ADDENDUM 1

MCSB
J S Clark

EMA
DESIGN SOLVE ENHANCE
EMA Engineering & Consulting, Inc.
Texas Registered Engineering Firm #F-893
Louisiana Registered Engineering Firm #EF-5818

EMA Job #5-001-1972-003

June 20, 2024

GENERAL:

1. Reference MEP drawings included in their entirety that were not previously posted to BidExpress.
2. Where building finishes are currently cut or penetrated to accommodate existing MEP systems that are being removed, and where any portion of the building is cut, penetrated, or damaged by new work, this contractor shall patch and paint to match existing and make like new.
3. All exposed conduit shall be routed tight to building, parallel and perpendicular to building lines, and shall be painted to match building.

MECHANICAL

General

1. The basis of design for the packaged HVAC units shall be Lennox. Acceptable manufacturers shall include CaptiveAire, Trane, and TempMaster.
2. The new packaged units (PAHU #1 and PAHU #2) shall not be integrated into the existing Building Automation System (BAS) under this project scope. Provide conventional thermostats equal to KMC Controls BAC-120063CW-zec FlexStat, with BACnet compatibility, and the ability to connect to the BAS in the future. Provide all control wiring for control of PAHUs; control wiring shall be in conduit.
3. For PAHU #1 and PAHU #2 provide supply curb suitable for slab applications. Transition from unit and curb openings to duct sizes indicated on the drawings.
4. Provide five (5) pipe bollards per PAHU. Coordinate the exact arrangement with the owner prior to installation.

ELECTRICAL

Plans

Sheet MEP1.2

1. Provide a ¾" empty conduit with pull string from the existing electrical room, route underground, and stub up and cap adjacent to new panel "G" located on the southwest exterior wall of the gym building.

END OF ADDENDUM

HVAC REPLACEMENT
AT
J. S. CLARK MAGNET SCHOOL
MONROE, LOUISIANA
FOR
MONROE CITY SCHOOL DISTRICT

EMA
DESIGN SOLVE ENHANCE

9441 STEVENS ROAD - SUITE 200
SHREVEPORT, LOUISIANA 71106
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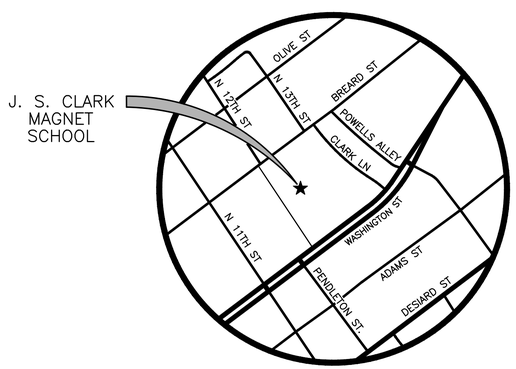
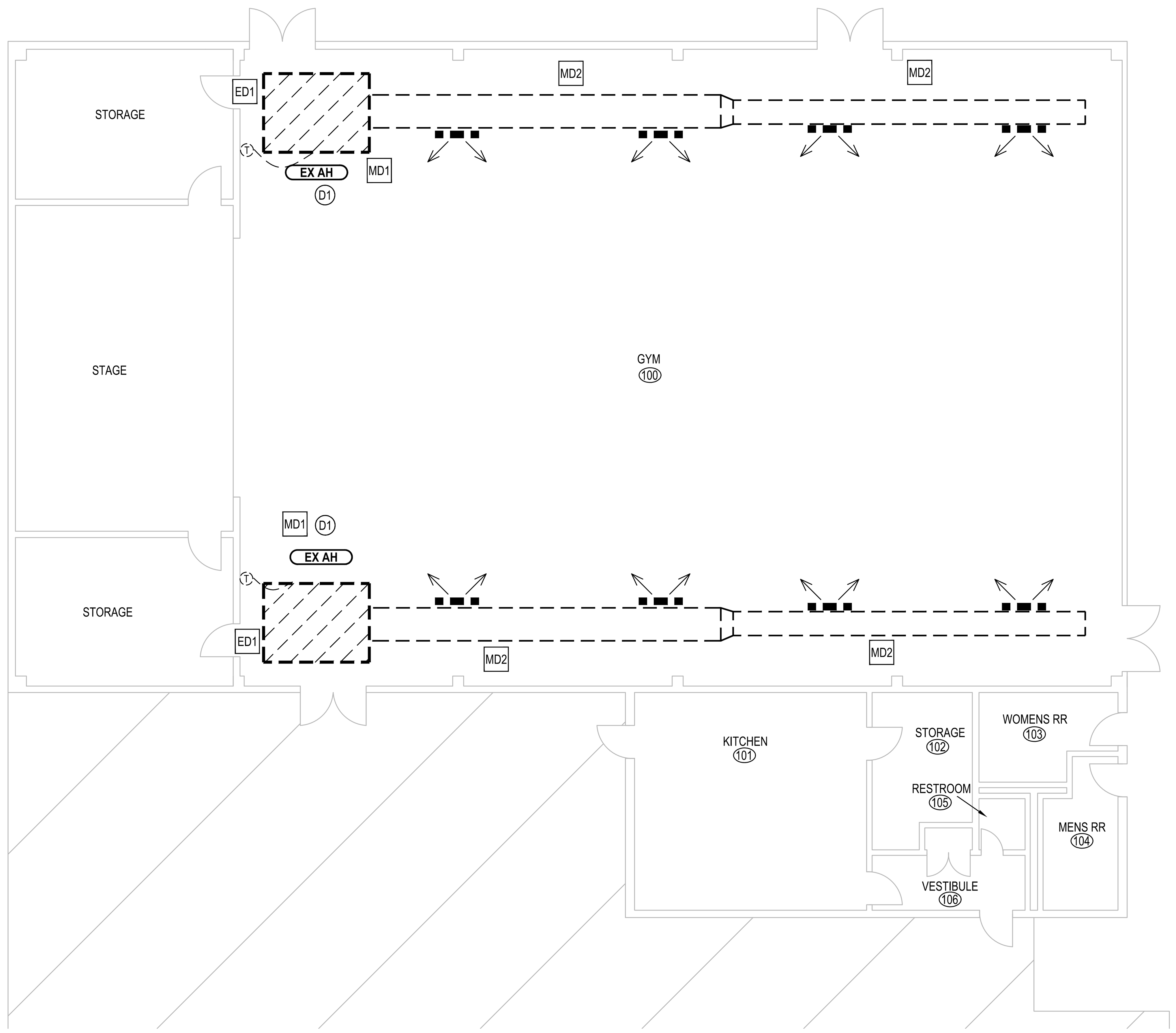
LOUISIANA REGISTERED ENGINEERING FIRM #F-5818
TEXAS REGISTERED ENGINEERING FIRM #F-893
EMA N0. 5-001-1972-003



VICINITY MAP

INDEX OF DRAWINGS	
SHEET	DESCRIPTION
T1	TITLE SHEET
MEP1.1	MEP DEMOLITION GYM FLOOR PLAN
MEP1.2	MEP GYM FLOOR PLAN
MEP2.1	MEP DETAILS, SCHEDULES AND SYMBOLS
MEP2.2	MEP DETAILS
MEP3.1	MEP SPECIFICATIONS

SET NO. _____



1 MEP DEMOLITION GYM FLOOR PLAN
1/8"=1'-0"

PLUMBING DEMOLITION GENERAL NOTES

1. CONTRACTOR TO VISIT SITE AND BE FAMILIAR WITH BUILDING MECHANICAL AND ELECTRICAL LAYOUTS.
2. ALL MATERIAL, EQUIPMENT, DUCTS, PIPE, ETC. TO BE REMOVED SHALL BE DISPOSED OF OFF SITE IN A LEGAL AND LAWFUL MANNER.
3. CAP ANY UNUSED PIPE AT FLOOR, WALL, OR CEILING. REMOVE MATERIAL NOT BEING REUSED.
4. IF ASBESTOS IS FOUND, CONTACT OWNER IMMEDIATELY. DO NOT WORK IN ANY AREA SUSPECTED TO CONTAIN ASBESTOS.
5. ALL EXISTING EQUIPMENT SHOWN IN APPROXIMATE LOCATION. ALL EXISTING CONCEALED PIPING SHOWN IS BASED ON THE MOST RECENT EXISTING M.E.P. AND CIVIL DRAWINGS AVAILABLE. FIELD VERIFY.
6. TAKE CARE NOT TO DESTROY INSULATION VALUE TO ANY WATER PIPING BEING REUSED. REPAIR AS NECESSARY.
7. CONTRACTOR TO VERIFY LOCATION OF ALL UTILITIES AND RELOCATE AS REQUIRED BY NEW CONSTRUCTION.

PLUMBING DEMOLITION PLAN NOTES

(D1) DISCONNECT EXISTING CONDENSATE DRAINAGE PIPING FROM MECHANICAL EQUIPMENT BEING REMOVED. PERENNIALLY CAP PIPING IN CONCEALED LOCATION.

MECHANICAL DEMOLITION GENERAL NOTES

1. CONTRACTOR TO VISIT SITE AND BE FAMILIAR WITH BUILDING MECHANICAL AND ELECTRICAL LAYOUTS.
2. IF ASBESTOS IS FOUND CONTACT OWNER IMMEDIATELY. DO NOT WORK IN ANY AREA SUSPECTED TO CONTAIN ASBESTOS.
3. ALL EXISTING EQUIPMENT SHOWN IN APPROXIMATE LOCATION. FIELD VERIFY.
4. DO NOT RELEASE ANY REFRIGERANT TO ATMOSPHERE. DISPOSE OF IN A LAWFUL MANNER.
5. ALL REUSED EXISTING MECHANICAL EQUIPMENT SHALL BE INSPECTED AND CLEANED FOR PROPER OPERATION.
6. PROVIDE AND INSTALL A FIRE DAMPER WHERE NEW DUCT- WORK CROSSES AN EXISTING FIRE RATED WALL. IF ANY EXISTING DUCTWORK CROSSES A NEW FIRE RATED WALL A FIRE DAMPER IS TO BE PROVIDED AND INSTALLED.
7. ALL MATERIAL, EQUIPMENT, DUCTS, PIPE, ETC. TO BE REMOVED SHALL BE DISPOSED OF OFF SITE IN A LEGAL AND LAWFUL MANNER.
8. ALL EXISTING FIRE DAMPERS OR SMOKE DAMPERS BEING REUSED SHALL REMAIN IN PLACE AND OPERATIONAL.
9. IF EXISTING CEILING ARE TO REMAIN, REMOVE ONLY CEILING TILE NECESSARY TO ACCOMPLISH DEMOLITION AND NEW WORK. REMOVE AND REINSTALL ELECTRICAL, LIGHTING FIXTURES, FIRE ALARM DEVICES, SPEAKERS, ETC. REPLACE ALL BROKEN TILES WITH NEW TILES TO MATCH EXISTING WHERE REQUIRED. REUSE EXISTING TILES.
10. CAP ANY UNUSED PIPE AT FLOOR, WALL, CEILING. REMOVE MATERIAL NOT BEING REUSED.
11. WHERE REMOVING HVAC AND PIPING, PATCH ALL WALLS WITH 5/8 SHEET ROCK ON EACH SIDE OF WALL, PAINT TO MATCH.

MECHANICAL DEMOLITION PLAN NOTES

MD1 REMOVE AND DISCARD EXISTING AIR HANDLER AND THERMOSTAT. ALL EXISTING HYDRONIC PIPING TO REMAIN TO TIE INTO NEW UNIT.

MD2 REMOVE AND DISCARD EXISTING DUCTWORK AND GRILLES.

ELECTRICAL DEMOLITION GENERAL NOTES

1. UNLESS NOTED ON DRAWINGS, ALL LIGHTING, SWITCHES, OUTLETS AND OTHER ELECTRICAL DEVICES ARE TO REMAIN.
2. ALL MATERIAL REMOVED AND NOT RETAINED BY THE OWNER SHALL BE DISPOSED OF OFF SITE IN A LAWFUL MANNER.

ELECTRICAL DEMOLITION PLAN NOTES

ED1 EXISTING HVAC EQUIPMENT TO BE REMOVED. REMOVE CONDUIT AND CONDUCTORS BACK TO SOURCE. TAG BREAKER AS SPARE IF IT SERVES NO OTHER LOADS.

