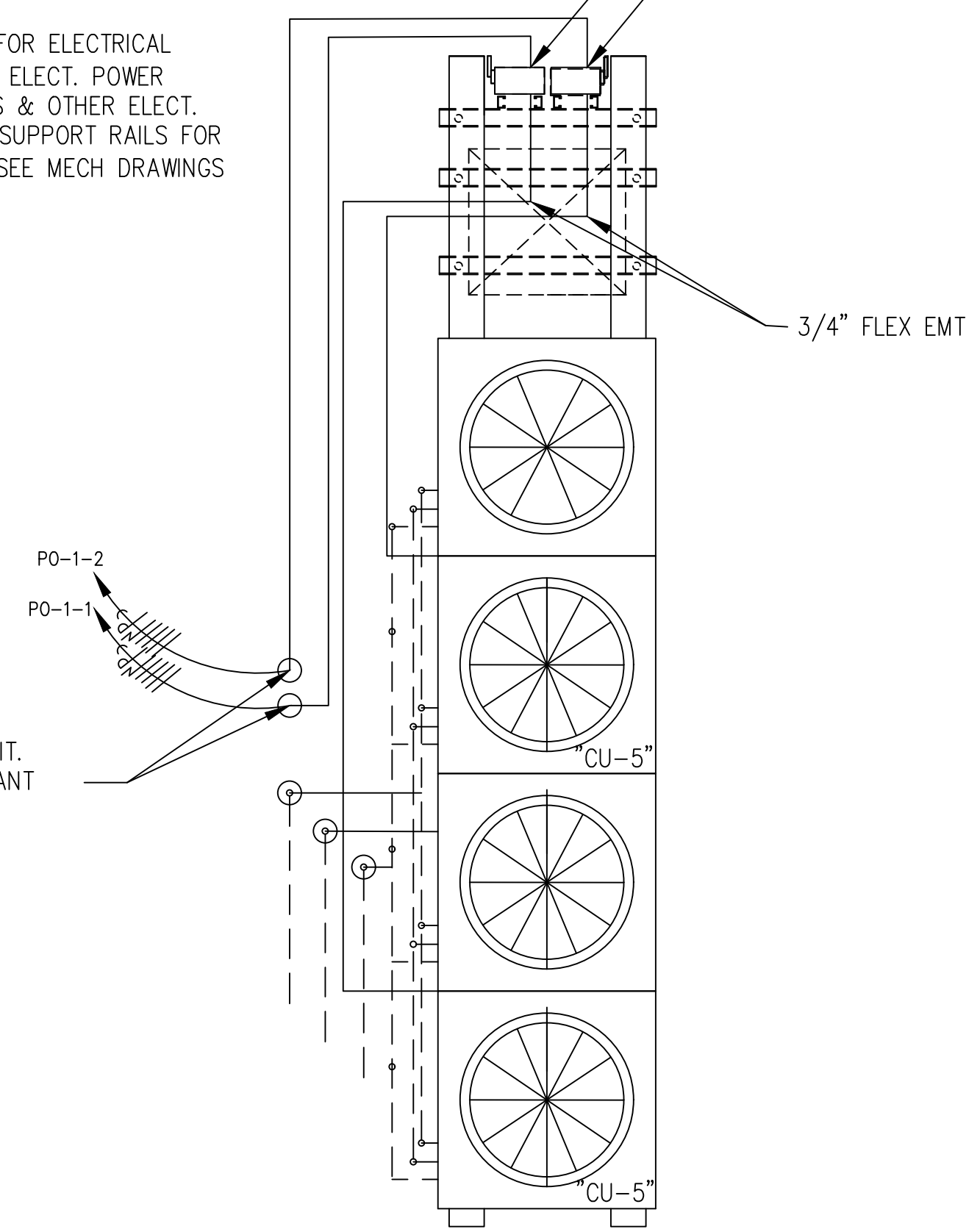


FLAT ROCK - NEW HVAC UPGRADE SYSTEMS - ENLARGED ELECTRICAL FLOOR PLAN @ UPGRADE VRV ZONE NO. 5
SCALE: 1/8" = 1'-0"

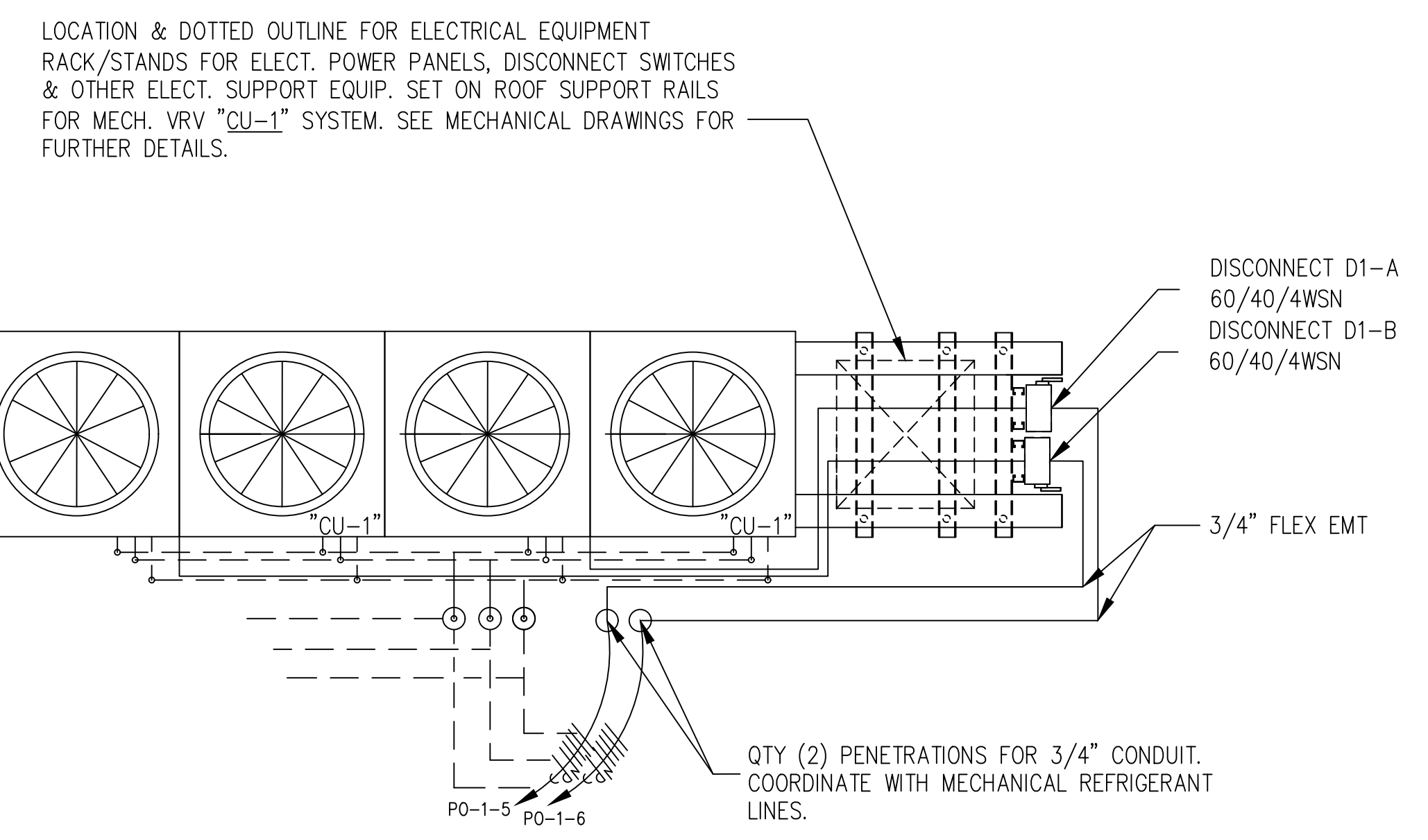


FLAT ROCK - NEW HVAC UPGRADE SYSTEMS - ENLARGED ELECTRICAL FLOOR PLAN @ UPGRADE VRV ZONE NO. 1
SCALE: 1/8" = 1'-0"

LOCATION & DOTTED OUTLINE FOR ELECTRICAL EQUIPMENT RACK/STANDS FOR ELECT. POWER PANELS, DISCONNECT SWITCHES & OTHER ELECT. SUPPORT EQUIP. SET ON ROOF SUPPORT RAILS FOR MECH. VRV "CU-5" SYSTEM. SEE MECH DRAWINGS FOR FURTHER DETAILS

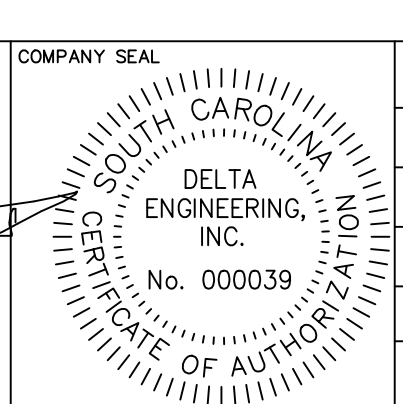
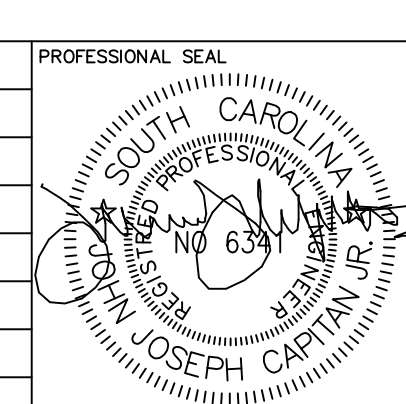


FLAT ROCK - ENLARGED HVAC ROOF PLAN @ NEW "CU-5" VRV ZONE NO. 5 OUTDOOR UNITS
SCALE: 1/2" = 1'-0"



FLAT ROCK - ENLARGED HVAC ROOF PLAN @ NEW "CU-1" VRV ZONE NO. 1 OUTDOOR UNITS
SCALE: 1/2" = 1'-0"

NO.	DATE	DESCRIPTION	BY
-	0	TEXT HERE	JJC



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DRAWN BY: NAME
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DATE: MONTH-DAY-YEAR
SCALE: AS NOTED
JOB NO.: DEI JOB NO. 19005

