

HVAC IMPROVEMENTS AT JOHN H. SHARY ELEMENTARY

FOR SHARYLAND INDEPENDENT SCHOOL DISTRICT - CSP #1819-16

2300 GLASSCOCK DR., MISSION, TX 78574



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100% CONSTRUCTION DOCUMENTS

HALFF AVO #31981WA05

PROJECT TEAM		LOCATION	Sheet List Table	
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TBPE FIRM #F-312

Revision No.	Date	Description

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MECHANICAL COVER SHEET

G001
Sheet Number

MECHANICAL GENERAL LEGEND												
DUCTWORK SYMBOLS			MISCELLANEOUS SYMBOLS			GENERAL ABBREVIATIONS			GENERAL MECHANICAL NOTES		COMMISSIONING NOTES	
DESCRIPTION	SINGLE LINE	DOUBLE LINE		DUCT STATIC PRESSURE SENSOR	AAV	AUTOMATIC AIR VALVE	MAX	MAXIMUM	1. INFORMATION ON THIS PLAN HAS BEEN OBTAINED FROM EXISTING DRAWINGS AND SITE SURVEY. CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS PRIOR TO COMMENCING WORK. ANY DISCREPANCIES BETWEEN EXISTING CONDITIONS AND CONSTRUCTION DOCUMENTS SHALL BE REPORTED IMMEDIATELY TO THE ENGINEER AND/OR ARCHITECT. 2. THE CONTRACTOR IS FULLY RESPONSIBLE FOR PERFORMING THE WORK IN FULL COMPLIANCE WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL CODES UNDER THIS SECTION OF THE CONTRACT. IF THE CONTRACTOR DETERMINES THAT THE CONTRACT DOCUMENTS AND PLANS ARE NOT IN COMPLIANCE WITH THE APPLICABLE LOCAL CODES, HE SHALL INFORM THE ARCHITECT PRIOR TO CONSTRUCTION START FOR DIRECTION. FAILURE TO DO SO SHALL NOT RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITY TO MEET APPLICABLE LOCAL CODES, AND REWORK SHALL BE AT CONTRACTOR'S EXPENSE. 3. CONTRACTOR SHALL HANG AND INSTALL ALL DUCTWORK TIGHT WITH THE BUILDING STRUCTURE WHEN FEASIBLE TO ACCOMMODATE NEW CEILINGS. CONTRACTOR SHALL COORDINATE ALL INSTALLATION WORK WITH ARCHITECTURAL AND ELECTRICAL DESIGN. ALL DUCTWORK SHALL BE MODIFIED AS NECESSARY AND REQUIRED TO FIT AROUND BUILDING STRUCTURES, ARCHITECTURAL BUILD-OUT AND ELECTRICAL CABLE TRAY INSTALLATIONS. MECHANICAL CONTRACTOR SHALL FAMILIARIZE HIMSELF WITH THE WORK SCOPE OF OTHER TRADES AND PARTICIPATE IN COORDINATING ALL CONSTRUCTION EFFORTS. 4. CONTRACTOR SHALL INSTALL ALL EXHAUST SYSTEMS, INCLUDING FANS AND EXHAUST DUCTS. PROVIDE COMPLETE NEW SYSTEMS AS INDICATED. 5. CONTRACTOR SHALL PROVIDE ALL CEILING DIFFUSERS AS SHOWN. CONNECT EACH DIFFUSER TO THE MAIN DISTRIBUTION DUCT WITH A FLEX-DUCT SECTION; CONNECTIONS SHALL BE COMPLETED IN ACCORDANCE WITH THE DETAIL. EACH FLEX-DUCT CONNECTION SHALL INCLUDE A BUTTERFLY DAMPER TO BE INSTALLED AT THE TRUNK DUCT. 6. CONTRACTOR SHALL PROVIDE ALL DUCTWORK REQUIRED TO COMPLETE THE HVAC SYSTEM. FIT IN BRANCH DUCTS TO MAIN DUCTS WITH SHEET METAL FLANGES. FLANGE CONNECTION SHALL BE FASTENED WITH CRIMPED SHEET METAL STRIPS AND SEALED WITH SILICONE CAULK. 7. CONTRACTOR SHALL SUPPLY AND INSTALL FIRE DAMPERS AND ACCESS DOORS IN THE HORIZONTAL DUCTS WHERE THEY PENETRATE FIRE BARRIERS. 8. CONTRACTOR SHALL PROVIDE FIRE DAMPERS IN ALL DIFFUSERS AND GRILLES LOCATED IN FIRE RATED CEILINGS. ALL HALLWAY DIFFUSERS AND GRILLES SHALL BE INSTALLED WITH FIRE DAMPERS. ALL DIFFUSERS AND GRILLES SHOWN WITH A CIRCLED "F" SHALL BE EQUIPPED WITH FIRE DAMPERS. 9. ALL OPENINGS CUT IN MASONRY AND PLASTER WALLS OR CONCRETE FLOORS SHALL BE CORE DRILLED OR SAWN WHEN POSSIBLE. CONTRACTOR SHALL CHECK BUILDING CONSTRUCTION BEFORE MAKING PENETRATIONS TO AVOID CUTTING THROUGH STRUCTURAL BEAMS AND REINFORCING. CONTRACTOR SHALL INFORM THE ENGINEER IF REINFORCING IS CUT OR DAMAGED WHILE MAKING OPENINGS. CONTRACTOR SHALL REINFORCE ALL OPENINGS AS REQUIRED BY DRAWINGS AND SPECIFICATIONS. PATCH AND SEAL OPENINGS WITH 6000 PSI CEMENT GROUT. INSTALL DECORATIVE TRIM (EQUIPMENT FLANGES, FRAMING OR ESCUTCHEONS) AROUND OPENINGS IN FINISHED AREAS. COORDINATE ALL CUTTING AND PATCHING WITH THE OTHER TRADES. 10. ON ANY WORK SHOWN ON MECHANICAL DRAWINGS REQUIRING DEMOLITION OF EXISTING OR NEW BUILDING STRUCTURES AND FINISHES, IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO COMPLETE THE NECESSARY DEMOLITION. CONTRACTOR SHALL PATCH AND REPAIR ALL DEMOLITION WORK. PATCHING SHALL BE COMPLETED WITH THE SAME MATERIALS AS THE SURROUNDING AREAS, OR WITH ARCHITECT-APPROVED PATCHING MATERIALS. REPAIRS SHALL BE COMPLETED ACCORDING TO ARCHITECTURAL SPECIFICATIONS. ALL REFINISHING SHALL BE APPROVED BY THE ARCHITECT. 11. CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLETING THE INSTALLATION OF THE AIR DISTRIBUTION SYSTEM SHOWN. DUCTWORK, DUCT ACCESSORIES AND CONTROLS SHOWN AND REQUIRED SHALL BE SUPPLIED AND INSTALLED. ALL INSTALLATION WORK SHALL BE DONE IN ACCORDANCE WITH APPLICABLE CODES, INCLUDING NFPA 90A AND 90B. 12. CONTRACTOR SHALL BALANCE ALL AIR DISTRIBUTION SYSTEMS TO ACHIEVE THE AIR VOLUME REQUIREMENTS INDICATED. BALANCING SHALL INCLUDE ADJUSTMENT OF ALL MANUAL VOLUME DAMPERS, SPLITTER DAMPERS, ZONE DAMPERS (IF REQUIRED), AND BUTTERFLY DAMPERS. CONTRACTOR SHALL SUPPLY THE ENGINEER WITH A COMPLETE BALANCING REPORT WHICH INCLUDES VOLUME, ROOM REFERENCE AND ZONE VOLUME TOTALS. 13. MOUNT ALL THERMOSTATS (SENSORS) 48" ABOVE THE FINISHED FLOOR LEVEL UNLESS NOTED OTHERWISE. THERMOSTATS SHOWN SHALL BE IN CONTROL OF THE ZONE SYSTEM WHICH IS SUPPLYING AIR TO THE AREA WHERE THE THERMOSTAT IS LOCATED. CONTRACTOR SHALL COORDINATE THE FINAL LOCATION OF EACH THERMOSTAT WITH THE ROOM FINISHES AND USES. CONTRACTOR SHALL SUPPLY AND INSTALL ALL CONTROL VOLTAGE WIRING AND CONDUIT FOR THERMOSTAT (DDC CONTROL) INSTALLATION. 14. CONTRACTOR SHALL COORDINATE THE FINAL LOCATIONS OF ALL CEILING DIFFUSERS WITH LIGHTING INSTALLATIONS AND ARCHITECTURAL REFLECTED CEILING PLANS. MOVE THE DIFFUSER LOCATIONS IF REQUIRED TO AVOID OBSTRUCTIONS FROM DUCTWORK AND LIGHT FIXTURES. COORDINATE RELOCATION WITH ENGINEER. 15. CONTRACTOR SHALL INSTALL NEW REFRIGERANT PIPING FLUSH WITH THE BUILDING STRUCTURE AND MECHANICAL ROOM BOUNDARIES AS SHOWN. CONTRACTOR SHALL COORDINATE ALL INSTALLATION WORK WITH DUCTS AND ELECTRICAL CONDUIT. MECHANICAL CONTRACTOR SHALL FAMILIARIZE HIMSELF WITH THE WORK SCOPE OF OTHER TRADES AND PARTICIPATE IN COORDINATING ALL CONSTRUCTION EFFORTS. 16. ALL PIPING SHALL BE INSULATED AND JACKETED. REFER TO THE SPECIFICATIONS. CONDENSER COILS ARE TO BE COATED IN ACCORDANCE WITH THE SPECIFICATIONS 17. VERIFY THE LOCATION OF ALL WALLS, PARTITIONS, DOORS, CABINETS, AND CEILINGS FROM ACTUAL FIELD MEASUREMENTS. 18. PROVIDE SMOKE DETECTOR AND SHUTDOWN CONTROLS ON AIR HANDLERS AND SUPPLY FANS. SMOKE DETECTORS SHALL BE PROVIDED, INSTALLED AND WIRED FOR SHUT DOWN BY DIVISION 16. PROVIDE BOTH SUPPLY AND RETURN SIDE DEVICES.	1. COMMISSIONING AGENCY A COMMISSIONING AGENCY WILL BE CONTRACTED DIRECTLY WITH AND BY THE OWNER FOR THIS PROJECT. THE COMMISSIONING AGENCY HAS OVERALL RESPONSIBILITY FOR PLANNING AND COORDINATING THE COMMISSIONING PROCESS. HOWEVER, COMMISSIONING INVOLVES ALL PARTIES TO THE DESIGN AND CONSTRUCTION PROCESS, INCLUDING THE CONTRACTOR. 2. CONTRACTOR RESPONSIBILITY THE MECHANICAL SPECIFICATIONS DEFINES THE CONTRACTOR'S RESPONSIBILITIES WITH RESPECT TO THE COMMISSIONING PROCESS. EACH CONTRACTOR AND SUB-CONTRACTOR SHALL REVIEW THE SPECIFICATION SECTIONS, AND SHALL INCLUDE IN THEIR BIDS FOR CARRYING OUT THE WORK DESCRIBED, AS IT APPLIES TO EACH DIVISION AND SECTION OF THOSE SPECIFICATIONS, INDIVIDUALLY AND COLLECTIVELY. 3. DESCRIPTION OF WORK THE PURPOSE OF THE COMMISSIONING PROCESS IS TO PROVIDE THE OWNER/OPERATOR OF THE FACILITY WITH ASSURANCE THAT THE BUILDING ENVELOPE, MECHANICAL, PLUMBING, AND ELECTRICAL SYSTEMS HAVE BEEN INSTALLED ACCORDING TO THE CONTRACT DOCUMENTS, AND OPERATE WITHIN THE PERFORMANCE GUIDELINES SET OUT IN THE DESIGN INTENT DOCUMENTS AND THE SPECIFICATIONS. THE COMMISSIONING AGENCY WILL PROVIDE THE OWNER WITH AN UNBIASED, OBJECTIVE VIEW OF THE SYSTEM'S INSTALLATION, OPERATION, AND PERFORMANCE. THE COMMISSIONING PROCESS DOES NOT TAKE AWAY OR REDUCE THE RESPONSIBILITY OF THE INSTALLING CONTRACTORS TO PROVIDE A FINISHED PRODUCT THAT IS INSTALLED AND FULLY FUNCTIONAL IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. COMMISSIONING IS INTENDED TO ENHANCE THE QUALITY OF SYSTEM START-UP AND AID IN THE ORDERLY COMPLETION AND TRANSFER OF SYSTEMS FOR BENEFICIAL USE BY THE OWNER. THE COMMISSIONING AGENCY WILL BE THE LEADER OF THE COMMISSIONING TEAM, PLANNING AND COORDINATING ALL COMMISSIONING ACTIVITIES IN CONJUNCTION WITH THE DESIGN PROFESSIONALS, SUBCONTRACTORS, MANUFACTURERS AND EQUIPMENT SUPPLIERS. THE GENERAL CONTRACTOR, MECHANICAL CONTRACTOR, ALL DIVISION 22 AND 23 SUB-CONTRACTORS, AND THE ELECTRICAL CONTRACTOR, DIVISION 26 & 28, SHALL BE RESPONSIBLE FOR COOPERATING, AND COORDINATING THEIR WORK, WITH THE COMMISSIONING AGENCY. EACH SHALL ALSO BE RESPONSIBLE FOR CARRYING OUT ALL THE PHYSICAL ACTIVITIES REQUIRED FOR INSTALLATION OF COMPONENTS AND SYSTEMS AND FOR OPERATING THEM DURING THE COMMISSIONING PROCESS AS REQUIRED BY THE PROJECT SPECIFICATIONS. 4. COMMISSIONING PLAN THE PROJECT COMMISSIONING PLAN SHALL BE DEVELOPED BY THE COMMISSIONING AGENCY AND SHALL INCLUDE THE FOLLOWING: A. A NARRATIVE DESCRIPTION OF THE ACTIVITIES THAT WILL BE ACCOMPLISHED DURING EACH PHASE OF COMMISSIONING, INCLUDING THE PERSONNEL INTENDED TO ACCOMPLISH EACH OF THE ACTIVITIES. B. A LISTING OF THE SPECIFIC EQUIPMENT OR SYSTEMS TO BE TESTED AND A DESCRIPTION OF THE TESTS TO BE PERFORMED. C. FUNCTIONS TO BE TESTED INCLUDING CALIBRATIONS AND ECONOMIZER CONTROLS. OTHER TEST LISTED ON THE CONSTRUCTION DOCUMENTS. D. CONDITIONS UNDER WHICH THE TEST WILL BE PERFORMED. TESTING SHALL AFFIRM WINTER AND SUMMER DESIGN CONDITIONS AND FULL OUTSIDE AIR CONDITIONS. E. MEASURABLE CRITERIA FOR PERFORMANCE. REFER TO PROJECT SPECIFICATIONS FOR ADDITIONAL COMMISSIONING PLAN REQUIREMENTS. 5. PROJECT CLOSEOUT PROCEDURES CONTRACTOR SHALL BE AWARE THAT ALL SYSTEMS SHOULD HAVE TEST AND BALANCE WORK COMPLETED PRIOR TO THE ONSET OF MECHANICAL SYSTEMS COMMISSIONING. CONTRACTOR SHALL BE FURTHER AWARE THAT MECHANICAL AND PLUMBING FINAL INSPECTIONS SHALL NOT OCCUR PRIOR TO COMPLETION, SUBMISSION AND ACCEPTANCE OF A PRELIMINARY COMMISSIONING REPORT. 6. REQUIRED DOCUMENTS THE FOLLOWING DOCUMENTS SHALL BE PROVIDE TO THE BUILDING OWNER WITHIN 90 DAYS OF THE RECEIPT OF THE CERTIFICATE OF OCCUPANCY. A. FINAL AS BUILT DRAWINGS B. OPERATING AND MAINTENANCE MANUALS C. FINAL CERTIFIED TEST AND BALANCE REPORT D. FINAL COMMISSIONING REPORT		
ACCESS DOOR				DUCT SMOKE DETECTOR	AFMS	AIR FLOW MEASURING STATION	MIN	MINIMUM				
BACKDRAFT DAMPER				CARBON DIOXIDE SENSOR	AMB	AMBIENT	MVD	MOTORIZED VOLUME DAMPER				
FIRE DAMPER				NEW CONNECTION TO EXISTING	APD	AIR PRESSURE DROP	MW	MAKE UP WATER				
FLEXIBLE CONNECTION				HUMIDISTAT	BD	BLOWDOWN	NC	NORMALLY CLOSED				
MOTORIZED DAMPER				RELATIVE HUMIDITY SENSOR	BF	BLIND FLANGE	NK	NECK				
CONTROL DAMPER				THERMOSTAT OR TEMPERATURE SENSOR (MOUNT 48" AFF)	BFP	BACKFLOW PREVENTER	NO	NORMALLY OPEN OR NUMBER				
VOLUME DAMPER, MANUAL				TIME CLOCK	BFV	BUTTERFLY VALVE	NTS	NOT TO SCALE				
DUCT ELBOW WITH TURNING VANES				FREEZESTAT	BHP	BRAKE HORSEPOWER	OA	OUTSIDE AIR				
DUCT SECTION - SUPPLY AIR				DIFFUSER, GRILLE OR REGISTER MARK	BLV	BALANCING VALVE	ODB	OPPOSED BLADE DAMPER				
DUCT SECTION - EXHAUST AIR				AIR FLOW (CFM)	BOD	BOTTOM OF DUCT						
DUCT SECTION - RETURN, OUTSIDE, OR RELIEF AIR				RECTANGULAR FACE SIZE (WHERE APPLICABLE)	BOP	BOTTOM OF PIPE						
DUCT, INCLINED DROP				IDENTIFYING NUMBER OR LETTER FOR SECTIONS.	BOS	BOTTOM OF STEEL						
DUCT, INCLINED RISE				IDENTIFYING NUMBER OR LETTER FOR DETAILS.	BV	BALL VALVE						
FLEXIBLE DUCT - ROUND				NUMBER OF REFERENCE DRAWING WHERE SECTION IS SHOWN.	CAP	CAPACITY						
DUCT TRANSITION				ENLARGED DETAIL REFERENCE	CCMS	CENTRAL CONTROL MONITORING SYSTEM	PD	PRESSURE DROP				
DUCT TRANSITION (SQUARE OR RECTANGULAR TO ROUND)				MATCHLINE	CENT	CENTRIFUGAL	PH	PHASE				
RECTANGULAR DUCT, SIZE IN INCHES, FIRST DIMENSION IS SIDE SHOWN (NET CLEAR INSIDE DIMENSION)				FABRIC DUCT	CMBST	COMBUSTION AIR	PI	PRESSURE INDICATOR				
ROUND DUCT, DIAMETER IN INCHES (NET CLEAR INSIDE DIMENSION)				METAL DUCT	CL	CENTERLINE	PRV	PRESSURE RELIEF VALVE				
AIR FLOW IN DIRECTION OF ARROW					CV	CONTROL VALVE OR CONSTANT VOLUME	PS	PRESSURE SAFETY VALVE				
45° BRANCH TAKE-OFFS					CHWS	CHILLED WATER SUPPLY	PTRV	PRESSURE TEMPERATURE RELIEF VALVE				
CONICAL LATERAL BRANCH TAKE-OFFS					CHWR	CHILLED WATER RETURN	PV	PLUG VALVE				
CEILING SUPPLY DIFFUSERS					D	DIFFUSER OR DAMPER	PCW	PRIMARY CHILLED WATER				
CEILING RETURN GRILLE/REGISTER					DB	DRY BULB	PCWS	PRIMARY CHILLED WATER SUPPLY				
CEILING EXHAUST FAN (EF-)					DEG	DEGREES	PCWR	PRIMARY CHILLED WATER RETURN				
CEILING EXHAUST GRILLE/REGISTER					DIA	DIAMETER	PCWP	PRIMARY CHILLED WATER PUMP				
SIDEWALL SUPPLY GRILLE/REGISTER					DN	DOWN						
SIDEWALL RETURN/EXHAUST GRILLE/REGISTER					DX	DIRECT EXPANSION						
EXTRACTOR					EAT	ENTERING AIR TEMPERATURE	RED	REDUCER				
DUCT TEE WITH SPLITTER DAMPER					EDB	ENTERING DRYBULB TEMPERATURE	REG	REGISTER				
DOOR UNDERCUT					EFF	EFFICIENCY	RH	RELATIVE HUMIDITY				
DOOR LOUVER					ENT	ENTERING	RPM	REVOLUTIONS PER MINUTE				
					ESP	EXTERNAL STATIC PRESSURE						
					EWB	ENTERING WET BULB						
					EWI	ENTERING WATER TEMPERATURE						
					FCV	FLOW CONTROL VALVE	SA	SUPPLY AIR				
					FLA	FULL LOAD AMP	SENS	SENSIBLE				
					FLEX	FLEXIBLE	SL	SOUND LINING				
					FM	FLOW METER	SD	SMOKE DETECTOR				
					FWL	FIXED WALL LOUVER	SOV	SOLENOID OPERATED VALVE OR SHUT-OFF VALVE				
					GR	GRILLE	SP	STATIC PRESSURE				
					GV	GATE VALVE	SS	STAINLESS STEEL				
					HZ	CYCLES PER SECOND (HERTZ)	SCW	SECONDARY CHILLED WATER				
					KW	KILOWATT	SOWS	SECONDARY CHILLED WATER SUPPLY				
					LAT	LEAVING AIR TEMPERATURE	SCWR	SECONDARY CHILLED WATER RETURN				
					LDB	LEAVING DRYBULB TEMPERATURE	SCWP	SECONDARY CHILLED WATER PUMP				
					LWT	LEAVING WATER TEMPERATURE						
							WB	WET BULB				
							WPD	WATER PRESSURE DROP				
							WTR	WATER				
							WtHxL	WIDTH BY HEIGHT BY LENGTH				
AIRFLOW DIAGRAM SYMBOLS					EQUIPMENT ABBREVIATIONS							
				COOLING COIL	AHU	AIR HANDLING UNIT	FCCU	FAN COIL CONDENSING UNIT				
				HEATING COIL	ACU	AIR CONDENSING UNIT	FPB	FAN POWER BOX				
				LOUVER	ACCU	AIR COOLED CONDENSING UNIT	GFUH	GAS FIRED UNIT HEATER				
				BACKDRAFT DAMPER	AS	AIR SEPARATOR	HC	HOT WATER HEATING COIL				
				FAN	B	BOILER	HWP	HOT WATER PUMP				
				FAN WITH ADJUSTABLE FREQUENCY MOTOR CONTROLLER	BCU	BLOWER COIL UNIT	OAH	OUTSIDE AIR HOOD				
				FIRE/SMOKE DAMPER	CC	COOLING COIL	L	LOUVER				
				AIR FLOW MEASURING STATION	CF	CHEMICAL FEEDER	P	PUMP				
					CH	CHILLER	PP	PRIMARY PUMP				
					CP	CONDENSOR PUMP	PTAC	PACKAGE TERMINAL AIR CONDITIONING				
					CRAC	COMPUTER ROOM AIR CONDITIONER	RH	RELIEF HOOD				
					CRCU	COMPUTER ROOM CONDENSING UNIT	RHEF	RELIEF HOOD EXHAUST FAN				
					CT	COOLING TOWER	RTU	ROOF TOP UNIT				
					CWP	CHILLED WATER PUMP	SDB	SINGLE DUCT BOX				
					EDH	ELECTRIC DUCT HEATER	SP	SECONDARY PUMP				
					DC	DUST COLLECTOR	ST	CHILLED WATER STORAGE TANK				
					EF	EXHAUST FAN	VAV	VARIABLE AIR VOLUME BOX				
					EH	ELECTRIC HEATER	VFD	VARIABLE FREQUENCY DRIVE				
					ET	EXPANSION TANK						
					F	FILTER						
					FCU	FAN COIL UNIT						

1. COMMISSIONING AGENCY
A COMMISSIONING AGENCY WILL BE CONTRACTED DIRECTLY WITH AND BY THE OWNER FOR THIS PROJECT. THE COMMISSIONING AGENCY HAS OVERALL RESPONSIBILITY FOR PLANNING AND COORDINATING THE COMMISSIONING PROCESS. HOWEVER, COMMISSIONING INVOLVES ALL PARTIES TO THE DESIGN AND CONSTRUCTION PROCESS, INCLUDING THE CONTRACTOR.

2. CONTRACTOR RESPONSIBILITY
THE MECHANICAL SPECIFICATIONS DEFINES THE CONTRACTOR'S RESPONSIBILITIES WITH RESPECT TO THE COMMISSIONING PROCESS. EACH CONTRACTOR AND SUB-CONTRACTOR SHALL REVIEW THE SPECIFICATION SECTIONS, AND SHALL INCLUDE IN THEIR BIDS FOR CARRYING OUT THE WORK DESCRIBED, AS IT APPLIES TO EACH DIVISION AND SECTION OF THOSE SPECIFICATIONS, INDIVIDUALLY AND COLLECTIVELY.

3. DESCRIPTION OF WORK
THE PURPOSE OF THE COMMISSIONING PROCESS IS TO PROVIDE THE OWNER/OPERATOR OF THE FACILITY WITH ASSURANCE THAT THE BUILDING ENVELOPE, MECHANICAL, PLUMBING, AND ELECTRICAL SYSTEMS HAVE BEEN INSTALLED ACCORDING TO THE CONTRACT DOCUMENTS, AND OPERATE WITHIN THE PERFORMANCE GUIDELINES SET OUT IN THE DESIGN INTENT DOCUMENTS AND THE SPECIFICATIONS. THE COMMISSIONING AGENCY WILL PROVIDE THE OWNER WITH AN UNBIASED, OBJECTIVE VIEW OF THE SYSTEM'S INSTALLATION, OPERATION, AND PERFORMANCE. THE COMMISSIONING PROCESS DOES NOT TAKE AWAY OR REDUCE THE RESPONSIBILITY OF THE INSTALLING CONTRACTORS TO PROVIDE A FINISHED PRODUCT THAT IS INSTALLED AND FULLY FUNCTIONAL IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. COMMISSIONING IS INTENDED TO ENHANCE THE QUALITY OF SYSTEM START-UP AND AID IN THE ORDERLY COMPLETION AND TRANSFER OF SYSTEMS FOR BENEFICIAL USE BY THE OWNER. THE COMMISSIONING AGENCY WILL BE THE LEADER OF THE COMMISSIONING TEAM, PLANNING AND COORDINATING ALL COMMISSIONING ACTIVITIES IN CONJUNCTION WITH THE DESIGN PROFESSIONALS, SUBCONTRACTORS, MANUFACTURERS AND EQUIPMENT SUPPLIERS. THE GENERAL CONTRACTOR, MECHANICAL CONTRACTOR, ALL DIVISION 22 AND 23 SUB-CONTRACTORS, AND THE ELECTRICAL CONTRACTOR, DIVISION 26 & 28, SHALL BE RESPONSIBLE FOR COOPERATING, AND COORDINATING THEIR WORK, WITH THE COMMISSIONING AGENCY. EACH SHALL ALSO BE RESPONSIBLE FOR CARRYING OUT ALL THE PHYSICAL ACTIVITIES REQUIRED FOR INSTALLATION OF COMPONENTS AND SYSTEMS AND FOR OPERATING THEM DURING THE COMMISSIONING PROCESS AS REQUIRED BY THE PROJECT SPECIFICATIONS.