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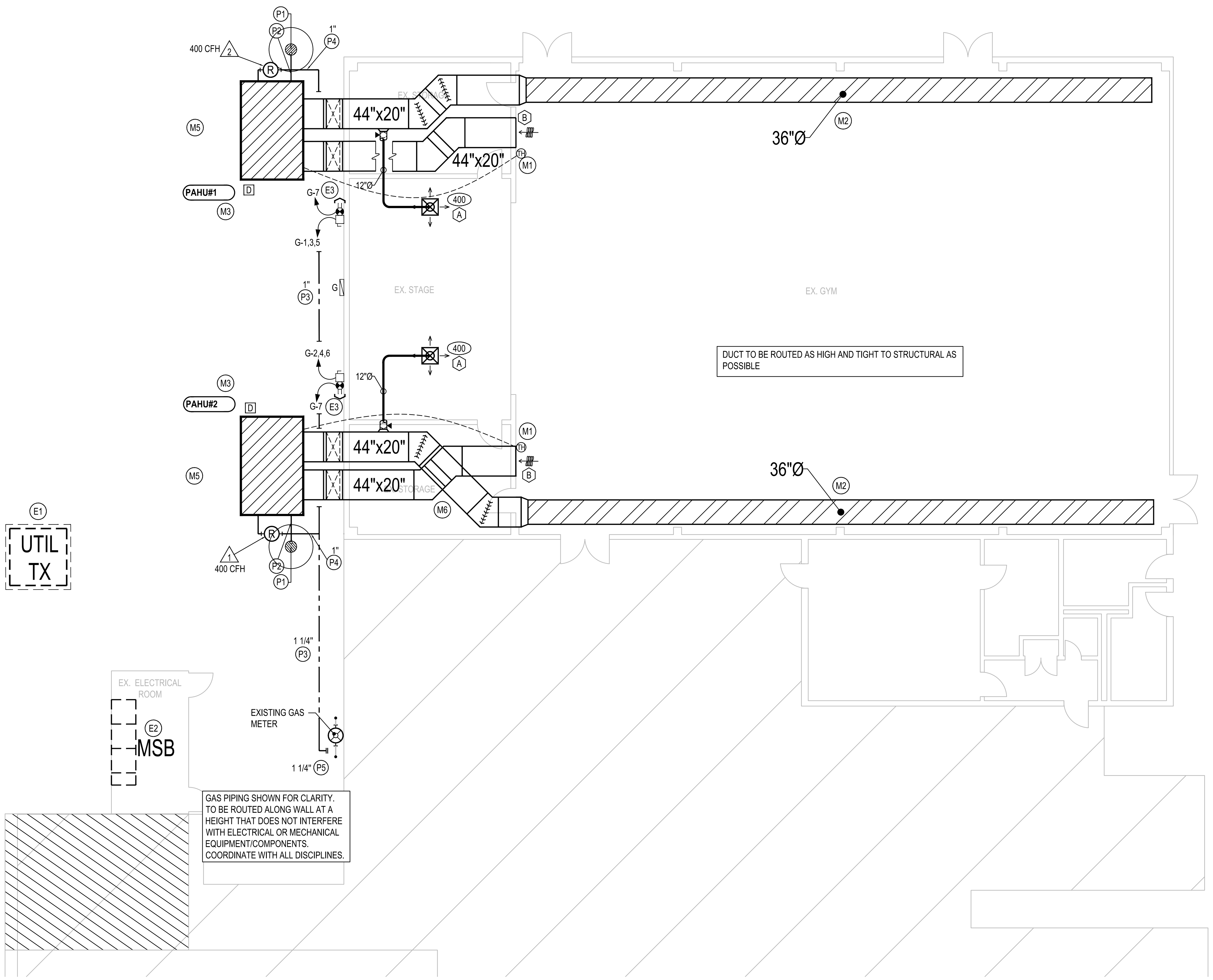
SUBMISSION OF BID WILL BE CONSIDERED ACKNOWLEDGMENT THAT THE CONTRACTOR HAS VISITED THE SITE AND HAS VERIFIED ALL EXISTING JOB CONDITIONS AND INCLUDED ANY NECESSARY MODIFICATION TO EXISTING AND NEW WORK REQUIRED FOR INSTALLATION OF A COMPLETE AND WORKING SYSTEM.

HVAC REPLACEMENT FOR J. S. CLARK MAGNET SCHOOL
MONROE, LOUISIANA

NO.	DATE	REVISIONS

JOB NO: 5-001-1972-003
DRAWN BY: VL
DESIGNED BY: QS
DATE: 05-10-2024
SCALE: AS SHOWN

SHEET
MEP1.1
OF



1 MEP GYM FLOOR PLAN
1/8"=1'-0"

PLUMBING GENERAL NOTES

1. PLUMBING CONTRACTOR TO COORDINATE ALL PIPING ROUTING ABOVE WITH MECHANICAL AND ELECTRICAL CONTRACTORS BEFORE INSTALLING.
2. ALL PIPING PENETRATIONS SHALL BE SLEEVED. COMPLETELY GROUT AROUND OUTSIDE OF SLEEVE AND FILL SLEEVE VOID AROUND PIPE WITH FIBERFRAX FYRE-PUTTY.
3. AT ALL DISSIMILAR METAL CONNECTIONS, PROVIDE AND INSTALL DIELECTRIC UNIONS IMMEDIATELY TO MINIMIZE USE OF GALVANIZED PIPE MATERIAL.
4. MECHANICAL CONTRACTOR TO PROVIDE TO THE PLUMBING CONTRACTOR THE RECOMMENDED AC MANUFACTURERS' DATA FOR CONDENSATE TRAPS PER EACH TYPE OF UNIT.
5. ALL CONCEALED EXISTING PIPING SHOWN IS BASED ON EXISTING M.E.P. DRAWINGS. FIELD VERIFY AS NECESSARY.

PLUMBING PLAN NOTES

P1 1 1/2" CONDENSATE DRAIN DOWN TO CONDENSATE PIT.

P2 1 1/2" CONDENSATE TIE-IN TO UNIT / AIR HANDLER WITH P-TRAP.

P3 MEDIUM PRESSURE GAS PIPING ALONG GROUND TO REGULATOR AND UNIT CONNECTION USING PIPE SUPPORTS.

P4 MEDIUM PRESSURE GAS PIPING LATERAL ALONG WALL. SECURE TO WALL USING UNISTRUT WITH GALVANIZED HARDWARE.

P5 TIE-IN TO EXISTING MEDIUM PRESSURE GAS PIPING ABOVE SLAB AT EXISTING GAS METER IN APPROXIMATE LOCATION. FIELD VERIFY EXACT TIE-IN LOCATION.

GAS REGULATOR SCHEDULE

#	MANUFACTURER	C.F.H.	IN	OUT
1	ITRON SERIES B	200	1"	1 1/4"
2	ITRON SERIES B	200	1"	1 1/4"
TOTAL CONNECTED GAS LOAD		400 C.F.H.		

PLUMBING CONTRACTOR TO COORDINATE WITH GAS REGULATOR MANUFACTURER ALL ORIFICE AND SPRING SIZES, AS REQUIRED, TO ACCOMMODATE GAS LOAD.

GAS LOAD BREAKDOWN

HVAC UNITS ADDED TO THE SYSTEM 400 C.F.H.

PLUMBING CONTRACTOR SHALL FURNISH AND INSTALL GAS COCK VALVES PRIOR TO CONNECTION TO EACH UNIT.

EACH BRANCH LINE SHOULD HAVE A CUT-OFF TO ALLOW REPAIRS TO THAT SECTION OF PIPE WITHOUT SHUTTING DOWN THE WHOLE SYSTEM.

MECHANICAL GENERAL NOTES

1. MECHANICAL CONTRACTOR TO PROVIDE TO THE PLUMBING CONTRACTOR THE RECOMMENDED AC MANUFACTURER'S DATA FOR CONDENSATE TRAPS PER EACH TYPE OF UNIT.
2. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVAL OR ADJUSTMENT OF ALL HOLD DOWN BOLTS ON COMPRESSORS AT HVAC EQUIPMENT TO ALLOW FOR PROPER VIBRATION ISOLATION.
3. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVAL OF ALL ABANDONED SCREWS, PIPING, TAPE, PAPERS, PACKING PRODUCTS, ETC.
4. ALL EQUIPMENT SHALL BE PROPERLY LABELED PER SPECIFICATIONS.
5. CLOSE ALL OUTSIDE AIR DAMPERS UPON INSTALLATION AND KEEP ALL OUTSIDE AIR DAMPERS CLOSED UNTIL THE "TEST AND BALANCE" IS PERFORMED.
6. DUCT MOUNTED SMOKE DETECTORS SHALL BE FURNISHED BY THE FIRE ALARM CONTRACTOR, INSTALLED BY THE MECHANICAL CONTRACTOR, AND FINAL TIE-IN BY THE FIRE ALARM CONTRACTOR.
7. SEAL WITH FIRE RETARDING SEALANT AROUND PIPE THROUGH ANY PENETRATION OF FIRE WALLS. REFER TO ARCHITECTURAL SHEETS FOR FIRE WALLS.
8. THE SPACE AROUND DUCTS AND PENETRATING ITEMS OF SMOKE PARTITION WALLS SHALL BE FILLED WITH AN IBC APPROVED MATERIAL LIMITING THE FREE PASSAGE OF SMOKE.
9. ALL AIR HANDLERS: NO PIPING, CONDUITS, DUCTS, WIRING, DISCONNECTS, ETC. WILL BE ALLOWED TO BE INSTALLED CLOSER THAN 3'-0" (THREE FEET) IN FRONT OF THE SERVICE ACCESS PANEL.
10. PROVIDE AND INSTALL 18 GAUGE 2" DEEP GALVANIZED DRAIN PAN UNDER EACH AIR HANDLER (PER DETAIL).
11. ALL VARIABLE FREQUENCY DRIVES (VFD'S) ARE TO BE PROVIDED BY THE MECHANICAL CONTRACTOR, INSTALLED AND POWERED BY THE ELECTRICAL CONTRACTOR, AND CONTROLLED BY THE CONTROL CONTRACTOR.

MECHANICAL PLAN NOTES

M1 PROVIDE A PROTECTIVE COVER GUARD, VANDAL-RESISTANT (CORRIDORS, CAFETERIA, HALLS, & COMMONS AREAS).

M2 FABRIC DUCT TO BE SKELECORE OR EQUAL. HOLES TO BE LOCATED ON INTERIOR SIDE OF FABRIC DUCT.

M3 UNIT TO BE GROUND MOUNTED WITH HORIZONTAL DISCHARGE, INSTALLED PER MANUFACTURER'S RECOMMENDATIONS ON 6" CONCRETE PAD. BOLLARD LAYOUT TO BE COORDINATED WITH UNIT CLEARANCES PER MANUFACTURER'S REQUIREMENTS.

M5 MECHANICAL CONTRACTOR SHALL FURNISH AND INSTALL PIPE BOLLARDS AROUND PAHU AS INDICATED ON THE DRAWING.PROVIDE SUFFICIENT SPACE BETWEEN BOLLARDS AND PAHU TO ENSURE THE MANUFACTURER'S RECOMMENDED CLEARANCES ARE MAINTAINED.COORDINATE WITH THE EXACT EQUIPMENT PROVIDED AND EXISTING CONDITIONS PRIOR TO INSTALLATION OF BOLLARDS.

M6 ROUTE SUPPLY DUCTWORK OVER RETURN DUCTWORK.

ELECTRICAL GENERAL NOTES

1. BRANCH CIRCUIT - PROVIDE A SEPARATE NEUTRAL CONDUCTOR FOR EACH CIRCUIT. MULTIPLE CIRCUITS SHALL NOT SHARE A COMMON NEUTRAL. NEUTRAL CONDUCTORS SHALL BE SIZED AS LARGE AS THE PHASE CONDUCTORS. NEUTRAL CONDUCTORS SHALL NOT BE OF A REDUCED SIZE.
2. CONDUIT - WHERE POSSIBLE, ALL CONDUIT AND/OR CABLING SHALL BE INSTALLED BETWEEN THE BOTTOM AND TOP CHORD OF JOIST. WHERE NO CEILINGS ARE SCHEDULED, ALL CONDUIT SHALL BE UP AGAINST BOTTOM OF THE TOP CHORD. DO NOT SUPPORT OR REST CONDUITS ON BOTTOM CHORD OF THE JOISTS.
3. CONDUIT - ROUTE CONDUIT IN EXPOSED AREAS PERPENDICULAR OR PARALLEL TO WALLS. ROUTE CONDUIT AS HIGH AS POSSIBLE AND ROUTE CONDUIT RUNS ADJACENT TO EACH OTHER. CONDUITS SHALL BE ORDERLY AND NEAT.
4. DO NOT INSTALL CONDUIT/CABLING WITHIN 3'-0" OF ANY HVAC UNIT UNLESS THE CONDUIT AND/OR CABLING SERVES THAT UNIT.
5. CONDUIT - COORDINATE CONDUIT ROOF PENETRATIONS WITH MECHANICAL ROOF TOP UNITS AND/OR THRU HOODED PLUMBING PENETRATIONS TO CONDENSING UNITS.
6. MECHANICAL - ALL VARIABLE FREQUENCY DRIVES (VFD's) ARE TO BE PROVIDED BY THE MECHANICAL CONTRACTOR, INSTALLED AND POWERED BY THE ELECTRICAL CONTRACTOR, AND CONTROLLED BY THE CONTROLS CONTRACTOR. THIS CONTRACTOR TO PROVIDE ALL NECESSARY POWER WIRING FROM PANEL TO VFDs AND FROM VFDs TO EACH MOTOR.
7. MECHANICAL - FOR ALL UNITS WITH PLASMA AIR IONIZATION DEVICE. PROVIDE CONTROL WIRING AS REQUIRED BY MANUFACTURER FROM LOW VOLTAGE FAN CONTROL TERMINALS TO POWER INPUT TERMINALS ON IONIZATION DEVICE. PROVIDE STEP-DOWN TRANSFORMERS AS REQUIRED TO PROVIDE LOW VOLTAGE POWER FROM UTILIZING THE CIRCUIT POWERING THE UNIT. COORDINATE EXACT ELECTRICAL REQUIREMENTS WITH MECHANICAL INSTALLER. LOCATE EACH TRANSFORMER IN A NEMA 3R ENCLOSURE MOUNTED AT THE UNIT.
8. CONTRACTOR SHALL PROVIDE ALL WORK AND MATERIALS NECESSARY FOR A COMPLETE AND OPERATIONAL INSTALLATION OF ALL ELECTRICAL DEVICES, EQUIPMENT, AND SYSTEMS.
9. CONTRACTOR SHALL COORDINATE EXACT POWER REQUIREMENTS WITH EQUIPMENT PROVIDED AND ADJUST CIRCUITS AS REQUIRED PER MANUFACTURER RECOMMENDATIONS IN ACCORDANCE WITH THE NEC.
10. CONTRACTORS AND SUBCONTRACTORS SHALL VERIFY LOCATION, CONDUCT TEST AND INSPECTIONS, COORDINATE WITH UTILITIES, OWNER'S REPRESENTATIVES, AND CHECK FOR ALL UNDERGROUND UTILITIES AND LINES BEFORE DITCHING TAKES PLACE. CONTRACTOR AND SUBCONTRACTORS PERFORMING THESE DUTIES SHALL BE RESPONSIBLE FOR ANY REPAIRS OF CUT OR DAMAGED LINES AND UTILITIES.