DESIGN & ENGINEERING ENERGY SYSTEMS INFRASTRUCTURE UTILITIES SYSTEMS ANALYSIS COMMISSIONING REVIEW

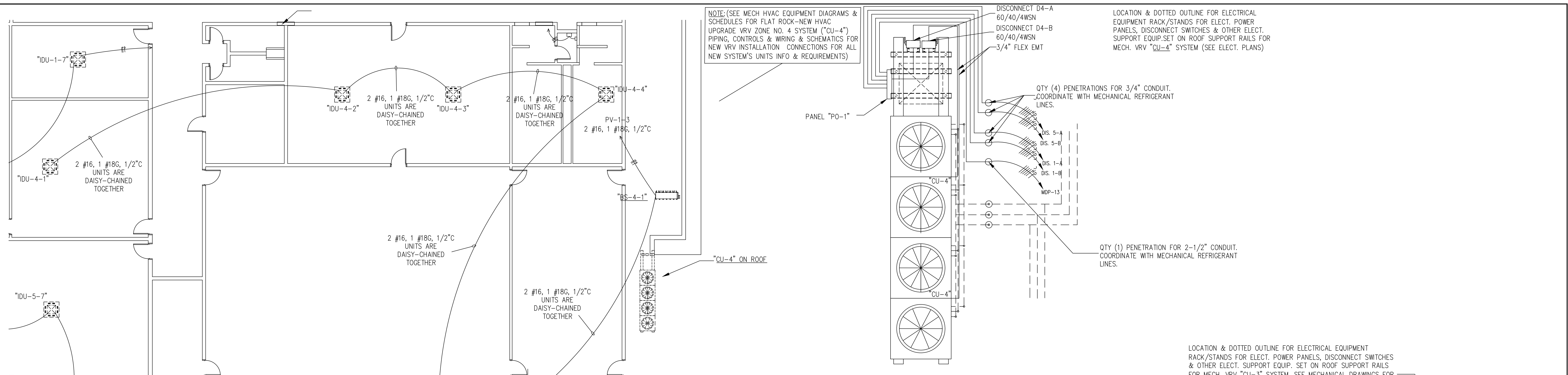
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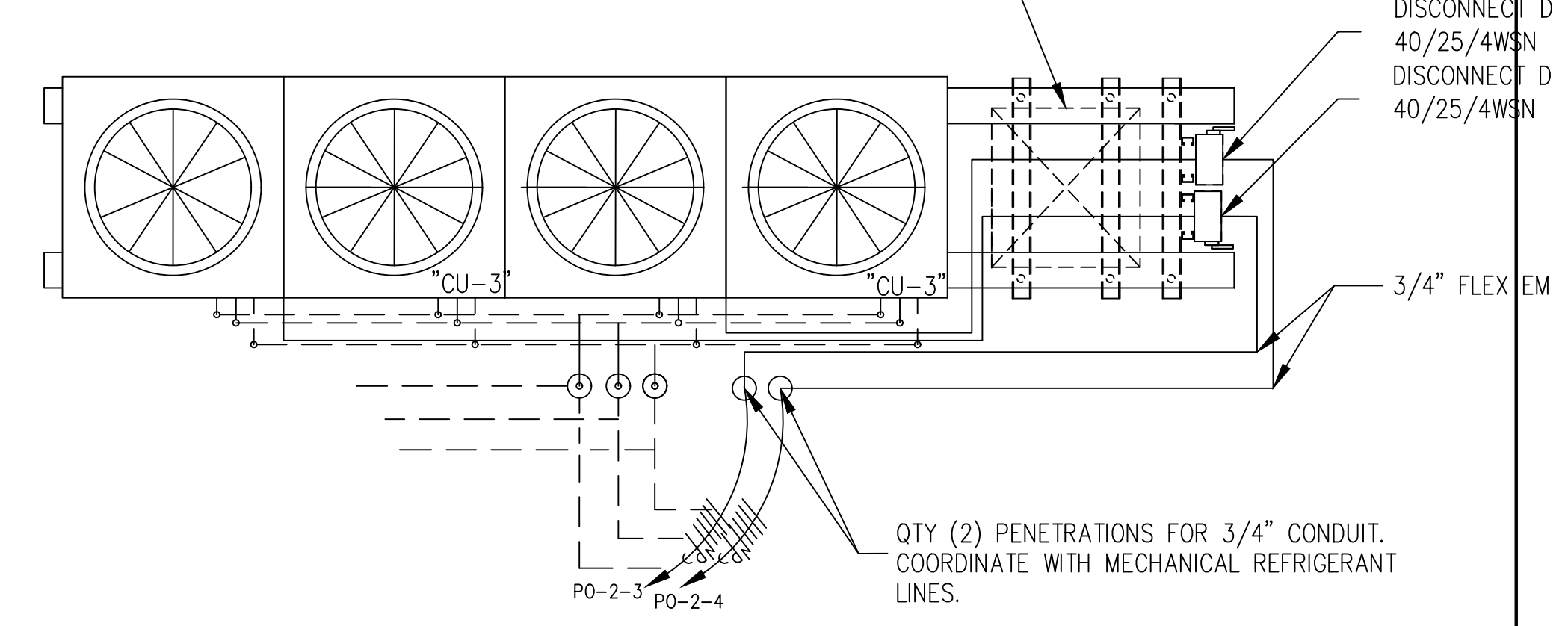
SYSTEMS ENLARGED ELECTRICAL FLOOR PLANS (ZONES 1 AND 5)

PROJECT: 2019 - 2020 HVAC UPGRADES TO FLAT ROCK & RUGBY MIDDLE SCHOOLS
HENDERSON COUNTY PUBLIC SCHOOLS
414 - 4TH STREET, HENDERSONVILLE, HENDERSON COUNTY, NORTH CAROLINA 29621

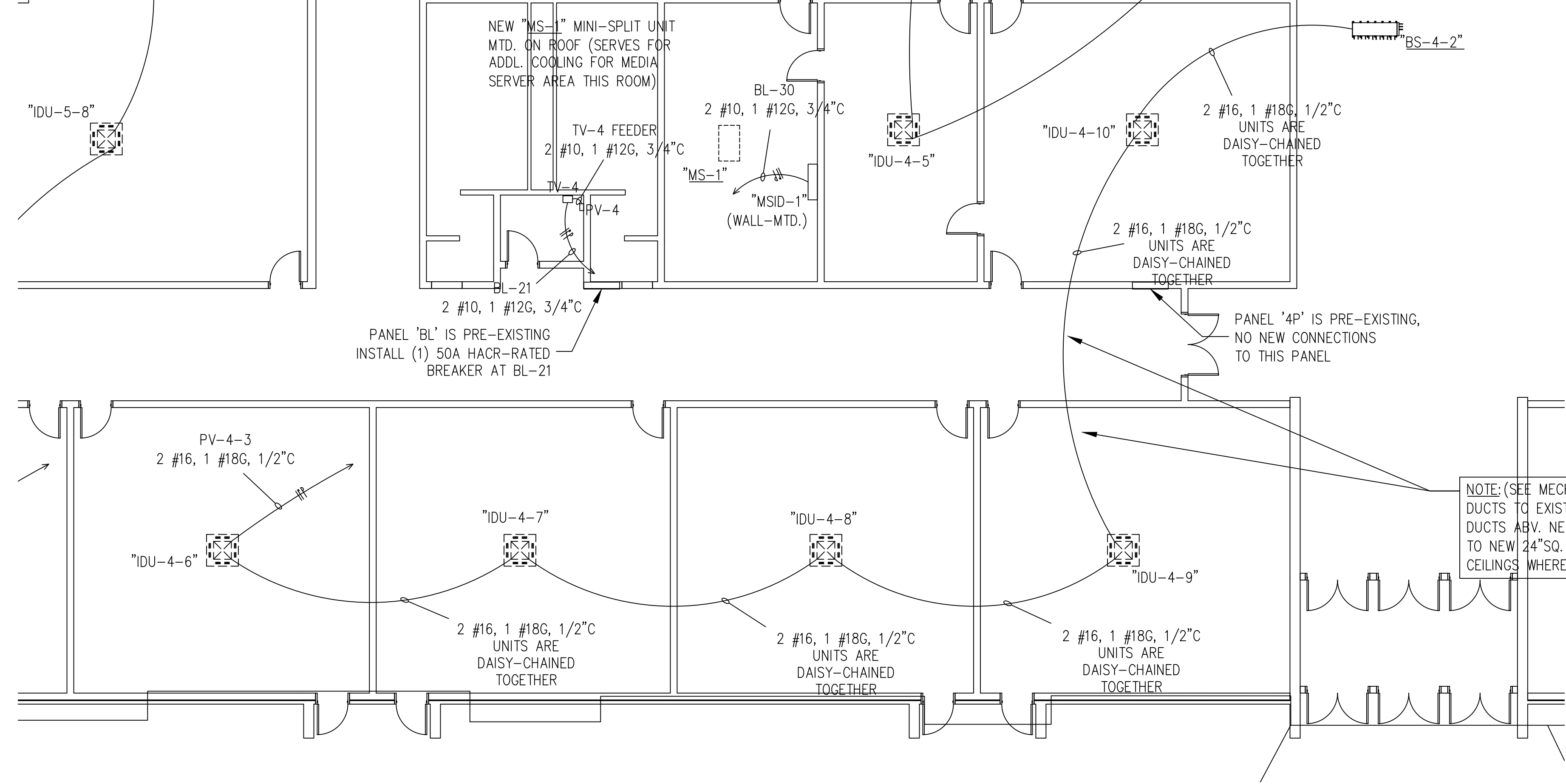
DRAWING: FR-E-2
SHEET: 6 OF 11
REV. NO.: IFOB