4. COMMISSIONING PLAN
THE PROJECT COMMISSIONING PLAN SHALL BE DEVELOPED BY THE COMMISSIONING AGENCY AND SHALL INCLUDE THE FOLLOWING:
A. A NARRATIVE DESCRIPTION OF THE ACTIVITIES THAT WILL BE ACCOMPLISHED DURING EACH PHASE OF COMMISSIONING, INCLUDING THE PERSONNEL INTENDED TO ACCOMPLISH EACH OF THE ACTIVITIES.
B. A LISTING OF THE SPECIFIC EQUIPMENT OR SYSTEMS TO BE TESTED AND A DESCRIPTION OF THE TESTS TO BE PERFORMED.
C. FUNCTIONS TO BE TESTED INCLUDING CALIBRATIONS AND ECONOMIZER CONTROLS. OTHER TEST LISTED ON THE CONSTRUCTION DOCUMENTS.
D. CONDITIONS UNDER WHICH THE TEST WILL BE PERFORMED. TESTING SHALL AFFIRM WINTER AND SUMMER DESIGN CONDITIONS AND FULL OUTSIDE AIR CONDITIONS.
E. MEASURABLE CRITERIA FOR PERFORMANCE.

5. PROJECT CLOSEOUT PROCEDURES
CONTRACTOR SHALL BE AWARE THAT ALL SYSTEMS SHOULD HAVE TEST AND BALANCE WORK COMPLETED PRIOR TO THE ONSET OF MECHANICAL SYSTEMS COMMISSIONING. CONTRACTOR SHALL BE FURTHER AWARE THAT MECHANICAL AND PLUMBING FINAL INSPECTIONS SHALL NOT OCCUR PRIOR TO COMPLETION, SUBMISSION AND ACCEPTANCE OF A PRELIMINARY COMMISSIONING REPORT.

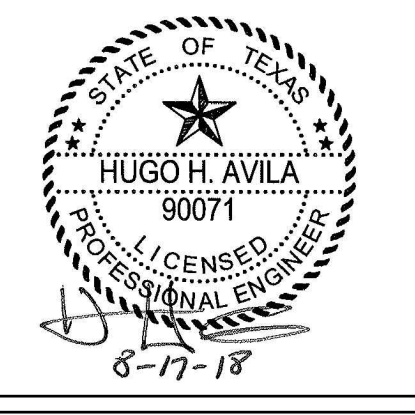
6. REQUIRED DOCUMENTS
THE FOLLOWING DOCUMENTS SHALL BE PROVIDED TO THE BUILDING OWNER WITHIN 90 DAYS OF THE RECEIPT OF THE CERTIFICATE OF OCCUPANCY.
A. FINAL AS BUILT DRAWINGS
B. OPERATING AND MAINTENANCE MANUALS
C. FINAL CERTIFIED TEST AND BALANCE REPORT
D. FINAL COMMISSIONING REPORT

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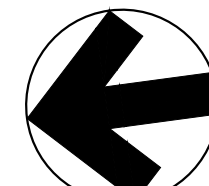
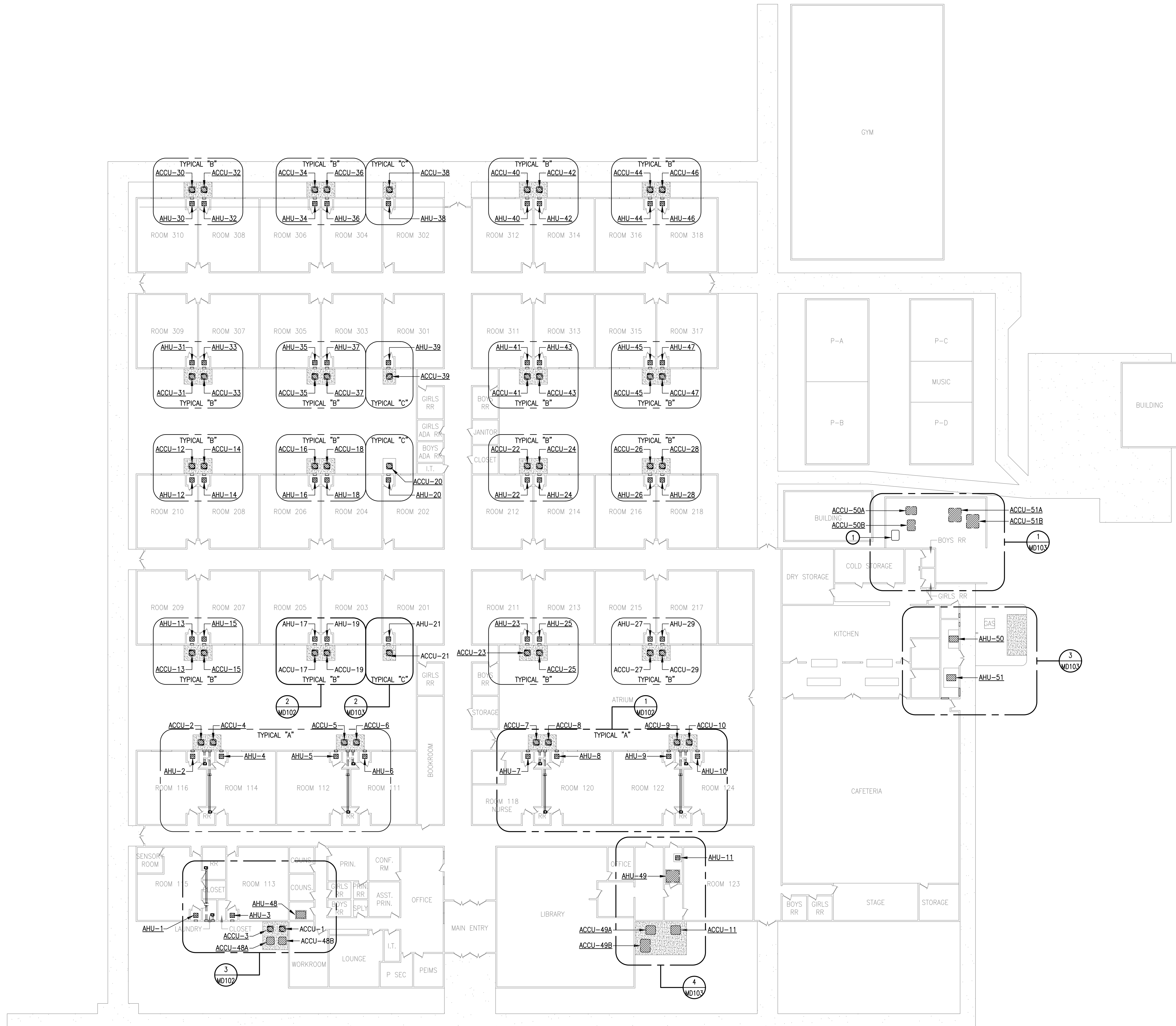
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MECHANICAL GENERAL LEGEND

M001
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1 MECHANICAL OVERALL DEMOLITION PLAN

SCALE: 1"=20'

GENERAL NOTES:

A. REFER TO M001 FOR MECHANICAL GENERAL NOTES.

LEGEND

----- EXISTING MECHANICAL EQUIPMENT TO BE DEMOLISHED
————— EXISTING MECHANICAL EQUIPMENT TO REMAIN

KEY NOTES:

1. EXISTING UNIT TO REMAIN

GENERAL DEMO NOTES

- A. INFORMATION ON THE PLAN HAS BEEN OBTAINED FROM EXISTING DRAWINGS AND SITE SURVEY. CONTRACTOR SHALL VERIFY EXISTING CONDITIONS PRIOR TO COMMENCING WORK. ANY DISCREPANCIES BETWEEN EXISTING CONDITIONS AND CONSTRUCTION DOCUMENTS SHALL BE REPORTED IMMEDIATELY TO THE ENGINEER.
- B. THE CONTRACTOR IS FULLY RESPONSIBLE FOR PERFORMING THE DEMOLITION WORK UNDER THIS SECTION OF THE PROJECT IN FULL COMPLIANCE WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL CODES. IF THE CONTRACTOR DETERMINES THAT THE CONTRACT DOCUMENTS AND PLANS ARE NOT IN COMPLIANCE WITH THE APPLICABLE CODES, HE SHALL INFORM THE ENGINEER PRIOR TO CONSTRUCTION START FOR DIRECTION. FAILURE TO DO SO SHALL NOT RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITY TO MEET CODE REQUIREMENTS AND REWORK SHALL BE AT CONTRACTOR'S EXPENSE. APPLICABLE CODES AND STANDARDS ON DEMOLITION WORK SHALL INCLUDE THOSE PUBLISHED BY OSHA AND EPA. AN ASBESTOS SURVEY SHALL BE KEPT ON SITE AT ALL TIMES PER TEXAS DEPARTMENT OF HEALTH REQUIREMENTS.
- C. ALL DUST PRODUCTION, SMOKE PRODUCTION AND NOISE SHALL BE SUBJECT TO REAL TIME REVIEW BY THE ENGINEER. WORK SHALL BE SHUT DOWN DURING CRITICAL ACTIVITIES BY FORMAL REQUEST FROM THE DESIGNATED AUTHORITY OR CONTRACTING ENGINEER. WORK IN DUSTY AREAS SHALL BE CONTROLLED WITH TEMPORARY PARTITIONS. FLAME CUTTING SHALL BE MINIMIZED TO ELIMINATE SMOKE PRODUCTION. PROVIDE FIRE EXTINGUISHERS IN THE IMMEDIATE AREA.
- D. GENERAL CONTRACTOR SHALL BE ADVISED OF ALL NEW PROPOSED ROOF AND WALL OPENINGS BY ANY SUB-CONTRACTOR.
- E. ON ANY WORK SHOWN ON MECHANICAL DRAWINGS WHICH REQUIRES DEMOLITION OF BUILDING STRUCTURES AND FINISHES, IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO COMPLETE THE NECESSARY DEMOLITION. CONTRACTOR SHALL PATCH AND REPAIR ALL BUILDING DAMAGE CREATED BY DEMOLITION WORK. PATCHING SHALL BE COMPLETED WITH THE SAME MATERIALS AS THE SURROUNDING AREAS, OR WITH APPROVED PATCHING MATERIALS.
- F. ALL OPENINGS CUT IN MASONRY AND PLASTER WALLS OR CONCRETE FLOORS SHALL BE CORE-DRILLED OR SAWED WHEN POSSIBLE. CONTRACTOR SHALL CHECK BUILDING CONSTRUCTION WITH STRUCTURAL ENGINEER BEFORE MAKING PENETRATIONS TO AVOID CUTTING THROUGH STRUCTURAL BEAMS AND REINFORCING. CONTRACTOR SHALL INFORM THE ENGINEER IF REINFORCING IS CUT OR DAMAGED WHILE MAKING OPENINGS AS REQUIRED BY DRAWINGS AND SPECIFICATIONS. PATCH AND SEAL OPENINGS WITH 8000 PSI CEMENT GROUT. INSTALL DECORATIVE TRIM (EQUIPMENT FLANGES, FRAMING, OR ESCUTCHEONS) AROUND OPENINGS IN FINISHED AREAS. COORDINATE ALL CUTTING AND PATCHING WITH THE OTHER TRADES.
- G. ALL SURFACES COVERED BY "SPRAY POLY" AND PROTECTED BY TEMPORARY PARTITIONS SHALL REMOVE THE PROTECTIVE BARRIERS ONLY AFTER THE NEW EQUIPMENT PIPING AND DUCTWORK IS INSTALLED. PATCH AND MAINTAIN THE PROTECTIVE BARRIERS DURING CONSTRUCTION. COVER ALL EQUIPMENT OPENINGS WITH 4 MIL. POLY AND DUCT TAPE IN PLACE.
- H. ALL NEW ROOF PENETRATIONS SHALL BE ROUTED THRU ANY EXISTING OPENING WHEREVER POSSIBLE. LARGER AND NEW OPENINGS SHALL BE KEPT TO A MINIMUM.
- I. CONTRACTOR SHALL REMOVE AND RETURN ANY AND ALL EXISTING EQUIPMENT/MATERIALS TO OWNER. OWNER SHALL HAVE FULL RIGHT OF OWNERSHIP UNLESS SPECIFIED OTHERWISE. IF THE OWNER WAIVES THIS OPTION, ANY EQUIPMENT, MATERIAL, ETC SHALL BECOME THE PROPERTY OF THE CONTRACTOR.
- J. CONTRACTOR SHALL KEEP THE ENTIRE MEP DEMOLITION SITE CLEAN AT ALL TIMES.
- K. CONTRACTOR AND OWNER SHALL BE FULLY RESPONSIBLE TO IDENTIFY ANY AND ALL ASBESTOS PRESENT IN THE BUILDING PRIOR TO DEMOLITION AS REQUIRED BY LAW.
- L. COORDINATION AMONG OTHER CONSTRUCTION DISCIPLINES PRIOR TO DEMOLITION IS MANDATORY.
- M. CONTRACTOR SHALL IDENTIFY ALL WATER CONNECTION LINES, NATURAL GAS LINES AND SANITARY SEWER LINES PRIOR TO COMMENCING DEMOLITION WORK.

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TBP# FIRM #F-312

Revision No.	Date	Description

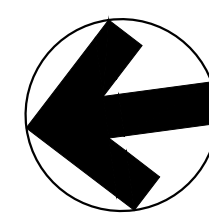
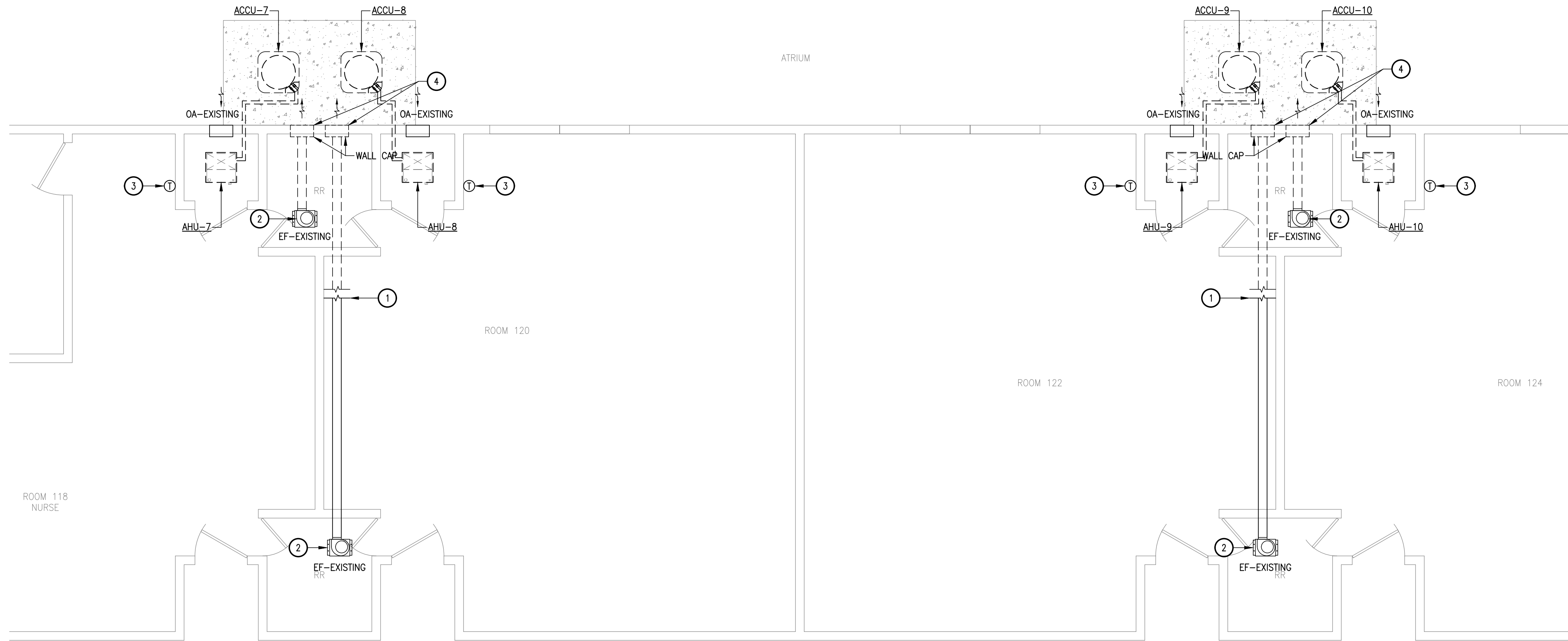


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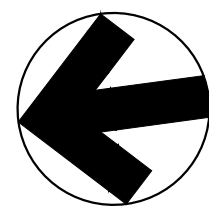
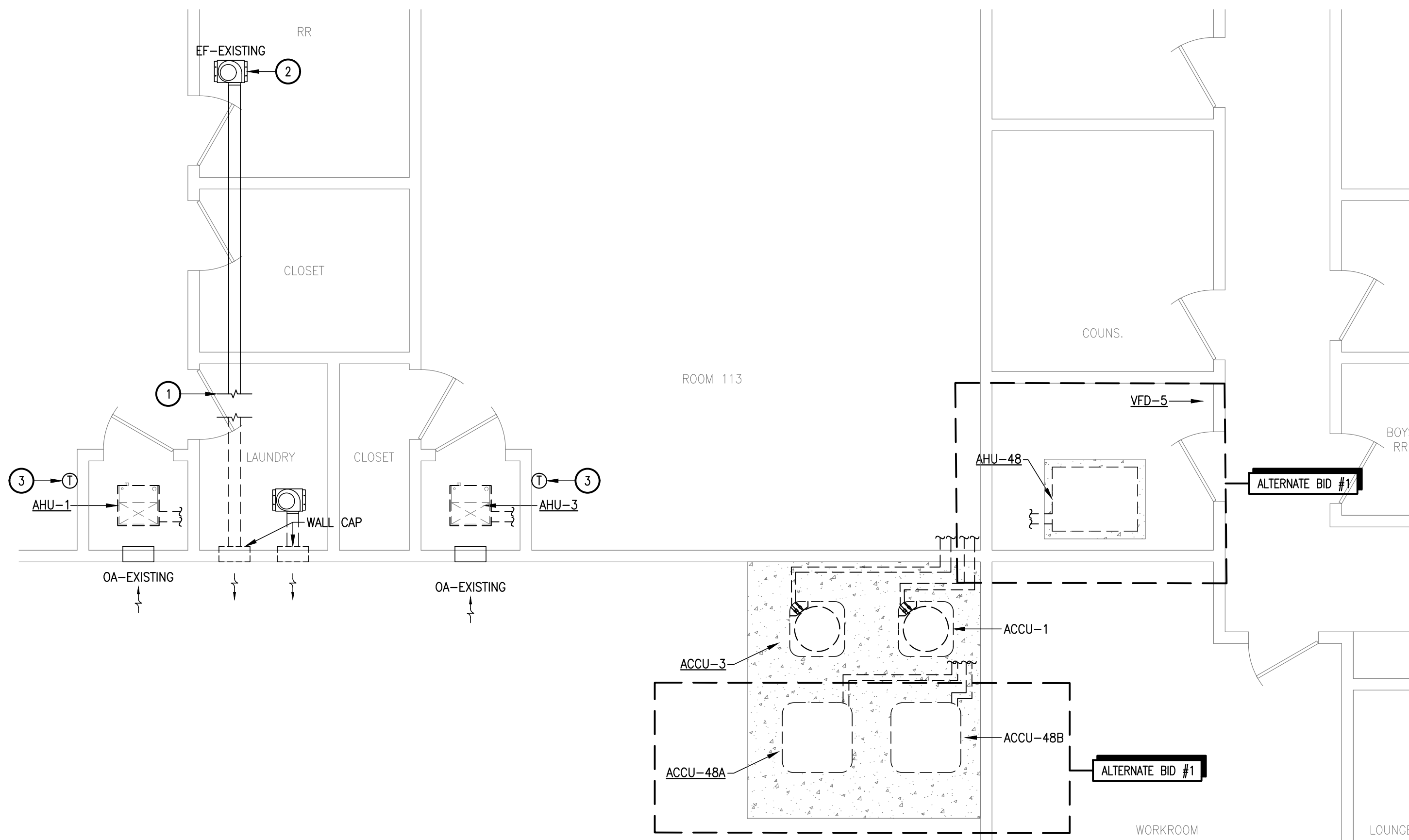
Project No.: 31981.005
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Drawn By: JB.KG
Checked By: HA
Scale: AS NOTED
Sheet Title
MECHANICAL OVERALL DEMOLITION PLAN

MD101
Sheet Number

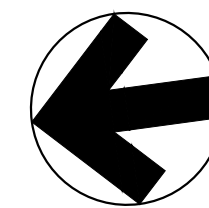
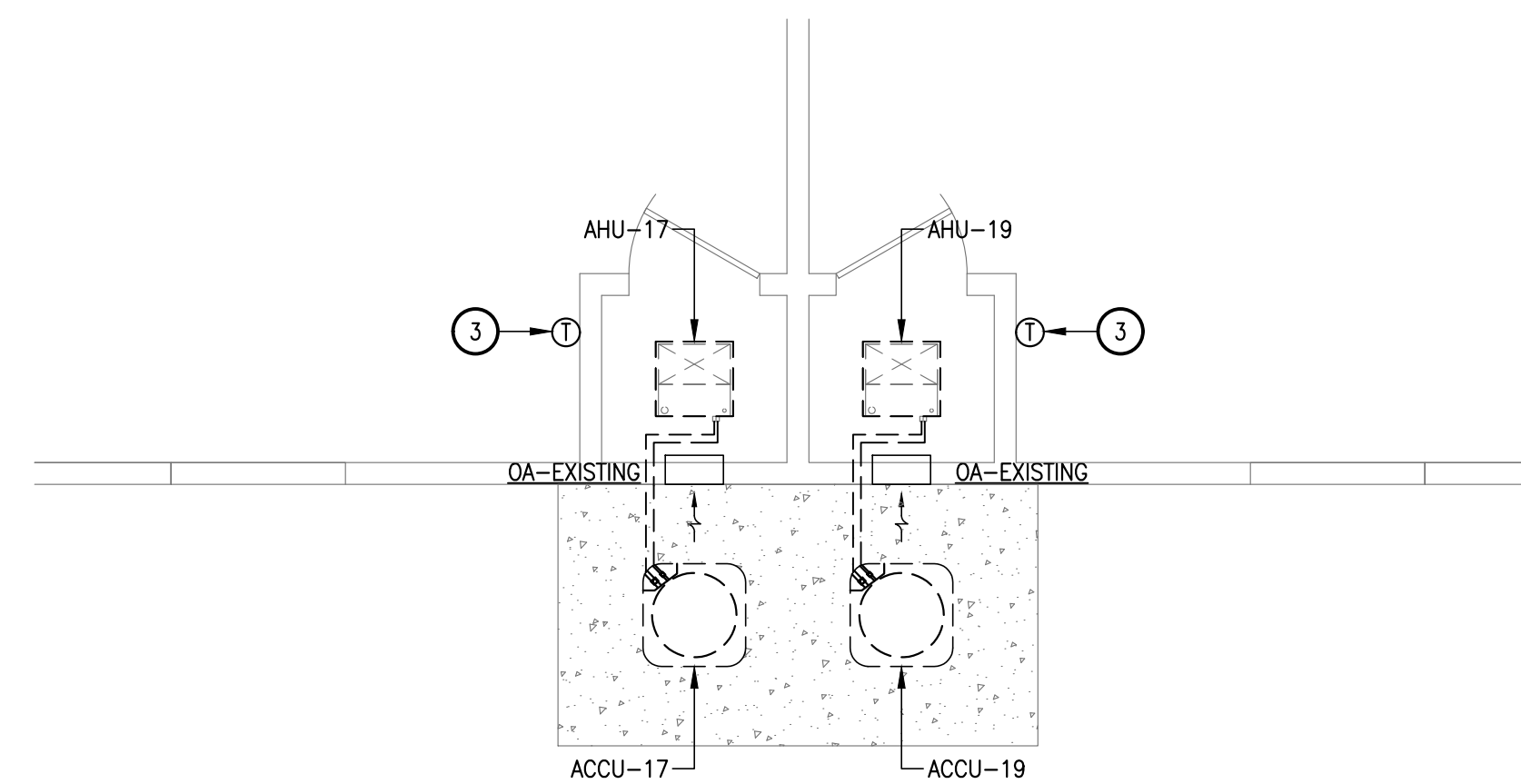
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1 MECHANICAL DEMOLITION PLAN -
TYPICAL CLASSROOM LAYOUT 'A'
SCALE: 1/4" = 1'-0"



3 MECHANICAL DEMOLITION PLAN - NORTH WEST
MECHANICAL YARD - ADMINISTRATION - RM 115 - RM 113
SCALE: 1/4" = 1'-0"



2 MECHANICAL DEMOLITION PLAN -
TYPICAL CLASSROOM LAYOUT 'B'
SCALE: 1/4" = 1'-0"

GENERAL NOTES:

- REFER TO M001 FOR MECHANICAL GENERAL NOTES.
- DEMOLISH REFERENCE LINES.

LEGEND

- EXISTING MECHANICAL EQUIPMENT TO BE DEMOLISHED
- EXISTING MECHANICAL EQUIPMENT TO REMAIN

KEY NOTES:

- CONTRACTOR SHALL DEMOLISH EXHAUST DUCT WORK TO THIS POINT.
- EXISTING EXHAUST FAN TO REMAIN.
- CONTRACTOR SHALL DEMOLISH EXISTING THERMOSTAT.
- CONTRACTOR SHALL PATCH OPENING TO MATCH EXISTING.