ELECTRICAL PLAN NOTES

E1 EXISTING UTILITY TRANSFORMER AT THIS APPROXIMATE LOCATION SHALL REMAIN IN PLACE AND OPERATIONAL.

E2 APPROXIMATE LOCATION OF EXISTING 208Y/120 V, 3PH, 4W, 2500A MAIN SWITCHBOARD 'MSB'. PROVIDE NEW 3-POLE 250A BREAKER TO SERVE PANEL 'G'.

E3 WEATHERPROOF MAINTENANCE RECEPTACLE MOUNTED BELOW DISCONNECT.

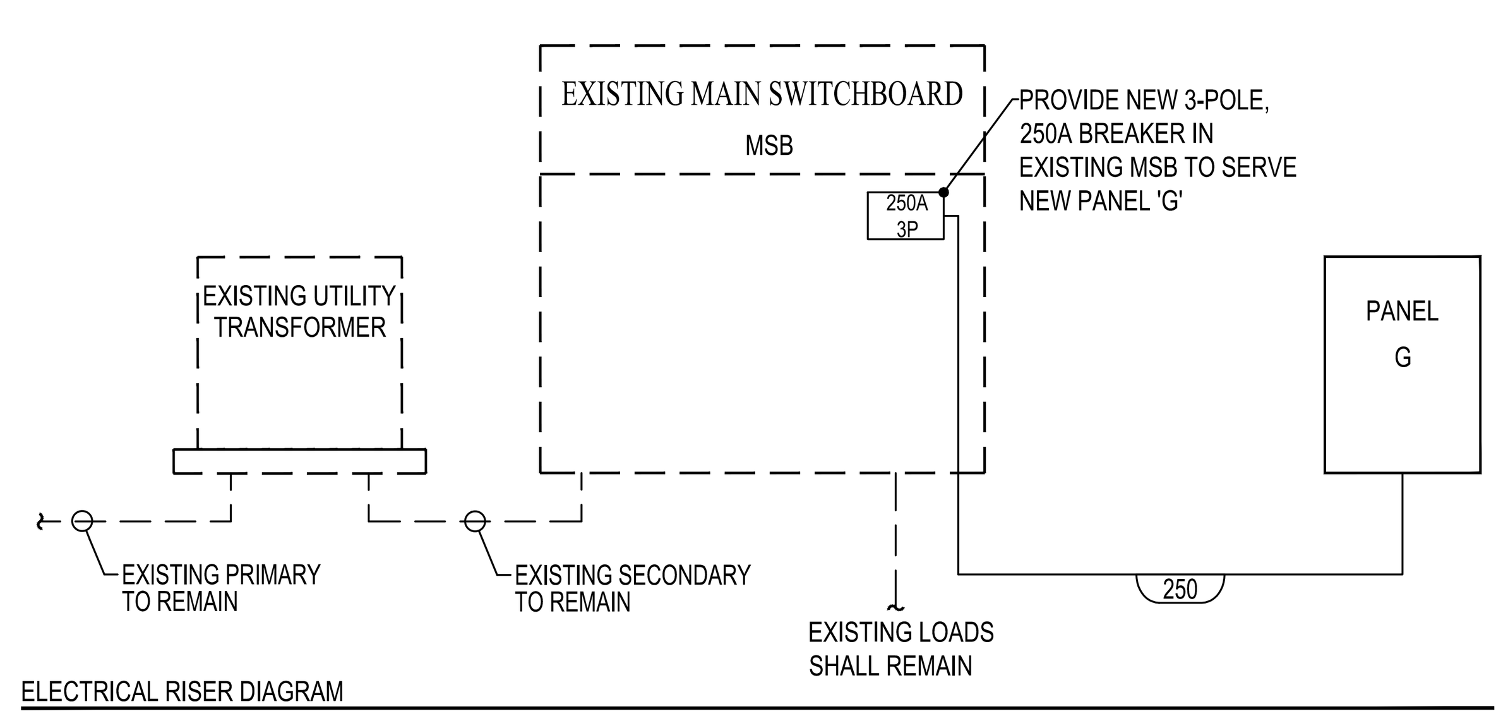
Panel - G

Fed from - MSB (208V 3PH)

Bus - 250A / MLO
Service - 120/208 3PH 4Wire

Located - OUTSIDE
Surface Mount - Outside (NEMA 3R)
Branch AIC - 22kA (20.53kA - Available)
Div. Load - 147A (A), 144A (B), 144A (C)

* See Riser Diagram for more information DEVICES & EQUIPMENT SERVED	Phase	Trip	Wire	Ckt #	ø LOAD in KiloWatts	Ckt #	Wire	Trip	Phase	* See Riser Diagram for wire size DEVICES & EQUIPMENT SERVED
RTU# 1 - GYM EXTERIOR	3	90	2	1	8.6 (a) 8.6	2	2	90	3	RTU# 2 - GYM EXTERIOR
THRU 100A DISCONNECT W/ 90A FUSES				3	8.6 (b) 8.6	4				THRU 100A DISCONNECT W/ 90A FUSES
				5	8.6 (c) 8.6	6				
MAINTENANCE RECEPTACLE - GYM EXTERIOR	1	20	12	7	0.4 (a) 0	8	-	20	1	SPARE
SPARE	1	20	-	9	0 (b) 0	10	-	20	1	SPARE
SPACE	1	-	-	11	0 (c) 0	12	-	-	1	SPACE
SPACE	3	-	-	13	0 (a) 0	14	-	-	3	SPACE
				15	0 (b) 0	16				
				17	0 (c) 0	18				



ELECTRICAL RISER DIAGRAM

NO SCALE

GENERAL RISER NOTES:

1. PROVIDE AND INSTALL BURNDY OR NSI (OR APPROVED EQUIVALENT) UL RATED COMPRESSION REDUCING PIN TERMINALS ON COPPER CONDUCTORS AS REQUIRED. SEE IMAGE TO THE RIGHT

ELECTRICAL RISER NOTES:

WHERE THE BELOW RISER NOTES ARE USED FOR SERVICE ENTRANCE CONDUCTORS, DISREGARD THE EQUIPMENT GROUNDING CONDUCTOR SHOWN. HOWEVER, ALL FEEDERS AFTER THE MAIN SERVICE DISCONNECT(S) DO REQUIRE A GROUNDING CONDUCTOR.

(250) 4-#250, 1-#4 GRN, 2 1/2"C.

AT ALL TERMINATIONS USE ANTIOXIDANT PER MANUFACTURE'S RECOMMENDATION.

SAMPLE REDUCING PIN TERMINAL

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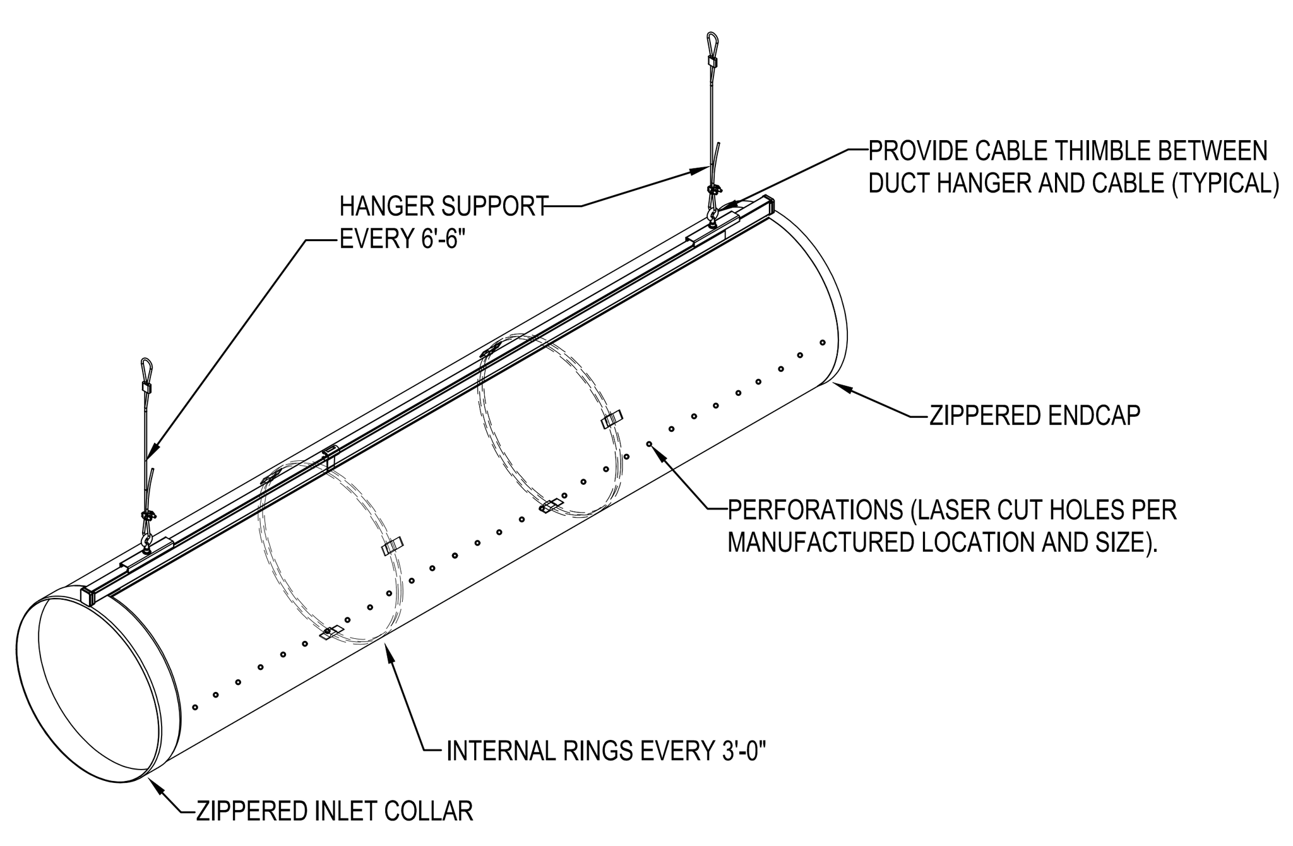
HVAC REPLACEMENT
FOR
J. S. CLARK MAGNET SCHOOL
MONROE, LOUISIANA