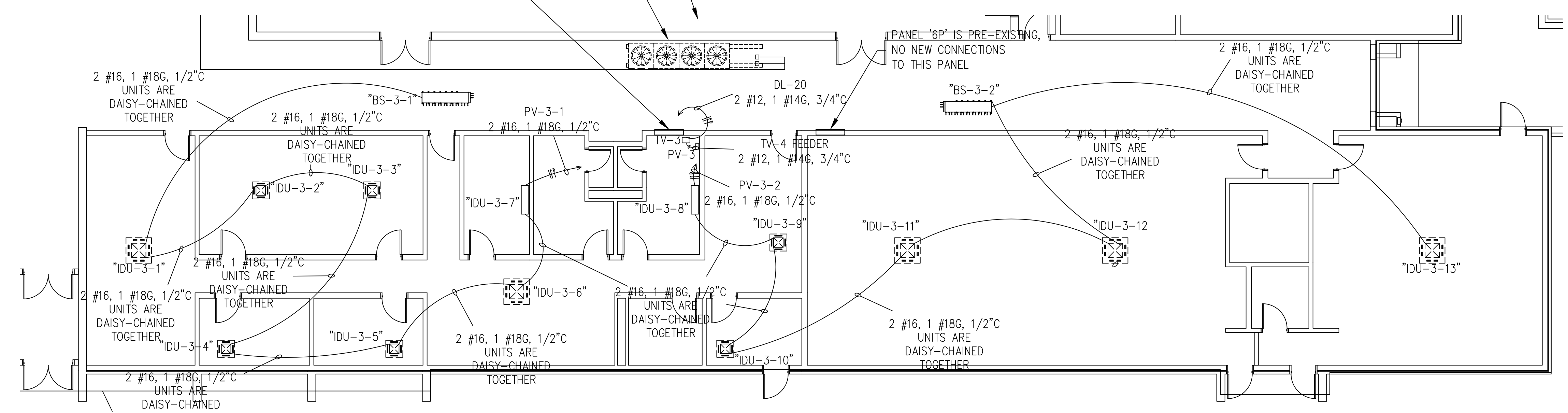
FLAT ROCK - ENLARGED HVAC ROOF PLAN @ NEW "CU-4" VRV ZONE NO. 4 OUTDOOR UNITS
SCALE: 1/2" = 1'-0"



FLAT ROCK - ENLARGED HVAC ROOF PLAN @ NEW "CU-3" VRV ZONE NO. 3 OUTDOOR UNITS
SCALE: 1/2" = 1'-0"



FLAT ROCK - NEW HVAC UPGRADE SYSTEMS - ENLARGED ELECTRICAL FLOOR PLAN @ NEW HVAC UPGRADE VRV ZONE NO. 4
SCALE: 1/8" = 1'-0"



FLAT ROCK - NEW HVAC UPGRADE SYSTEMS - ENLARGED ELECTRICAL FLOOR PLAN @ NEW HVAC UPGRADE VRV ZONE 3
SCALE: 1/8" = 1'-0"

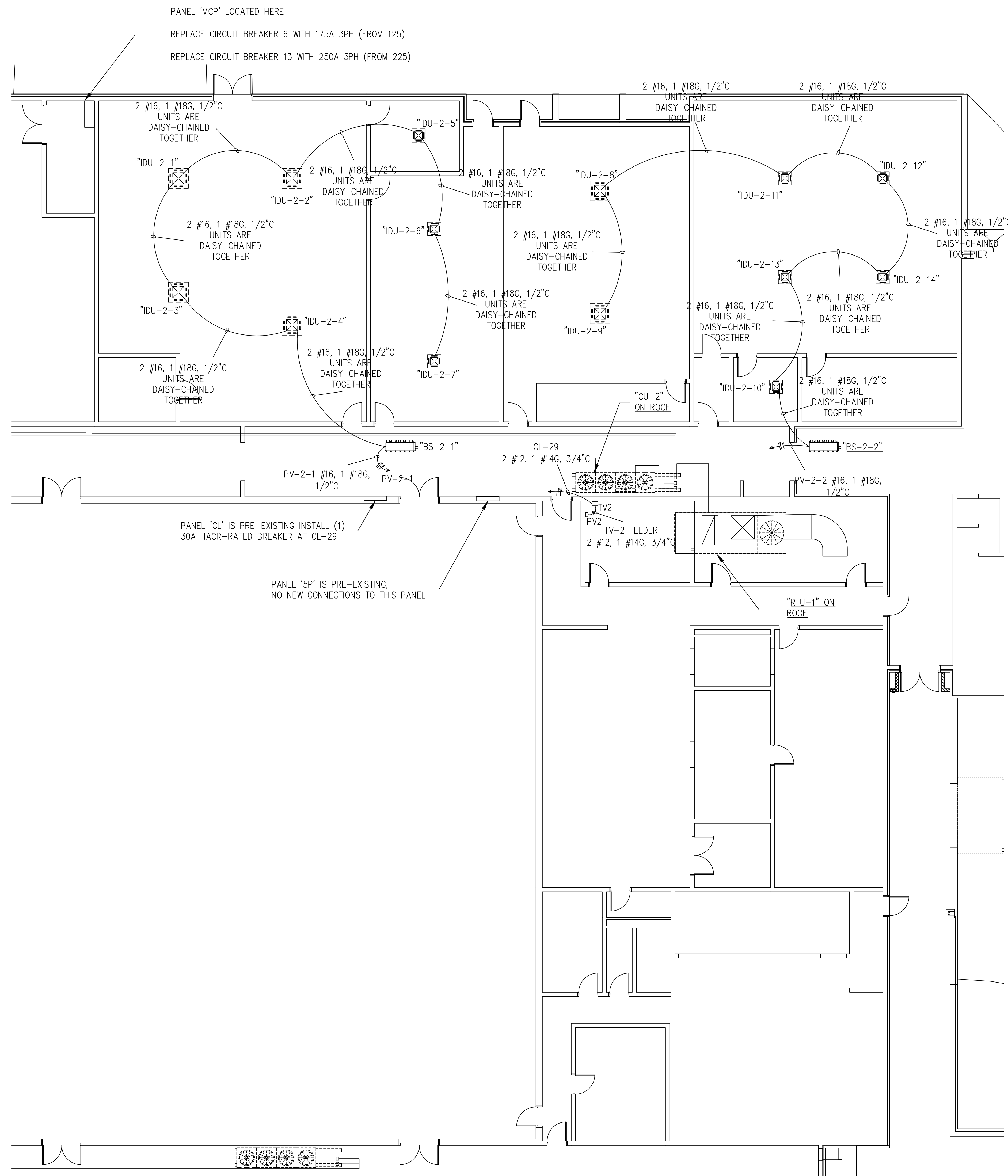
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-	0		TEXT HERE	JJC

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DRAWN BY: NAME	NAME
CHECKED BY: NAME	NAME
DATE: MONTH-DAY-YEAR	
SCALE: AS NOTED	
JOB NO: DEI JOB NO. 19005	

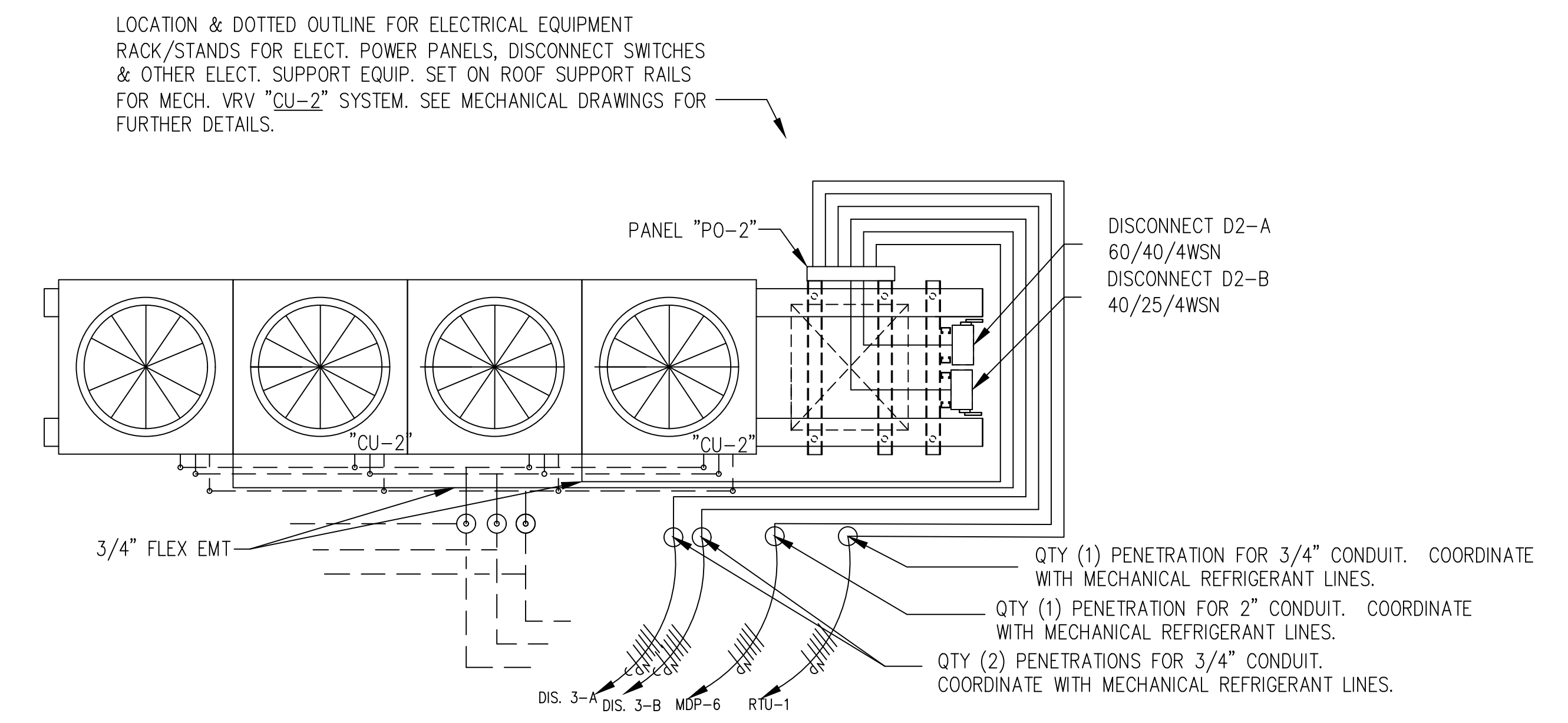
DESIGN & ENGINEERING ENERGY SYSTEMS INFRASTRUCTURE UTILITIES SYSTEMS ANALYSIS COMMISSIONING REVIEW	<p>DELTA DELTA ENGINEERING, INC. CONSULTING ENGINEERS 315 EAST BROAD STREET, GREENVILLE, SC 29601 GREENVILLE, SC TEL. NO. (864) 505-5358 3106 RIVERVIEW VIEW, CHARLESTON, SC 29414 CHARLESTON, SC TEL. NO. (864) 505-2976 Em: jjoecapitan@gmail.com</p>	<p>THIS DRAWING IS THE PROPERTY AND COPYRIGHT OF DELTA ENGINEERING, INC. AND SHALL NOT BE USED OR COPIED WITHOUT WRITTEN PERMISSION. COPYRIGHT ©</p>
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PROJECT:	2019 - 2020 HVAC UPGRADES TO FLAT ROCK & RUGBY MIDDLE SCHOOLS
	HENDERSON COUNTY PUBLIC SCHOOLS 414 - 4TH STREET, HENDERSONVILLE, HENDERSON COUNTY, NORTH CAROLINA 29621