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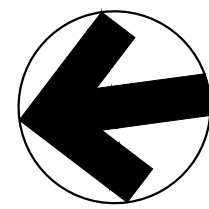


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Drawn By:	JB.KG
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Sheet Title	MECHANICAL DEMOLITION PLAN

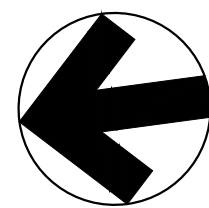
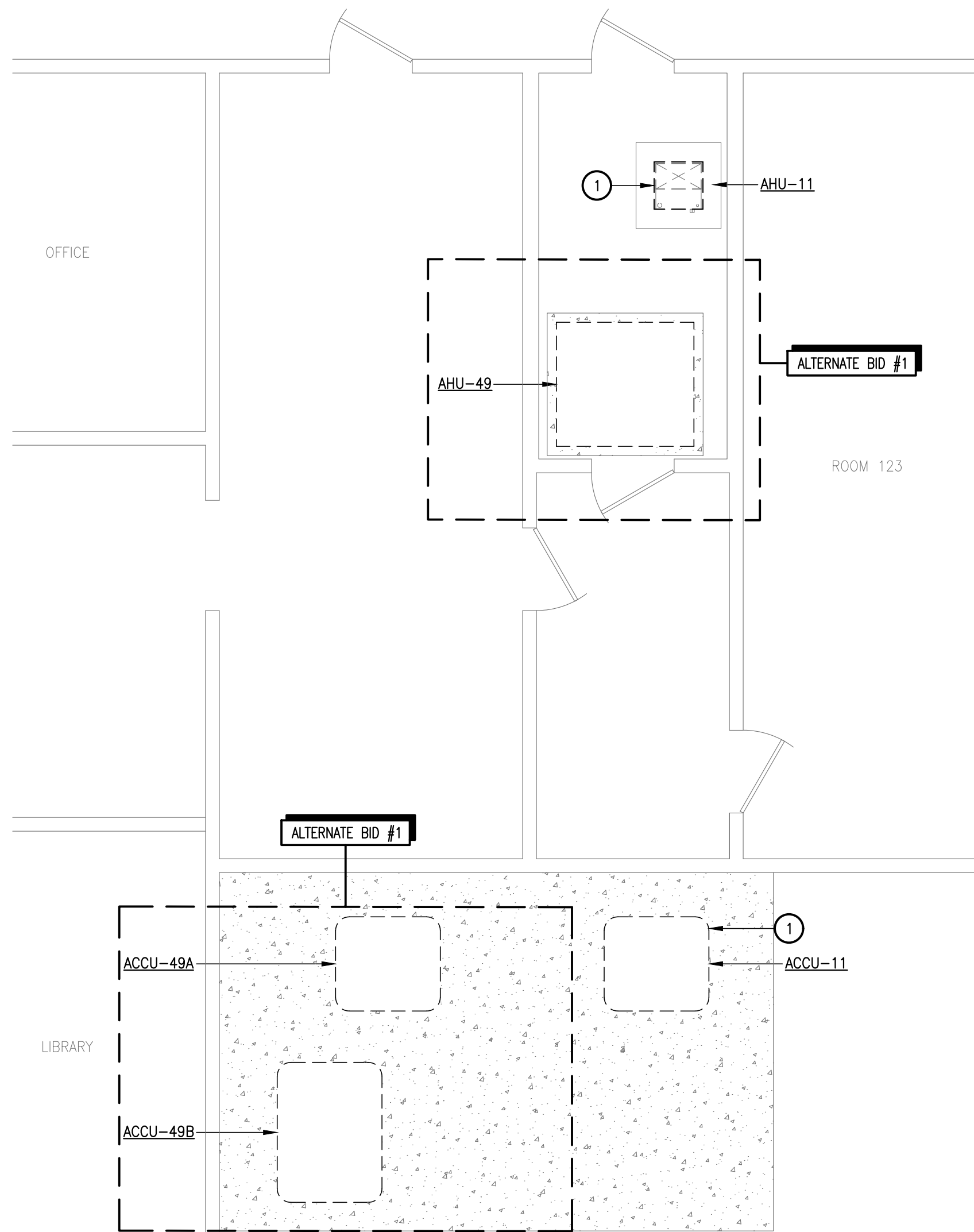
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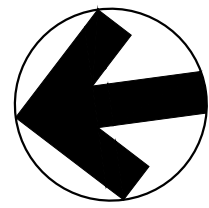
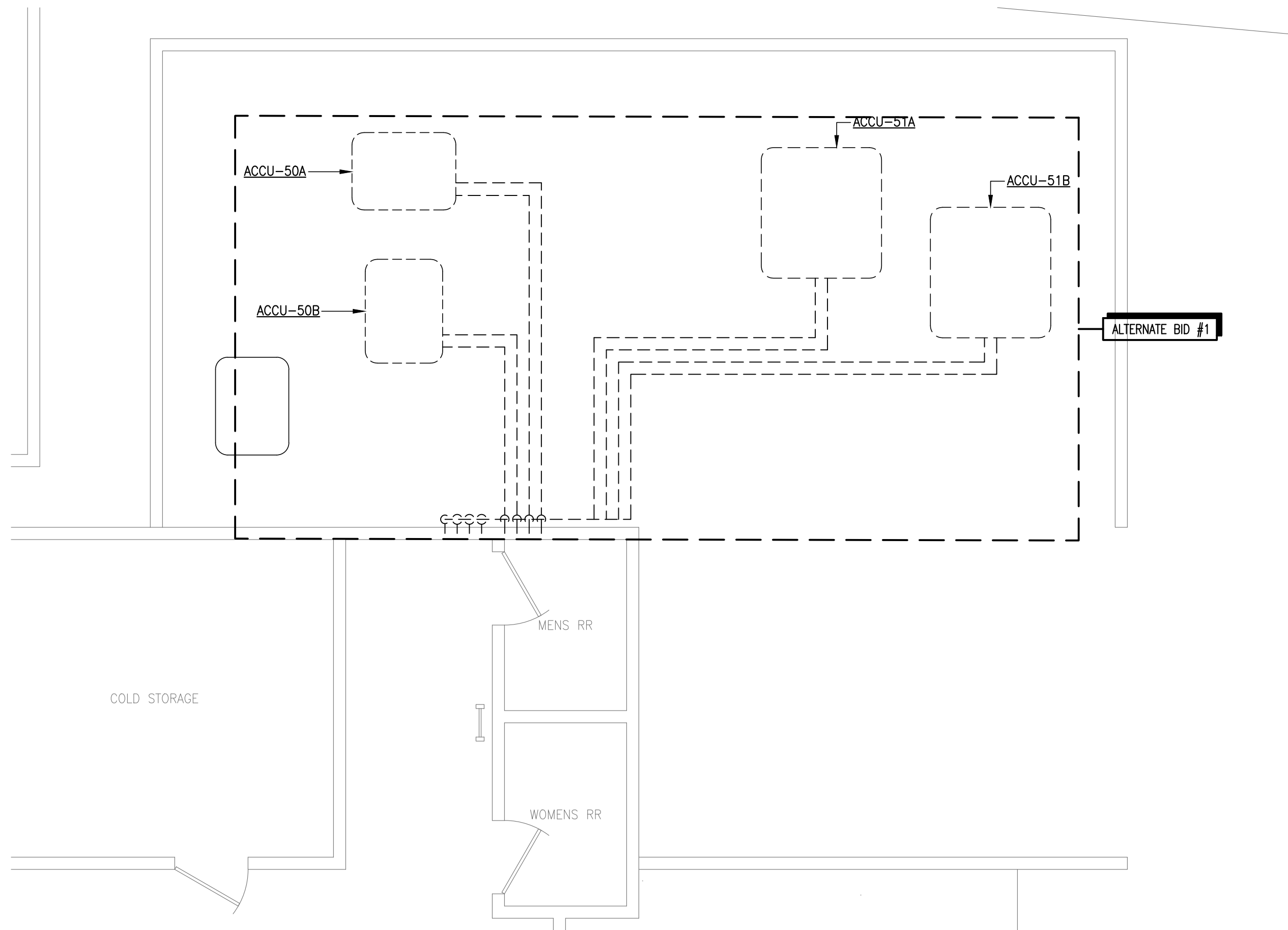
2 MECHNAICAL DEMOLITION PLAN - TYPICAL CLASSROOM LAYOUT 'C'

SCALE: 1/4" = 1'-0"



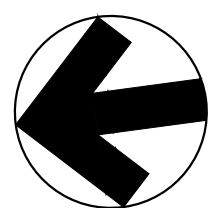
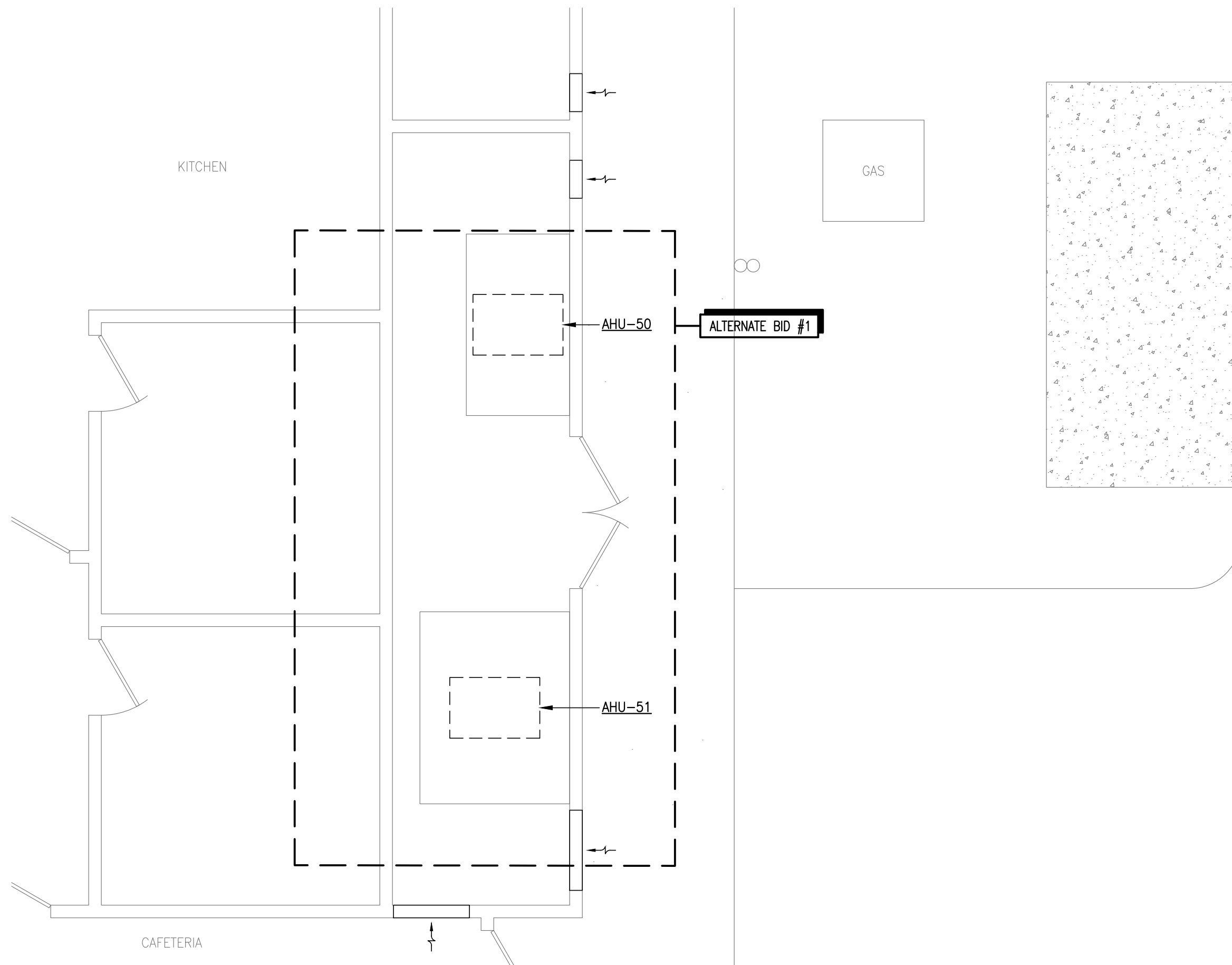
4 MECHANICAL DEMOLITION PLAN - SOUTH WEST MECHANICAL YARD & RM 123

SCALE: 1/4" = 1'-0"



1 MECHANICAL DEMOLITION PLAN - SOUTH MECHANICAL YARD

SCALE: 1/4" = 1'-0"



3 MECHANICAL DEMOLITION PLAN - SOUTH MECHANICAL ROOM

SCALE: 1/4" = 1'-0"

GENERAL NOTES:

- REFER TO M001 FOR MECHANICAL GENERAL NOTES.
- ROUTE CONDENSATE TO NEAREST DRAIN.
- EXTERIOR REFRIGERANT LINES SHALL BE JACKETED AND INSULATED WITH CELLULAR GLASS INSULATION.

LEGEND

- EXISTING MECHANICAL EQUIPMENT TO BE DEMOLISHED
- EXISTING MECHANICAL EQUIPMENT TO REMAIN

KEY NOTES: ①

- THIS WORK TO BE DONE UNDER BASE BID.
- CONTRACTOR SHALL DEMOLISH EXISTING THERMOSTAT.

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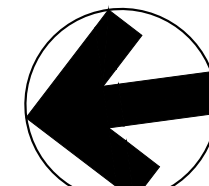
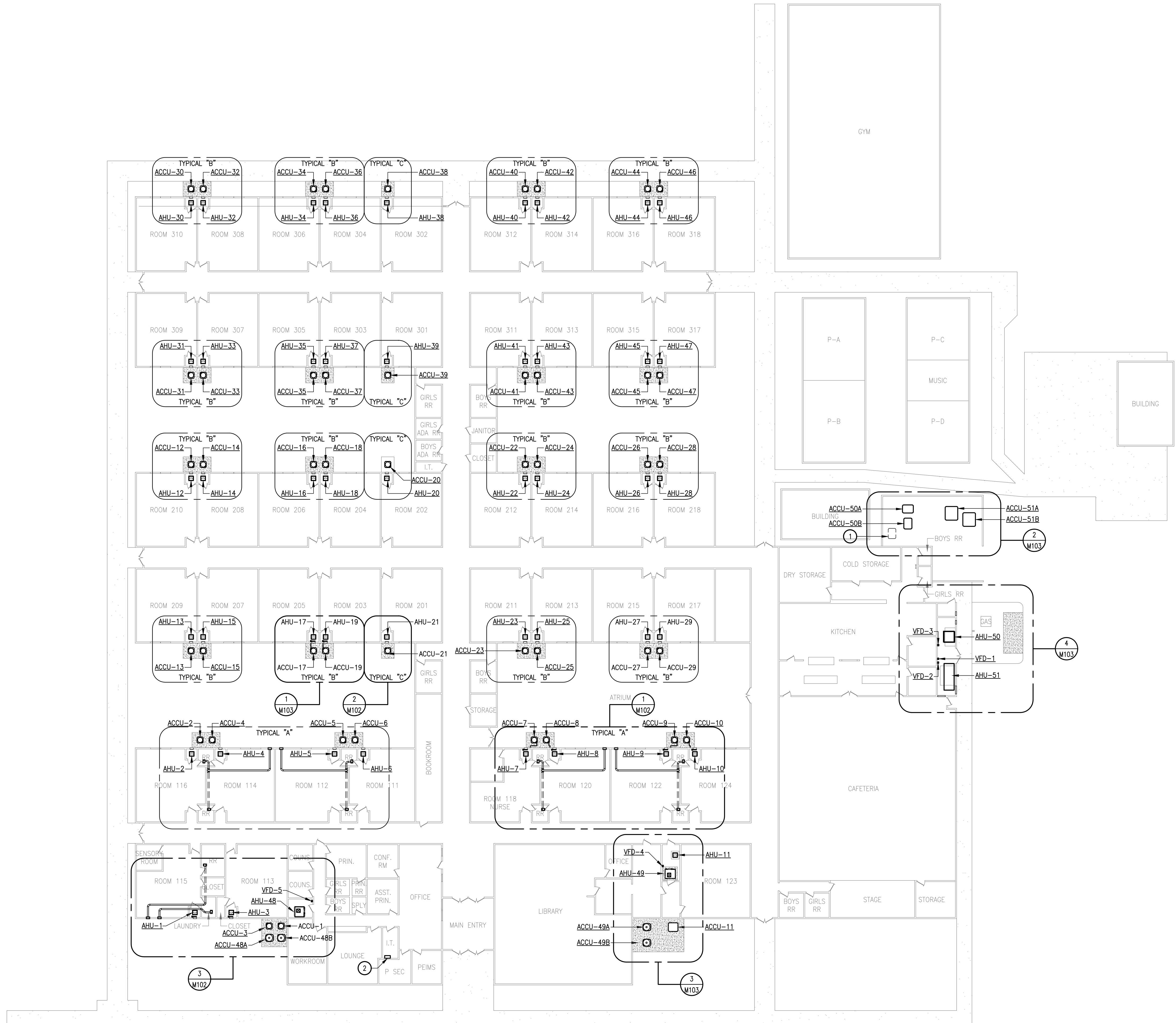


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Sheet Title	MECHANICAL DEMOLITION PLAN

MD103
Sheet Number

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1 MECHANICAL OVERALL PLAN

SCALE: 1"=20'

GENERAL NOTES:

A. REFER TO M001 FOR MECHANICAL GENERAL NOTES.

LEGEND

- EXISTING MECHANICAL EQUIPMENT TO REMAIN
- NEW MECHANICAL EQUIPMENT

KEY NOTES: ①

- EXISTING UNIT TO REMAIN
- NEW BAS CONTROLLER PROVIDED BY CONTRACTOR.

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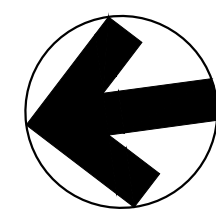
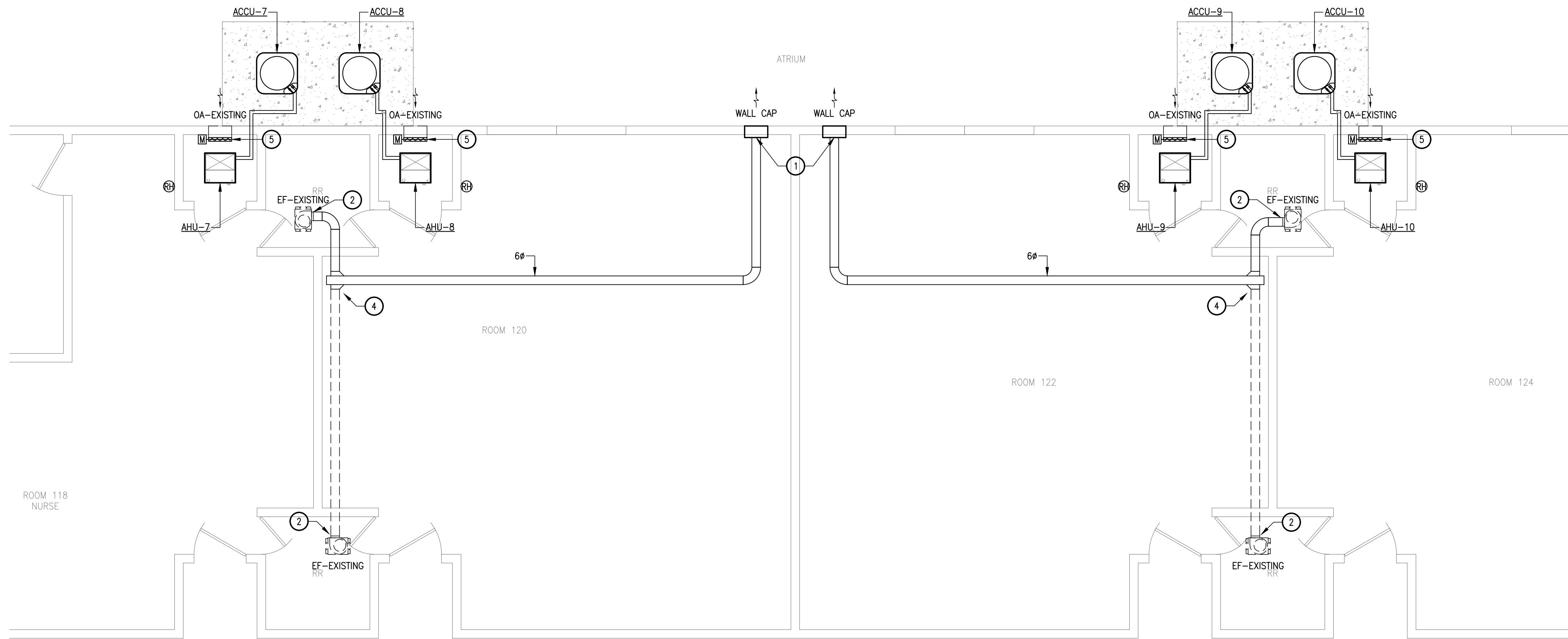


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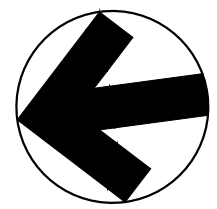
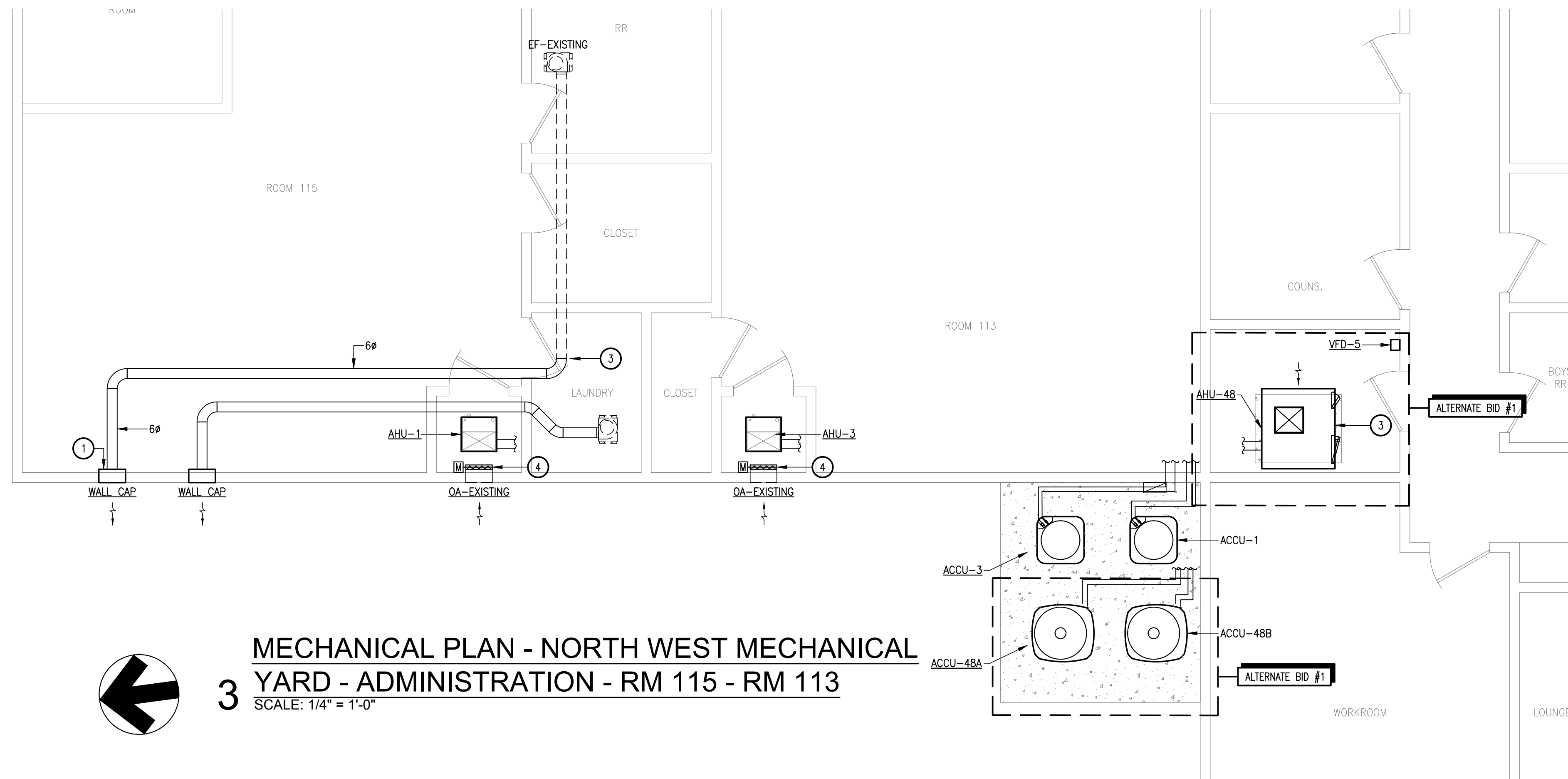
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Issued:	08/17/2018
Drawn By:	JB.KG
Checked By:	HA
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M101
Sheet Number

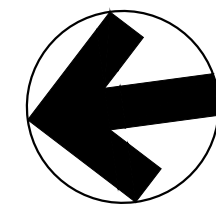
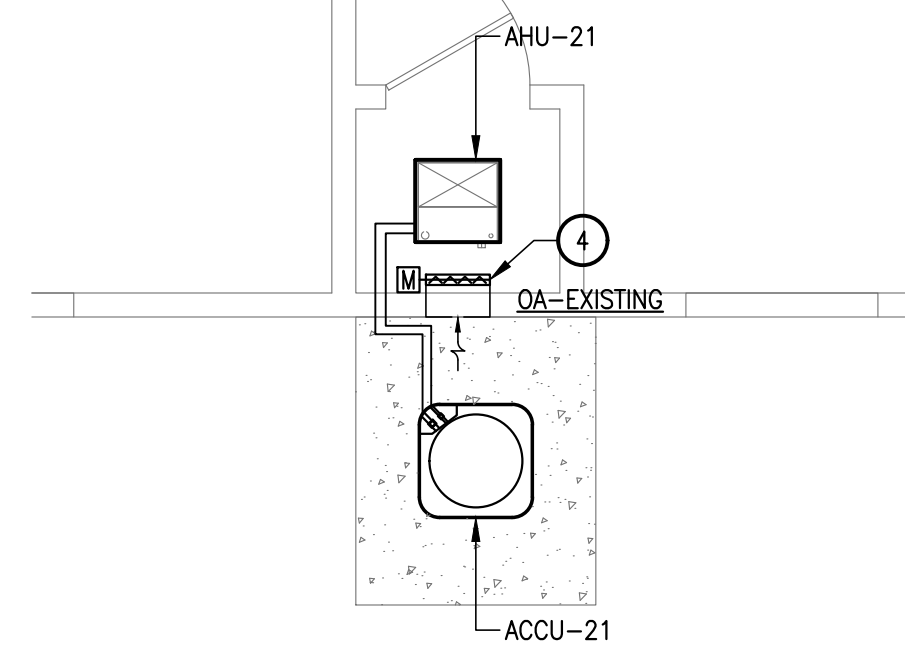
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1 MECHANICAL PLAN - TYPICAL
CLASSROOM LAYOUT 'A'
SCALE: 1/4" = 1'-0"



3 MECHANICAL PLAN - NORTH WEST MECHANICAL
YARD - ADMINISTRATION - RM 115 - RM 113
SCALE: 1/4" = 1'-0"



2 MECHANICAL PLAN - TYPICAL
CLASSROOM LAYOUT 'C'
SCALE: 1/4" = 1'-0"

GENERAL NOTES:

- REFER TO M001 FOR MECHANICAL GENERAL NOTES.
- ROUTE CONDENSATE TO NEAREST DRAIN.