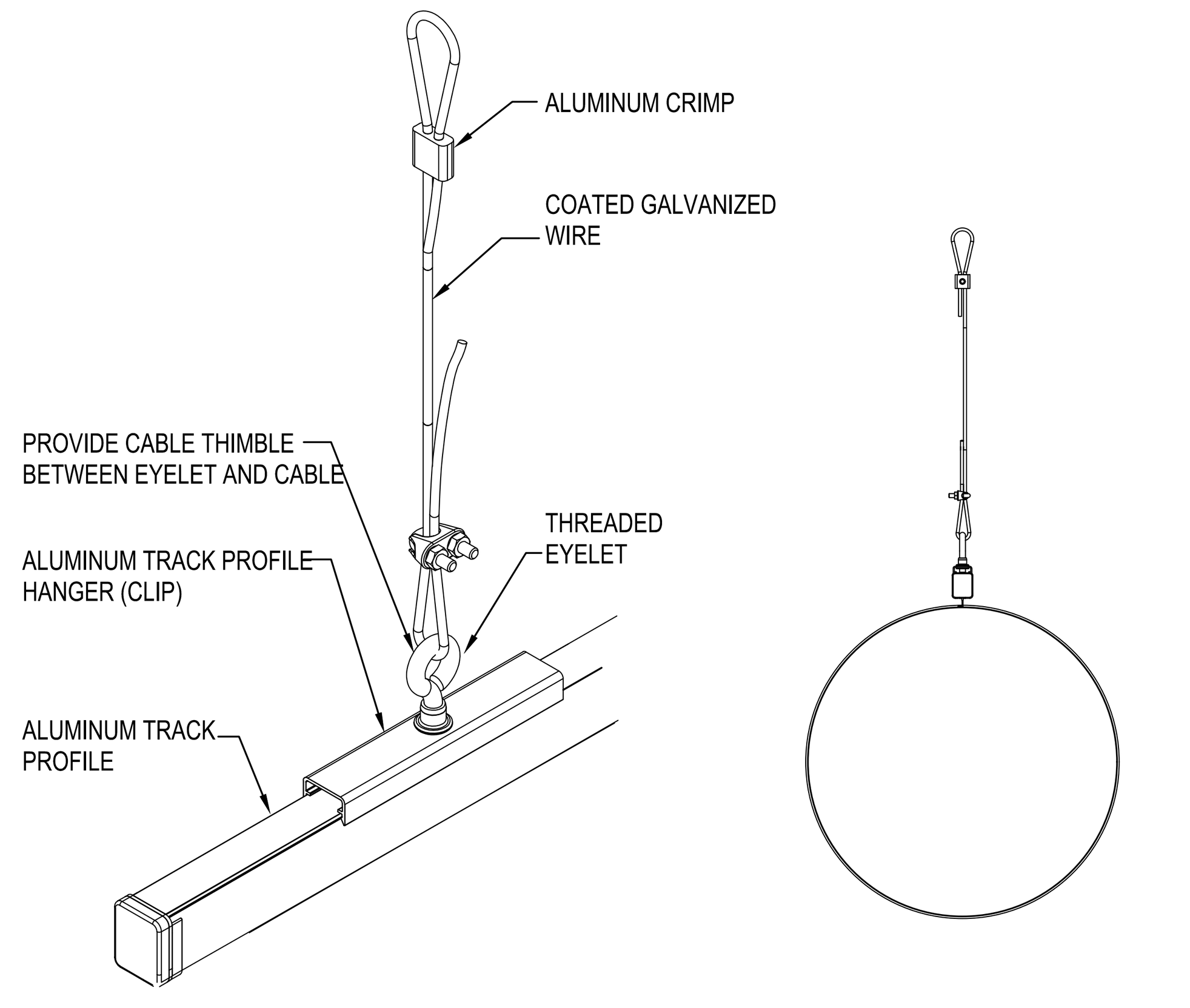
NO.	DATE	REVISIONS

JOB NO: 5-001-1972-003
DRAWN BY: VL
DESIGNED BY: QS
DATE: 05-10-2024
SCALE: AS SHOWN

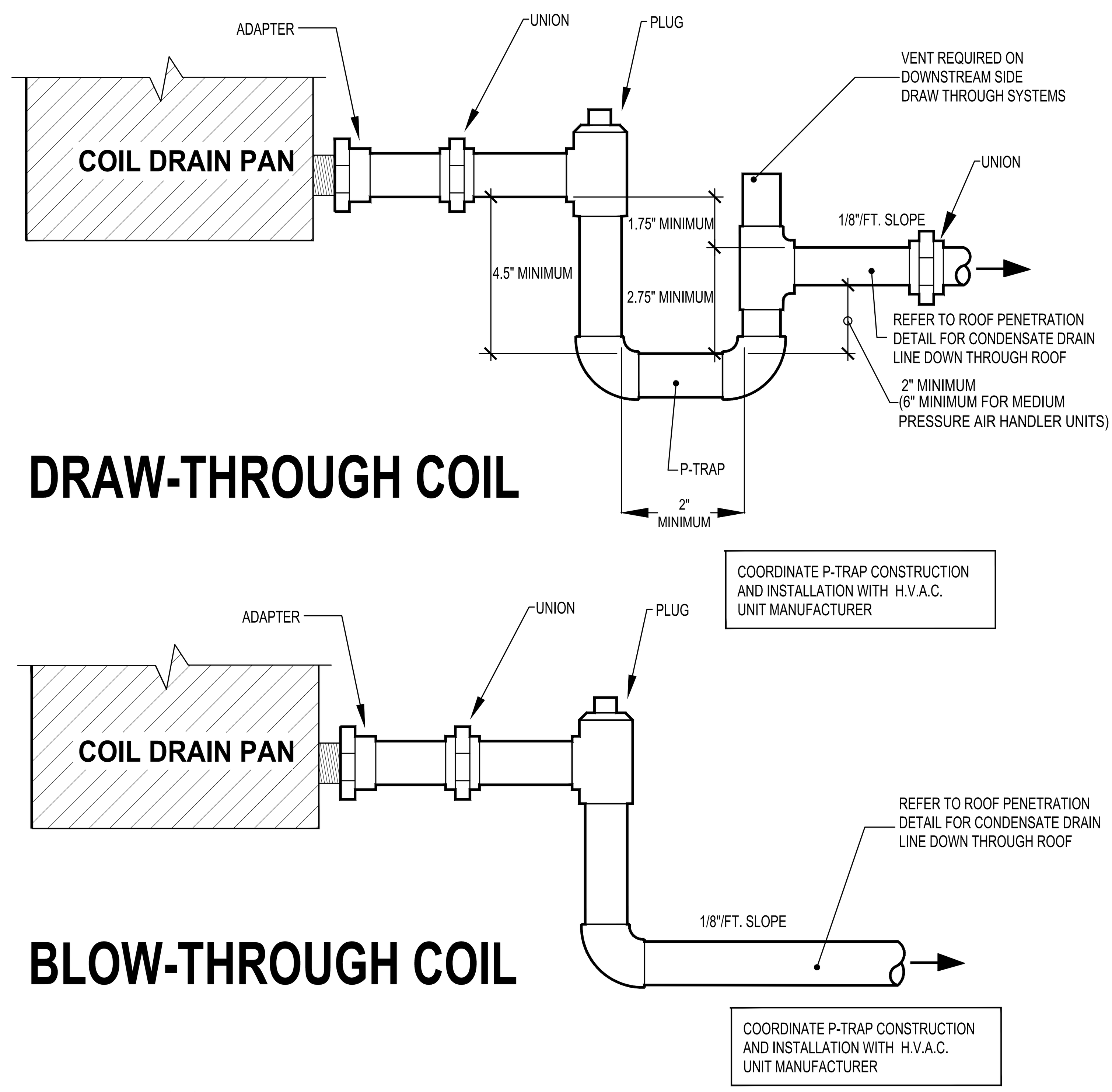
SHEET
MEP1.2
OF



1 SINGLE TRACK - PERFORATED FABRIC DUCT
N.T.S.



4 FABRIC DUCT HANGER - SINGLE TRACK PROFILE
N.T.S.



NOTES:

1 PROVIDE CLEANOUT AT FIRST CONNECTION, AT INCREASE IN PIPE SIZE, EVERY 100'-0", AND EVERY CHANGE IN DIRECTION, WHETHER SHOWN ON PLAN OR NOT.

7 CONDENSATE DRAIN DETAIL
N.T.S.

EXISTING MECHANICAL SYMBOLS

EXISTING THERMOSTAT	
CFM (CUBIC FT. PER MIN.)	
EXISTING RETURN AIR GRILLE	
EXISTING SUPPLY GRILLE	
EXISTING DUCT	
EXISTING UNIT	
EXISTING EXHAUST/SUPPLY FAN/ ROOF RELIEF	
EXISTING GAS REGULATOR	R
EXISTING GAS METER	
EXISTING GAS LINE	
CAP	

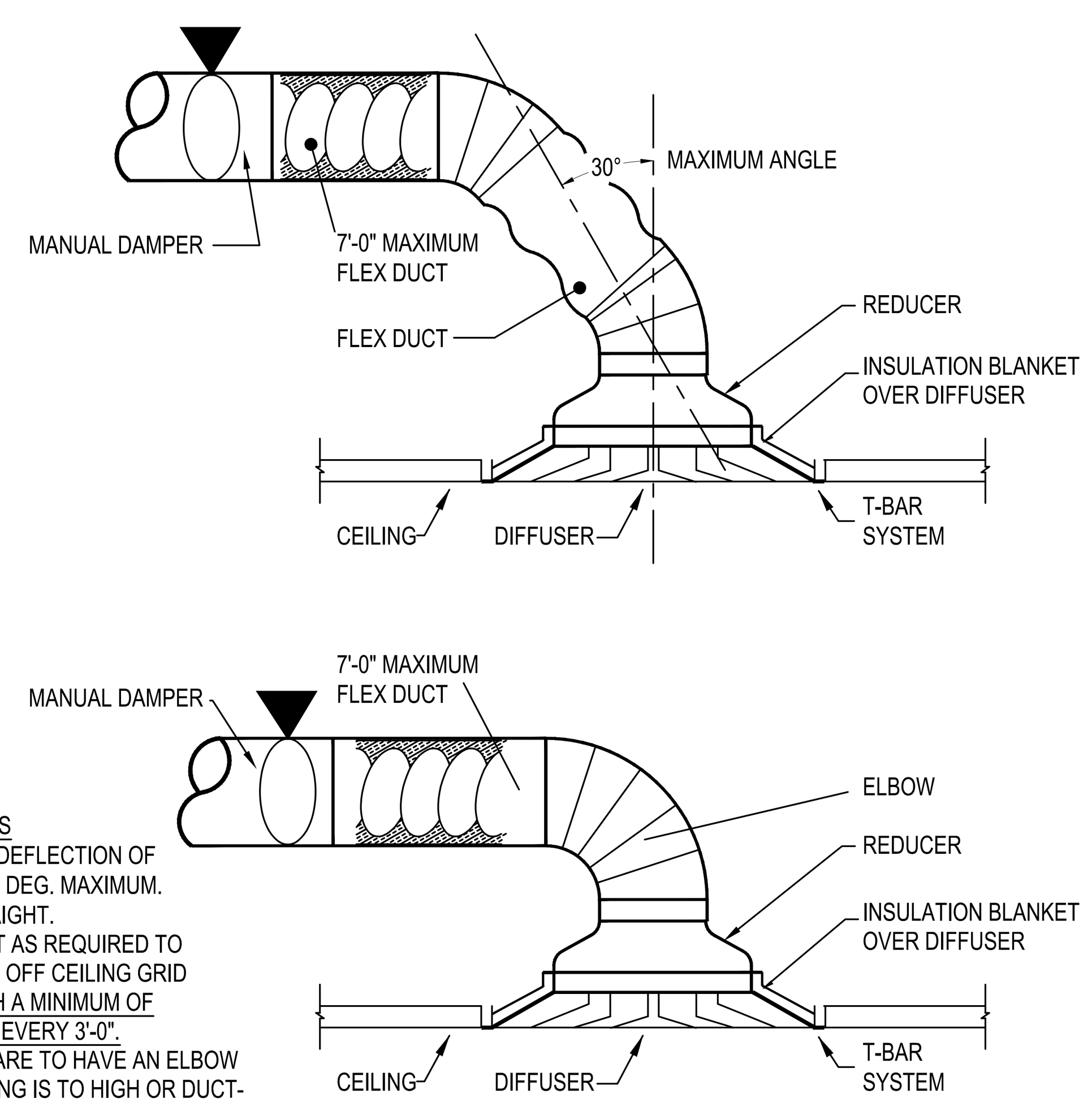
NOTE: SOME SYMBOLS MAY NOT BE USED.

MECHANICAL SYMBOLS

THERMOSTAT/SENSOR (PER SPEC.)	T	
CO2 SENSOR	C2	
HUMIDISTAT	H	
THERMOSTAT / HUMIDISTAT	TH	
CONTROL RELAY	CR	
DUCT DETECTOR WITH CONTROL RELAY	D	
CFM (CUBIC FT. PER MIN.)		###
GRILLE TYPE		XX
DUCT DIAMETER	Ø	
RETURN AIR GRILLE WITH ARROW		
SUPPLY GRILLE WITH AIR FLOW		
MANUAL VOLUME DAMPER		
DOWN WITH MANUAL VOLUME DAMPER	DN W/MD	
MOTORIZED DAMPER		
FIRE DAMPER (FD) SMOKE FIRE DAMPER (SFD) ROUND		
BALANCING DAMPER * (BAL)		
BACK DRAFT DAMPER (BDD)		
EXHAUST FAN		
ROOF RELIEF		
SUPPLY FAN		
EXISTING DUCT / PIPE CAP		
REFRIGERANT LINE		
SERVICE ACCESS AREA		
UNIT		
SPIRAL DUCT		
FLEX DUCT		
MEDIUM PRESSURE DUCT		
FLAT OVAL DUCT		

NOTE: SOME SYMBOLS MAY NOT BE USED.