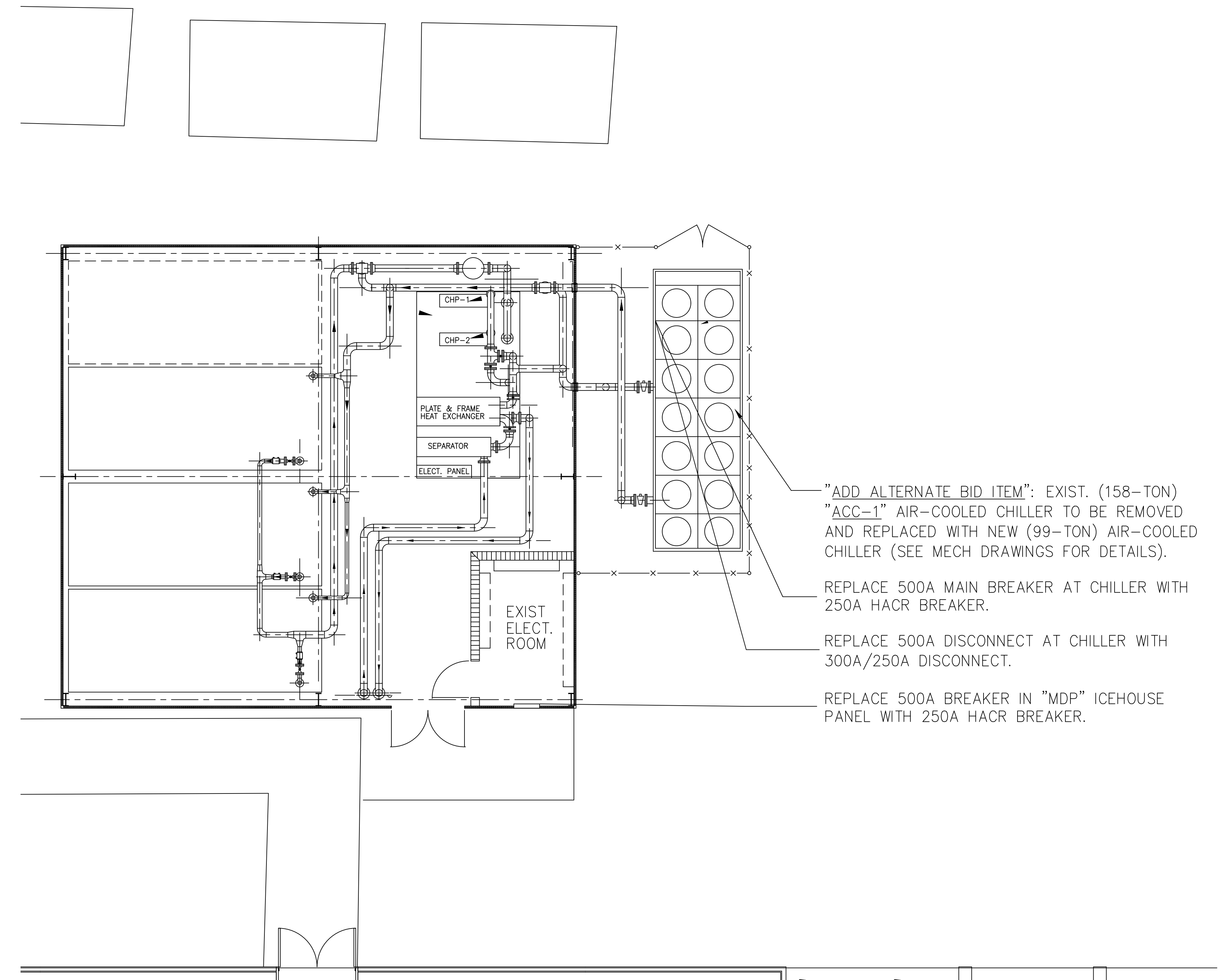
DRAWING:	FR-E - 3
	SHEET: 7 OF 11 REV. NO.: IFOB



FLAT ROCK - NEW HVAC UPGRADE SYSTEMS - ENLARGED ELECTRICAL FLOOR PLAN @ UPGRADE VRV ZONE NO. 2 & NEW HVAC UPGRADES @ EXISTING BOYS & GIRLS LOCKER AREA
SCALE: 1/8" = 1'-0"

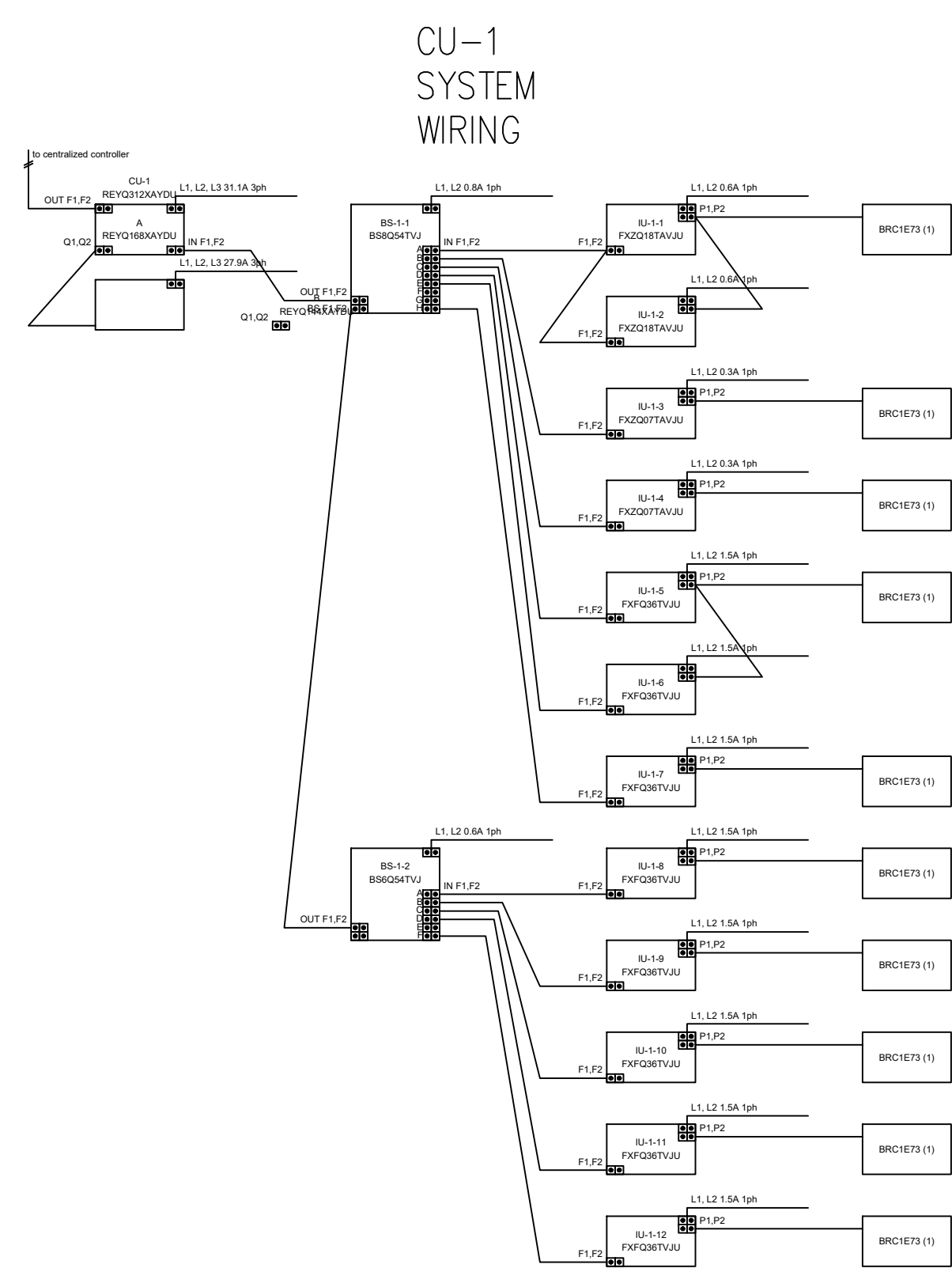


FLAT ROCK - ENLARGED HVAC ROOF PLAN @ NEW "CU-2" VRV ZONE NO. 2 OUTDOOR UNITS
SCALE: 1/2" = 1'-0"