LEGEND

- EXISTING MECHANICAL EQUIPMENT TO REMAIN
- NEW MECHANICAL EQUIPMENT

KEY NOTES: ①

- CONTRACTOR SHALL PROVIDE AND INSTALL WALL CAP EQUAL TO L.COOK WCA. WALL CAP SHALL BE A MINIMUM OF 10FT FROM AHU OUTSIDE AIR INTAKE.
- CONTRACTOR SHALL PROVIDE AND INSTALL BACKDRAFT DAMPER FOR CEILING MOUNTED EXHAUST FAN.
- CONTRACTOR SHALL CONNECT TO EXISTING DUCT.
- CONTRACTOR SHALL PROVIDE AND INSTALL MOTORIZED DAMPER ON OUTSIDE AIR INTAKE.

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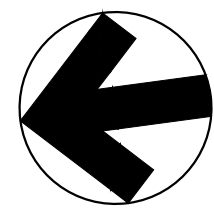
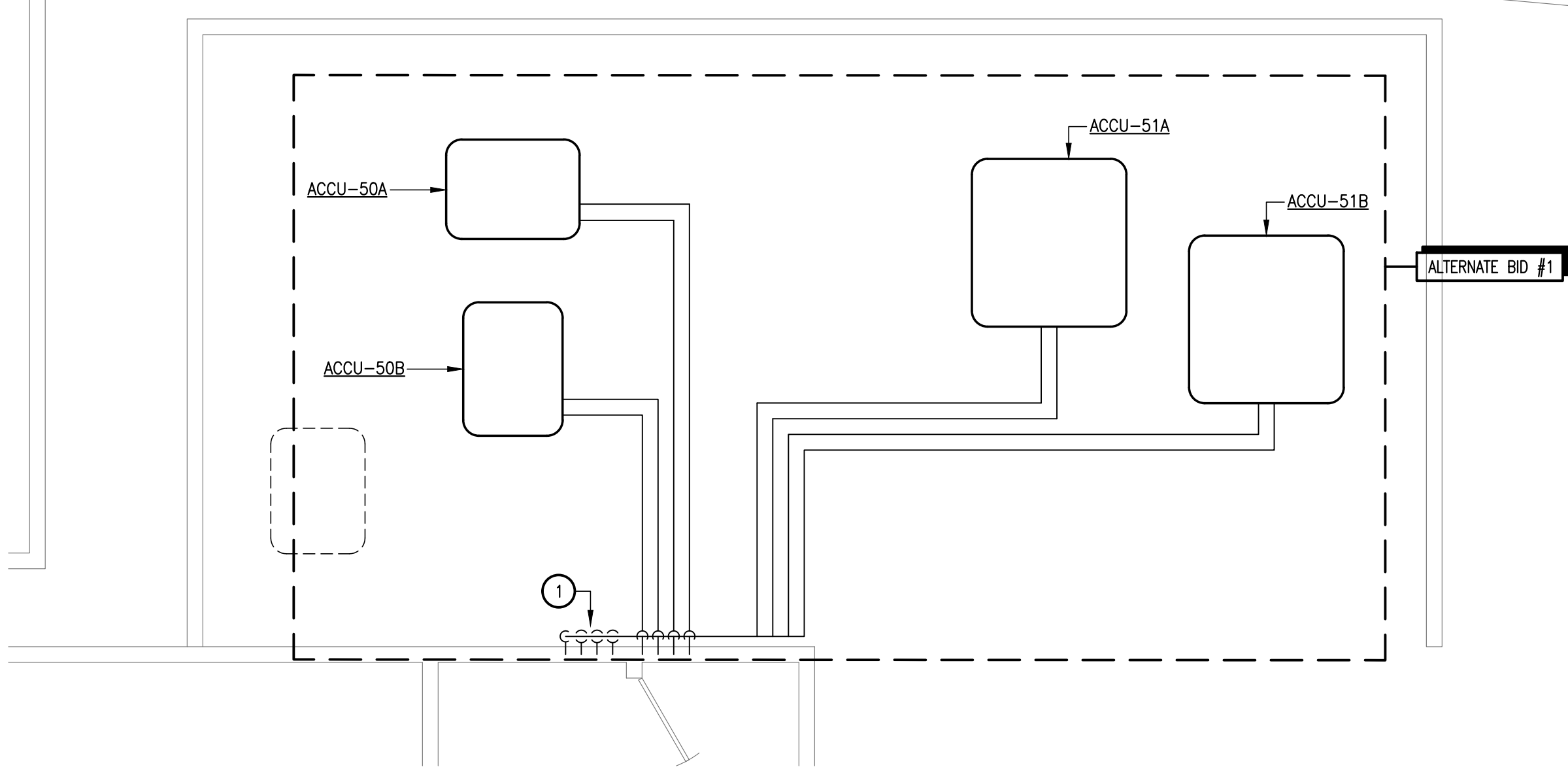
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Project No.: 31981.005
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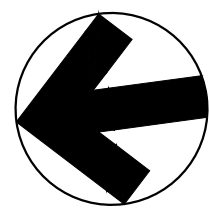
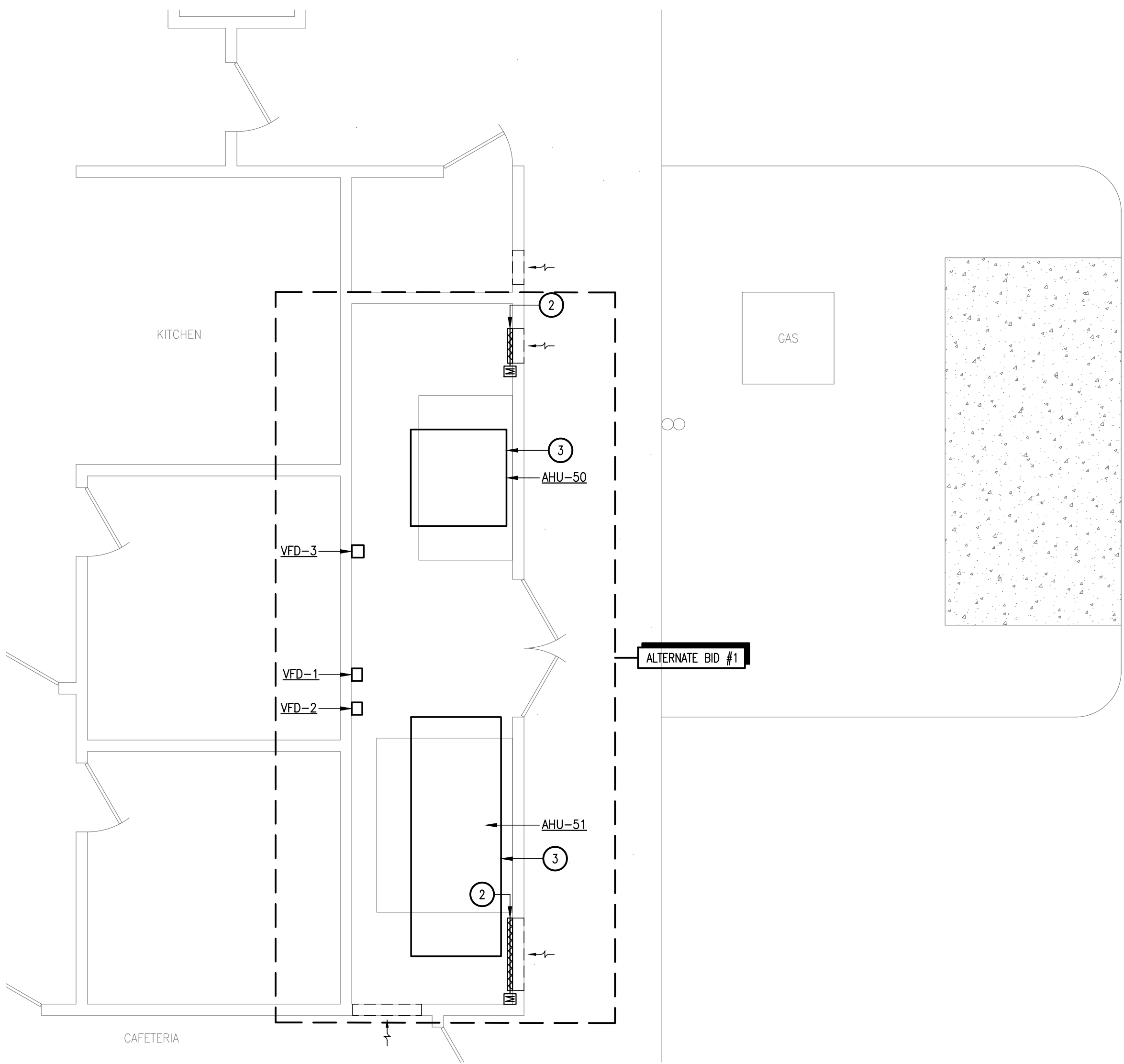
MECHANICAL PLAN

M102
Sheet Number

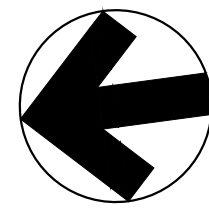
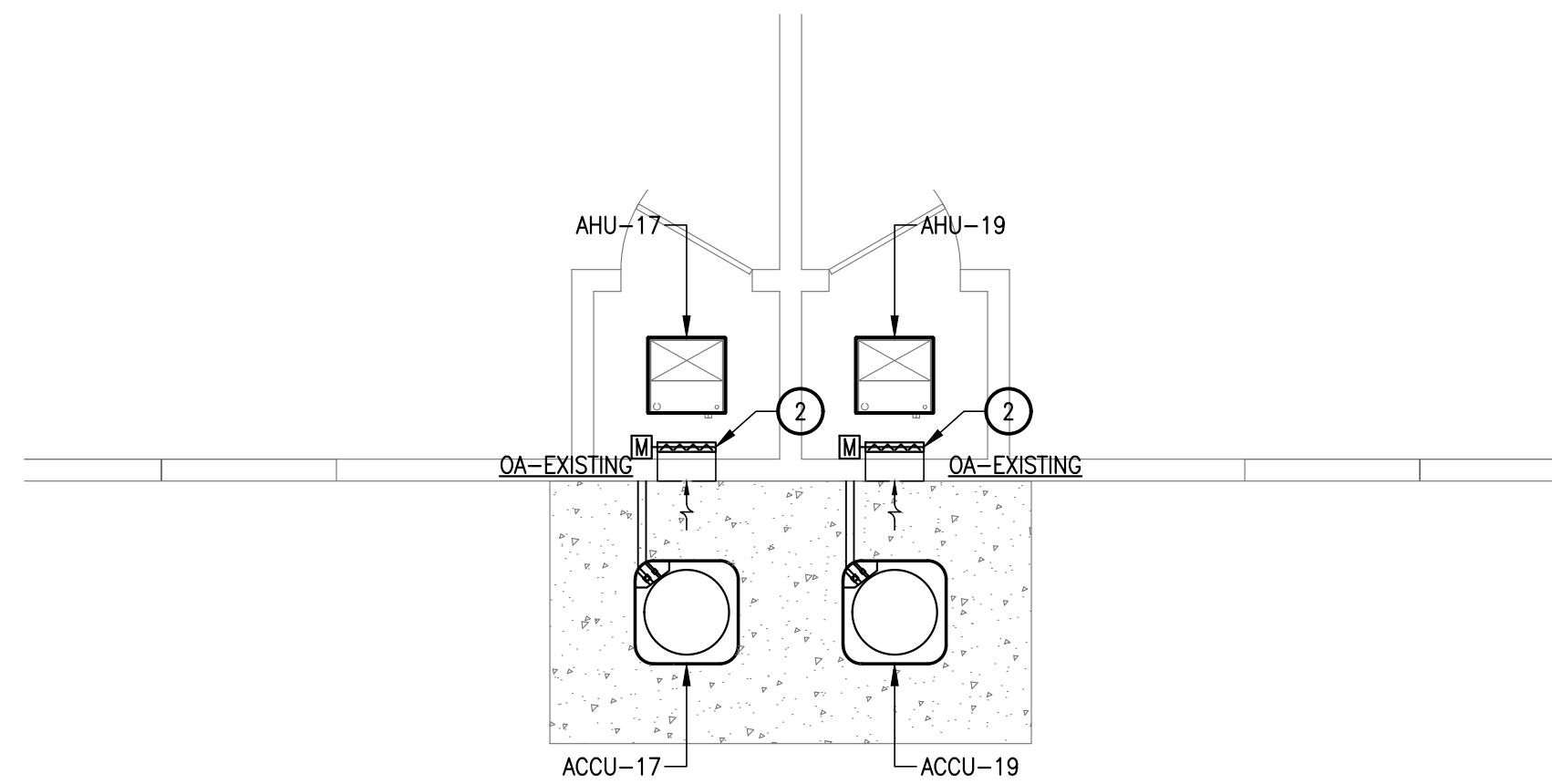
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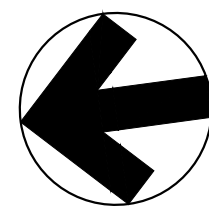
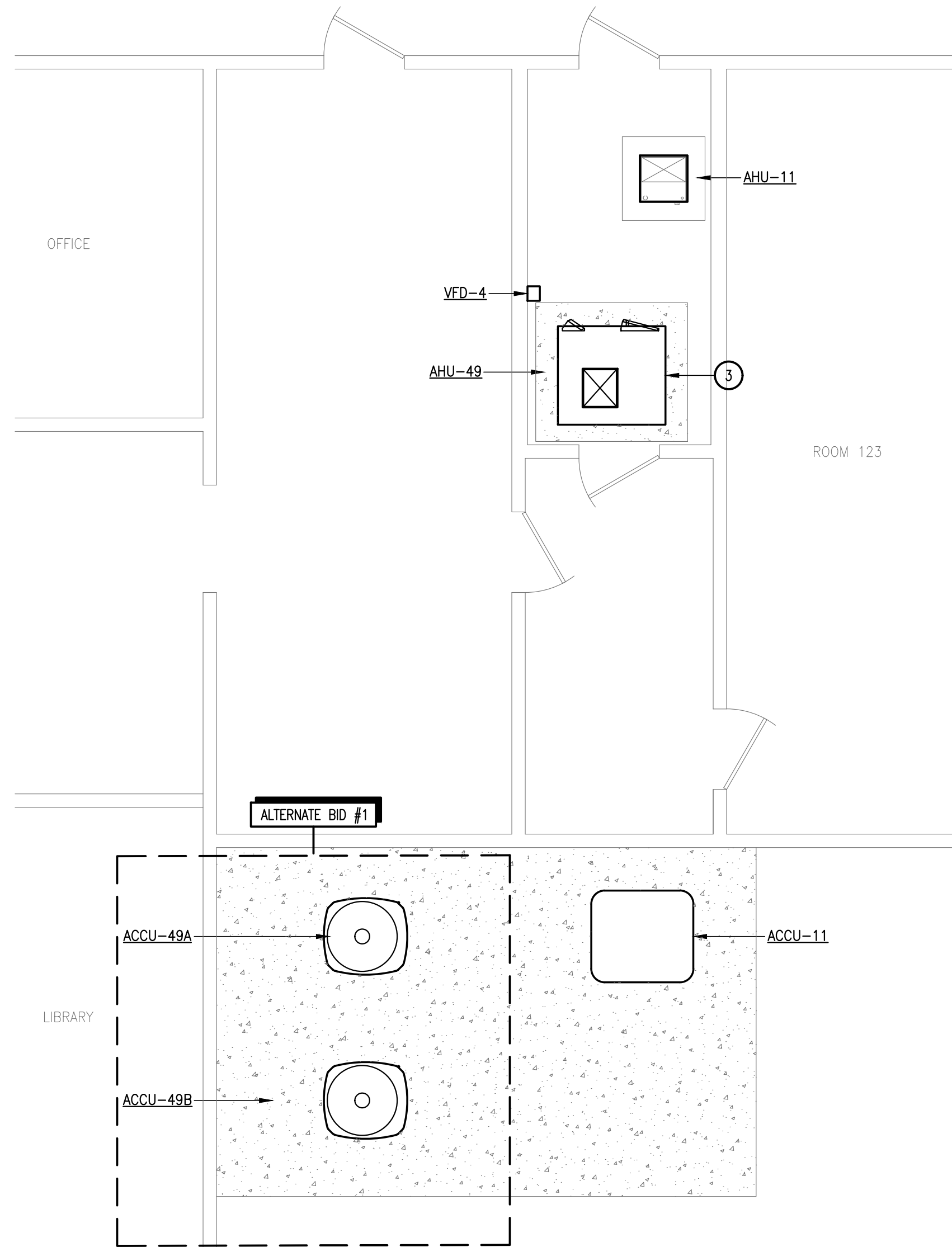
2 MECHANICAL PLAN - SOUTH
MECHANICAL YARD
SCALE: 1/4" = 1'-0"



4 MECHANICAL PLAN - SOUTH MECHANICAL ROOM
SCALE: 1/4" = 1'-0"



1 MECHANICAL PLAN - TYPICAL
CLASSROOM LAYOUT 'B'
SCALE: 1/4" = 1'-0"



3 MECHANICAL PLAN - SOUTH WEST
MECHANICAL YARD & RM 123
SCALE: 1/4" = 1'-0"

GENERAL NOTES:

- REFER TO M001 FOR MECHANICAL GENERAL NOTES.
- ROUTE CONDENSATE TO NEAREST DRAIN.

LEGEND

- EXISTING MECHANICAL EQUIPMENT TO REMAIN
- NEW MECHANICAL EQUIPMENT

KEY NOTES: ①

- REFRIGERANT LINES SHALL PENETRATE THROUGH EXISTING OPENINGS. OPENINGS SHALL BE WATER TIGHT.
- CONTRACTOR SHALL PROVIDE AND INSTALL MOTORIZED DAMPER ON OUTSIDE AIR INTAKE.
- CONTRACTOR SHALL CONNECT TO EXISTING DUCT.



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M103
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SPLIT DX HEAT PUMP UNIT SCHEDULE																																	
AIR HANDLING UNIT																					CONDENSING UNIT								SYSTEM EFFICIENCY				
TAG	MANUFACTURER	MODEL	SERVICE	L x W x H (in)	WEIGHT (LBS)	AIRFLOW (CFM)	OUTSIDE AIR (CFM)	E.S.P. (in. WC)	POWER (HP)	SENSIBLE CAPACITY (BTUH)	TOTAL CAPACITY (BTUH)	EAT-DB °F	EAT-WB °F	LAT-DB °F	LAT-WB °F	HEATING EAT °F	HEATING LAT MIN.°F	HEATING LAT MAX.°F	VOLTAGE / PHASE	MCA	MOCP	TAG	MANUFACTURER	MODEL	L x W x H (in)	WEIGHT (LBS)	AMBIENT AIR TEMP. °F	VOLTAGE / PHASE	MCA	MOCP	EER	SEER	NOTES
AHU 1-8, 12-19, 21-47	TRANE	BCCD024	CLASSROOM	28 x 18 x 52	153	815	340	0.8	1/2	26500	40100	86.5	71.2	55.4	56.0	59.8	85	95	208/1	5.3	15	AHU 1-8, 12-19, 21-47	TRANE	4TWR5042G	34 X 37 X 38	243	98	208/1	23	40	N/A	14.3	ALL
AHU 9-11,20	TRANE	BCCD036	COMPUTER LAB	21 x 28 x 56	186	1100	340	0.8	1	31900	44700	82.6	68.5	55.9	54.7	59.8	85	95	208/1	9.6	15	AHU 9-11,20	TRANE	4TWR5048E	34 X 37 X 45	294	98	208/1	29	50	N/A	14.3	ALL
NOTES: 1. CONTRACTOR TO PROVIDE CONCRETE PAD FOR CONDENSING UNITS. 2. PROVIDE WITH SINGLE POINT POWER FOR INDOOR UNIT AND INDEPENDENT SINGLE POINT POWER FOR OUTDOOR UNIT. 3. UNIT TO INCLUDE VARIABLE SPEED ECM MOTOR. 4. PROVIDE HUMIDISTAT WITH INTEGRATED HUMIDITY CONTROL. 5. PROVIDE HAIL GUARDS FOR CONDENSING UNIT. 6. PROVIDE 7 DAY TOUCH SCREEN LCD THERMOSTAT.																																	

SPLIT DX UNIT SCHEDULE (ALTERNATE #1)																														
AIR HANDLING UNIT																		CONDENSING UNIT										SYSTEM EFFICIENCY		
TAG	MANUFACTURER	MODEL	SERVICE	L x W x H (in)	WEIGHT (LBS)	AIRFLOW (CFM)	OUTSIDE AIR (CFM)	E.S.P. (in. WC)	POWER (HP)	SENSIBLE CAPACITY (BTUH)	TOTAL CAPACITY (BTUH)	EAT-DB °F	EAT-WB °F	LAT-DB °F	LAT-WB °F	VOLTAGE / PHASE	MCA	MOCP	TAG	MANUFACTURER	MODEL	L x W x H (in)	WEIGHT (LBS)	AMBIENT AIR TEMP. °F	VOLTAGE / PHASE	MCA	MOCP	EER	SEER	NOTES
AHU-48	TRANE	CSAA060	ADMINISTRATION	60 x 52 x 76	841	3000	275	1	3	63.4	74.4	77.7	93.7	55	53.7	208/3	6	15	ACCU-48A,48B	TRANE	4TTR7	39 X 35 X 51	312	98	208/1	37	60	12.5	17	ALL
AHU-49	TRANE	CSAA060	LIBRARY	60 x 64 x 76	841	3000	480	1	3	68.6	93.8	79.2	66.1	55.7	54.5	208/3	6	15	ACCU-49A,49B	TRANE	4TTR7	39 X 35 X 51	312	98	208/1	37	60	12.5	17	ALL
AHU-50	TRANE	CSAA	KITCHEN	50 X 50.5 X 75.5	997	3650	3000	1	5	132.3	221	97	77	54.5	53.9	208/3	9	15	ACCU-50A,50B	TRANE	TTA180	52 X 96 X 48	648	98	208/3	67	110	11	12.8	ALL
AHU-51	TRANE	TCFS	CAFETERIA	125 X 47 X 87	2590	8000	4080	1	2 X 2.5	269.3	458.6	87.4	72.8	55	54.4	208/3	20	25	ACCU-51A,51B	TRANE	TTA300	96 X 48 X 57	857	98	208/3	103	125	11.2	12	ALL
NOTES: 1. CONTRACTOR TO PROVIDE CONCRETE PAD FOR CONDENSING UNITS. 2. PROVIDE WITH INDEPENDENT SINGLE POINT POWER FOR INDOOR UNIT AND FUSED DISCONNECT. INDEPENDENT SINGLE POINT POWER FOR OUTDOOR UNIT. 3. PROVIDE WITH INDEPENDENT SINGLE POINT POWER FOR OUTDOOR UNIT AND FUSED DISCONNECT. 4. PROVIDE HUMIDISTAT WITH INTEGRATED HUMIDITY CONTROL. 5. PROVIDE HAIL GUARDS FOR CONDENSING UNIT. 6. PROVIDE 7 DAY TOUCH SCREEN LCD THERMOSTAT.																														

VFD SCHEDULE (ALTERNATE #1)												
MARK	SERVES	EQUIP	HP	INPUT VOLT/PH	OUTPUT VOLT/PH	MOUNTING	ENCLOSURE	MANUF.	MODEL	HxWxD (IN.)	NOTES	
VFD-1	AHU-51	SUPPLY FAN	3	208/3	208/3	WALL	NEMA 1	YASKAWA	E7	11.02 X 5.51 X 6.3	1, 2	
VFD-2	AHU-51	SUPPLY FAN	3	208/3	208/3	WALL	NEMA 1	YASKAWA	E7	11.02 X 5.51 X 6.3	1, 2	
VFD-3	AHU-50	SUPPLY FAN	5	208/3	208/3	WALL	NEMA 1	YASKAWA	E7	11.02 X 5.51 X 7.1	1, 2	
VFD-4	AHU-49	SUPPLY FAN	3	208/3	208/3	WALL	NEMA 1	YASKAWA	E7	11.02 X 5.51 X 6.3	1, 2	
VFD-5	AHU-48	SUPPLY FAN	3	208/3	208/3	WALL	NEMA 1	YASKAWA	E7	11.02 X 5.51 X 6.3	1, 2	
NOTES: 1. VFD SHALL BE PROVIDED BY MECHANICAL CONTRACTOR AND WIRED BY ELECTRICAL CONTRACTOR. 2. PROVIDE BACNET DEVICE FOR INTERFACE WITH DDC SYSTEM. COORDINATE WITH OWNER'S DDC CONTRACTOR PRIOR TO RELEASE. 3. PROVIDE WITH AUXILIARY CONTACT FOR DISCONNECT SWITCH INTERFACE.												