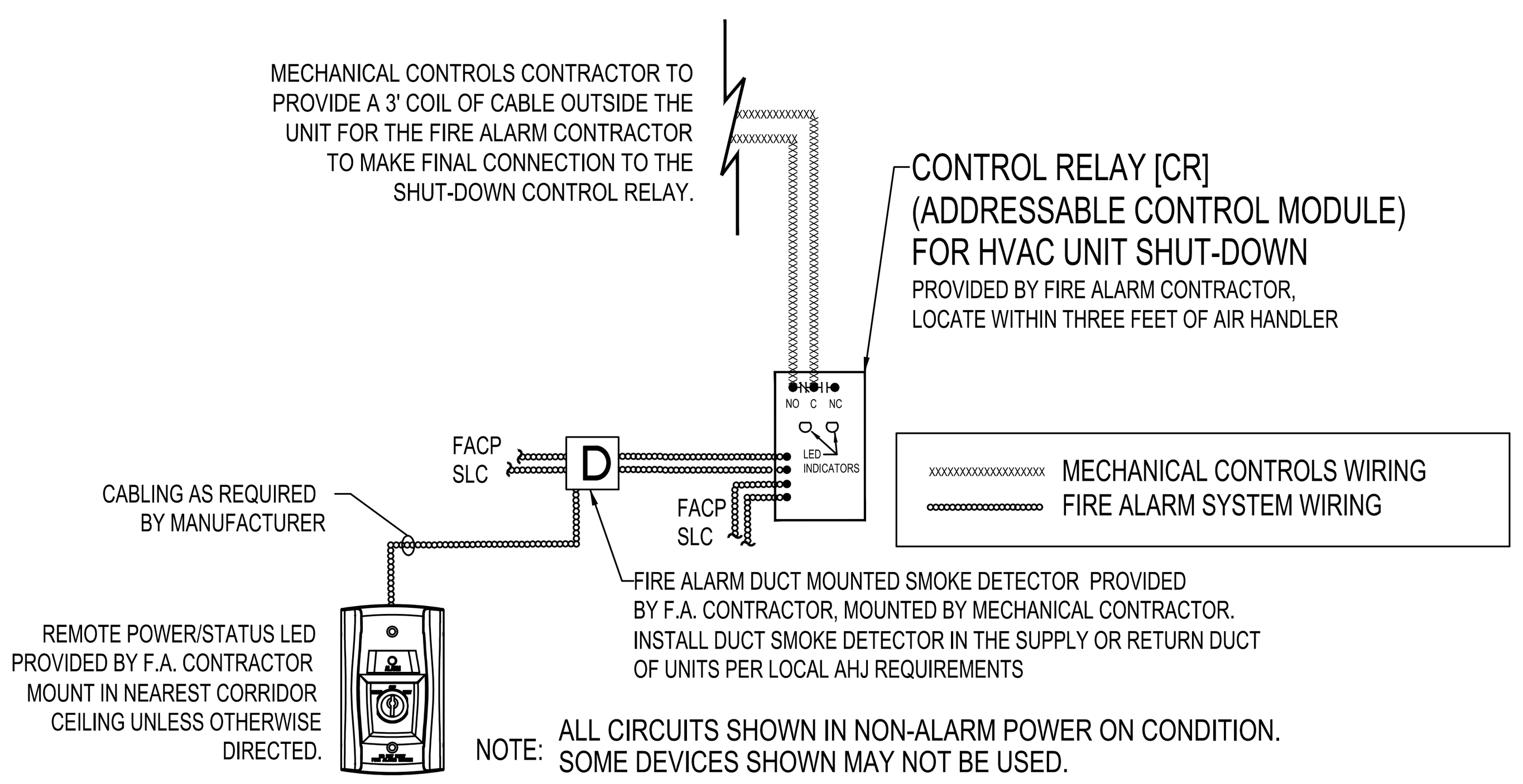
* OPPOSED BLADE DAMPER TO BE:
NAILER SERIES 1021 OR EQUAL FOR AIR BALANCING



FLEX DUCT NOTES

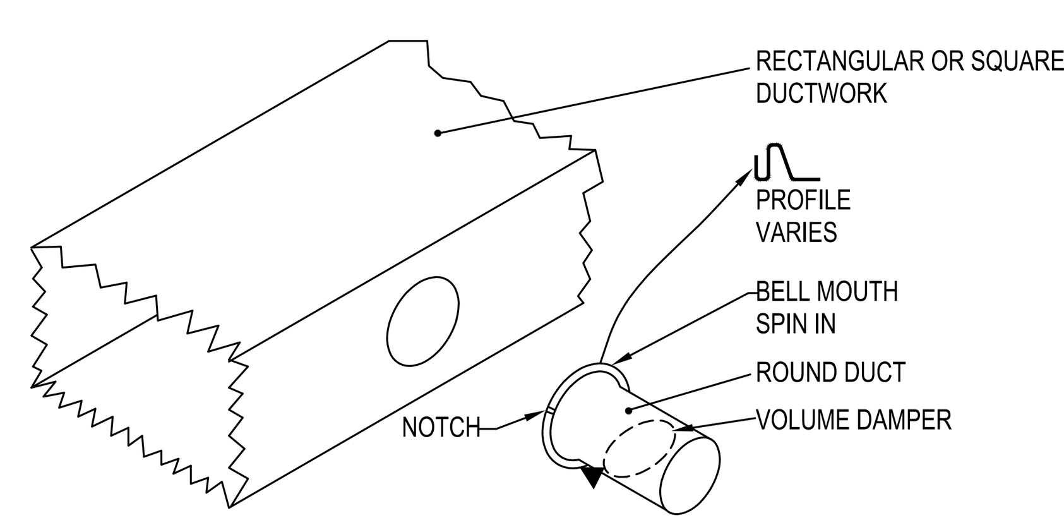
1. HORIZONTAL DEFLECTION OF FLEX DUCT 30 DEG. MAXIMUM.
2. INSTALL STRAIGHT.
3. ADD SUPPORT AS REQUIRED TO KEEP WEIGHT OFF CEILING GRID SYSTEM, WITH A MINIMUM OF ONE HANGER EVERY 3'-0".
4. ALL GRILLES ARE TO HAVE AN ELBOW UNLESS CEILING IS TO HIGH OR DUCT-WORK DROPS DIRECTLY FROM A UNIT.

2 SUPPLY DIFFUSER
N.T.S.

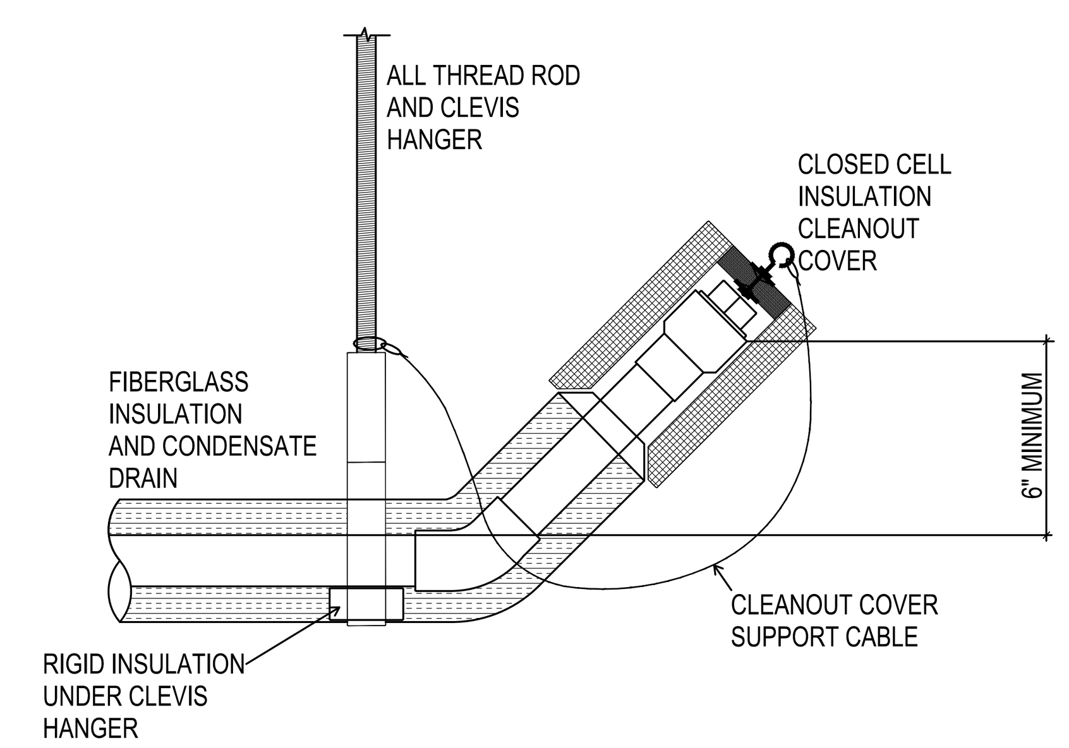


NOTE: ALL CIRCUITS SHOWN IN NON-ALARM POWER ON CONDITION. SOME DEVICES SHOWN MAY NOT BE USED.

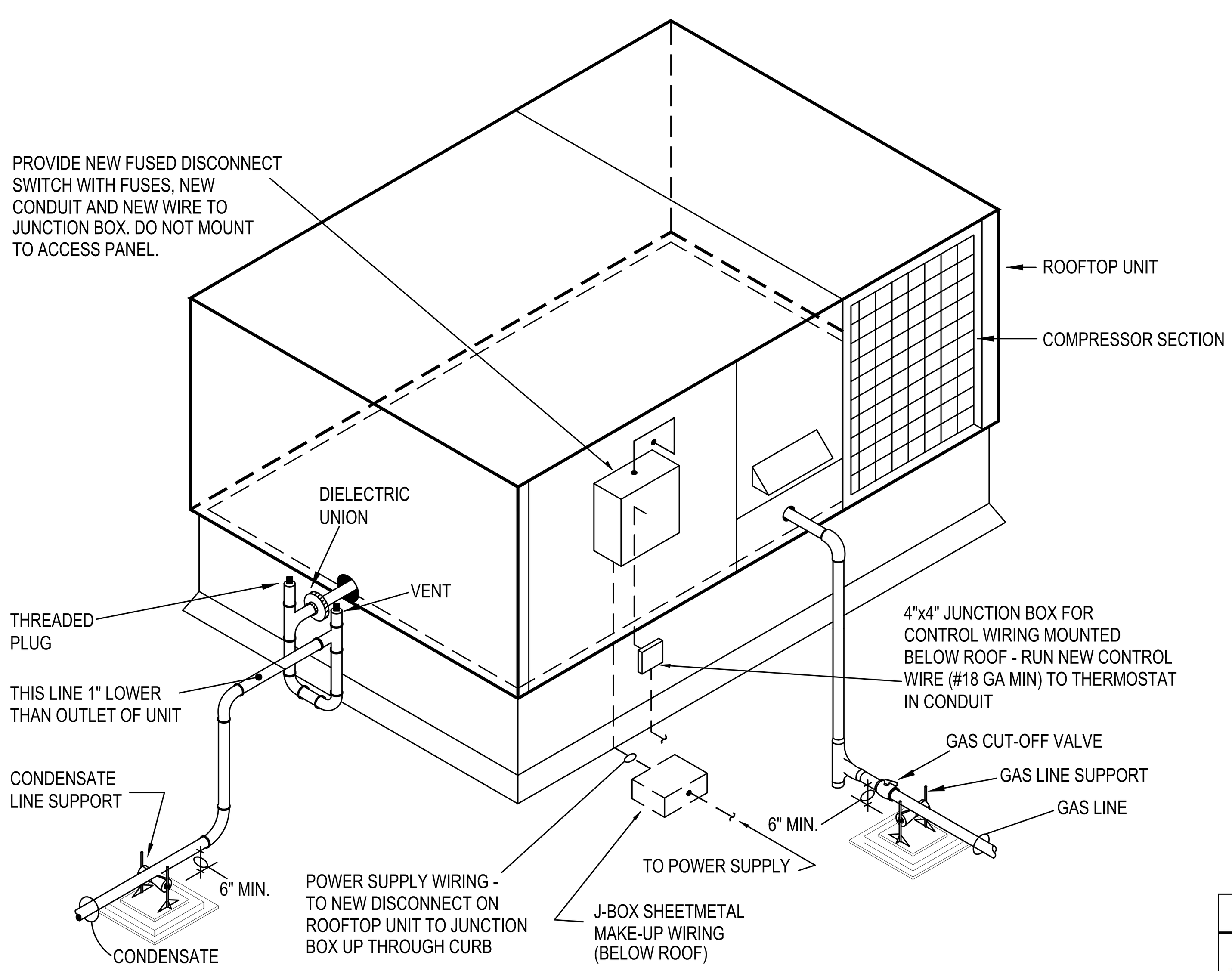
5 TYPICAL HAVC UNIT
FIRE SAFETY CONTROL FUNCTION CIRCUIT WIRING DIAGRAM
N.T.S.



6 DUCT TAKEOFF
N.T.S.



8 CONDENSATE CLEANOUT DETAIL
N.T.S.



3 PAHU with GAS PIPE, CONDENSATE, AND ELEC. WIRING
N.T.S.

PACKAGED HVAC EQUIPMENT (DX COOLING/ GAS HEATING)

								Electrical		DX Cooling		Gas Heating			
MARK	NOM. TONS	HIGH SPEED CFM	LOW SPEED CFM	OA CFM MAX	MANUFACTURER USED IN DESIGN: LENNOX MODEL NO.	EXTERNAL STATIC PRESSURE (IN. W.C.)	SEER/ EER	VOLTAGE/ PHASE	MOCP	TOTAL CAPACITY (MBTUh)	SENSIBLE CAPACITY (MBTUh)	HEAT INPUT (MBTUh)	UNIT WEIGHT (LB.)	REMARKS:	HEAT RECLAIM
A	20.0	8000	5400	1200	LGT 240 H4	0.5	15.7/12.0	208V., 3Ø	90	237.8	156.2	200.0	3000	1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 14	HOT GAS REHEAT

A: RTU #1, 2

Remarks:

1. 2" MERV 13 FILTERS
2. GROUND MOUNTED ON 6" CONCRETE PAD
3. HAIL COIL GUARD
4. MOTORIZED OUTSIDE AIR DAMPER
5. CRANKCASE HEATER
6. FREEZE THERMOSTAT
7. R-410A REFRIGERANT
8. SIDE DISCHARGE
9. MULTIPLE COMPRESSORS
10. STAINLESS STEEL HEAT EXCHANGER
11. POWER EXHAUSTER
12. ECM OR VFD ON SUPPLY FAN
13. FUSED DISCONNECT BY EC
14. BIPOLAR IONIZATION

AIR IONIZER SCHEDULE

SYSTEM CFM	MANUFACTURER	MODEL	REMARKS
4200 - 6000	BIOCLIMATIC	IGDN-4	BULB-LESS DESIGN, 24V POWER

GRILLE SCHEDULE

"XX" CFM	DESCRIPTION	MODEL	FINISH	NECK	REMARKS: PROVIDE
A	CEILING SUPPLY DIFFUSER	PRICE SCD	PER ARCH.	12" Ø	MODULE SIZE 24"x24", (FLUSH MOUNT ADD TRIM FRAME AND ADJUSTABLE DAMPER)
B	SIDEWALL RETURN LOUVER	PRICE LOUVERED GRILL	PER ARCH.	48"x20"	BACKDRAFT DAMPER, FINISH COLOR TO BE DETERMINED BY ARCHITECT/ OWNER.