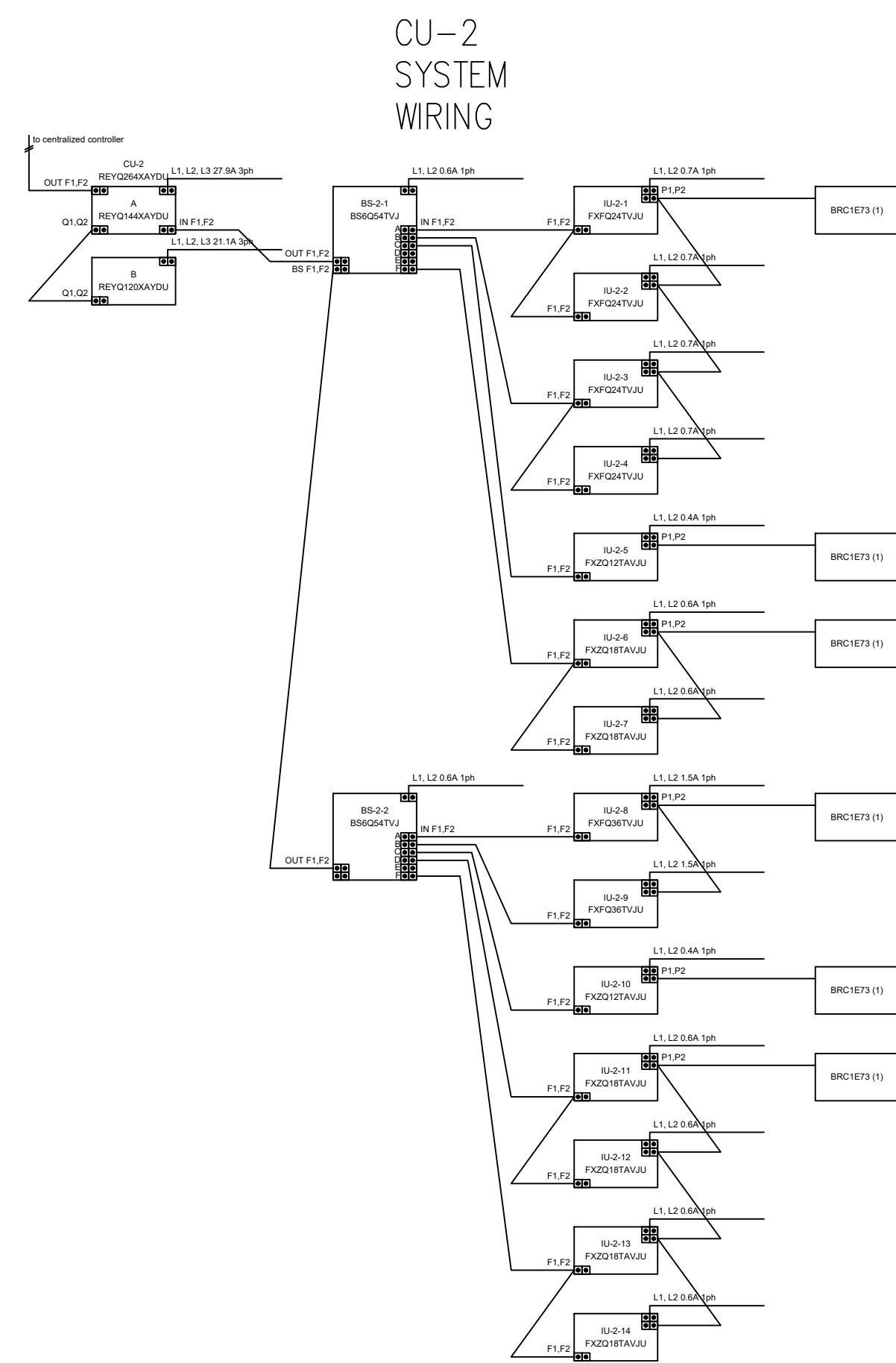


ICEHOUSE CHILLER ALTERNATE BID ELECTRICAL DETAILS
SCALE: 1/8" = 1'-0"

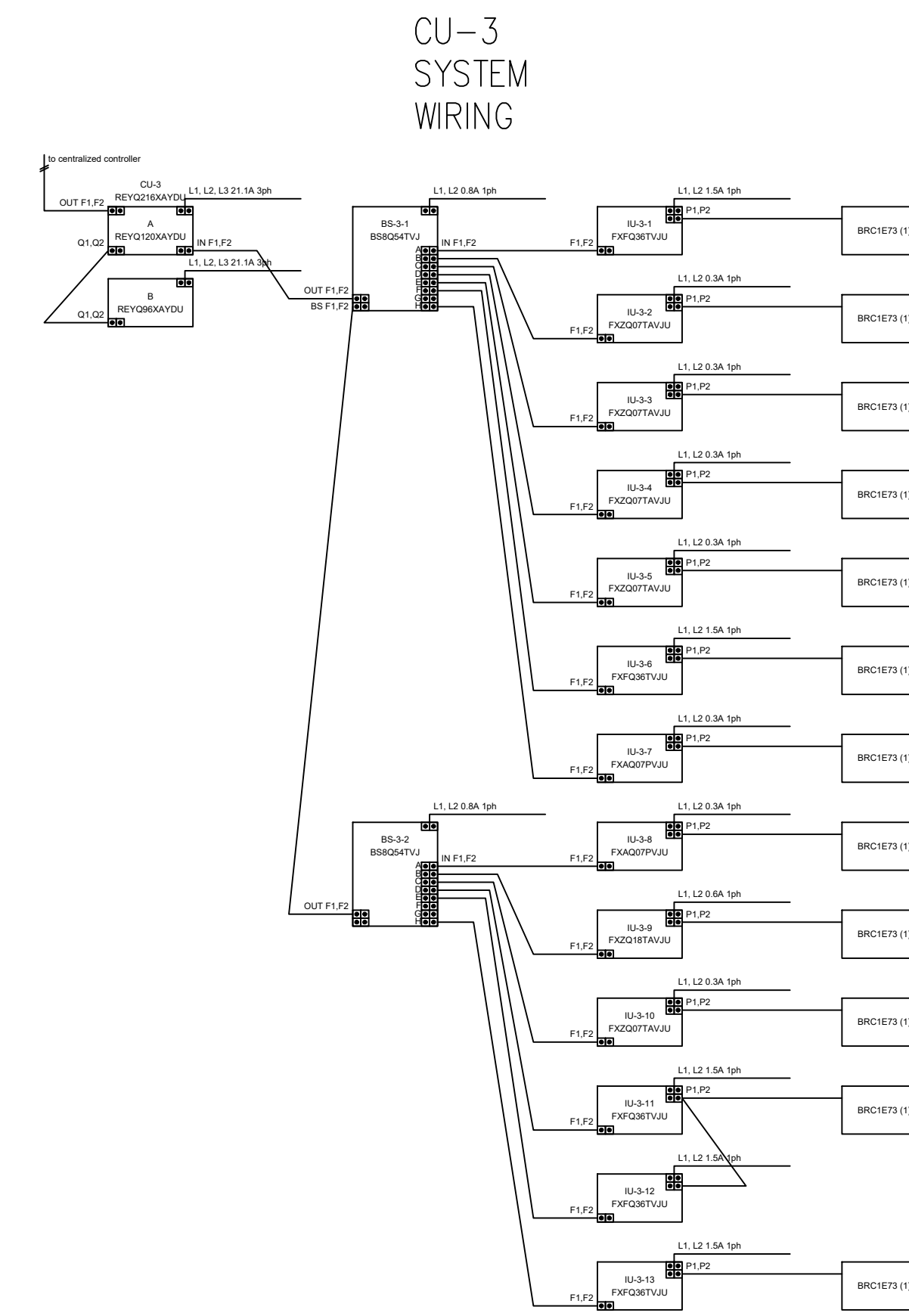
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-	0	TEXT HERE	JJC	DATE: MONTH-DAY-YEAR	CHECKED BY: NAME						
				DATE: MONTH-DAY-YEAR	DATE: MONTH-DAY-YEAR						
				DATE: MONTH-DAY-YEAR	DATE: MONTH-DAY-YEAR						



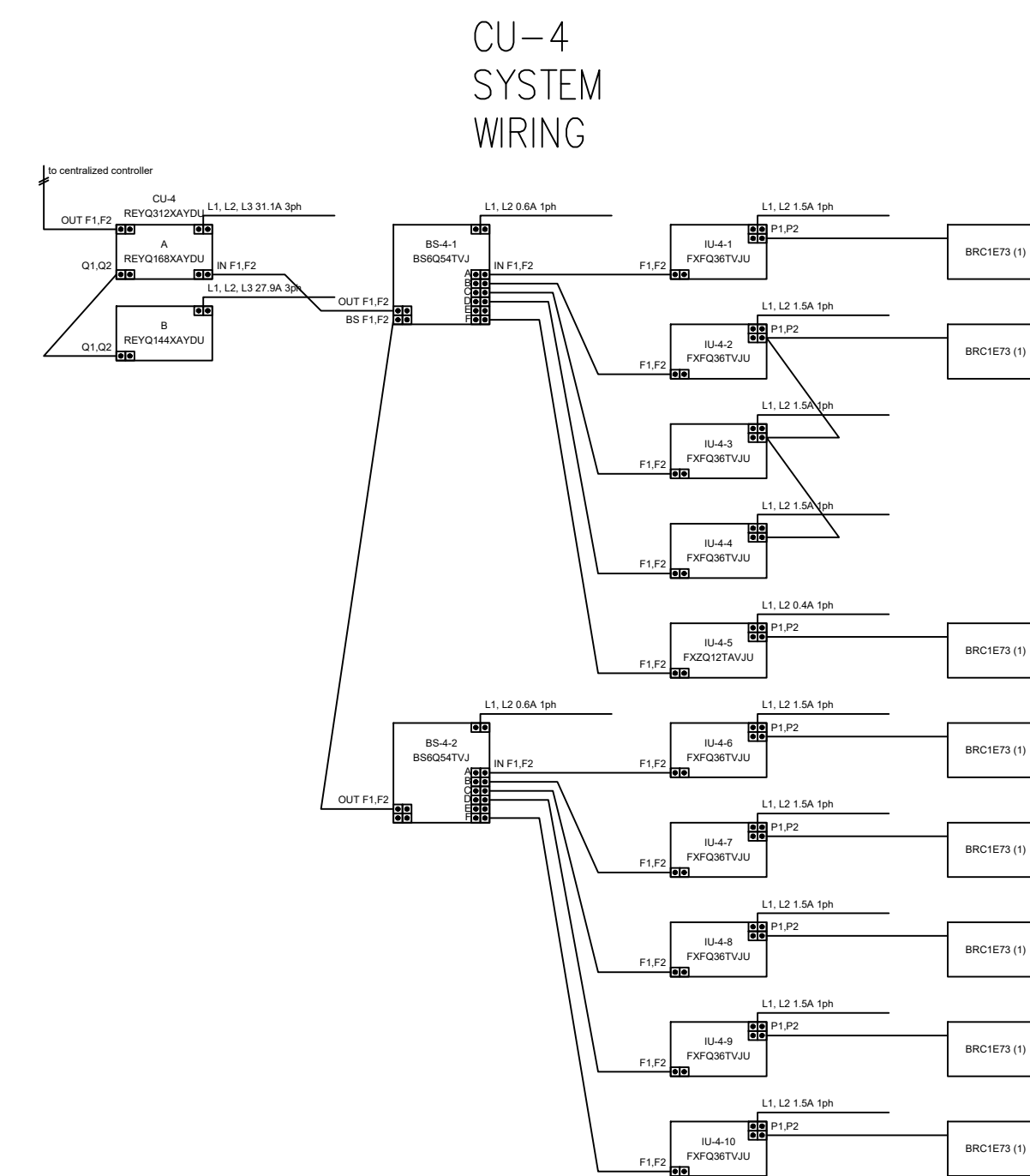
VRV - ZONES NO. 1 - "CU-1" VRV SYSTEM
WIRING SCHEMATIC DIAGRAMS DETAIL
NO. SCALE