HVAC DUCTWORK MATERIALS SCHEDULE									
SERVICE	SHAPE	METAL TYPE	DUCT TYPE	JOINTS	W.G.	INSULATION			NOTE
						CONDITIONED SPACES	UNCONDITIONED SPACED	OUTDOORS	
SUPPLY LOW PRESSURE CONCEALED	ROUND/OVAL	GALVANIZED	SPIRAL	MASTIC & COUPLING	1"	2" AND 1.5LB/CF DENSITY	2" AND 1.5LB/CF DENSITY	N/A	
	RECTANGULAR	GALVANIZED	SINGLE WALL	SLIPS AND DRIVES	1"	2" AND 1.5LB/CF DENSITY	2" AND 1.5LB/CF DENSITY	RIGID: 3" AND 1.5LB/CF DENSITY	W/ FLEXCLAD 400 JACKET OUTDOORS
SUPPLY LOW PRESSURE EXPOSED	ROUND/OVAL	GALVANIZED	DOUBLE WALL WITH INSULATION	MASTIC & COUPLING	1"	DOUBLE WALL W/ INTERSTITIAL	DOUBLE WALL W/ INTERSTITIAL	N/A	
	RECTANGULAR	GALVANIZED	DOUBLE WALL WITH INSULATION	SLIPS AND DRIVES	1"	DOUBLE WALL W/ INTERSTITIAL	DOUBLE WALL W/ INTERSTITIAL	RIGID: 3" AND 1.5LB/CF DENSITY	W/ FLEXCLAD 400 JACKET OUTDOORS
RETURN AIR CONCEALED	ROUND	GALVANIZED	SPIRAL	MASTIC & COUPLING	-1"	2" AND 1.5LB/CF DENSITY	2" AND 1.5LB/CF DENSITY	N/A	
	RECTANGULAR	GALVANIZED	SINGLE WALL	SLIPS AND DRIVES	-1"	2" AND 1.5LB/CF DENSITY	2" AND 1.5LB/CF DENSITY	RIGID: 3" AND 1.5LB/CF DENSITY	W/ FLEXCLAD 400 JACKET OUTDOORS
RETURN AIR EXPOSED	ROUND	GALVANIZED	DOUBLE WALL WITH INSULATION	MASTIC & COUPLING	-1"	NONE	DOUBLE WALL W/ INTERSTITIAL	N/A	
	RECTANGULAR	GALVANIZED	DOUBLE WALL WITH INSULATION	SLIPS AND DRIVES	-1"	NONE	DOUBLE WALL W/ INTERSTITIAL	RIGID: 3" AND 1.5LB/CF DENSITY	W/ FLEXCLAD 400 JACKET OUTDOORS
OUTSIDE AIR	ROUND	GALVANIZED	SPIRAL	MASTIC & COUPLING	-1"	2" AND 1.5LB/CF DENSITY	2" AND 1.5LB/CF DENSITY	NONE	
	RECTANGULAR	GALVANIZED	SINGLE WALL	SLIPS AND DRIVES	-1"	2" AND 1.5LB/CF DENSITY	2" AND 1.5LB/CF DENSITY	NONE	
GENERAL EXHAUST	ROUND	GALVANIZED	SPIRAL	MASTIC & COUPLING	-1"	NONE	2" AND 1.5LB/CF DENSITY	N/A	

HVAC PIPING MATERIALS SCHEDULE								
SERVICE	SIZE	PIPE	FITTINGS	JOINTS	HANGERS	INSULATION		
						CONDITIONED SPACES	UNCONDITIONED SPACES	OUTDOORS
CONDENSATE	ALL	TYPE M COPPER	WROT COPPER	95-5 SOLDER	COPPER PLATED	3/4" FLEXIBLE ELASTOMERIC - PVC JACKET	3/4" FLEXIBLE ELASTOMERIC - PVC JACKET	3/4" FLEXIBLE ELASTOMERIC - ALUMINUM JACKET
REFRIGERANT	0-4"	TYPE L COPPER ACR	WROT COPPER LONG RAD.	SILFOS	COPPER PLATED	1" FLEXIBLE ELASTOMERIC	1" FLEXIBLE ELASTOMERIC	1" FLEXIBLE ELASTOMERIC
	5" & UP	TYPE L COPPER ACR	WROT COPPER LONG RAD.	SILFOS	COPPER PLATED	1" FLEXIBLE ELASTOMERIC	1" FLEXIBLE ELASTOMERIC	1" FLEXIBLE ELASTOMERIC

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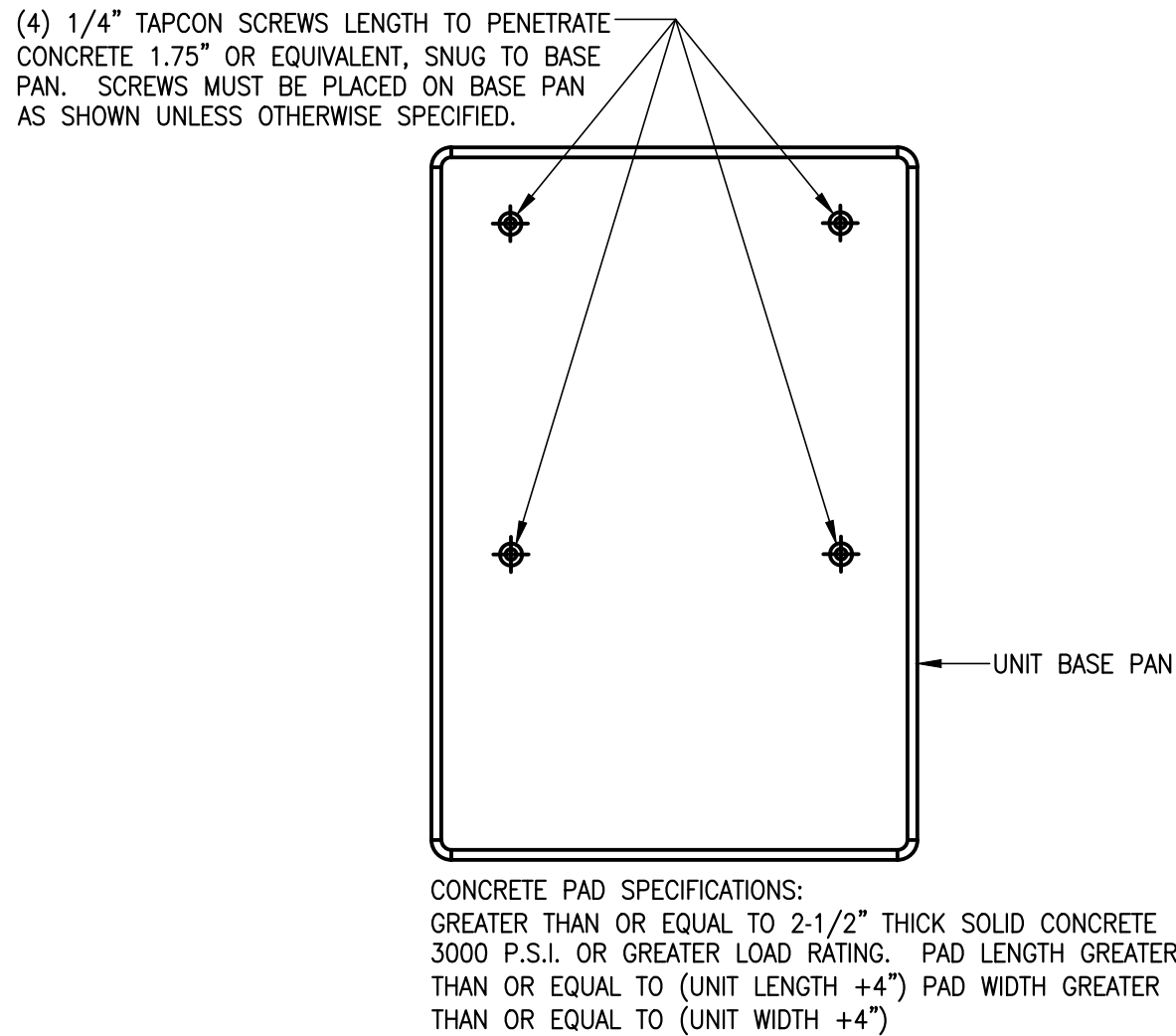
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M201
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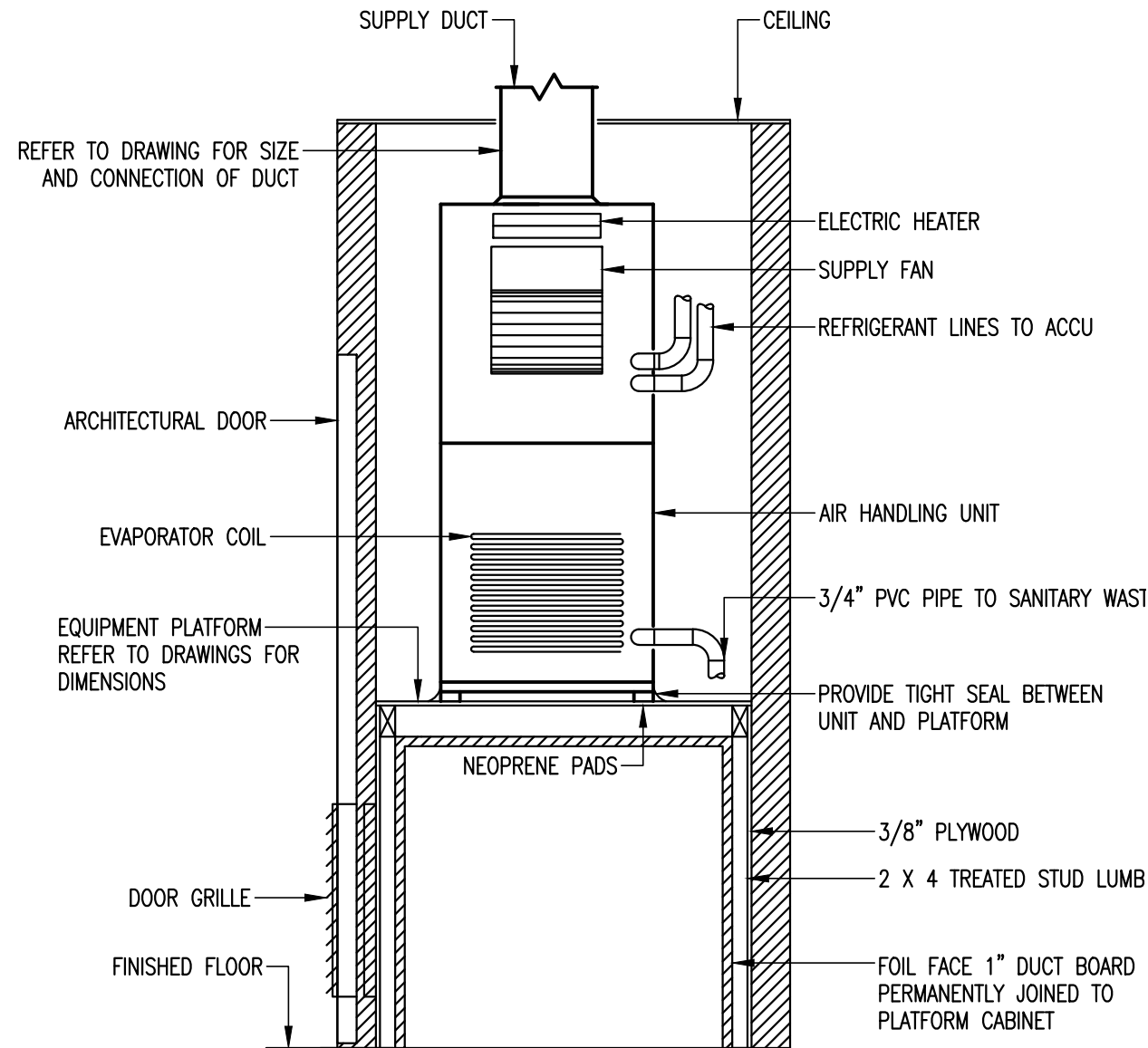
06 CONDENSING UNIT CONCRETE MOUNTING

N.T.S.



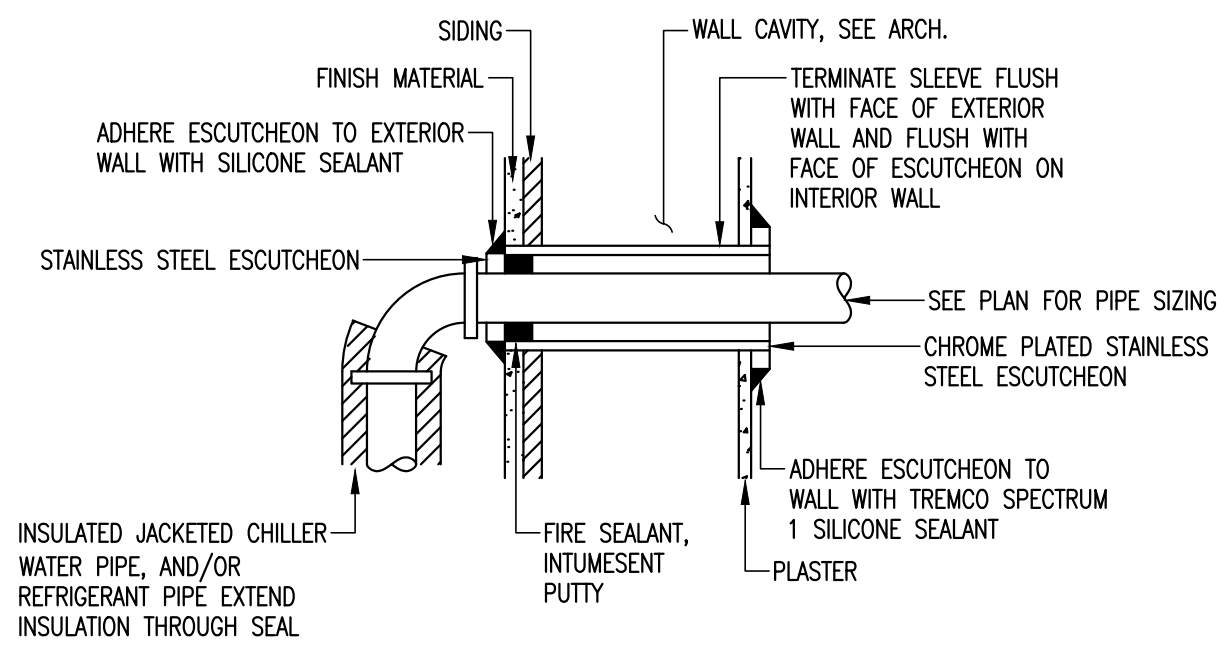
05 FAN COIL - SECTION VIEW

N.T.S.



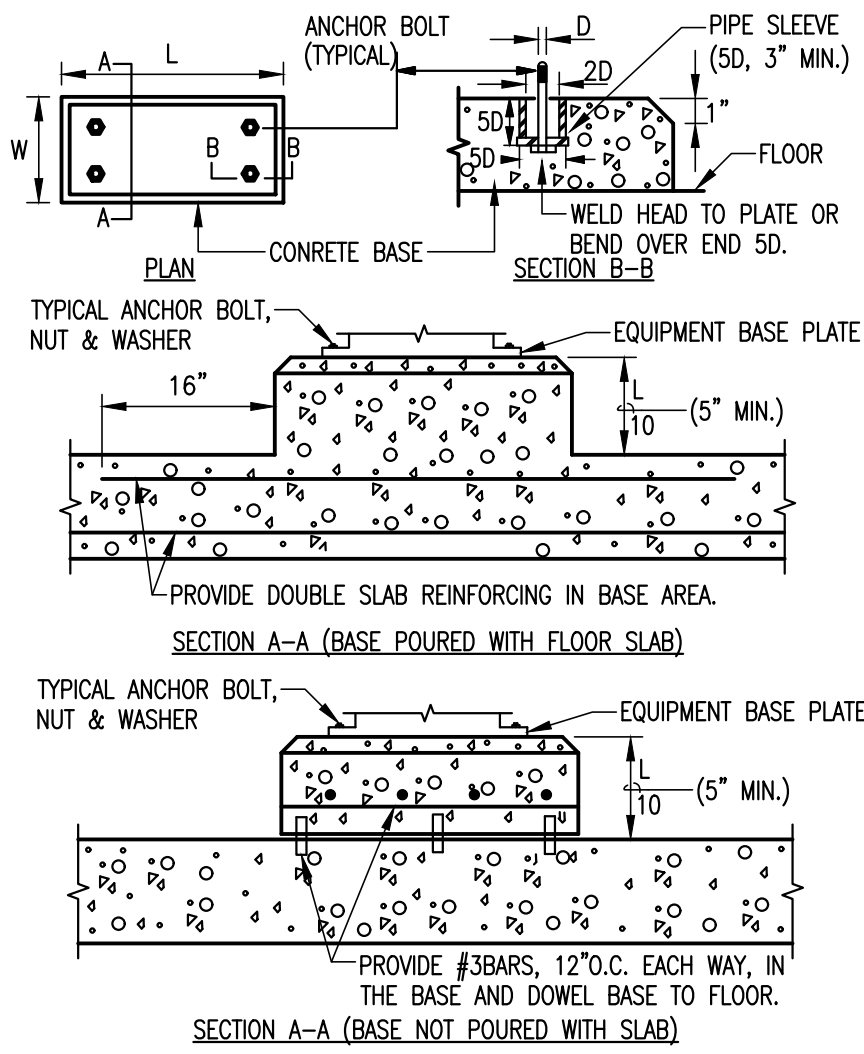
04 TYP. EXTERIOR WALL PENETRATION

N.T.S.



03 EQUIPMENT PAD DETAIL

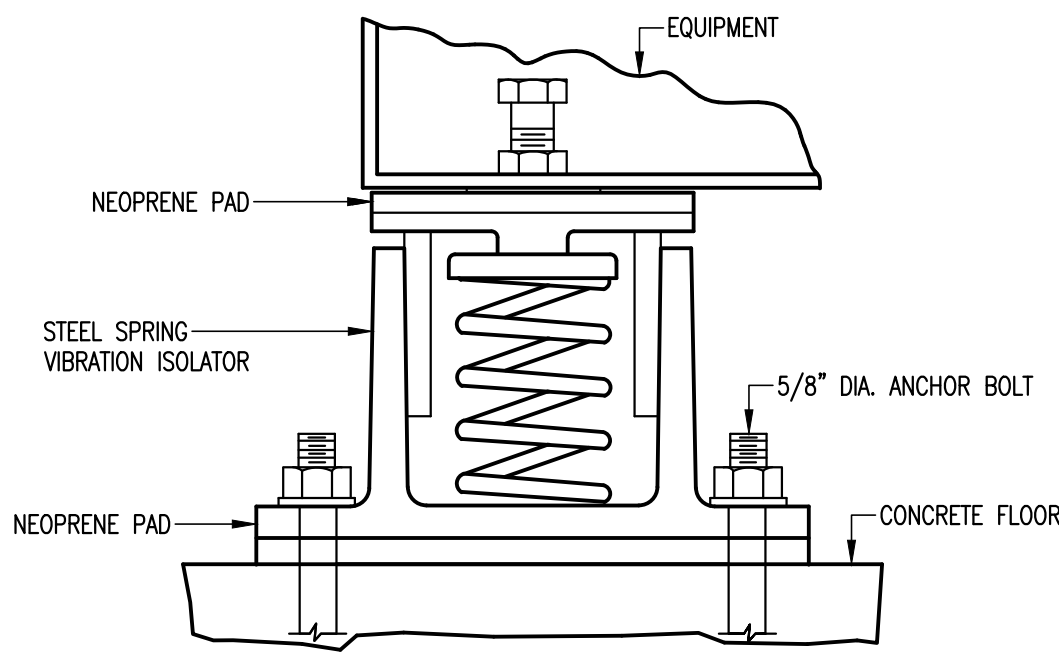
N.T.S.



- NOTE:
1. THIS DETAIL APPLIES TO EQUIPMENT NOT SPECIFIED TO BE MOUNTED ON SPRING ISOLATED BASES.
 2. L AND W DIMENSIONS SHALL BE 6 INCHES GREATER THAN THE EQUIPMENT BASE PLATE.

02 VIBRATION ISOLATION

N.T.S.

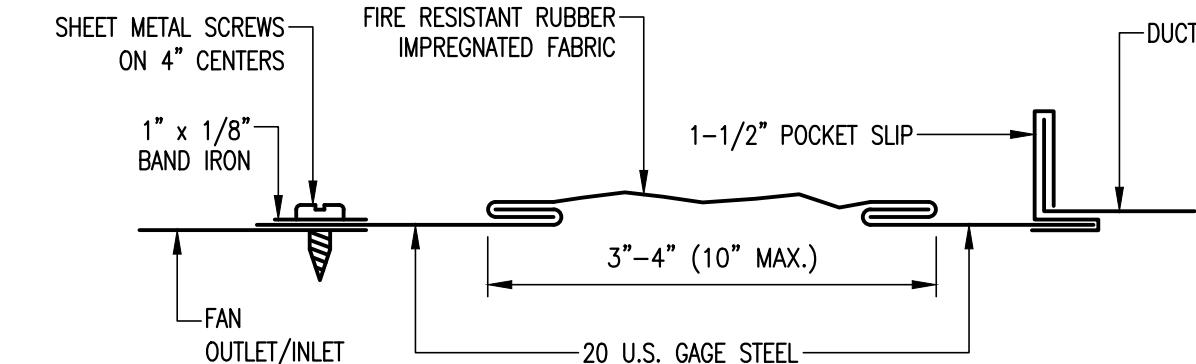


VIBRATION ISOLATION NOTES:

- A. ALL PIPING THAT IS CONNECTED TO EQUIPMENT SHALL BE SUPPORTED FROM RESILIENT CEILING HANGERS OR FROM FLOOR-MOUNTED RESILIENT SUPPORTS. (SPRING AND NEOPRENE IN SERIES) THE FIRST 3 HANGERS NEXT TO THE EQUIPMENT SHALL HAVE A MIN. STATIC DEFLECTION EQUAL TO ONE HALF OF THE STATIC DEFLECTION OF THE EQUIPMENT MOUNTING SYSTEM. BEYOND THE THIRD PIPE SUPPORT A STATIC DEFLECTION OF 1/4" TO 1/2" WILL BE UTILIZED.
- B. PIPES PASSING THROUGH THE MECHANICAL EQUIPMENT ROOMS WALLS SHALL BE PROVIDED A 1 INCH CLEARANCE BETWEEN THE PIPE AND PIPE SLEEVE INSTALLED IN THE WALL. THE PIPE SHALL BE SUPPORTED EITHER SIDE OF THE WALL SO THAT THE PIPE DOES NOT REST ON THE SLEEVE. THE CLEARANCE SPACE SHALL BE FILLED WITH FIBEROUS FILLER MATERIAL AND SEALED WITH A NON-HARDENING CAULKING COMPOUND AT BOTH WALL SURFACES OR AS REQUIRED FOR FIRE STOPPING IN FIRE WALLS.

01 FLEXIBLE CONNECTION

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MECHANICAL DETAILS

M202

Sheet Number



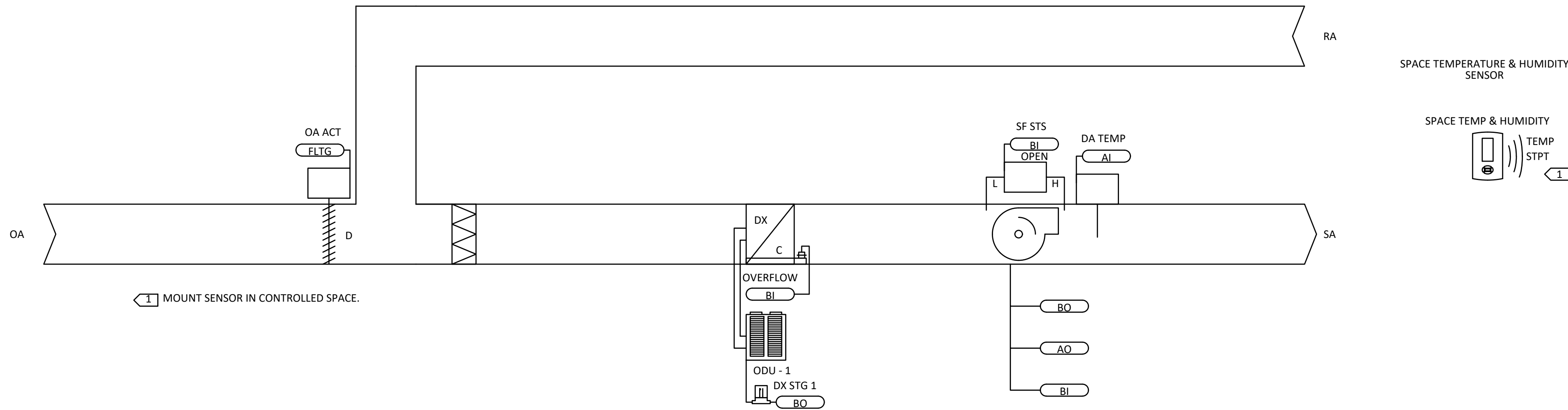
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TYPICAL FOR 43
CLASSROOMS DX SPLIT 1 ~ 43



Sequence of Operations
DX Split 1 ~ 43 Flow

Building Automation System Interface:
The Building Automation System (BAS) shall send the controller Occupied Bypass, Morning Warm-up / Pre-Cool, Occupied / Unoccupied and Heat / Cool modes. If a BAS is not present, or communication is lost with the BAS the controller shall operate using default modes and setpoints.

Occupied Mode:
During occupied periods the supply fan shall run continuously and the outside air damper shall open to maintain minimum ventilation requirements. The DX cooling and heating modes shall operate accordingly to maintain the active space temperature setpoint.

Optimal Start:
The BAS shall monitor the scheduled occupied time, occupied space setpoints and space temperature to calculate when the optimal start occurs.

Morning Warm-Up Mode:
During optimal start, if the space temperature is below the occupied heating setpoint a morning warm-up mode shall be activated. When morning warm-up is initiated the unit shall enable the heat pump mode. The outside air damper shall remain closed. When the space temperature reaches the occupied heating setpoint (adj.), the unit shall transition to the occupied mode.

Optimal Stop:
The BAS shall monitor the scheduled unoccupied time, occupied setpoints and space temperature to calculate when the optimal stop occurs. When the optimal stop mode is active the unit controller shall maintain the space temperature to the space temperature offset setpoint.

Occupied Bypass:
The BAS shall monitor the status of the "on" and "cancel" buttons of the space temperature sensor. When an occupied bypass request is received from a space sensor, the unit shall transition from its current occupancy mode to occupied bypass mode and the unit shall maintain the space temperature to the occupied setpoints (adj.).

Space Temperature Control:
The space temperature shall be maintained between the occupied cooling setpoint of 74.0 deg. F (adj.) and the occupied heating setpoint of 71.0 deg. F (adj.). The unit shall transition to the cooling mode when the space temperature rises one degree above the occupied cooling setpoint of 74.0 deg. F (adj.). The unit shall transition to the heating mode when the space temperature drops one degree below the occupied heating setpoint of 74.0 deg. F (adj.).

Condensate Overflow Monitoring:
If the condensate level reaches the trip point, a condensate overflow diagnostic shall be annunciated at the BAS. To prevent the condensate drain pan from overflowing and causing water damage to the building the fan shall be disabled and the DX cooling shall be disabled.

Filter Timer:
The fan-run time (hrs) shall be compared to the filter maintenance timer setpoint. Once the setpoint is reached a filter timer alarm diagnostic shall be annunciated at the BAS. When the diagnostic is cleared, the filter-maintenance timer is reset to zero, and the timer begins accumulating fan-run time again.