ELECTRICAL LEGEND

SYMBOL	DESCRIPTION
	BRANCH CIRCUIT - CONDUIT IN WALL or ABOVE CEILING, INDICATES DEVICES AND EQUIPMENT ON A CIRCUIT. NOT INTENDED TO SHOW ROUTING
	BRANCH CIRCUIT OR FEEDER CONDUIT UNDER FLOOR or UNDERGROUND
	SWITCH WIRE - SWITCH CIRCUIT
CL-1,3,5	ARROW INDICATES HOMERUN, TEXT INDICATES PANEL AND CIRCUIT
	PANEL BOARD or SWITCHGEAR (SEE PANEL SCHEDULES AND RISER DIAGRAM)
	DISCONNECT / SAFETY SWITCH - SEE SCHEDULES FOR MORE INFORMATION
;	GROUND ; WEATHERHEAD
J ; J	JUNCTION BOX - @ 18" AFF OR AS NOTED ; FLUSH WALLS / FLUSH CEILING or FLOOR or ELSE
	WEATHERPROOF GFCI 18" AFF

EMA Engineering & Consulting, INC.
9441 STEVENS ROAD, SUITE 200
SHREVEPORT, LOUISIANA 71106
318 425 4500
LOUISIANA Registered Engineering Firm #EF-5818
TEXAS Registered Engineering Firm #F-893

EMA
DESIGN SOLVE ENHANCE

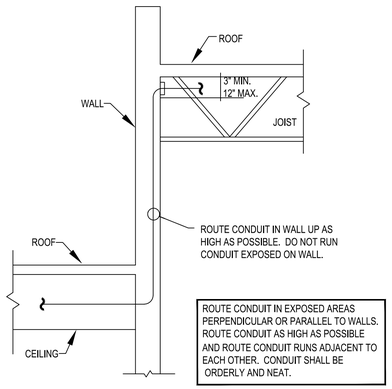
SUBMISSION OF BID WILL BE CONSIDERED ACKNOWLEDGMENT THAT THE CONTRACTOR HAS VISITED THE SITE AND HAS VERIFIED ALL EXISTING JOB CONDITIONS AND INCLUDED ANY NECESSARY MODIFICATION TO EXISTING AND NEW WORK REQUIRED FOR INSTALLATION OF A COMPLETE AND WORKING SYSTEM.

HVAC REPLACEMENT FOR J. S. CLARK MAGNET SCHOOL
MONROE, LOUISIANA

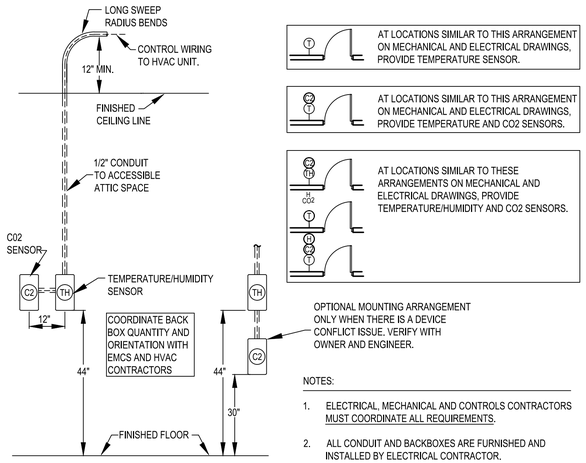
NO.	DATE	REVISIONS

JOB NO: 5-001-1972-003
DRAWN BY: VL
DESIGNED BY: QS
DATE: 05-10-2024
SCALE: AS SHOWN

SHEET
MEP2.1
OF



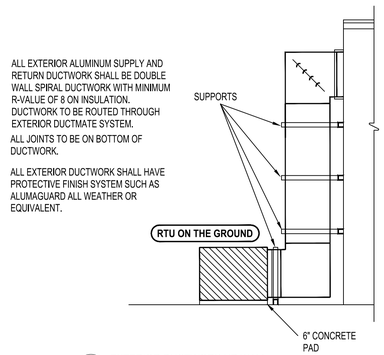
1 EXPOSED CONDUIT ROUTING
N.T.S.



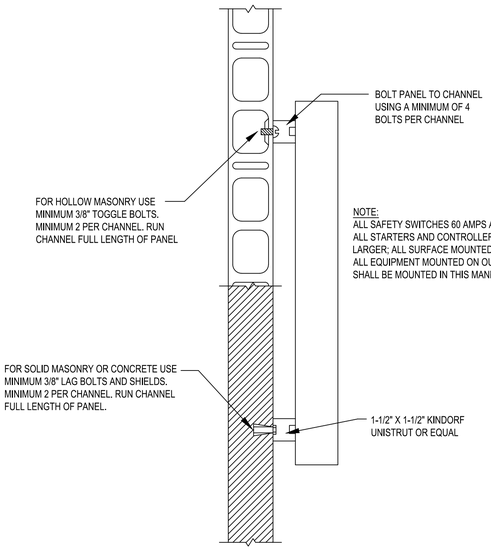
NOTES:

1. ELECTRICAL, MECHANICAL AND CONTROLS CONTRACTORS MUST COORDINATE ALL REQUIREMENTS.
2. ALL CONDUIT AND BACKBOXES ARE FURNISHED AND INSTALLED BY ELECTRICAL CONTRACTOR.
3. ALL SENSORS, CONTROL WIRING AND ASSOCIATED DEVICES ARE FURNISHED AND INSTALLED BY CONTROLS CONTRACTOR.

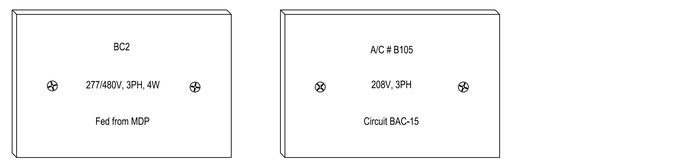
4 SENSOR MOUNTING DETAIL
N.T.S.



7 EXTERIOR DUCTWORK UP WALL
N.T.S.



2 SURFACE EQUIPMENT MOUNTING DETAIL
N.T.S.

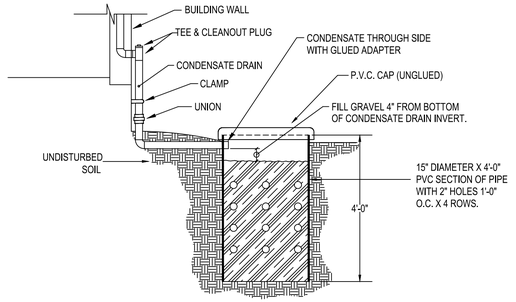


PANELBOARD LABEL (TYPICAL) HVAC DISCONNECT SWITCH LABEL (TYPICAL)

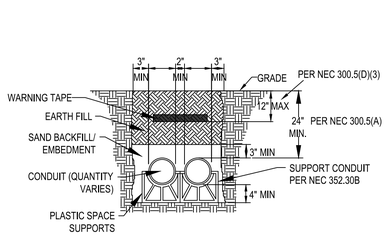
NOTES:

1. ATTACH SECURELY WITH NON-CORRODING STAINLESS STEEL SCREWS, NON-CORRODING POP RIVETS ARE ACCEPTABLE, ADHESIVE ATTACHMENT IS NOT ACCEPTABLE.
2. LABEL ALL PANELBOARDS, SWITCHBOARDS, TRANSFORMERS, HVAC DISCONNECT SWITCHES, AND MOTOR CONTROL CENTERS AS REQUIRED, REFERENCE SPECIFICATION SECTION 260553.

5 ELECTRICAL EQUIPMENT IDENTIFICATION
N.T.S.

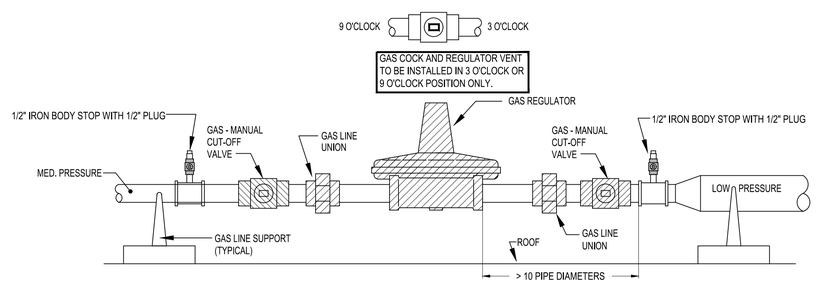


8 CONDENSATE PIT DETAIL
N.T.S.



SEE SPECIFICATION SECTION 26 21 00 PART 3.2 FOR MORE INFORMATION.

3 UNDERGROUND FEEDER CONDUITS
N.T.S.



6 TYPICAL GAS REGULATOR INSTALLATION
N.T.S.

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EMA DESIGN SOLVE ENHANCE

HVAC REPLACEMENT
FOR
J. S. CLARK MAGNET SCHOOL
MONROE, LOUISIANA

NO.	DATE	REVISIONS

JOB NO: 5-001-1972-003
DRAWN BY: VL
DESIGNED BY: QS
DATE: 05-10-2024
SCALE: AS SHOWN

SHEET
MEP2.2
OF

DUCT AND GRILLE INSULATION

PART 1 PRODUCTS

1.1 MANUFACTURERS
- A. Owens Corning
- B. Knauf
- C. Johns Manville

1.2 EXTERNAL DUCT WRAP AND GRILLE INSULATION
- A. Minimum Density:
  1. 3/4 pound per cubic foot
- B. Material:
  1. Fiberglass blanket with type FRK foil reinforced Kraft vapor barrier jacket
- C. Thickness:
  1. 2.0 inch, Minimum Value R-6.0
- D. Comply with ASTM C553 standard
- E. Comply with ASTM C1136-02
- F. Comply with ASTM E84
- G. Comply with IECC

1.3 INTERNAL DUCT LINER
- A. Use:
  1. Use only where specifically noted, or with written approval of Engineer.
- B. Install internal duct liner that extends no more than 2'-0" below roof deck at each rooftop unit.
- C. Thickness:
  1. 1½ inch thick, Minimum Value R-6.0
- D. Fasteners:
  1. Pronged straps.
- E. Comply With ASTM C916-85(2001)e1
- F. Comply with ASTM C1071 standard
- G. Comply with ASTM C553 standard
- H. Comply with ASTM C1136-02
- I. Comply with ASTM E84
- J. Comply with IECC

PART 2 EXECUTION

2.1 DUCT WRAP INSTALLATION
- A. Wrap insulation tightly on the ductwork with all circumferential joints butted and longitudinal joints overlapped a minimum of 3 inches.
- B. Adhere insulation to metal with 4 inch strips of insulation bonding, using adhesive at 8 inch centers.
- C. On circumferential joints, secure the 2-inch flange of the facing and tape with a minimum of 3 inch wide foil reinforced Kraft tape.
- D. On longitudinal joints, secure the overlap using 9/16 inch flared door staples applied 6 inches on centers and taped with minimum 3 inch wide foil reinforced Kraft tape.
- E. Tape all pin penetrations or punctures in facing.
- F. The duct wrap insulation on all rectangular/square ducts 24-inch or wider shall be additionally secured to the bottom of the duct with mechanical fasteners such as pins and speed clip washers.1.8 Spacing at 18-inch on center each direction to prevent sagging.
- G. Fasten insulation installed on diffusers, grilles, and registers using 3-inch minimum wide foil reinforced Kraft tape.
- H. Extend insulation 1 inch beyond each outer surface of diffuser, grille, and register.

2.2 INTERNAL DUCT LINER
- A. Provide internal duct liner as indicated on the plans.
- B. Install internal duct liner on rooftop unit supply and return ducts no more than 2'-0" below roof deck.
- C. Apply the liner to the inside of the duct with heavy density side to the air stream and secure to the duct with adhesive Insul-Coustic No. 225 completely coating the clean sheet metal.
- D. Do not use duct liner in kitchen or other areas that may have excess moisture present.
- E. Secure fasteners to the ducts with adhesive.
- F. Conform to SMACNA Standards for all duct construction standards.
- G. Accurately cut the liner and thoroughly coat the ends with adhesive to make a firmly butted and tightly sealed joint.
- H. Where ducts are lined, exterior insulation will not be needed except as otherwise specified.
- I. Install duct liner in accordance with SMACNA standards..

ENERGY MANAGEMENT CONTROL SYSTEM

PART 1 PRODUCTS

1.1 TYPE
- A. New controls to be provided are to fully integrate with existing Siemons TEC

1.2 SINGLE ZONE DX RTU WITH IONIZER
- A. Unit Enabling/Disabling
  1. The occupied mode shall be determined by existing BAS schedules. Contractor is responsible for coordination with existing system.
  2. During the unoccupied mode the units are to be off.
- B. Fan Control
  1. Fan speed shall be controlled by the unit's internal controls. If unit requires fan speed to be controlled by external source, contractor to provide everything necessary to achieve fan control as noted below.
     - a. Fan shall run in tandem with each associated stage of cooling/heating. Fan speeds shall correlate and be consistent with what is set by TAB.
     - b. For a two stage unit, fan shall have low and high fan speeds to coincide with each stage.
     - c. For a three stage unit, fan shall have low, medium and high fan speeds to coincide with each stage.
- C. TEC to provide:

1.	Fan Status	AI
2.	Supply Air Temperature	AI
3.	Space Temperature	AI
4.	Fan Start/Stop Command (Each Fan)	DO
5.	Compressor Cooling Command (Each Stage)	DO
6.	Heating Command (Each Stage)	DO
7.	Hot Gas Bypass Reheat	DO/AO

METAL DUCTWORK

PART 1 PRODUCTS

1.1 RECTANGULAR AND ROUND RIGID DUCTS:
- A. Material:
  1. New, prime grade sheet or coil steel
- B. Gauge:
  1. Select gauge in accordance with SMACNA Duct Construction Standards Tables 1-3 to 1-9 and Appendix- page 2.
- C. Coating:
  1. Type:
     - a. Continuous, hot-dip, galvanized coating
- D. Application:
  1. 1-1/4 ounces per 1 square foot, two-sided sheet
  2. Comply with ASTM A 653.
- E. Identification:
  1. Sheet steel:
     - a. Stencil each sheet with manufacturer's name and gauge.
- F. Coil steel:
  1. Stencil coils on 10 foot centers with manufacturer's name and gauge.
- G. Construction:
  1. Manufacture in accordance with SMACNA Round Duct Standards, Tables 3-2A, 3-2B, and 3-3, Figures 3-1, 3_2, 3-3, 3-4, and 3-5.
  2. Pre-manufactured round duct may be used if approved by the Architect/Engineer.