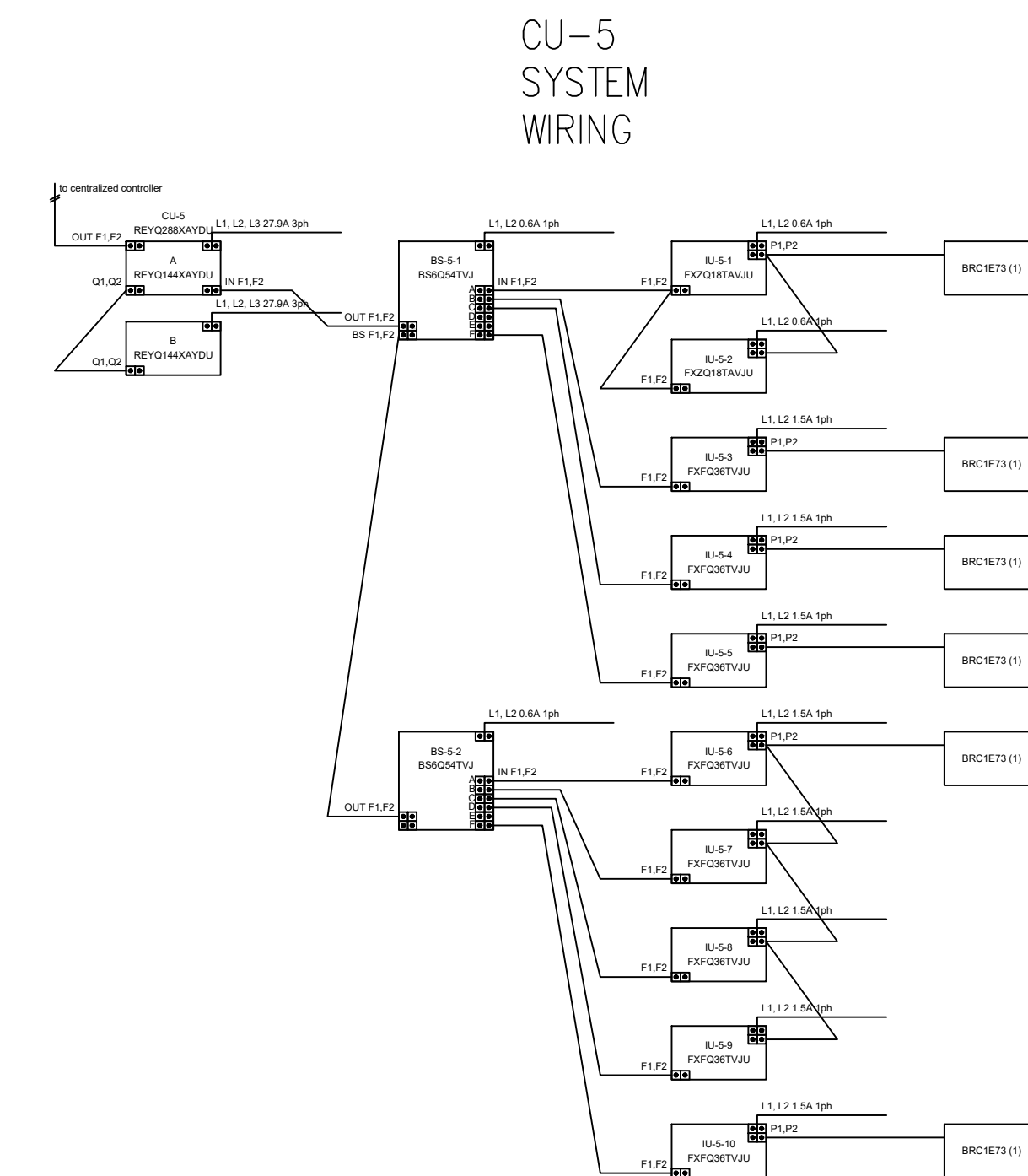
VRV - ZONES NO. 2 - "CU-2" VRV SYSTEM
WIRING SCHEMATIC DIAGRAM DETAIL
NO. SCALE



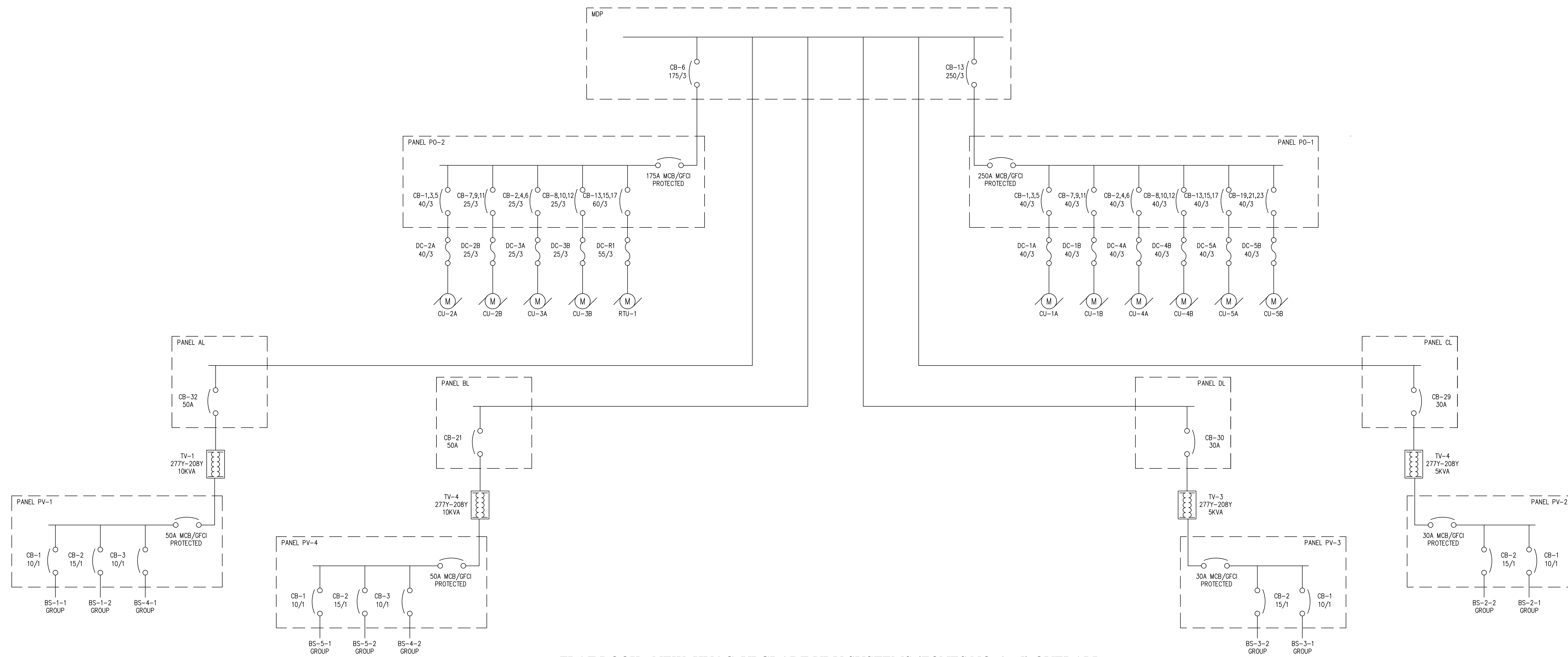
VRV - ZONES NO. 3 - "CU-3" VRV SYSTEM
WIRING SCHEMATIC DIAGRAMS DETAIL
NO. SCALE



VRV - ZONES NO. 4 - "CU-4" VRV SYSTEM
WIRING SCHEMATIC DIAGRAMS DETAIL
NO. SCALE



VRV - ZONES NO. 5 - "CU-5" VRV SYSTEM
WIRING SCHEMATIC DIAGRAMS DETAIL
NO. SCALE

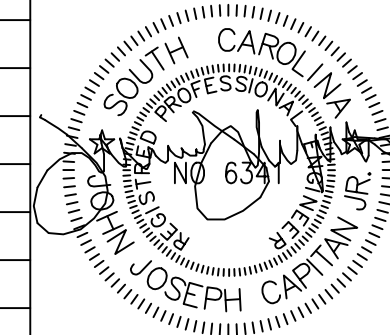


FLAT ROOK - NEW HVAC UPGRADE VRV SYSTEMS (ZONES NO. 1 - 5) OVERALL
POWER WIRING SCHEMATIC DIAGRAMS DETAILS
NO. SCALE

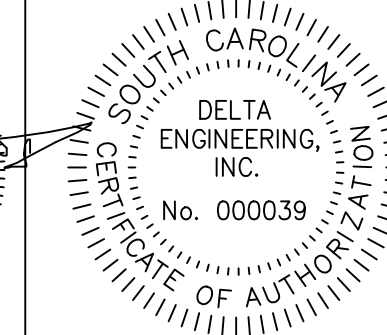
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DESIGN & ENGINEERING
ENERGY SYSTEMS
INFRASTRUCTURE UTILITIES
SYSTEMS ANALYSIS
COMMISSIONING REVIEW