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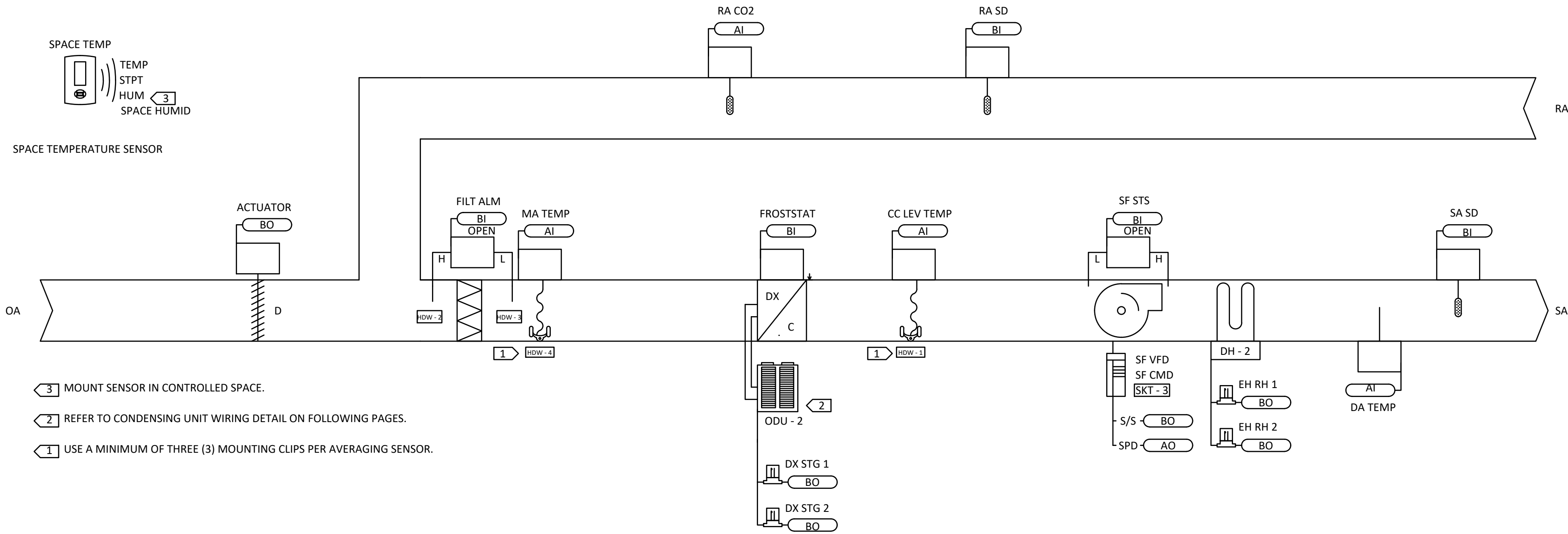
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M301
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TYPICAL FOR 4
(AHU 48 ~ 51)

AHU 48 ~ 51



Sequence of Operations
SZVAV AHU - 48 ~ 51 Flow

Building Automation System Interface:

The Building Automation System (BAS) shall send the controller Occupied Bypass, Morning Warm-up/Pre-Cool, Occupied/Unoccupied and Heat/Cool modes. If a BAS is not present, or communication is lost with the BAS the controller shall operate using default modes and setpoints.

Optimal Start:

The BAS shall monitor the scheduled occupied time, occupied space setpoints and space temperature to calculate when the optimal start occurs.

Occupied Bypass:

The BAS shall monitor the status of the "on" and "cancel" buttons of the space temperature sensor. When an occupied bypass request is received from a space sensor, the unit shall transition from its current occupancy mode to occupied bypass mode and the unit shall maintain the space temperature to the occupied setpoints (adj.).

Heat/Cool Mode:

When the space temperature rises above the occupied cooling setpoint the mode shall transition to cooling. When the space temperature falls below the occupied heating setpoint the mode shall transition to heating. When the space temperature is above the occupied cooling setpoint or below the occupied heating setpoint the mode shall remain in its last state. If the space temperature sensor fails the mode shall remain in its last state and an alarm shall be annunciated at the BAS. If the local and communicated setpoints fail the controller shall disable the supply fan and an alarm shall be annunciated at the BAS.

Supply Air Temperature Reset Control:

On a rise in space temperature (+2.0 deg. F adj. or greater) above the space cooling setpoint (74.0 deg. F adj.); the supply fan speed shall modulate from minimum (50% adj.) to maximum (or design) air flow to maintain space cooling temperature setpoint while keeping the discharge air temperature setpoint at minimum (55.0 deg. F adj.). As space temperature decreases below 76.0 deg. F (space cooling setpoint 74.0 deg. F + 2.0 deg. F); the fan speed shall be locked at minimum air flow and the discharge air temperature setpoint remains at minimum. When space temperature decreases to 75.0 deg. F (cooling setpoint of 74.0 deg. F adj. + 1.0 deg. F) or below for a period of time (default 1 min. adj.); the fan speed shall remain at minimum, the discharge air temperature setpoint remains at minimum, and control enters into discharge air temperature setpoint reset mode. As space temperature continues to drop below 75.0 deg. F (space temperature cooling setpoint + 1.0 deg. F); the fan speed shall remain at minimum and the discharge air temperature setpoint shall be reset from minimum (55.0 deg. F adj.) to maximum (65.0 deg. F adj.) as space temperature drops from 75.0 deg. F to 74.0 deg. F to maintain the space cooling temperature setpoint. On a continued drop of space temperature below the space cooling temperature setpoint (74.0 deg. F adj.) through (71.0 deg. F adj.) the space temperature control shall be within its deadband; the fan speed remains at minimum and discharge air setpoint of (65.0 deg. F adj.) for cooling. As space temperature decreases to the heating setpoint (71.0 deg. F adj.) the control shall switch to the heating discharge air temperature reset. In the heating mode, the staged heat will be enabled; the supply fan shall remain at minimum air flow and the discharge air temperature setpoint shall be reset from 70.0 deg. F to 90.0 deg. F as the space temperature drops from 71.0 deg. F to 70.0 deg. F. As space temperature continues to decrease to heating setpoint (71.0 deg. F adj.) - 1.0 deg. F; the discharge air temperature setpoint shall remain at maximum (90.0 deg. F adj.), the fan shall be modulated from minimum to maximum air flow to maintain the space temperature heating setpoint. When the space temperature increases the reverse control shall be implemented.

Occupied Humidity Control:

If the space relative humidity is greater than 50% (adj.), the DX cooling shall stage to maintain space relative humidity setpoint of 50% (adj.) and the electric heat shall stage to maintain the discharge air temperature setpoint. Mode shall terminate when the space relative humidity falls below the relative humidity setpoint of 50% (adj.) minus 3% (adj.). If the space relative humidity sensor fails, the dehumidification sequence shall be terminated and an alarm shall be annunciated at the BAS.

Supply Fan:

The supply fan shall be enabled while in the occupied mode and cycled on during the unoccupied mode. The unit controller shall vary the supply fan speed to optimize minimum fan speed in all cooling and heating modes. A differential pressure switch shall monitor the differential pressure across the fan. If the switch does not open within 30 seconds after a request for fan operation a fan failure alarm shall be annunciated, the unit shall stop, requiring a manual reset.

Filter Status:

A differential pressure switch shall monitor the differential pressure across the filter when the fan is running. If the switch closes during normal operation a dirty filter alarm shall be annunciated at the BAS.

Automatic Shutdown Control:

Upon detection of smoke at any of the duct mounted S.D. (furnished, installed, and wired for shutdown by division 26), motor shall be de-energized. Upon detection of air below 36 deg., the freeze stat shall de-energize the ahv motor and cause the outside air damper to close fully.

Outside Air Damper:

The Outside air damper shall open and close when cooling is initiated.



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M302
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A. REFER TO E001 FOR ELECTRICAL GENERAL NOTES.

----- EXISTING HVAC EQUIPMENT

_____ EXISTING ELECTRICAL EQUIPMENT



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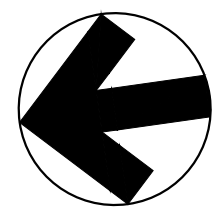
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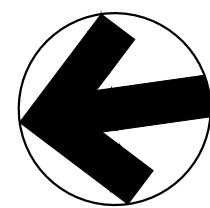
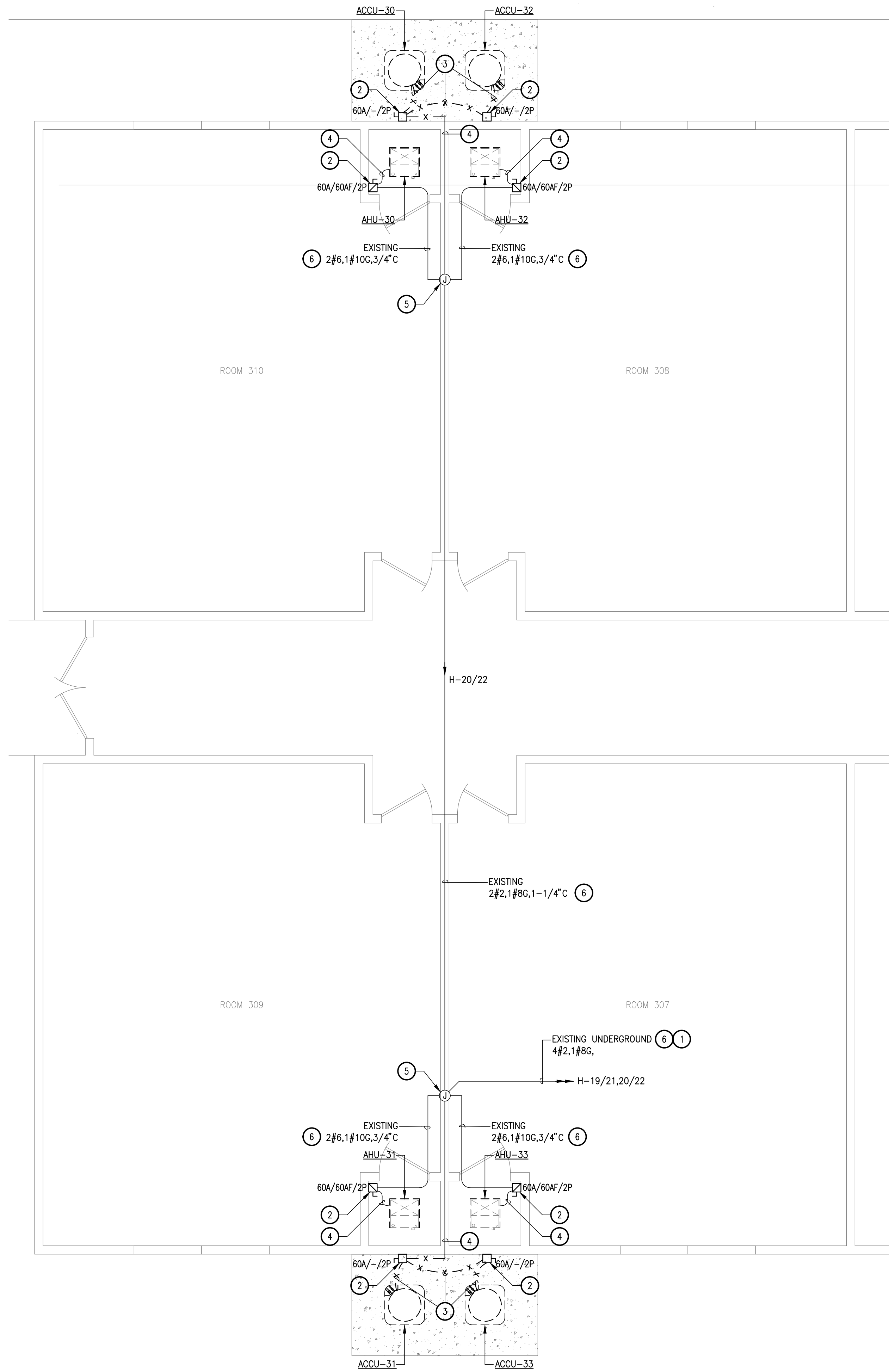
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ELECTRICAL DEMOLITION PLAN - OVERALL	
ED101	
Sheet Number	

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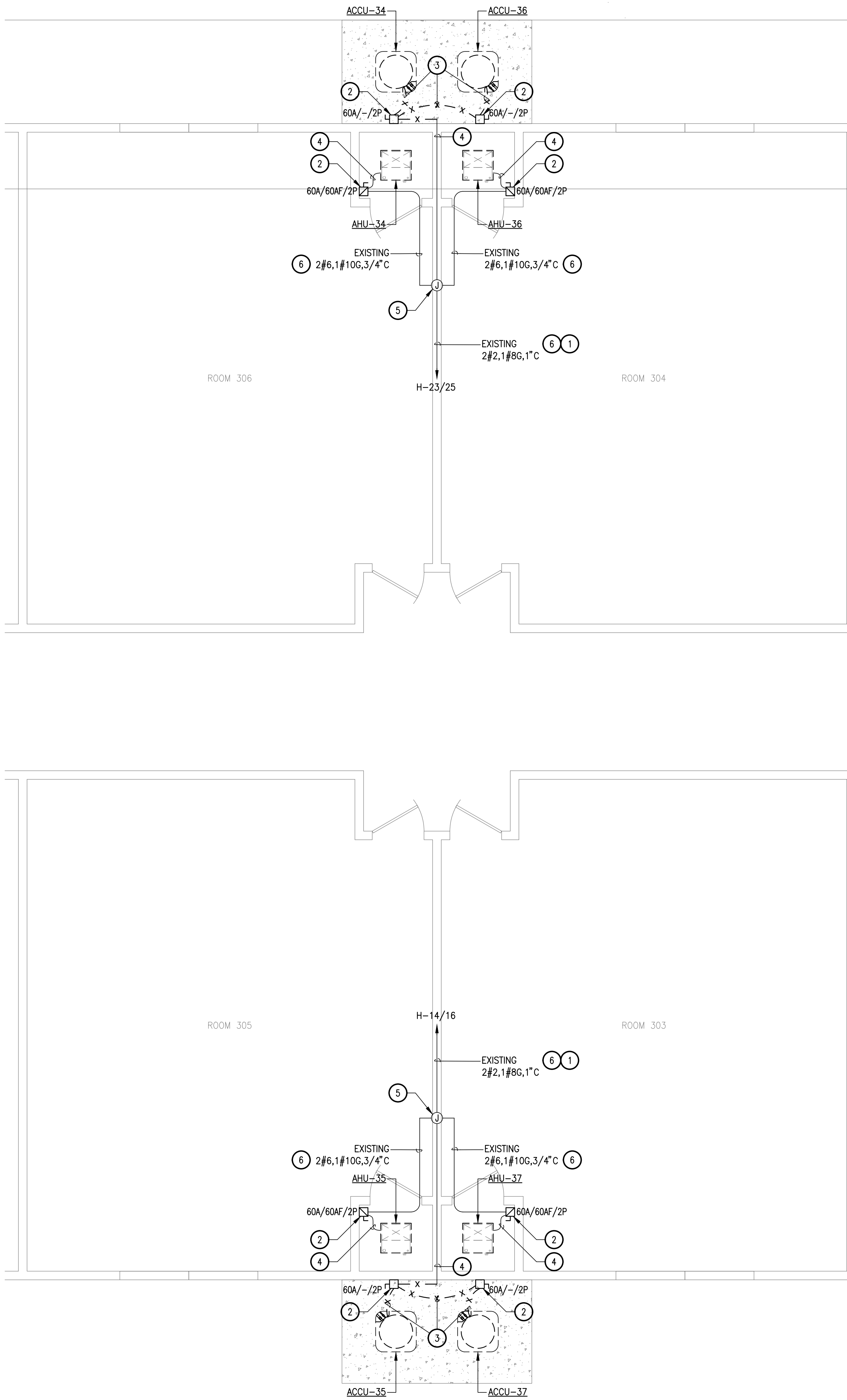
01

**ELECTRICAL DEMOLITION PLAN - TYPICAL
CLASSROOM LAYOUT 'A'**
SCALE: 1/4" = 1'-0"



02

**ELECTRICAL DOMOLITION PLAN - TYPICAL
CLASSROOM LAYOUT 'B'**
SCALE: 1/4" = 1'-0"



GENERAL NOTES:

A. REFER TO E001 FOR ELECTRICAL GENERAL NOTES.

KEY NOTES:

- EXISTING HOMERUN MAY BE UNDERGROUND OR ABOVE CEILING DEPENDING ON THE CLASSROOMS' LOCATION. FIELD VERIFY PRIOR TO COMMENCING WORK.
- EXISTING DISCONNECT SWITCH TO BE REMOVED.
- EXISTING CONDUIT AND CONDUCTORS TO BE REMOVED.
- EXISTING CONDUCTORS TO BE REMOVED. EXISTING CONDUIT TO REMAIN.
- EXISTING 10"x10"x6" JUNCTION BOX TO REMAIN. FIELD VERIFY EXACT LOCATION OF JUNCTION BOX.
- EXISTING CONDUIT AND CONDUCTORS TO REMAIN.

LEGEND

- EXISTING ELECTRICAL EQUIPMENT TO REMAIN
- x - x - EXISTING ELECTRICAL EQUIPMENT TO BE DEMOLISHED
- - - - EXISTING HVAC EQUIPMENT TO BE DEMOLISHED

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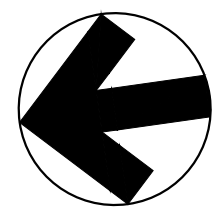


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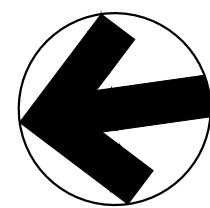
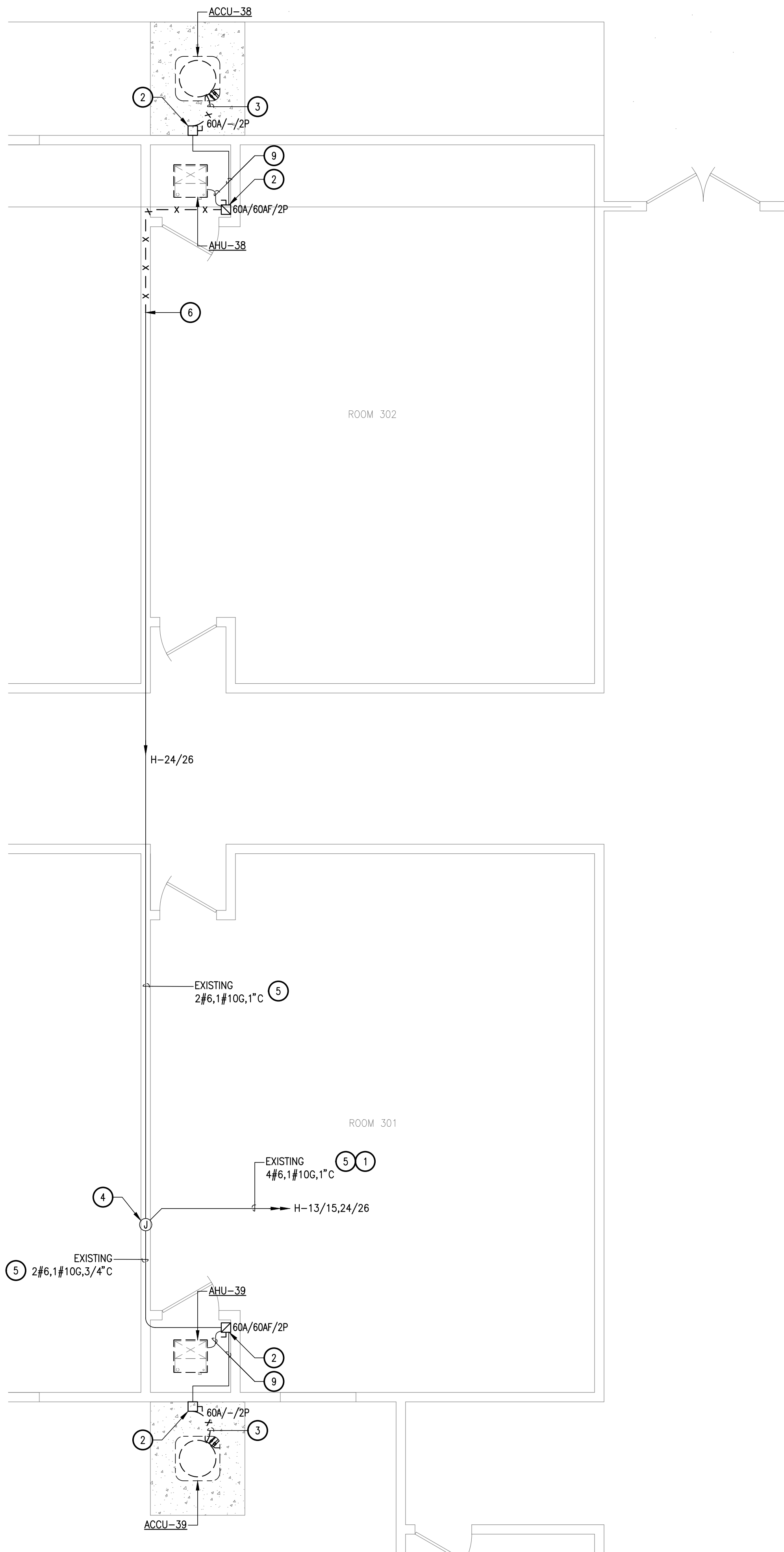
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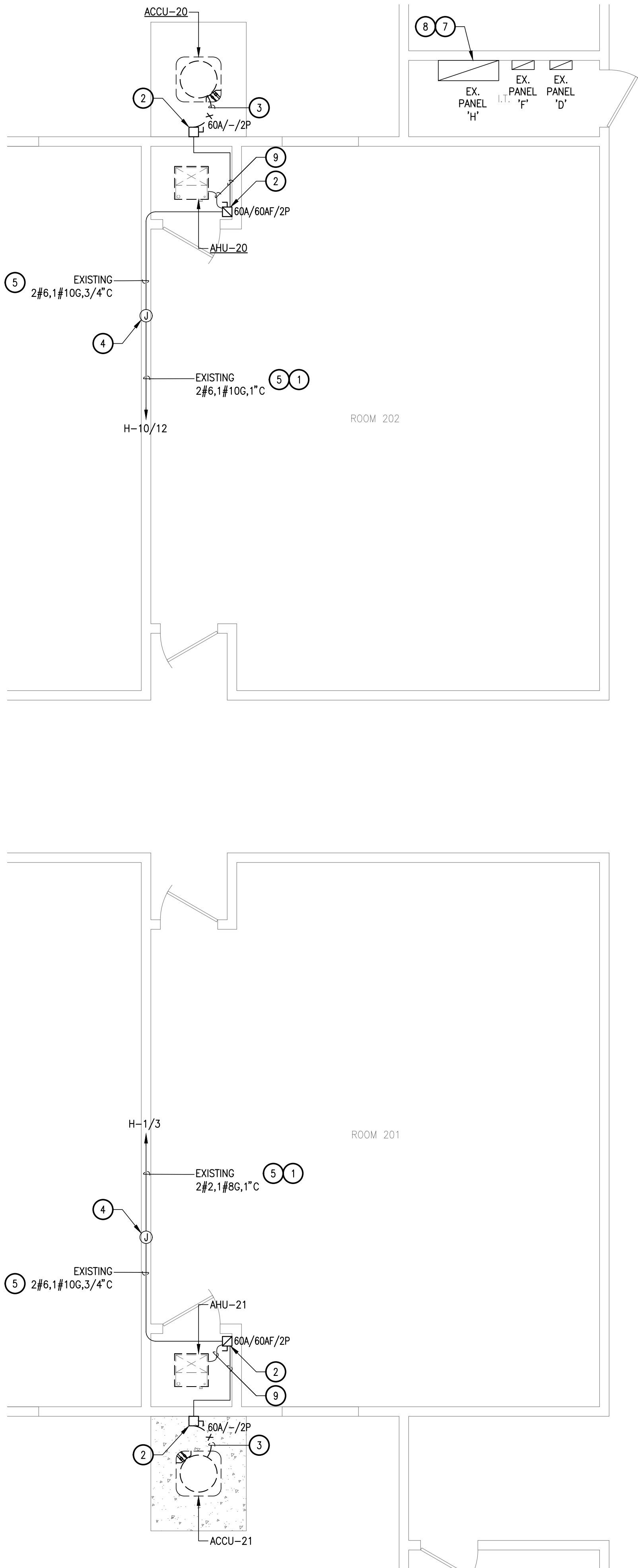
01

**ELECTRICAL DOMOLITION PLAN - TYPICAL
CLASSROOM LAYOUT 'C'**
SCALE: 1/4" = 1'-0"



02

**ELECTRICAL DOMOLITION PLAN - TYPICAL
CLASSROOM LAYOUT 'D'**
SCALE: 1/4" = 1'-0"



GENERAL NOTES:

A. REFER TO E001 FOR ELECTRICAL GENERAL NOTES.

KEY NOTES:

- EXISTING HOMERUN MAY BE UNDERGROUND OR ABOVE CEILING DEPENDING ON THE CLASSROOMS' LOCATION. FIELD VERIFY PRIOR TO COMMENCING WORK.
- EXISTING DISCONNECT SWITCH TO BE REMOVED.
- EXISTING CONDUIT AND CONDUCTORS TO BE REMOVED.
- EXISTING 10"x10"x6" JUNCTION BOX TO REMAIN. FIELD VERIFY EXACT LOCATION OF JUNCTION BOX.
- EXISTING CONDUIT AND CONDUCTORS TO REMAIN.
- EXISTING CONDUIT SHALL BE CUT AT THIS APPROXIMATE LOCATION AND REMOVED. EXISTING CONDUCTORS SHALL BE PULLED BACK TO PREVIOUS EXISTING JUNCTION BOX PRIOR TO CUTTING THE CONDUIT. IF THE EXISTING CONDUCTORS ARE DAMAGED, REPLACE CONDUCTORS WITH EQUAL SIZE AND QUANTITY OF CONDUCTORS. REFER TO SHEET E103 DETAIL 01 FOR NEW REQUIREMENTS.
- EXISTING PANELBOARD TO BE MODIFIED. REFER TO PANEL SCHEDULES FOR MODIFICATIONS.
- REMOVE EXISTING (3) SETS OF 3#3/0, 2#6G FROM PANEL 'H' TO SWITCHBOARD 'MDP'. EXISTING CONDUIT TO BE ABANDONED. REFER TO SHEET E101 KEYNOTES 1 AND 2 FOR NEW REQUIREMENTS.
- EXISTING CONDUCTORS TO BE REMOVED. EXISTING CONDUIT TO REMAIN.

LEGEND

- EXISTING ELECTRICAL EQUIPMENT TO REMAIN
- x - x - EXISTING ELECTRICAL EQUIPMENT TO BE DEMOLISHED
- - - - EXISTING HVAC EQUIPMENT TO BE DEMOLISHED

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TBE FIRM #F-312

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Sheet Title	ELECTRICAL DEMOLITION PLAN

ED103

Sheet Number

A. REFER TO E001 FOR ELECTRICAL GENERAL NOTES.

1. FURNISH AND INSTALL (3) SETS OF 3#500, 1#2G, IN NEW 3" IN PLENUM SPACE. CONTRACTOR SHALL SEAL ALL WALL PENETRATIONS WITH FIRE STOPPING INTUMESCENT MATERIAL.
2. FURNISH AND INSTALL (2) NEW NEMA 4X, 316--SS, 3#X36"X24" JUNCTION BOXES ADJACENT TO SWITCHBOARD "MDP". ROUTE NEW FEEDERS FOR PANEL "H" THROUGH JUNCTION BOXES AND INTO BUILDING AT PLENUM SPACE.
3. MOUNT FEEDER JUNCTION BOX ABOVE SWITCHBOARD. SHOULD ALTERNATE BID #1 NOT BE ACCEPTED.