1.2 ACCESS DOORS
- A. Install access doors to facilitate cleaning as required by code.
- B. Install access doors as required for access to fire protection devices.

1.3 FLEXIBLE DUCTS
- A. Material: In accordance with SMACNA Metal and Flexible Duct Standards, Latest Edition.
- B. Construction:
  1. Factory insulate with high density fiberglass to a minimum R value of 5.79.
  2. Provide a positive interior air seal permanently bonded to a carbon steel spring helix.
  3. Sheath seall in a Class 1 vapor barrier and factory seal at both ends.
  4. Conform to ULL 181, NFPA 90A
- C. Manufacturer/Model:
  1. ATCO 30 Series

1.4 VOLUME CONTROL DAMPERS
- A. Manufacturer: Nailor Industries Series 1020, 1021 or equal.
- B. Type:
  1. Manually operated single blade or multi-blade
  2. Conform to SMACNA Duct Standards (Metal & Flexible), Figures 2-12 & 2-13.
- C. Application:
  1. Provide in all branches, splits and taps whether indicated on plans or not.
- D. Construction:
  1. Provide an indicating device with lock to hold damper in proper position.
  2. All manual dampers installed above hard ceilings or at other inaccessible areas shall be supplied with a cable operated damper equal to Young Regulator Model 830A-CC. Damper(s) to be opposed blade type constructed of .050 minimum heavy duty extruded aluminum frames and blades. All necessary hardware to ensure compatibility with remote cable control system shall be included. Damper blades to include individual blade bushings for smooth and quiet operation. Damper blades shall rotate between a matched pair of formed and punched 306 stainless steel connecting slide rails which facilitate smooth blade movement and ensure alignment.

1.5 TURNING VANES
- A. Provide in all rectangular supply elbows. Turning vanes in return air ductwork is not necessary.
- B. Conform to SMACNA Duct Standards, Figures 2-3 and 2-4.

1.6 DUCT SEALANT
- A. Equal to Glenkote "Seal-Flex" duct sealer, Hardcast "Irongrip 601", Foster 32-19" or "Childers CP-146"

1.7 FIRE DAMPERS
- A. Manufacturer/Model:
  1. Fire Dampers - Pottorff, Ruskin, Greenheck, National Controlled Air or Nailor
  2. Ceiling Fire Dampers/Thermal Blankets - CK-2000-1 thermal blanket and Model CFSR-2 ceiling damper for supply outlets (round or square) and CFSR-2 for return outlets (square).
- B. Type:
  1. 212ºF fusible link fire damper.
  2. Fire protection rating: 1.5 hours
  3. Conform to UL Standard 555 and be UL labeled
  4. Tested in accordance with AMCA 500.
- C. Application:
  1. Provide at locations shown on plans and where required by Local and State ordinances.
- D. Features:
  1. Maximum leakage 8 cfm at 4-inch S.P.
  2. Vertical or horizontal installation
  3. Radiation blanket
  4. Blades 16 gauge galvanized, maximum 6-inch width,
  5. 5 year warranty.
- E. Manufacturer/Model:
  1. Ceiling Fire Dampers:
     - a. Pottorff Ceiling Fire Dampers/Thermal Blankets - Series CFD
     - b. Equals by Nailor Industries, NCA, United Air, Ruskin, Greenheck

FIRE SAFETY FUNCTIONS - DUCT MOUNTED SMOKE DETECTORS, CONTROL RELAYS, AND SMOKE FIRE DAMPER CONTROL
- A. The Fire Alarm Contractor shall provide the Duct Mounted Smoke Detectors, Control Modules, Power Relays, and Control Relay devices and perform the final low-voltage hook-up to the fire alarm system.
- B. Duct mounted smoke detector housings and sample tubes shall be furnished by the Fire Alarm Contractor and mounted by the Mechanical Contractor.
- C. Line voltage hook-up shall be by the Electrical Contractor.
- D. Fire Alarm Safety Control Functions, which may include the operation of fire alarm Control Relays [CR] associated with duct mounted smoke detector [D]/air handler shut down, high volume low speed (HVLS) fan shut down, fire door hold-back and release, smoke fire damper motor control, et cetera, shall be initiated via Control Relays which shall be de-energized under fire alarm conditions. These Control Relays shall be provided and mounted by the Fire Alarm Contractor and located within three feet of the unit. These Control Relays shall be controlled by a fail-safe Fire Safety Control Function circuit. For each controlled device the contractor providing the device shall wire it internally for fail-safe shut-down and provide a labeled 3' coil of cable outside the unit to allow the fire alarm contractor to make final connection to the Common and N.O. or N.C. dry contacts on the fire alarm SPDT Control Relay. Each Fire Safety Control Function circuit controlled device shall be configured such that when the fire alarm system safety control circuit is re-energized, by the fire alarm control panel, the device shall return to normal operation (e.g. be ready to re-start) without a need for manual or environmental control system intervention.

PART 2 EXECUTION

2.1 INSTALLATION
- A. Erect all ductwork in the general locations shown.
- B. Conform to all structural and finish conditions of the building.
- C. Ductwork shall not be allowed to pass through or over designated electrical rooms.
- D. Before fabricating any ductwork, check the physical conditions at the job site and make all necessary changes in cross sections, offsets, and similar items, whether they are specifically indicated or not.
- E. Where ductwork is shown to be lined on the inside with duct liner, the sizes shown on the plans are the inside dimensions. Therefore, sheet metal dimensions shall be increased accordingly.
- F. Seal all joints both transverse and longitudinal seams, with duct sealant in accordance to Table 1-2 Class B.
- G. Install 1" roll type filter media on all return duct openings prior to starting blowers. Leave in place and change as necessary during construction.
- H. Before installing grilles, operate air conditioning unit fans and remove all debris or foreign matter.
- I. Rectangular ductwork:
  1. Construct in accordance with SMACNA, Duct Construction Standards for the specific duct pressure classification involved (see pressure classification). Do not use radius ells with square throats.
- J. Round ductwork:
  1. Connect with slip type joints using a minimum of three sheet metal screws per joint and in accordance with SMACNA Duct Construction Standards.
- K. Flexible ductwork:
  1. All flexible ducts shall be demountable and individual lengths shall not be in excess of seven feet.
  2. Use only factory-made connectors.
  3. Flexible ducts should be installed fully extended, free of sags and kinks.
- L. Exterior Ductwork
  1. Exterior ductwork shall use a Ductmate Industries connection and sealing system. Install per manufacturers recommendations.
  2. All exterior ductwork to be protected and sealed with a weather-proofing, protective finishing system such as Alumaguard All Weather, Venture Clad System, or equivalent. Both insulation and protective finish cover system shall be pitched in order to shed water. Level or flat covers will not be accepted.
- M. Reinforcement:
  1. Reinforce all ducts to prevent buckling, breathing, vibration, or unnecessary noise.
  2. Reinforcing shall be in accordance with SMACNA Duct Construction Standards (Metal and Flexible), Tables 1_3, 1_4, 1_5, 1_6, 1_7, 1_8, and 1_9 plus any additional reinforcing to meet job conditions.
  3. All ducts shall be supported in accordance with SMACNA Duct Construction Standards (Metal and Flexible), Tables 4_1, 4_2, 4_3.
- M. Flexible Connections:
  1. Where ducts connect to fans or air handling units, make flexible airtight connections using "Ventglas" fabric.
  2. The fabric must be fire_resistant, waterproof and mildew resistant with a weight of approximately 30 ounces per square yard.
  3. Provide a minimum of 1/2 inch slack in the connections, and a minimum of 2_1/2 inches distance between the edges of the ducts.
  4. Provide a minimum of 1 inch slack for each inch of static pressure on the fan system.
  5. Securely fasten fabric to apparatus and to adjacent ductwork by means of galvanized flats or draw bands.
  6. Do not install outdoors, except where detailed on plans.
  7. Where connections are made in outdoor locations, seal fabric to metal with mastic.
- N. Access Doors:
  1. Install ductwork access doors in structural angle frames and provide with sash locks and hinges arranged for convenient access.
  2. Construct doors which occur in insulated ducts with an insulation filler.
  3. All access doors shall be appropriately labeled.
- O. Flashing and Opening Sealing:
  1. Ducts passing through roofs or exterior walls:
     - a. Provide suitable flashing to prevent rain or air currents from entering the building as detailed on plans.
     - b. The flashing shall be minimum No. 24 gauge galvanized steel.
- P. Duct Leakage:
  1. Seal ductwork in accordance with Table 1_2 of the SMACNA HVAC Duct Construction Standards _ Metal and Flexible.
  2. Minimal leakage is expected for ductwork constructed to these standards but in no case shall the total leakage exceed 5% of designed CFM.
  3. All joints to be sealed with duct sealant.
- Q. Fire and Smoke Dampers:
  1. Install fire and smoke dampers at locations shown on plans, and where required by local and state ordinances.
  2. Do not compress or stretch SFD, FD frame into duct or opening.
  3. Install dampers square and free from racking with blade running horizontally.
  4. Handle damper suing sleeve or frame. Do not lift damper using blades actuator, or jackshaft.
  5. Install bracing for multiple section assemblies to support assembly weight and to hold against system pressure. Install bracing as needed.
  6. Provide access doors in attached ductwork for inspection.
  7. Stencil each door "Fire Damper Access" per U. L. 555 standard.
  8. Install fire dampers in openings utilizing steel angles, sleeves, and other materials, and practices required to provide an installation equivalent that used by manufacturer when dampers were tested at UL.
  9. Install in accordance with damper manufacturer's published recommendations and instructions and NFPA Standard 90A.

2.2 BALANCING DAMPERS
- A. Volume Control Dampers:
  1. Install manually operated volume control dampers in all branch ducts, splits or taps whether indicated on the drawings or not. Install a minimum of 5'-0" from grille/diffuser.
  2. Provide indicating device with lock to hold damper in position.
- B. Cable Operated Dampers:
  1. Install a minimum of 5'-0" from grille/diffuser.
  2. Install to facilitate smooth blade movement and ensure alignment.
- C. Back Draft Dampers:
  1. Install back draft dampers as shown on plans.
  2. Manufacturer: Nailor Industries Series 1300 or equal.
- D. Air Intake Ducts:
  1. Insulate all outside air intake ducts.

2.3 DAMPER IDENTIFICATION
- A. Provide a securely attached red band and a label reading "Damper Location" at the location of all concealed manual dampers.
- B. All manual dampers which are not readily visible after duct insulation installation shall be identified in this manner.

2.4 DUCTWORK SUPPORT
- A. All ducting must be supported from building structure.
- B. Duct straps are not allowed to be screwed to roof decks, support from cross bridging or supported from bottom chord of joists.
- C. Do not support from roof or floor deck joist bridging.
- D. Support sizes and spacing shall conform to SMACNA Standards.

Division 22

PLUMBING SPECIFICATIONS
GENERAL PROVISIONS

1. SCOPE:

PROVIDE ALL LABOR, MATERIAL AND EQUIPMENT IN ACCORDANCE WITH THESE SPECIFICATIONS AND THE ACCOMPANYING DRAWINGS TO PROVIDE A COMPLETE AND PROPERLY OPERATING PLUMBING SYSTEM FOR THE BUILDING. PROVIDE WATER, SEWER AND ANY OTHER REQUIRED UTILITIES AND EXTEND SERVICE FROM SAME TO BUILDING AS SHOWN ON DRAWINGS. CORE-DRILL EXISTING SLAB AS REQUIRED; PATCH TO MATCH EXISTING. COORDINATE THIS WORK WITH THE WORK OF THE OTHER TRADES ON THE PROJECT.

2. GENERAL REQUIREMENTS:

COMPLY WITH ALL FEDERAL, STATE, AND LOCAL REQUIREMENTS, CODES, RULES, AND ORDINANCES GOVERNING WORK ON THIS PROJECT. PAY FOR AND OBTAIN NECESSARY CONSTRUCTION PERMITS AND CERTIFICATES OF INSPECTION.

A. DRAWINGS: THE LOCATION OF THE PIPING RUNS ARE APPROXIMATE A. AND THE CONTRACTOR MUST MAKE ANY NECESSARY CHANGES IN THE PIPING RUNS, ETC., AND AT NO ADDITIONAL COST TO THE OWNER. OUTLET LOCATIONS ARE CRITICAL AND MUST BE LOCATED EXACTLY ACCORDING TO THE PLUMBING PLAN. COORDINATE THIS WORK WITH THE INSTALLERS OF EQUIPMENT FURNISHED AND INSTALLED BY OTHERS. REFER TO THE OTHER DRAWINGS FOR DETAILS OF THE BUILDING CONSTRUCTION AND THE OTHER MECHANICAL, ELECTRICAL, AND EQUIPMENT FEATURES.