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SYSTEMS POWER WIRING
SCHEMATIC DETAILS

PROJECT:

2019 - 2020 HVAC UPGRADES TO
FLAT ROCK & RUGBY MIDDLE SCHOOLS
HENDERSON COUNTY PUBLIC SCHOOLS
414 - 4TH STREET, HENDERSONVILLE, HENDERSON COUNTY, NORTH CAROLINA 29621

DRAWING:

FR-E-5
SHEET: 9 OF 11
REV. NO.: IFOB

PANEL		PV-1		MOUNTING:		SURFACE		ENCLOSURE:		NEMA 1	
VOLTAGE:		208-1P-4W		FEEDER:		AL-32		MAINS:		50A MBC	
DEVICE	BRANCH CIRCUIT	LOAD (VA)	VOLT AMPS	NO.	DESIGNATION	LOAD (VA)	VOLT AMPS	NO.	DESIGNATION	NOTES	POLES
10	1	1	1500	1	BS-1-1 GROUP	1700	1500	2	BS-1-2 GROUP	1	15
10	3	1	1500	3	BS-4-1 GROUP			4			
INTEGRATED EQUIPMENT		KVA TOTAL		4.7		TOTAL KVA:		4.7		TOTAL AMPS:	
RATING: 10,000 AIC MINIMUM										22.5	

NOTES:
1. BREAKER IS TO BE HACR TYPE

PANEL SCHEDULE - PV-1
SERVICES BS-1-1, BS-1-2, AND BS-4-1 GROUPS

NO SCALE

PANEL		PV-2		MOUNTING:		SURFACE		ENCLOSURE:		NEMA 1	
VOLTAGE:		208-1P-4W		FEEDER:		CL-29		MAINS:		30A MBC	
DEVICE	BRANCH CIRCUIT	LOAD (VA)	VOLT AMPS	NO.	DESIGNATION	LOAD (VA)	VOLT AMPS	NO.	DESIGNATION	NOTES	POLES
10	1	1	1100	1	BS-2-1 GROUP	1350	1100	2	BS-2-2 GROUP	1	15
INTEGRATED EQUIPMENT		KVA TOTAL		2.45		TOTAL KVA:		2.45		TOTAL AMPS:	
RATING: 10,000 AIC MINIMUM										11.77	

NOTES:
1. BREAKER IS TO BE HACR TYPE

PANEL SCHEDULE - PV-2
SERVICES BS-2-1 AND BS-2-2 GROUPS

NO SCALE

PANEL		PV-3		MOUNTING:		SURFACE		ENCLOSURE:		NEMA 1	
VOLTAGE:		208-1P-4W		FEEDER:		DL-20		MAINS:		30A MBC	
DEVICE	BRANCH CIRCUIT	LOAD (VA)	VOLT AMPS	NO.	DESIGNATION	LOAD (VA)	VOLT AMPS	NO.	DESIGNATION	NOTES	POLES
10	1	1	1100	1	BS-3-1 GROUP	1350	1100	2	BS-3-2 GROUP	1	15
INTEGRATED EQUIPMENT		KVA TOTAL		2.45		TOTAL KVA:		2.45		TOTAL AMPS:	
RATING: 10,000 AIC MINIMUM										11.77	

NOTES:
1. BREAKER IS TO BE HACR TYPE

PANEL SCHEDULE - PV-3
SERVICES BS-3-1 AND BS-3-2 GROUPS

NO SCALE

PANEL		PV-4		MOUNTING:		SURFACE		ENCLOSURE:		NEMA 1	
VOLTAGE:		208-1P-4W		FEEDER:		BL-21		MAINS:		50A MBC	
DEVICE	BRANCH CIRCUIT	LOAD (VA)	VOLT AMPS	NO.	DESIGNATION	LOAD (VA)	VOLT AMPS	NO.	DESIGNATION	NOTES	POLES
10	1	1	1500	1	BS-5-1 GROUP	1700	1500	2	BS-5-2 GROUP	1	15
10	3	1	1500	3	BS-4-2 GROUP			4			
INTEGRATED EQUIPMENT		KVA TOTAL		4.7		TOTAL KVA:		4.7		TOTAL AMPS:	
RATING: 10,000 AIC MINIMUM										22.5	

NOTES:
1. BREAKER IS TO BE HACR TYPE

PANEL SCHEDULE - PV-4
SERVICES BS-5-1, BS-5-2, AND BS-4-2 GROUPS

NO SCALE

PANEL		PO-1		MOUNTING:		SURFACE		ENCLOSURE:		NEMA 4X	
VOLTAGE:		480Y/277V-3P-4W		FEEDER:		MDP-13		MAINS:		250A MBC	
DEVICE	BRANCH CIRCUIT	DESIGNATION	VOLT AMPS	NO.	PHASE LOAD (VOLT-AMPS)			VOLT AMPS	DESIGNATION	NOTES	POLES
					ØA	ØB	ØC				
40	3	1	11085	1	22170	2	11085	1	CU-4A		3
40	3	1	11085	3	22170	4	11085	3	CU-4A		40
40	3	1	11085	5	22170	6	11085	5	CU-4A		40
40	3	1	11085	7	22170	8	11085	7	CU-4B		40
40	3	1	11085	9	22170	10	11085	9	CU-4B		40
40	3	1	11085	11	22170	12	11085	11	CU-4B		40
40	3	1	11085	13	11085	14	11085	13	CU-5A		40
40	3	1	11085	15	11085	16	11085	15	CU-5A		40
40	3	1	11085	17	11085	18	11085	17	CU-5A		40
40	3	1	11085	19	11085	20	11085	19	CU-5B		40
40	3	1	11085	21	11085	22	11085	21	CU-5B		40
40	3	1	11085	23	11085	24	11085	23	CU-5B		40
INTEGRATED EQUIPMENT		KVA TOTAL		66.5		TOTAL KVA:		66.5		TOTAL AMPS:	
RATING: 10,000 AIC MINIMUM										239.9	

NOTES:
1. BREAKER IS TO BE HACR TYPE

PANEL SCHEDULE - PO-1
SERVICES CU-1, CU-4, AND CU-5

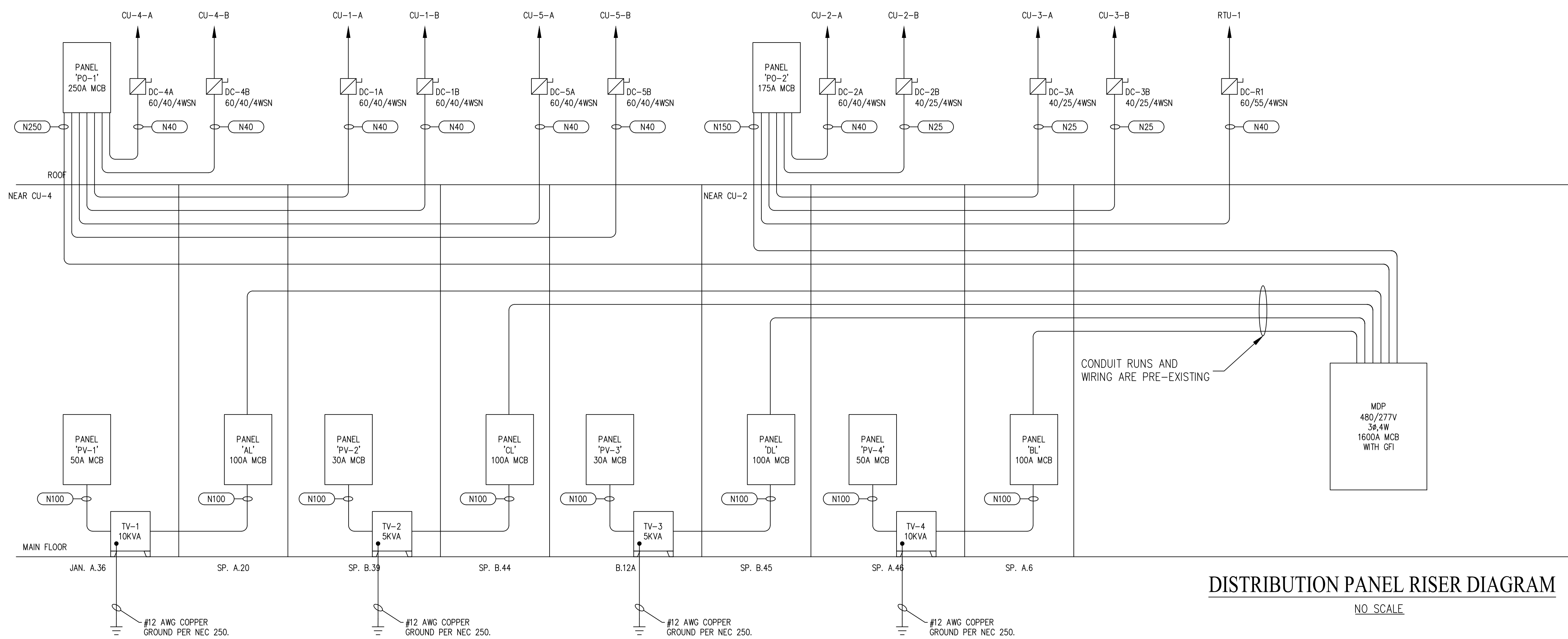
NO SCALE

PANEL		PO-2		MOUNTING:		SURFACE		ENCLOSURE:		NEMA 4X	
VOLTAGE:		480Y/277V-3P-4W		FEEDER:		MDP-6		MAINS:		175A MBC	
DEVICE	BRANCH CIRCUIT	DESIGNATION	VOLT AMPS	NO.	PHASE LOAD (VOLT-AMPS)			VOLT AMPS	DESIGNATION	NOTES	POLES
					ØA	ØB	ØC				
40	3	1	11085	1	18013	2	6928	1	CU-2A		25
40	3	1	11085	3	18013	4	6928	3	CU-2A		25
40	3	1	11085	5	18013	6	6928	5	CU-2A		25
40	3	1	11085	7	13856	8	6928	7	CU-2B		25
25	3	1	6928	9	13856	10	6928	9	CU-2B		25
40	3	1	12470	11	12470	12	6928	11	CU-2B		25
40	3	1	12470	13	12470	14	12470	13	RTU-1		25
40	3	1	12470	15	12470	16	12470	15	RTU-1		25
40	3	1	12470	17	12470	18	12470	17	RTU-1		25
40	3	1	12470	19	12470	20	12470	19	RTU-1		25
40	3	1	12470	21	12470	22	12470	21	RTU-1		25
40	3	1	12470	23	12470	24	12470	23	RTU-1		25
INTEGRATED EQUIPMENT		KVA TOTAL		44.4		TOTAL KVA:		44.4		TOTAL AMPS:	
RATING: 10,000 AIC MINIMUM										133.0	

NOTES:
1. BREAKER IS TO BE HACR TYPE

PANEL SCHEDULE - PO-2
SERVICES CU-2, CU-3, AND REBEL

NO SCALE



DISTRIBUTION PANEL RISER DIAGRAM

NO SCALE

CABLE/CONDUIT SCHEDULE	
TAG	WIRE AND CONDUIT
N250	4 #12, 1 #10G, 3/4" C
N40	4 #10, 1 #8G, 3/4" C
N150	4 #2, 1 #2G, 2" C
N250	4 #3/0, 1 #4G, 2-1/2" C

NO.	DATE	DESCRIPTION	BY
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PROFESSIONAL SEAL: JOSEPH CAPTAN, PE, License No. 000039, State of South Carolina, Electrical Engineering.