- - - - - EXISTING HVAC EQUIPMENT
 _____ EXISTING ELECTRICAL EQUIPMENT
 - - - - - PROPOSED HVAC EQUIPMENT
 _____ PROPOSED ELECTRICAL EQUIPMENT



HALFF.

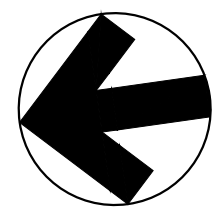
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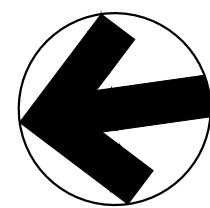
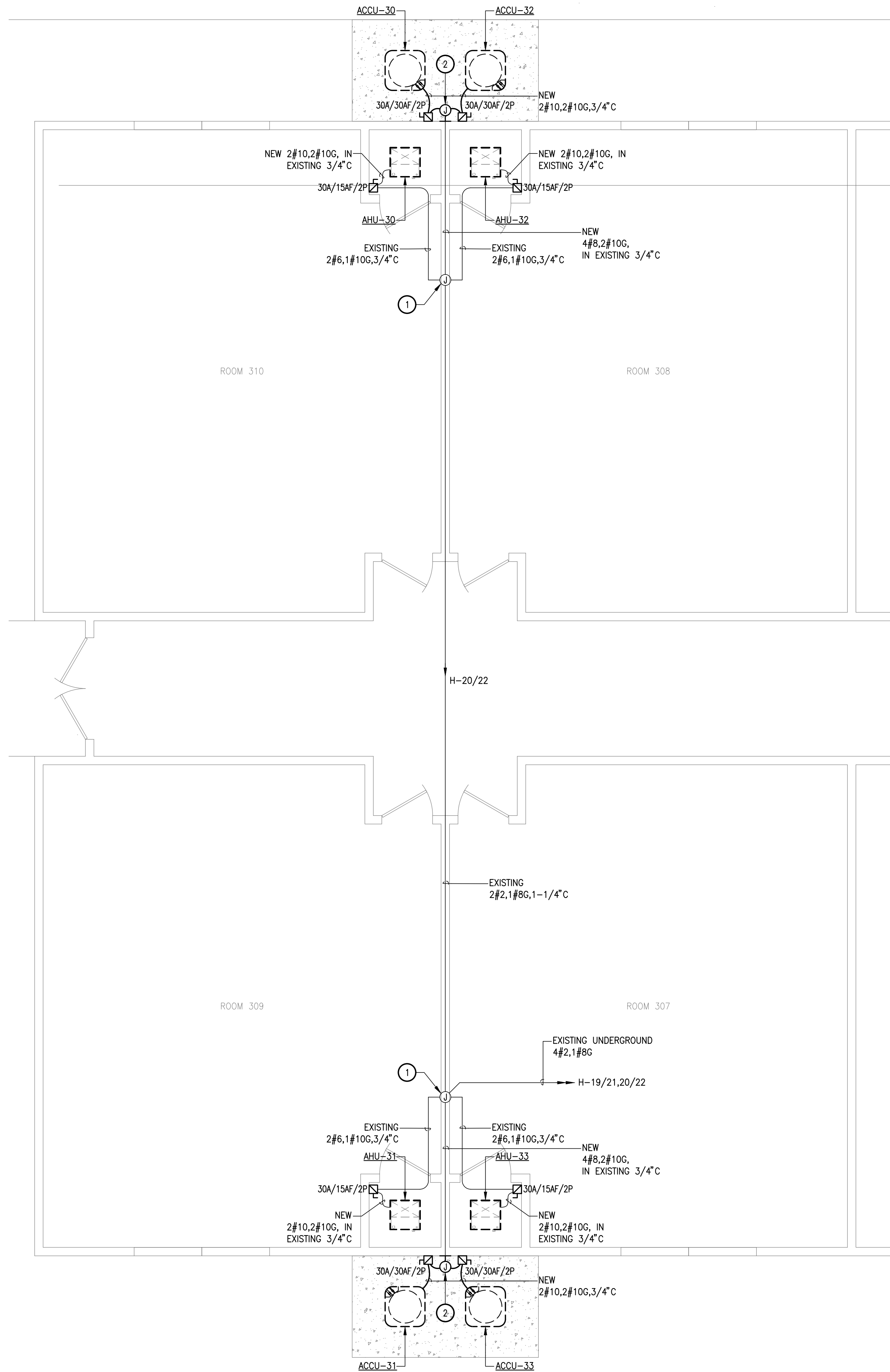
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Sheet Title	
ELECTRICAL POWER PLAN - OVERALL	
E101	
Sheet Number	

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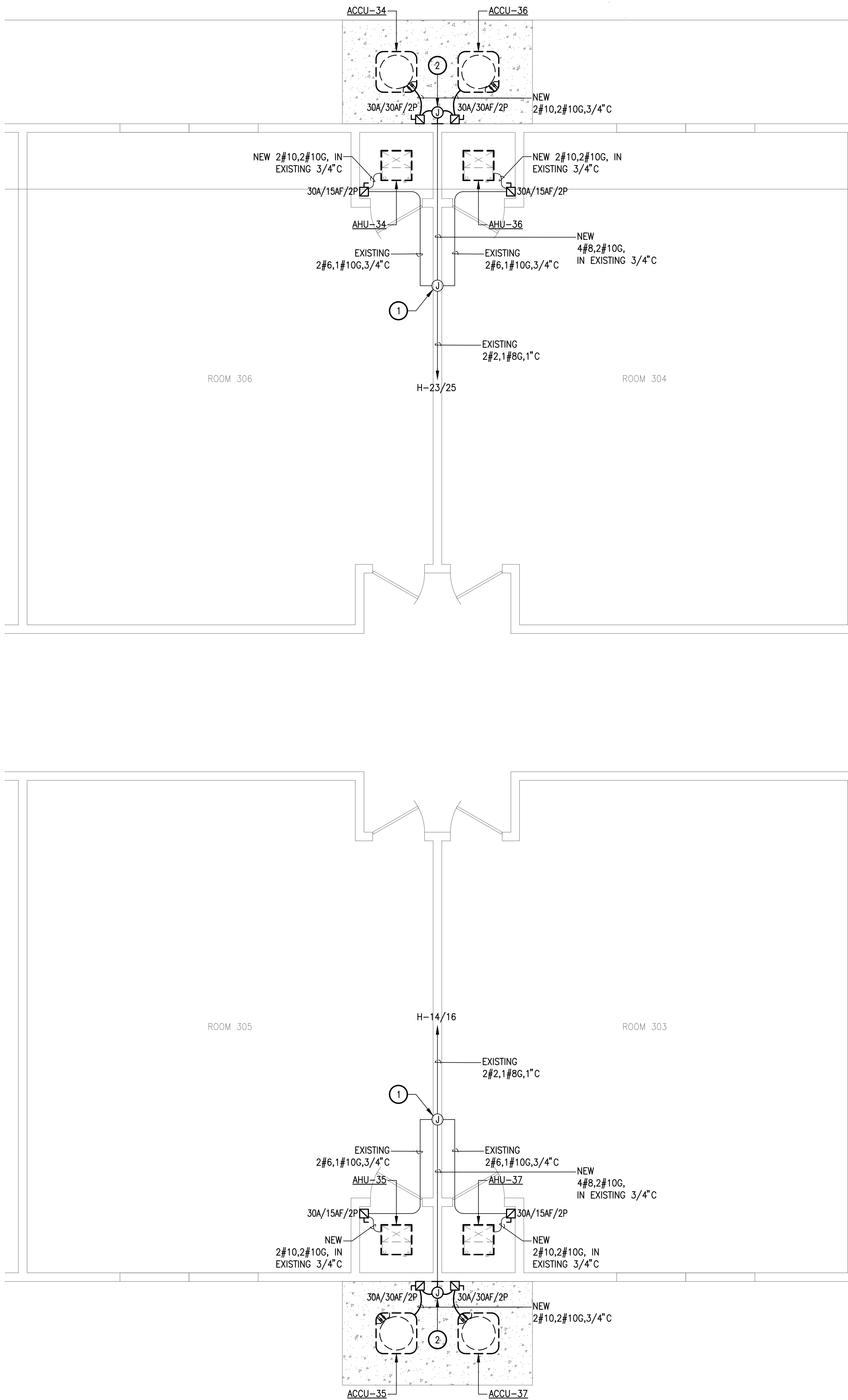
01

**ELECTRICAL POWER PLAN - TYPICAL
CLASSROOM LAYOUT 'A'**
SCALE: 1/4" = 1'-0"



02

**ELECTRICAL POWER PLAN - TYPICAL
CLASSROOM LAYOUT 'B'**
SCALE: 1/4" = 1'-0"



GENERAL NOTES:

- REFER TO E001 FOR ELECTRICAL GENERAL NOTES.
- ALL HVAC EQUIPMENT DISCONNECTING MEANS SHALL BE EQUIPPED WITH FUSES SIZED PER NEC 2017.

KEY NOTES:

- FURNISH AND INSTALL TERMINAL BLOCK IN EXISTING 10"x10"x6" JUNCTION BOX. EXISTING BRANCH FEEDERS AND TAP CONDUCTORS SHALL BE CONNECTED TO NEW TERMINAL BLOCK FOR ADEQUATE TAPPING OF FEEDERS.
- FURNISH AND INSTALL NEW 6"x6"x4" GALVANIZED WEATHER TIGHT JUNCTION BOX AT EXISTING CONDUIT WALL PENETRATION.

LEGEND

- EXISTING HVAC EQUIPMENT
- EXISTING ELECTRICAL EQUIPMENT
- PROPOSED HVAC EQUIPMENT
- PROPOSED ELECTRICAL EQUIPMENT
- PROPOSED ELECTRICAL CONDUIT



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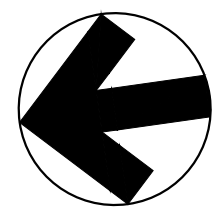
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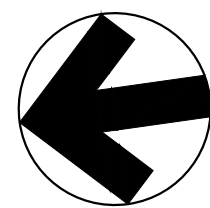
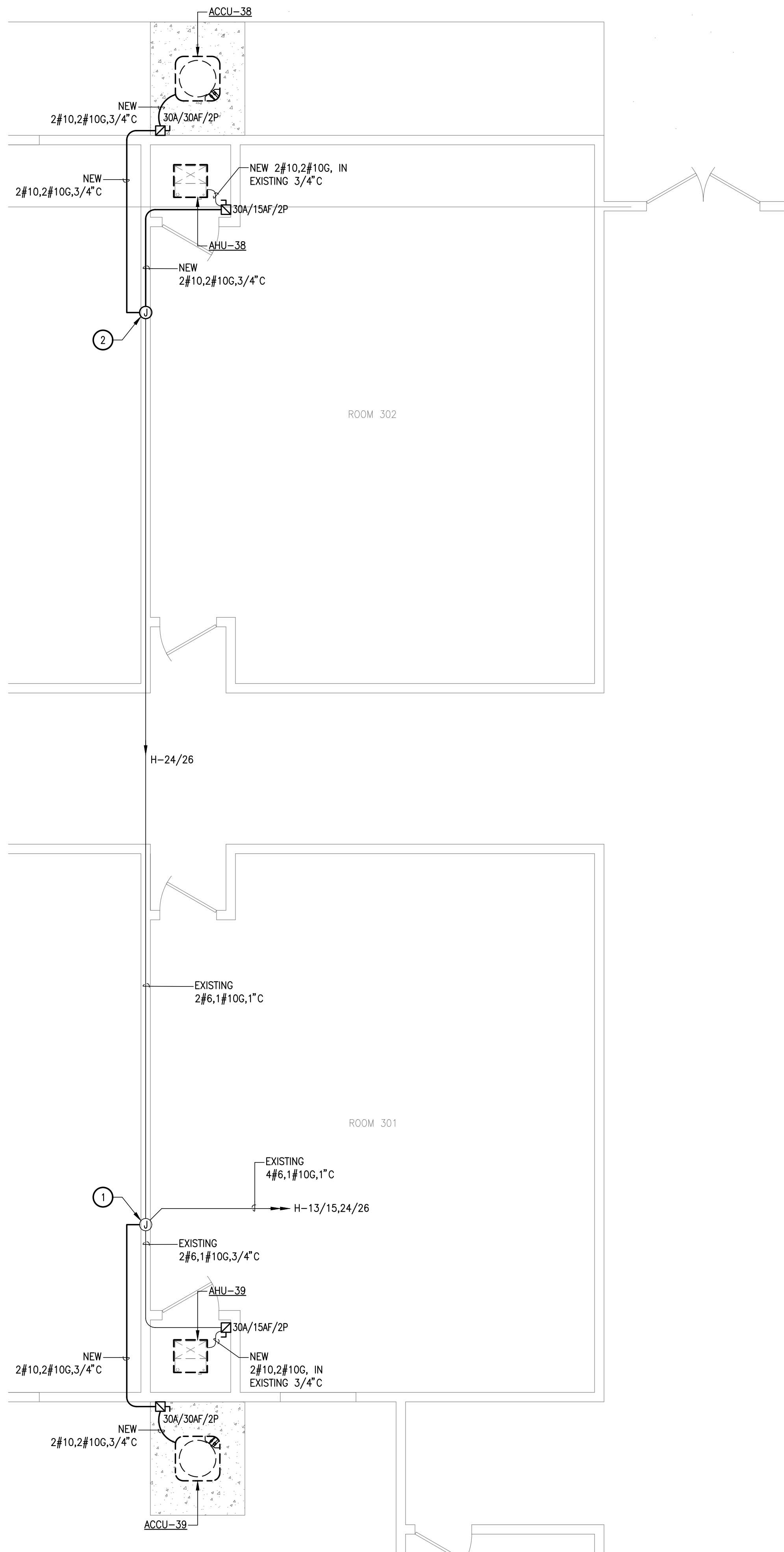
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01

ELECTRICAL POWER PLAN - TYPICAL CLASSROOM LAYOUT 'C'

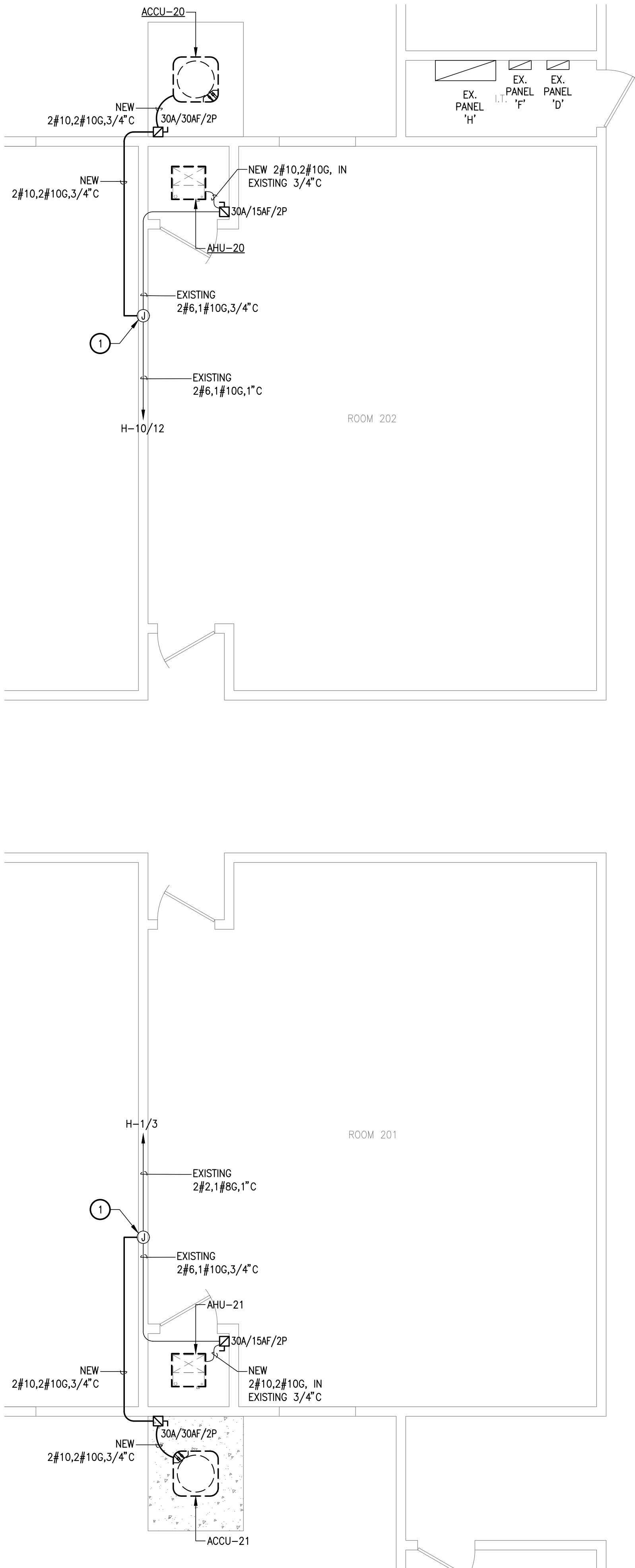
SCALE: 1/4" = 1'-0"



02

ELECTRICAL POWER PLAN - TYPICAL CLASSROOM LAYOUT 'D'

SCALE: 1/4" = 1'-0"



GENERAL NOTES:

- REFER TO E001 FOR ELECTRICAL GENERAL NOTES.
- ALL HVAC EQUIPMENT DISCONNECTING MEANS SHALL BE EQUIPPED WITH FUSES SIZED PER NEC 2017.

KEY NOTES:

- FURNISH AND INSTALL TERMINAL BLOCK IN EXISTING 10"x10"x6" JUNCTION BOX. EXISTING BRANCH FEEDERS AND TAP CONDUCTORS SHALL BE CONNECTED TO NEW TERMINAL BLOCK FOR ADEQUATE TAPPING OF FEEDERS.
- FURNISH AND INSTALL NEW 10"x10"x6" JUNCTION BOX WITH TERMINAL BLOCK ABOVE CEILING.

LEGEND

- EXISTING HVAC EQUIPMENT
- EXISTING ELECTRICAL EQUIPMENT
- PROPOSED HVAC EQUIPMENT
- PROPOSED ELECTRICAL EQUIPMENT
- PROPOSED ELECTRICAL CONDUIT

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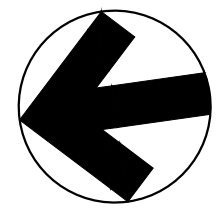
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Sheet Number	E103

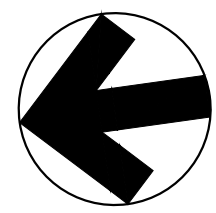
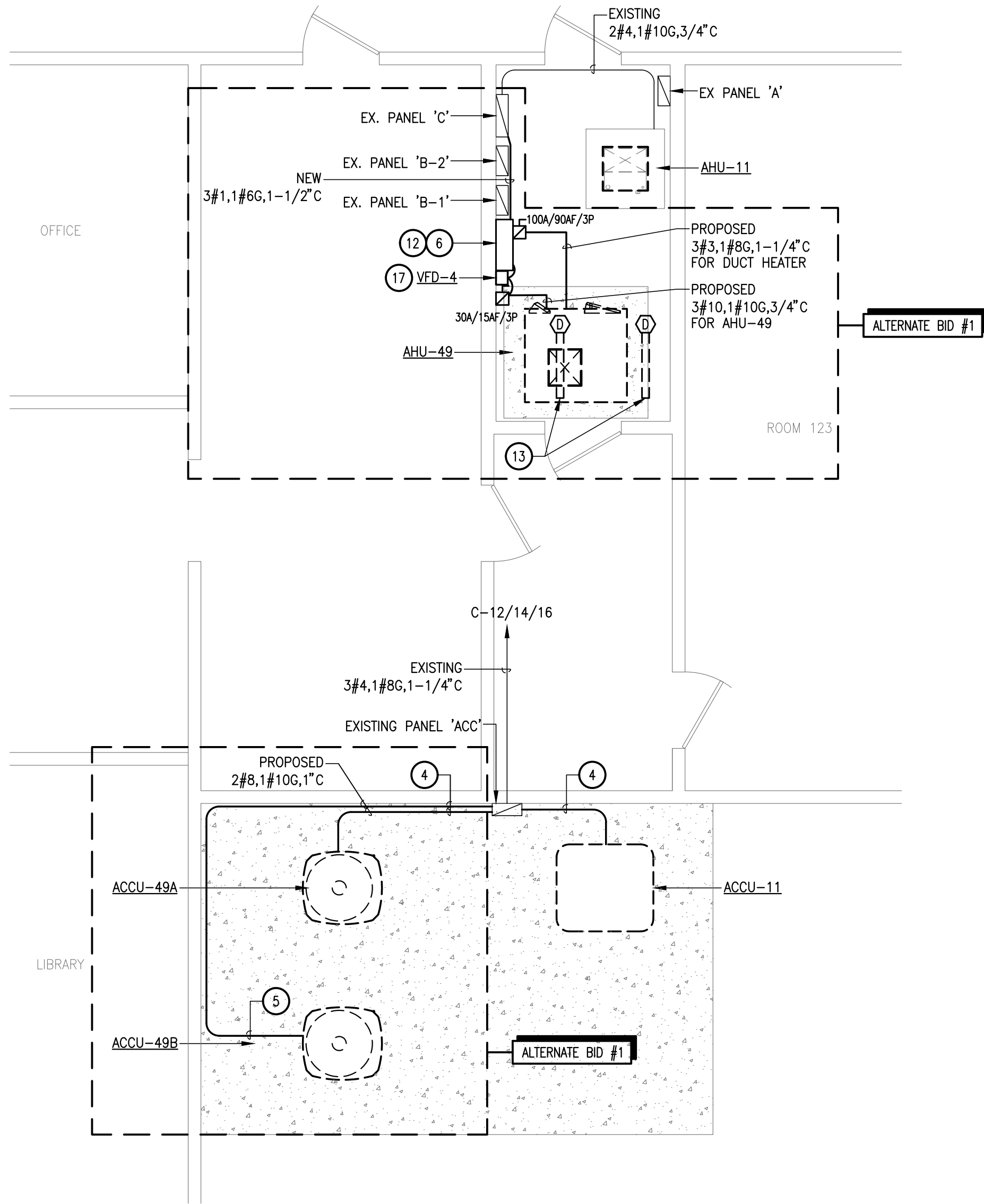
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02

ELECTRICAL POWER PLAN - NORTH WEST MECHANICAL YARD

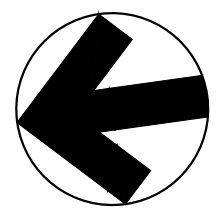
SCALE: 1/4" = 1'-0"



01

ELECTRICAL POWER PLAN - SOUTH WEST MECHANICAL YARD

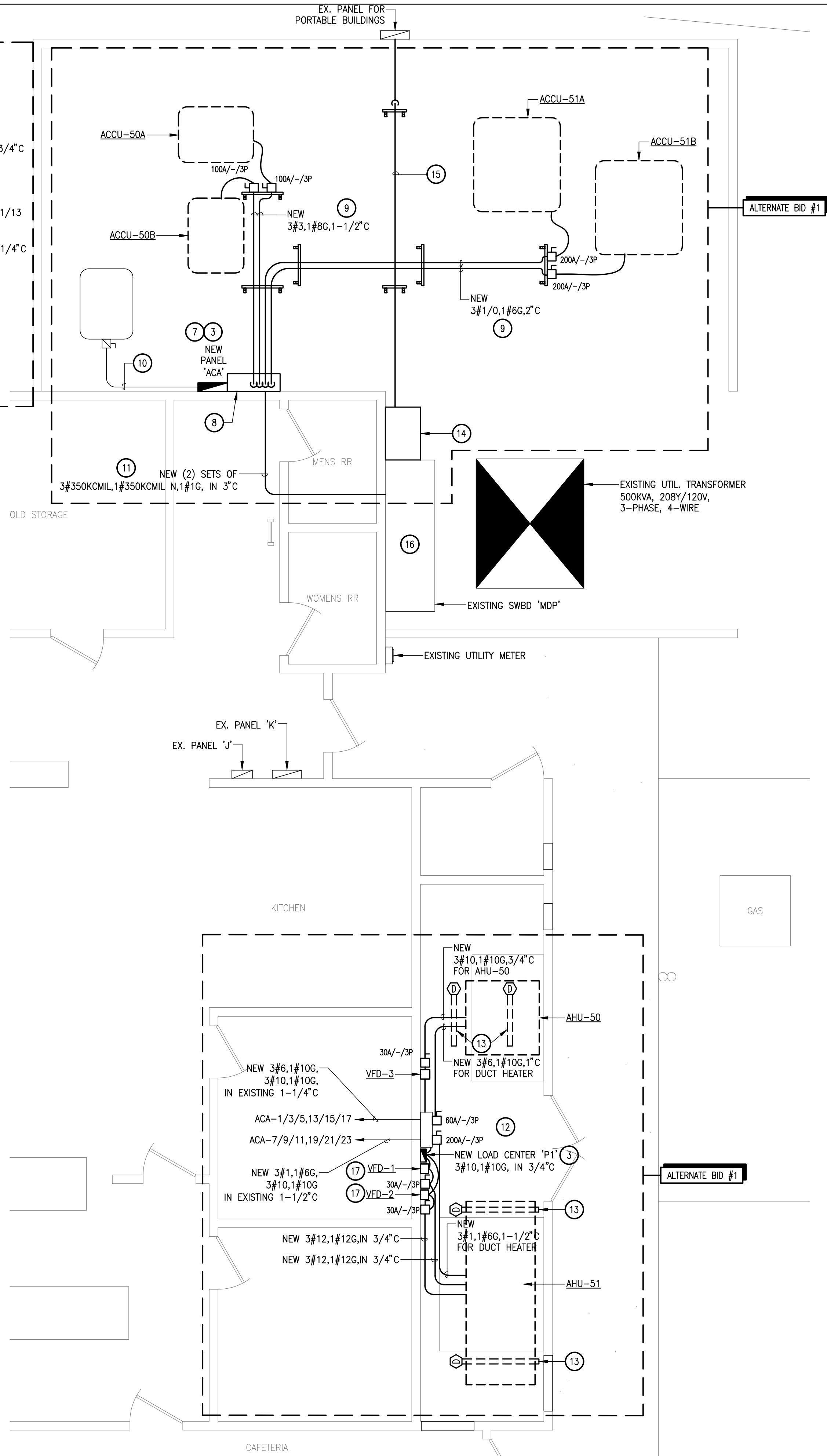
SCALE: 1/4" = 1'-0"



03

ELECTRICAL POWER PLAN - SOUTH MECHANICAL ROOM

SCALE: 1/4" = 1'-0"



GENERAL NOTES:

- REFER TO E001 FOR ELECTRICAL GENERAL NOTES.
- ALL HVAC EQUIPMENT DISCONNECTING MEANS SHALL BE EQUIPPED WITH FUSES SIZED PER NEC 2017.