B. COORDINATION AND WORKMANSHIP: SCHEDULE THIS WORK SO THAT IT WILL BE PROPERLY COORDINATED WITH ALL OTHER TRADES. WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE BEST PRACTICE FOR THE CLASS OF WORK INVOLVED. WORKMANSHIP SHALL ALLOW THE APPLIANCE TO OPERATE AS INTENDED AND BE INSTALLED TO BEST PROTECT THE PUBLIC AND OPERATORS FROM INJURY OR DAMAGE, AND TO PRESENT A NEAT, PLEASING, AND ORDERLY APPEARANCE.

MATERIALS AND PERFORMANCE

1. MATERIALS: ALL MATERIALS SHALL BE NEW AND OF THE QUALITY INDICATED BY THE SPECIFIED BRAND NAMES. SUBSTITUTIONS OF MATERIAL OF EQUAL QUALITY BY OTHER MANUFACTURERS MAY BE ACCEPTABLE PROVIDED SUCH SUBSTITUTIONS ARE EQUAL.

2. CONDENSATE AND AUXILIARY DRAIN

A. AUXILIARY DRAIN PIPING, EQUIPMENT DRAINS, APPLIANCE DRAIN PIPING AND WATER HEATER RELIEF PIPING SHALL BE TYPE "L" HARD DRAWN COPPER PIPING WITH CAST AND/OR WROUGHT COPPER FITTINGS PER ASTM B-88, 95/5 SOLDER. PROVIDE PIPE SUPPORTS AT SPECIFIED INTERVALS WITH ONLY COPPER-PLATED, COPPER PR BRASS IN CONTACT WITH COPPER PIPING.

B. ALL DRAIN PIPING SHALL BE INSTALLED WITH A MINIMUM FALL OF 1/8" PER FOOT UNLESS NOTED OTHERWISE ON PLAN.

3. NATURAL GAS PIPING:

UNDERGROUND: YELLOW POLYETHYLENE PLASTIC PIPE PER API 15LE
ASTM D-2513 WITH FUSION JOINTS EQUAL TO PPI PE-2406.

ABOVE GROUND: LOW PRESSURE PIPING (LESS THAN 1 PSI) SHALL BE
SCHEDULE 40 BLACK STEEL PIPE WITH SCHEDULE 40 BLACK THREADED
FITTINGS. INTERMEDIATE PRESSURE PIPING (1 PSI OR GREATER) SHALL BE SCHEDULE 40 BLACK STEEL WITH SOCKET WELDED FITTINGS AND WELDED JOINTS.

ALL THREADED FITTINGS TO BE JOINED WITH TEFLON TAPE SEAL AND TEFLON THREAD COMPOUND AND MADE IN CONFORMANCE WITH THE BEST
PRACTICES OF AGA AND NFPA 54. UNIONS SHALL BE CAST BLACK IRON
AND INSTALLED IN A MANNER SUCH THAT NO STRESS WILL BE PLACED
ON THE MALE-FEMALE SEALING SURFACES. PROPER ALIGNMENT WILL BE
MADE AT TIME OF INSTALLATION. ALL JOINTS AND CONNECTIONS SHALL
BE THOROUGHLY CLEANED OF OIL, THREAD CUTTINGS AND RESIDUALS TO
ACCEPT ENAMEL PAINT. ROUGH OR SHARP EXPOSED THREAD SURFACES
SHALL BE FILED SMOOTH. TESTING SHALL BE PER NFPA 54. PREP, PRIME AND PAINT ALL EXPOSED (INTERIOR AND EXTERIOR) GAS PIPING TO MATCH ADJACENT SURFACE FINISH; BLACK OTHERWISE.

Division 26

General Requirements

Perform all work in strict accordance with the requirements and recommendations stated in the below list of codes and on these plans except when requirements are modified by the contract documents. Provide a complete and properly operating electrical system.

Perform all work per, but not limited to, the latest version of the following standards: NECA (standards for installation), NFPA, National Electric Code (NEC), all applicable State and Local Codes and Ordinances, OSHA Standard 2207 – Construction Industry Standard, and OSHA 29 CFR 1926 - Regulation of Excavation.

All materials and components furnished under this contract shall be UL listed and approved for the purpose intended. Additionally, they shall be new, free from defects of any kind and of the quality and design hereinafter specified and as required.

It shall be the contractor's responsibility to obtain all necessary applicable manufacturer's instructions and install all product in accordance with the manufacturer's instructions. It shall be the Contractor's responsibility to install all equipment, materials, and devices shown on the plans and as called out in these specifications even if manufacturer's instructions are absolutely unattainable.

This Contractor shall keep a set of plans on the job, noting daily all changes made in connection with the final installation including exact dimensioned locations of all new and existing switchgear, devices, luminaires, equipment and new or existing site utilities and lights.

The Contractor will examine the site, verify all requirements, service points, and availability of all services required to complete this project. No consideration will be granted for any alleged misunderstanding of the materials and labor to be provided as necessitated by nature of the site including those items which may be fairly implied as essential to the execution and completion of any and all parts of this project. All proposals shall take these existing conditions into consideration and the lack of specific information on the drawings shall not relieve the Contractor of any responsibility. Verify location and check for existing underground utilities and lines before ditching.

Work must be performed by workmen skilled in their trade. The installation must be complete whether the work is concealed or exposed

Conceal electrical work in walls, floors, chases, under floors, underground and above ceilings. Branch circuits shall not be installed in the slab or under the slab unless shown or required on the drawings.

All equipment shall be new. Refurbished or used equipment will not be allowed.

General Requirements to support Other Trades

Throughout the project, the Electrical Contractor shall coordinate installation of all portions of the electrical system with the General Contractor, Mechanical, Plumbing, Communications and other Contractors to insure a complete working system for the Owner.

This contractor shall coordinate and provide all conduit and back boxes required for other trades.

All conduit and boxes for thermostats and/or sensors shall be provided by this contractor. A thermostat or sensor junction box and 1/2" conduit to accessible attic and/or to corridor shall be provided for each room served with HVAC equipment. Coordinate with Division 23 for exact locations and requirements.

Details on Electrical drawings showing HVAC/Mechanical/Control Equipment providing of various relays devices, wiring and other equipment shall be provided by this Contractor as directed and as required per drawing.

Warranty

This Contractor shall warranty all work against defective materials and workmanship for a period of one year from and after date of acceptance of the installation by the owner.

Submittals

This contractor shall provide electronic submittals on all devices and equipment used on this project. They shall be provided in PDF format. Paper submittals will be rejected. Submittals to include the manufacturer, model/series, and list all required accessories for a complete system.

Provide shop drawings for the following items: panelboards, motor starters and safety switches.

Existing conditions

Verify existing field measurements, circuiting arrangements, wiring and equipment served in areas as shown on the Drawings. Adjust all circuiting, wiring and materials to be provided as required by job conditions. Verify abandoned wiring and equipment serving only abandoned facilities. These construction drawings are based on casual field observation and existing record documents. Report discrepancies to the Engineer before disturbing existing installation. The Contractor accepts the existing conditions when beginning demolition.

Provide temporary wiring and connections to maintain required existing systems in service during construction. When work must be performed on energized equipment or circuits, use personnel experienced in such operations. Verify phasing on existing equipment and coordinate new phasing before energizing revised service.

Wiring / Conductors

Conductors shall be manufactured in the United States by Encore, Southwire, Cerro or General Cable. Minimum wire size shall be #12. Wire sizes #12 and #10 shall be solid and larger sizes may be stranded.

All feeders and branch circuit conductors shall be soft-drawn annealed copper rated for at least 600V. The insulation for branch circuit conductors shall be type THWN-2 or THHN/THWN or better.

Provide a separate neutral conductor for each circuit. Multiple circuits shall not share a common neutral. Neutral conductors shall be sized as large as the phase conductors. Neutral conductors shall not be of a reduced size.

There shall be no more than three current carrying conductors in each conduit run. For three-phase balanced loads, the neutral need not be included in this requirement.

The insulation of each feeder run and each branch circuit shall be tested with a megger. The test shall be performed after the conductors have been pulled into the conduit and after terminations have been added, but before final connections are made.

All wiring, regardless of voltage, shall be enclosed in conduit or raceway in all exposed areas.

Grounding and bonding

Provide grounding and bonding per NEC, ANSI/IEEE 142 - Recommended Practice for Grounding of Industrial and Commercial Power Systems and ANSI/UL 467 - Safety Standard for Grounding and Bonding Equipment

Comply with NEC 250 for sizes and quantities of equipment grounding conductors, except where larger sizes or more conductors are indicated.

All outdoor and below grade grounding connections shall be exothermic cadweld or thermoweld connected. No exceptions.

Grounding resistance values shall be tested and must meet or exceed the following: Equipment rated at 500kVA or less = 10 ohms or less to ground and Equipment grounds shall be 25 ohms or less to ground.

Conduit, fittings and back boxes

All conduit and fittings shall be provided of the proper type and installed using methods per NEC. Acceptable conduit types include PVC, EMT and Rigid Galvanized.

Conduit shall NOT be used as the means of grounding. Provide a grounding electrode conductor in all feeder and branch circuit conduits sized per NEC.

Apply fire caulking as required. All conduits shall be internally sealed on each end as required by the NEC.

Wherever possible and unless otherwise indicated on the drawings, install conduit concealed in walls, partitions and above the ceiling. Install conduit exposed in ceiling area at the structure in electrical rooms, mechanical rooms and other rooms where ceilings are not present or scheduled. All conduits and back boxes shall be installed per NEC.

Mounting height of a wall-mounted outlet box means the height from finished floor to bottom of box. Install and support boxes per NEC 314-23 as required and as directed.

Exterior conduits and conduit risers above grade shall be rigid galvanized.

Leave a pull-wire in all empty conduits.

Identification / Labeling

Provide all proper identification, labeling and signs for equipment, devices, etc. including values and conditions as shown on drawings and as required by NEC.

All labeling on equipment (panels, switchgear, transformers, disconnects, etc.) shall be black melamine plastic laminate with white engraving and affixed with permanent stainless steel fasteners.

Testing

Provide testing on all feeders and grounding per manufacturer's printed testing procedures, applicable industry standards, ANSI standards, IEEE standards, NEMA standards and as directed by the Engineer. Provide testing equipment in good working order and which complies with the applicable industry standards and manufacturer's requirements. Include a list of testing equipment used and date of last calibration.

Panelboards and Switchgear

Panelboard and switchgear shall be from Square-D, Siemens, ABB(GE) or Eaton (CH)

All panelboards and switchgear shall include a neutral bus, ground bus and shall have copper bussing, and a hinged lockable door, Each panelboard and switchgear enclosure shall be NEMA rated for the environment it is installed.

Provide circuit breakers unless the drawings indicate that fused switches are required. All circuit breakers shall be bolt-in type, Quick-make, quick-break. Manual and automatic operation, Trip free and trip indicating. All circuit breakers shall be capable of field-installable shunt trip, ground fault shunt-trip or under voltage trip.

More than one conductor shall not be installed in any termination in a panelboard unless the termination is marked as suitable for more than one conductor.

Provide ground fault circuit breakers (GFCI) where indicated on the plans, panel schedules and as required by NEC 422.5, 210.8(B), etc.

Provide typewritten circuit directories with clear plastic protectors in all panels. Directory entries must clearly identify each circuit uniquely from another per NEC 408.4.

Provide and install all required labels and applicable marking on all service entrance equipment and electrical panels per NEC article 110.

Breaker Coordination Studies

For any project where electrical panels are added or changed but the service entrance equipment is not changed, this contractor shall provide a breaker coordination study for the service entrance equipment and all affected panels and shall make adjustments so all breakers are properly coordinated.

Arc Flash Studies

For any project where electrical panels are added or changed but the service entrance equipment is not changed, this contractor shall provide an arc flash/fault study and all required labels for all affected panels per NEC 110.16 and 110.21(B).

Wiring Devices

All devices shall be UL Listed, spec grade or hospital grade, rated at 20A or greater at 120/277Vac and manufactured by Leviton, Hubbell, Eaton, Bryant, Wiremold or P&S. Commercial grade or residential grade devices will not be accepted.

Provide factory fabricated wiring devices of the type and electrical rating for the service indicated, provide proper selection to fulfill the wiring requirements.

Mount all devices between 18"AFF (from the bottom of the backbox) to 46" AFF (to the top of the backbox). Receptacles to be at 18" AFF and switches/controls to be at a maximum of 46" AFF unless otherwise noted on the drawings.

All receptacle covers used outside shall be in accordance with NEC 406.8.

Fuses

All fuses shall be manufactured by Bussman, Littlefuse or Mersen and shall be Class RK-1 dual element, time delay. (No Exceptions)

Prior to ordering fuses or fuse holders, coordinate fuse ratings with the mechanical contractor to verify that fuses for HVAC equipment matches the MOCP values of the HVAC equipment being provided.

Enclosed Safety Switches / Disconnects

Safety switches and disconnects shall be from the same manufacturer as the panelboards and switchgear where possible.

In accordance with the service indicated, use 240 or 600 volt switches, single throw, fusible, horsepower rated, 100% load break and make rated, designed for locking in "ON" or "OFF" position, in code gauge steel cabinets, as required by the application and the NEC.

Provide NEMA 1 enclosures indoors and NEMA 3R Heavy Duty enclosures outdoors (or where otherwise required).

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DESIGN SOLVE ENHANCE

HVAC REPLACEMENT
FOR
J. S. CLARK MAGNET SCHOOL
MONROE, LOUISIANA

NO.	DATE	REVISIONS

JOB NO: 5-001-1972-003
DRAWN BY: VL
DESIGNED BY: QS
DATE: 05-10-2024
SCALE: AS SHOWN

SHEET
MEP3.1
OF