COMPANY SEAL: DELTA ENGINEERING, INC., License No. 000039, State of South Carolina, Professional Engineer.

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DRAWN BY: NAME
CHECKED BY: NAME
DATE: MONTH-DAY-YEAR
SCALE: AS NOTED
JOB NO.: DEI JOB NO. 19005

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DESIGN & ENGINEERING ENERGY SYSTEMS INFRASTRUCTURE UTILITIES SYSTEMS ANALYSIS COMMISSIONING REVIEW

ELECTRICAL PANEL SCHEDULE AND RISER DETAILS

PROJECT: 2019 - 2020 HVAC UPGRADES TO FLAT ROCK & RUGBY MIDDLE SCHOOLS
HENDERSON COUNTY PUBLIC SCHOOLS
414 - 4TH STREET, HENDERSONVILLE, HENDERSON COUNTY, NORTH CAROLINA 29621

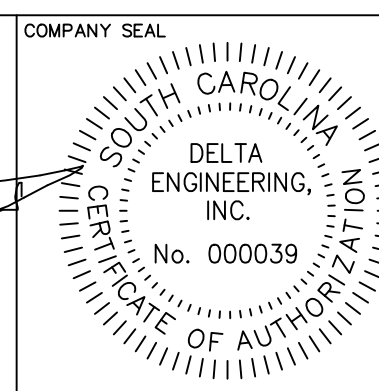
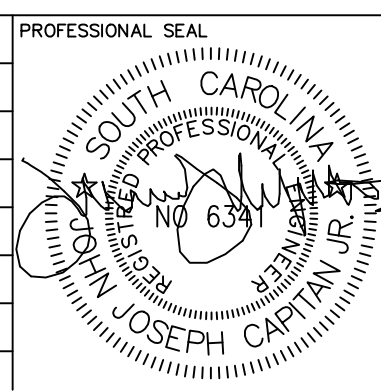
DRAWING: FR-E-6
SHEET: 10 OF 11
REV. NO.: IFOB

LOAD BREAKDOWN										
NAME	LOAD (A)	VOLTAGE (3PH)	VOLTAGE (1PH)	TOTAL LOAD	WATTS	BREAKER (+125%)	TOTAL WATTS	TRANSFORMER (277-208)	BREAKER	WIRING
CU-1-A	31.1	480						N/A	40A	10AWG
CU-1-B	27.9	480							40A	10AWG
BS-1-1	0.8		208		1476.8		3161.6	5KVA	10A	
IDU-1-1	0.6		208							
IDU-1-2	0.6		208							
IDU-1-3	0.3		208	7.1		8.88				
IDU-1-4	0.3		208							
IDU-1-5	1.5		208							
IDU-1-6	1.5		208							
IDU-1-7	1.5		208							
BS-1-2	0.6		208		1684.8				15A	
IDU-1-8	1.5		208							
IDU-1-9	1.5		208	8.1		10.13				
IDU-1-10	1.5		208							
IDU-1-11	1.5		208							
IDU-1-12	1.5		208							
CU-2-A	27.9	480							40A	10AWG
CU-2-B	21.1	480							25A	12AWG
BS-2-1	0.6		208		1040		2371.2	5KVA		
IDU-2-1	0.7		208							
IDU-2-2	0.7		208							
IDU-2-3	0.7		208	5		6.25				
IDU-2-4	0.7		208							
IDU-2-5	0.4		208							
IDU-2-6	0.6		208							
IDU-2-7	0.6		208							
BS-2-2	0.6		208		1331.2					
IDU-2-8	1.5		208							
IDU-2-9	1.5		208							
IDU-2-10	0.4		208	6.4		8.00				
IDU-2-11	0.6		208							
IDU-2-12	0.6		208							
IDU-2-13	0.6		208							
IDU-2-14	0.6		208							
CU-3-A	21.1	480							25A	12AWG
CU-3-B	21.1	480							25A	12AWG
BS-3-1	0.8		208		1102.4		2454.4	5KVA		
IDU-3-1	1.5		208							
IDU-3-2	0.3		208							
IDU-3-3	0.3		208	5.3		6.63				
IDU-3-4	0.3		208							
IDU-3-5	0.3		208							
IDU-3-6	1.5		208							
IDU-3-7	0.3		208							
BS-3-2	0.8		208		1352					
IDU-3-8	0.3		208							
IDU-3-9	0.6		208							
IDU-3-10	0.3		208	6.5		8.13				
IDU-3-11	1.5		208							
IDU-3-12	1.5		208							
IDU-3-13	1.5		208							
CU-4-A	31.1	480							40A	10AWG
CU-4-B	27.9	480							40A	10AWG
BS-4-1	0.6		208		1456		3140.8	5KVA		
IDU-4-1	1.5		208							
IDU-4-2	1.5		208	7		8.75				
IDU-4-3	1.5		208							
IDU-4-4	1.5		208							
IDU-4-5	0.4		208							
BS-4-2	0.6		208		1684.8					
IDU-4-6	1.5		208							
IDU-4-7	1.5		208	8.1		10.125				
IDU-4-8	1.5		208							
IDU-4-9	1.5		208							
IDU-4-10	1.5		208							
CU-5-A	27.9	480							40A	10AWG
CU-5-B	27.9	480							40A	10AWG
BS-5-1	0.6		208		1310.4		2995.2	5KVA		
IDU-5-1	0.6		208							
IDU-5-2	0.6		208	6.3		7.875				
IDU-5-3	1.5		208							
IDU-5-4	1.5		208							
IDU-5-5	1.5		208							
BS-5-2	0.6		208		1684.8					
IDU-5-6	1.5		208							
IDU-5-7	1.5		208	8.1		10.125				
IDU-5-8	1.5		208							
IDU-5-9	1.5		208							
IDU-5-10	1.5		208							
RUT-1	45	480							60A	

TRANSFORMER (277-208) CALCULATIONS					
NAME	GROUP	WATTS	TOTAL WATTS	SIZE (KVA)	FEEDER AMPS (277)
TV-1	BS-1-1	1476.8	4617.6	10	36.10108
	BS-1-2	1684.8			
	BS-4-1	1456			
TV-2	BS-2-1	1040	2371.2	5	18.05054
	BS-2-2	1331.2			
TV-3	BS-3-1	1102.4	2454.4	5	18.05054
	BS-3-2	1352			
TV-4	BS-5-1	1310.4	4680	10	36.10108
	BS-5-2	1684.8			
	BS-4-2	1684.8			

PANEL SCHEDULE CALCULATIONS					
NAME	GROUP	CALC LOAD	LOAD + 125%	BREAKER	FEEDER
PV-1	BS-1-1	7.1	8.88	10	AL-32 (50A REPLACEMENT)
	BS-1-2	8.1	10.13	15	
	BS-4-1	7	8.75	10	
PV-2	BS-2-1	5	6.25	10	CL-29 (30A REPLACEMENT)
	BS-2-2	6.4	8.00	10	
PV-3	BS-3-1	5.3	6.63	10	DL-20 (30A REPLACEMENT)
	BS-3-2	6.5	8.13	10	
PV-4	BS-5-1	6.3	7.875	10	BL-21 (50A NEW)
	BS-5-2	8.1	10.125	15	
	BS-4-2	8.1	10.13	15	
PO-1	CU-1A	PER VENDOR		40	250MCB (FROM MDP-13)
	CU-1B	PER VENDOR		40	
	CU-4A	PER VENDOR		40	
	CU-4B	PER VENDOR		40	
	CU-5A	PER VENDOR		40	
	CU-5B	PER VENDOR		40	
PO-2	CU-2A	PER VENDOR		40	175MCB (FROM MDP-2)
	CU-2B	PER VENDOR		25	
	CU-3A	PER VENDOR		25	
	CU-3B	PER VENDOR		25	
	RTU-1	PER VENDOR		60	

REVISIONS			
NO.	DATE	DESCRIPTION	BY
-	0	TEXT HERE	JJC



DESIGNED BY: NAME
 DRAWN BY: NAME
 CHECKED BY: NAME
 DATE: MONTH-DAY-YEAR
 SCALE: AS NOTED
 JOB NO.: DEI JOB NO. 19005

DESIGN & ENGINEERING
 ENERGY SYSTEMS
 INFRASTRUCTURE UTILITIES
 SYSTEMS ANALYSIS
 COMMISSIONING REVIEW

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ELECTRICAL CALCULATIONS

PROJECT: 2019 - 2020 HVAC UPGRADES TO FLAT ROCK & RUGBY MIDDLE SCHOOLS
 HENDERSON COUNTY PUBLIC SCHOOLS
 414 - 4TH STREET, HENDERSONVILLE, HENDERSON COUNTY, NORTH CAROLINA 29621

DRAWING: **FR-E-7**
 SHEET: 11 OF 11
 REV. NO.: IF0B