KEY NOTES:

- FURNISH AND INSTALL TERMINAL BLOCK IN EXISTING 10"x10"x6" JUNCTION BOX. EXISTING BRANCH FEEDERS AND TAP CONDUCTORS SHALL BE CONNECTED TO NEW TERMINAL BLOCK FOR ADEQUATE TAPPING OF FEEDERS.
- FURNISH AND INSTALL TERMINAL BLOCK IN EXISTING WIREWAY. EXISTING BRANCH FEEDERS AND NEW TAP CONDUCTORS SHALL BE CONNECTED TO NEW TERMINAL BLOCK FOR ADEQUATE TAPPING OF FEEDERS.
- PROPOSED NEW PANELBOARD. REFER TO PANEL SCHEDULES FOR NEW CIRCUITS.
- INSTALL CONDUIT SURFACE TO THE EXTERIOR WALL. PROVIDE WITH MOUNTING HARDWARE AND FASTENERS OF GALVANIZED MATERIAL.
- FURNISH AND INSTALL CONDUIT SUPPORT TYPE CADDY#PSF6C WITH UNISTRUT CONDUIT CLAMP AT EVERY 5'-0". HARDWARE SHALL BE OF GALVANIZED MATERIAL. CONDUIT SHALL NOT BE INSTALLED DIRECTLY ON GROUND.
- FURNISH AND INSTALL A NEW 10"x10"x24" WIREWAY WITH TERMINAL BLOCK.
- NEW PANEL 'ACA' SHALL BE INSTALLED NORTH OF EXISTING LOCATION TO BE CLEAR OF HVAC PIPING WALL PENETRATION.
- FURNISH AND INSTALL A 12"x12"x36" WIREWAY FROM NEW PANEL 'ACA' TO EXISTING CONDUIT WALL PENETRATIONS. FIELD VERIFY HEIGHT OF CONDUIT WALL PENETRATIONS FOR WIREWAY INSTALLATION HEIGHT.
- CONDUIT FOR CONDENSING UNITS SHALL BE INSTALLED AT A MINIMUM OF 7'-0" HEIGHT ON EQUIPMENT RACK SUPPORTS.
- RECONNECT EXISTING CONDUIT AND CONDUCTORS FOR EXISTING CONDENSING UNIT TO NEW PANEL 'ACA'.
- NEW CONDUIT FOR PANEL 'ACA' SHALL BE INSTALLED ALONG THE SAME ROUTE AS DEMOLISHED CONDUIT. CONTRACTOR SHALL FIELD VERIFY THIS ROUTING.
- DISCONNECT SWITCHES SHALL NOT BE USED AS JUNCTION BOXES AND/OR TAP TERMINATION. EACH DISCONNECT SWITCH SHALL CONTAIN ITS DEDICATED RACEWAY.
- FURNISH AND INSTALL DUCT SMOKE DETECTORS ON BOTH SUPPLY AND RETURN SIDES OF THE UNIT. PROVIDE CONDUIT AND WIRING AND CONNECT TO EXISTING FA SYSTEM.
- FURNISH AND INSTALL (2) NEW 36"x36"x24" JUNCTION BOXES ADJACENT TO SWITCHBOARD 'MDP'. ROUTE NEW FEEDERS FOR PANEL 'H' THROUGH JUNCTION BOXES AND INTO BUILDING AT PLENUM SPACE.
- FURNISH AND INSTALL NEW 3#350KCMIL, 1#350KCMIL N, 1#2G, IN 3" C FROM SWITCHBOARD 'MDP' TO PORTABLE BUILDINGS PANEL.
- CONTRACTOR SHALL FURNISH AND INSTALL WEATHER PROOF COVERS FOR ALL REMAINING CONDUIT OPENINGS AT SWITCHBOARD 'MDP'. CONFIRM WITH SWITCHBOARD MANUFACTURER REQUIREMENTS TO MAINTAIN A NEMA 3R WEATHER TIGHT RATING.
- REFER TO MECHANICAL DRAWINGS FOR FAN STARTER SPECIFICATIONS. INSTALLATION OF STARTERS BY DIVISION 26.

LEGEND

- EXISTING HVAC EQUIPMENT
- EXISTING ELECTRICAL EQUIPMENT
- PROPOSED HVAC EQUIPMENT
- PROPOSED ELECTRICAL EQUIPMENT
- PROPOSED ELECTRICAL CONDUIT

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Sheet Title	ELECTRICAL POWER PLAN
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E104

Sheet Number

EXISTING SWITCHBOARD 'MDP'

LOCATION: EXTERIOR
FED FROM: UTILITY
MOUNTING: PAD MOUNTED
ENCLOSURE: NEMA 3R

VOLTS: 208
PHASES: 3
WIRES: 4

A.I.C. RATING: 65,000
MAINS TYPE: M.C.B.
MAINS RATING: 3000A
MCB RATING: 3000A

CKT	CIRCUIT DESCRIPTION	# OF POLES	TRIP RATING	LOAD	REMARKS
1	PANEL 'J'	3	225A	---	NOTE 1
2	PORTABLE BUILDINGS	3	400A	---	NOTE 1
3	PANEL 'ACA'	3	225A	83147	
4	PANEL 'D'	3	225A	---	NOTE 1
5	PANEL 'K'	3	225A	---	NOTE 1
6	PANEL 'G'	3	225A	---	NOTE 1
7	PANEL 'H'	3	600A	391373	
8	PANEL 'K'	3	1000A	---	NOTE 1
9	EXISTING LOAD	3	60A	---	NOTE 1
10	PAVILLION	3	300A	---	NOTE 1
11	EXISTING LOAD	3	300A	---	NOTE 1
12	PANEL 'B'	3	300A	---	NOTE 1
13	PANEL 'C'	3	600A	202653	

NET CALCULATED DEMAND = 1095210 VA
@208Y/120V,3PH = 3040.00 A

NOTES:

1. INFORMATION FOR THIS PANEL IS NOT PART OF THIS SCOPE OF WORK. TOTAL CALCULATED LOAD IS BASED ON EXISTING FEEDER TOTAL CAPACITY. CALCULATED LOAD IS FOR LOAD ESTIMATE COMPARISSON PURPOSES ONLY.

MODIFIED SWITCHBOARD 'MDP'

LOCATION: EXTERIOR
FED FROM: UTILITY
MOUNTING: PAD MOUNTED
ENCLOSURE: NEMA 3R

VOLTS: 208
PHASES: 3
WIRES: 4

A.I.C. RATING: 65,000
MAINS TYPE: M.C.B.
MAINS RATING: 3000A
MCB RATING: 3000A

CKT	CIRCUIT DESCRIPTION	# OF POLES	TRIP RATING	LOAD	REMARKS
1	PANEL 'J'	3	225A	---	NOTE 1
2	PORTABLE BUILDINGS	3	400A	---	NOTE 1
3	PANEL 'ACA'	3	600A	200260	NOTE 2
4	PANEL 'D'	3	225A	---	NOTE 1
5	PANEL 'K'	3	225A	---	NOTE 1
6	PANEL 'G'	3	225A	---	NOTE 1
7	PANEL 'H'	3	1000A LSI	177528	NOTE 2
8	PANEL 'K'	3	1000A	---	NOTE 1
9	EXISTING LOAD	3	60A	---	NOTE 1
10	PAVILLION	3	300A	---	NOTE 1
11	EXISTING LOAD	3	300A	---	NOTE 1
12	PANEL 'B'	3	300A	---	NOTE 1
13	PANEL 'C'	3	600A	141201	NOTE 2

NET CALCULATED DEMAND = 937026 VA
@208Y/120V,3PH = 2600.92 A

NOTES:

1. INFORMATION FOR THIS PANEL IS NOT PART OF THIS SCOPE OF WORK. TOTAL CALCULATED LOAD IS BASED ON EXISTING FEEDER TOTAL CAPACITY. CALCULATED LOAD IS FOR LOAD ESTIMATE COMPARISSON PURPOSES ONLY.
2. CONTRACTOR SHALL FURNISH AND INSTALL NEW BREAKER IN EXISTING SWITCHBOARD. IF NEW BREAKER FRAME DOES NOT FIT IN EXISTING LOCATION, CONTRACTOR SHALL BE RESPONSIBLE FOR ALL HARDWARE NEEDED TO INSTALL IN ANOTHER SPACE WITHIN SWITCHBOARD 'MDP'. BREAKER SHALL MATCH EXISTING SWITCHBOARD A.I.C. RATING.

ELECTRICAL LOAD ESTIMATE

EXISTING HVAC ELECTRICAL LOAD

PANEL 'ACA' = 83147 VA
PANEL 'C' = 202653 VA
PANEL 'H' = 391373 VA

NET CALCULATED DEMAND = 677173 VA
@ 208Y/120V 3 PH = 1880 A

REVISED HVAC ELECTRICAL LOAD

PANEL 'ACA' = 200260 VA
PANEL 'C' = 147691 VA
PANEL 'H' = 210226 VA

NET CALCULATED DEMAND = 558176 VA
@ 208Y/120V 3 PH = 1549 A

TOTAL LOAD SUMMARY

EXISTING SERVICE ENTRANCE CAPACITY OF
(8) SETS OF 500MCM: 3040 A

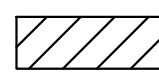
EXISTING HVAC LOAD DECREASED BY: 118997 VA
330 A

THEREFORE, IT IS ESTIMATED THAT EXISTING ELECTRICAL SERVICE IS ADEQUATE.

GENERAL NOTES:

- ALL BREAKER UNUSED SPACES SHALL BE PROVIDED WITH BREAKER SPACE COVERS.

LEGEND

 EXISTING CIRCUIT BREAKER TO BE REPLACED. UPDATE CIRCUIT DIRECTORY. NEW KAIC RATING SHALL MATCH EXISTING PANELBOARD'S KAIC RATING.

KEY NOTES:

1. CHANGE SHALL ONLY BE APPLICABLE UNDER ALTERNATE BID #1.

EXISTING PANELBOARD 'H'

VOLTAGE: 208Y/120 VOLT 3 PHASE 3 WIRE

1200A MAIN LUGS ONLY

BUSES: 1200 A; NO NEUTRAL; EQUIPMENT GROUND

LOCATION: IT ROOM

MOUNTING: SURFACE

Isc = 22,000 A RMS SYM AVAILABLE

VA-L	VA-R	VA-O	LOAD	BKR	CKT	PH	CKT	BKR	LOAD	VA-L	VA-R	VA-O
0	0	5366	AHU & ACCU-21	50/2	1	A	2	100/2	AHU & ACCU-17, AHU & ACCU-19	0	0	10733
0	0	5366	"	"	3	B	4	"	"	0	0	10733
0	0	10733	AHU & ACCU-13, AHU & ACCU-15	100/2	5	C	6	100/2	AHU & ACCU-12, AHU & ACCU-14	0	0	10733
0	0	10733	"	"	7	A	8	"	"	0	0	10733
0	0	10733	AHU & ACCU-16, AHU & ACCU-18	100/2	9	B	10	50/2	AHU & ACCU-20	0	0	5366
0	0	10733	"	"	11	C	12	"	"	0	0	5366
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0	0	5366	"	"	15	B	16	"	"	0	0	10733
0	0		SPACE	"	17	C	18	"	SPACE	0	0	
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0	0	10733	AHU & ACCU-34, AHU & ACCU-36	100/2	23	C	24	50/2	AHU & ACCU-38	0	0	5366
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0	0	10733	"	"	29	C	30	"	"	0	0	10733
0	0	10733	AHU & ACCU-27, AHU & ACCU-29	100/2	31	A	32	100/2	AHU & ACCU-26, AHU & ACCU-28	0	0	10733
0	0	10733	"	"	33	B	34	"	"	0	0	10733
0	0		SPACE	"	35	C	36	"	SPACE	0	0	
0	0	10733	AHU & ACCU-41, AHU & ACCU-43	100/2	37	A	38	100/2	AHU & ACCU-45, AHU & ACCU-47	0	0	10733
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0	0		SPACE	"	45	B	46	30/2	AC CUSTODIAN ROOM	0	0	2496
0	0		SPACE	"	47	C	48	"	"	0	0	2496
0	0		SPACE	"	49	A	50	"	SPACE	0	0	
0	0		SPACE	"	51	B	52	"	SPACE	0	0	
0	0		SPACE	"	53	C	54	"	SPACE	0	0	

VA-L (LIGHTING) 0 CONNECTED 0 DEMAND
VA-R (RECEPTACLES) 0 CONNECTED 0 DEMAND
VA-O (OTHER) 455770 CONNECTED 455770 DEMAND
VA: TOTAL 455770 CONNECTED 455770 DEMAND
AMPS: TOTAL 1265 CONNECTED 1265 DEMAND

L	R	O	TOTAL
0	0	155626	VA CONNECTED TO A PHASE 155626 VA = 1297 AMPS CONNECTED TO A PHASE @ 120 VOLTS
0	0	136656	VA CONNECTED TO B PHASE 136656 VA = 1139 AMPS CONNECTED TO B PHASE @ 120 VOLTS
0	0	99091	VA CONNECTED TO C PHASE 99091 VA = 826 AMPS CONNECTED TO C PHASE @ 120 VOLTS
0	0	391373	TOTAL 391373 VA

EXISTING PANELBOARD 'ACA'

VOLTAGE: 208Y/120 VOLT 3 PHASE 3 WIRE

225A MAIN LUGS ONLY

BUSES: 225A; NEUTRAL ~ 100%; EQUIPMENT GROUND

LOCATION: EXTERIOR SOUTH MECHANICAL YARD

MOUNTING: SURFACE

VA-L	VA-R	VA-O	LOAD	BKR	CKT	PH	CKT	BKR	LOAD	VA-L	VA-R	VA-O
0	0		SPACE	"	1	A	2	"	SPACE	0	0	
0	0		SPACE	"	3	B	4	"	SPACE	0	0	
0	0		SPACE	"	5	C	6	"	SPACE	0	0	
0	0	6207	AHU-50 & ELECTRIC DUCT HEATER	100/3	7	A	8	50/3	ACCU-50A	0	0	0
0	0	6207	"	"	9	B	10	"	"	0	0	0
0	0	6207	"	"	11	C	12	"	"	0	0	0
0	0	7699	CONDENSING UNIT (WALK-IN COOLERS)	80/3	13	A	14	50/3	ACCU-50B	0	0	0
0	0	7699	"	"	15	B	16	"	"	0	0	0
0	0	7699	"	"	17	C	18	"	"	0	0	0
					19	A	20	150/3	AHU-51 & ELECTRIC DUCT HEATER	0	0	13810
					21	B	22	"	"	0	0	13810
					23	C	24	"	"	0	0	13810

VA-L (LIGHTING) 0 CONNECTED 0 DEMAND
VA-R (RECEPTACLES) 0 CONNECTED 0 DEMAND
VA-O (OTHER) 83147 CONNECTED 83147 DEMAND
VA: TOTAL 83147 CONNECTED 83147 DEMAND
AMPS: TOTAL 231 CONNECTED 231 DEMAND

L	R	O	TOTAL
0	0	27716	VA CONNECTED TO A PHASE 27716 VA = 231 AMPS CONNECTED TO A PHASE @ 120 VOLTS
0	0	27716	VA CONNECTED TO B PHASE 27716 VA = 231 AMPS CONNECTED TO B PHASE @ 120 VOLTS
0	0	27716	VA CONNECTED TO C PHASE 27716 VA = 231 AMPS CONNECTED TO C PHASE @ 120 VOLTS
0	0	83147	TOTAL 83147 VA

MODIFIED PANELBOARD 'H'

VOLTAGE: 208Y/120 VOLT 3 PHASE 3 WIRE

1200A MAIN LUGS ONLY

BUSES: 1200 A; NO NEUTRAL; EQUIPMENT GROUND

LOCATION: IT ROOM

MOUNTING: SURFACE

Isc = 22,000 A RMS SYM AVAILABLE

VA-L	VA-R	VA-O	LOAD	BKR	CKT	PH	CKT	BKR	LOAD	VA-L	VA-R	VA-O
0	0	2371	AHU & ACCU-21	50/2	1	A	2	100/2	AHU & ACCU-17, AHU & ACCU-19	0	0	4742
0	0	2371	"	"	3	B	4	"	"	0	0	4742
0	0	4742	AHU & ACCU-13, AHU & ACCU-15	100/2	5	C	6	100/2	AHU & ACCU-12, AHU & ACCU-14	0	0	4742
0	0	4742	"	"	7	A	8	"	"	0	0	4742
0	0	4742	AHU & ACCU-16, AHU & ACCU-18	100/2	9	B	10	50/2	AHU & ACCU-20	0	0	3276
0	0	4742	"	"	11	C	12	"	"	0	0	3276
0	0	2371	AHU & ACCU-39	50/2	13	A	14	100/2	AHU & ACCU-35, AHU & ACCU-37	0	0	4742
0	0	2371	"	"	15	B	16	"	"	0	0	4742
0	0		SPACE	"	17	C	18	"	SPACE	0	0	
0	0	4742	AHU & ACCU-31, AHU & ACCU-33	100/2	19	A	20	100/2	AHU & ACCU-30, AHU & ACCU-32	0	0	4742
0	0	4742	"	"	21	B	22	"	"	0	0	4742
0	0	4742	AHU & ACCU-34, AHU & ACCU-36	100/2	23	C	24	50/2	AHU & ACCU-38	0	0	2371
0	0	4742	"	"	25	A	26	"	"	0	0	2371
0	0	4742	AHU & ACCU-23, AHU & ACCU-25	100/2	27	B	28	100/2	AHU & ACCU-22, AHU & ACCU-24	0	0	4742
0	0	4742	"	"	29	C	30	"	"	0	0	4742
0	0	4742	AHU & ACCU-27, AHU & ACCU-29	100/2	31	A	32	100/2	AHU & ACCU-26, AHU & ACCU-28	0	0	4742
0	0	4742	"	"	33	B	34	"	"	0	0	4742
0	0		SPACE	"	35	C	36	"	SPACE	0	0	
0	0	4742	AHU & ACCU-41, AHU & ACCU-43	100/2	37	A	38	100/2	AHU & ACCU-45, AHU & ACCU-47	0	0	4742
0	0	4742	"	"	39	B	40	"	"	0	0	4742
0	0	4742	AHU & ACCU-40, AHU & ACCU-42	100/2	41	C	42	100/2	AHU & ACCU-44, AHU & ACCU-46	0	0	4742
0	0	4742	"	"	43	A	44	"	"	0	0	4742
0	0		SPACE	"	45	B	46	30/2	AC CUSTODIAN ROOM	0	0	2496
0	0		SPACE	"	47	C	48	"	"	0	0	2496
0	0		SPACE	"	49	A	50	"	SPACE	0	0	
0	0		SPACE	"	51	B	52	"	SPACE	0	0	
0	0		SPACE	"	53	C	54	"	SPACE	0	0	

VA-L (LIGHTING) 0 CONNECTED 0 DEMAND
VA-R (RECEPTACLES) 0 CONNECTED 0 DEMAND
VA-O (OTHER) 211598 CONNECTED 211598 DEMAND
VA: TOTAL 211598 CONNECTED 211598 DEMAND
AMPS: TOTAL 587 CONNECTED 587 DEMAND

L	R	O	TOTAL
0	0	68765	VA CONNECTED TO A PHASE 68765 VA = 573 AMPS CONNECTED TO A PHASE @ 120 VOLTS
0	0	62681	VA CONNECTED TO B PHASE 62681 VA = 522 AMPS CONNECTED TO B PHASE @ 120 VOLTS
0	0	46082	VA CONNECTED TO C PHASE 46082 VA = 384 AMPS CONNECTED TO C PHASE @ 120 VOLTS
0	0	177528	TOTAL 177528 VA

NEW PANELBOARD 'ACA'

VOLT

EXISTING PANELBOARD 'C'

VOLTAGE: 208Y/120 VOLT 3 PHASE 3 WIRE										LOCATION: EAST (FRONT) MECHANICAL ROOM			
600A MAIN LUGS ONLY										MOUNTING: SURFACE			
BUSES: 600A; NO NEUTRAL; EQUIPMENT GROUND													
VA-L	VA-R	VA-O	LOAD	BKR	CKT	PH	CKT	BKR	LOAD	VA-L	VA-R	VA-O	
0	0	10733	AHU-1, AHU-3	100/2	1	A	2	80/2	AHU-11	0	0	5366	
0	0	10733	"		3	B	4		"	0	0	5366	
0	0	10733	AHU & ACCU-5, AHU & ACCU-6	100/2	5	C	6	80/3	PANEL 'ACB'	0	0	7332	
0	0	10733	"		7	A	8		"	0	0	3536	
0	0	7566	AHU-48 & ELECTRIC DUCT HEATER	100/3	9	B	10		"	0	0	3796	
0	0	7566	"		11	C	12	80/3	PANEL 'ACC'	0	0	7592	
0	0	7566	"		13	A	14		"	0	180	4368	
0	0	8902	AHU-49 & ELECTRIC DUCT HEATER	100/3	15	B	16		"	0	0	3224	
0	0	8902	"		17	C	18	100/2	AHU & ACCU-7, AHU & ACCU-8	0	0	10733	
0	0	8902	"		19	A	20		"	0	0	10733	
0	0	10733	AHU & ACCU-9, AHU & ACCU-10	100/2	21	B	22	100/2	AHU & ACCU-2, AHU & ACCU-4	0	0	10733	
0	0	10733	"		23	C	24		"	0	0	10733	
0	540		COPY MACHINE	20/2	25	A	26	20/2	COPY MACHINE	0	540		
0	540		"		27	B	28		"	0	540		
1000	0		MARQUEE LIGHT	20/1	29	C	30	30/1	MARQUEE LIGHTS	2000	0		
VA-L (LIGHTING)				3000	CONNECTED					3750	DEMAND		
VA-R (RECEPTACLES)				2340	CONNECTED					2340	DEMAND		
VA-O (OTHER)				197313	CONNECTED					197313	DEMAND		
VA: TOTAL				202653	CONNECTED					203403	DEMAND		
AMPS: TOTAL				563	CONNECTED					565	DEMAND		
L	R	O	TOTAL										
0	1260	61937	VA CONNECTED TO A PHASE	63197	VA =	527	AMPS CONNECTED TO A PHASE @ 120 VOLTS						
0	1080	61053	VA CONNECTED TO B PHASE	62133	VA =	518	AMPS CONNECTED TO B PHASE @ 120 VOLTS						
3000	0	74323	VA CONNECTED TO C PHASE	77323	VA =	644	AMPS CONNECTED TO C PHASE @ 120 VOLTS						
3000	2340	197313	TOTAL	202653	VA								

EXISTING PANELBOARD 'ACB'

VOLTAGE: 208Y/120 VOLT 3 PHASE 3 WIRE										LOCATION: EXTERIOR NORTH WEST MECHANICAL YARD			
100A MAIN LUGS ONLY										MOUNTING: SURFACE			
BUSES: 100A; NO NEUTRAL; EQUIPMENT GROUND													
VA-L	VA-R	VA-O	LOAD	BKR	CKT	PH	CKT	BKR	LOAD	VA-L	VA-R	VA-O	
0	0	1768	ACCU-1	50/2	1	A	2	50/2	ACCU-48B	0	0	1768	
0	0	1768	"		3	B	4		"	0	0	1768	
0	0	1612	ACCU-3	50/2	5	C	6	50/2	ACCU-48A	0	0	2184	
0	0	1612	"		7	A	8		"	0	0	2184	
0	0		SPACE		9	B	10		SPACE	0	0		
0	0		SPACE		11	C	12		SPACE	0	0		
0	0		SPACE		13	A	14		SPACE	0	0		
0	0		SPACE		15	B	16		SPACE	0	0		
0	0		SPACE		17	C	18		SPACE	0	0		
VA-L (LIGHTING)				0 CONNECTED				0 DEMAND					
VA-R (RECEPTACLES)				0 CONNECTED				0 DEMAND					
VA-O (OTHER)				14664 CONNECTED				14664 DEMAND					
VA: TOTAL				14664 CONNECTED				14664 DEMAND					
AMPS: TOTAL				41 CONNECTED				41 DEMAND					
L	R	O	TOTAL										
0	0	7332	VA CONNECTED TO A PHASE				7332	VA =	61	AMPS CONNECTED TO A PHASE @ 120 VOLTS			
0	0	3536	VA CONNECTED TO B PHASE				3536	VA =	29	AMPS CONNECTED TO B PHASE @ 120 VOLTS			
0	0	3796	VA CONNECTED TO C PHASE				3796	VA =	32	AMPS CONNECTED TO C PHASE @ 120 VOLTS			
0	0	14664	TOTAL				14664	VA					

EXISTING PANELBOARD 'ACC'

VOLTAGE: 208Y/120 VOLT 3 PHASE 3 WIRE										LOCATION: EXTERIOR SOUTH WEST MECHANICAL YARD			
100A MAIN LUGS ONLY										MOUNTING: SURFACE			
BUSES: 100 A; NO NEUTRAL; EQUIPMENT GROUND													
VA-L	VA-R	VA-O	LOAD	BKR	CKT	PH	CKT	BKR	LOAD	VA-L	VA-R	VA-O	
0	0	1456	ACCU-11	50/2	1	A	2	80/2	ACCU-49A	0	0	2912	
0	0	1456	"		3	B	4		"	0	0	2912	
0	0	3224	ACCU-49B	80/2	5	C	6	60/3	EXISTING LOAD (OFF)	0	0	0	
0	0	3224	"		7	A	8		"	0	0		
0	180		EXISTING LOAD	20/1	9	B	10		"	0	0		
0	0		SPACE		11	C	12		SPACE	0	0		
0	0		SPACE		13	A	14		SPACE	0	0		
0	0		SPACE		15	B	16		SPACE	0	0		
0	0		SPACE		17	C	18		SPACE	0	0		
VA-L (LIGHTING)				0	CONNECTED					0	DEMAND		
VA-R (RECEPTACLES)				180	CONNECTED					180	DEMAND		
VA-O (OTHER)				15184	CONNECTED					15184	DEMAND		
VA: TOTAL				15364	CONNECTED					15364	DEMAND		
AMPS: TOTAL				43	CONNECTED					43	DEMAND		
L	R	O	TOTAL										
0	0	7592	VA CONNECTED TO A PHASE				7592	VA =	63	AMPS CONNECTED TO A PHASE @ 120 VOLTS			
0	180	4368	VA CONNECTED TO B PHASE				4548	VA =	38	AMPS CONNECTED TO B PHASE @ 120 VOLTS			
0	0	3224	VA CONNECTED TO C PHASE				3224	VA =	27	AMPS CONNECTED TO C PHASE @ 120 VOLTS			
0	180	15184	TOTAL				15364	VA					

NEW LOAD CENTER 'P1'

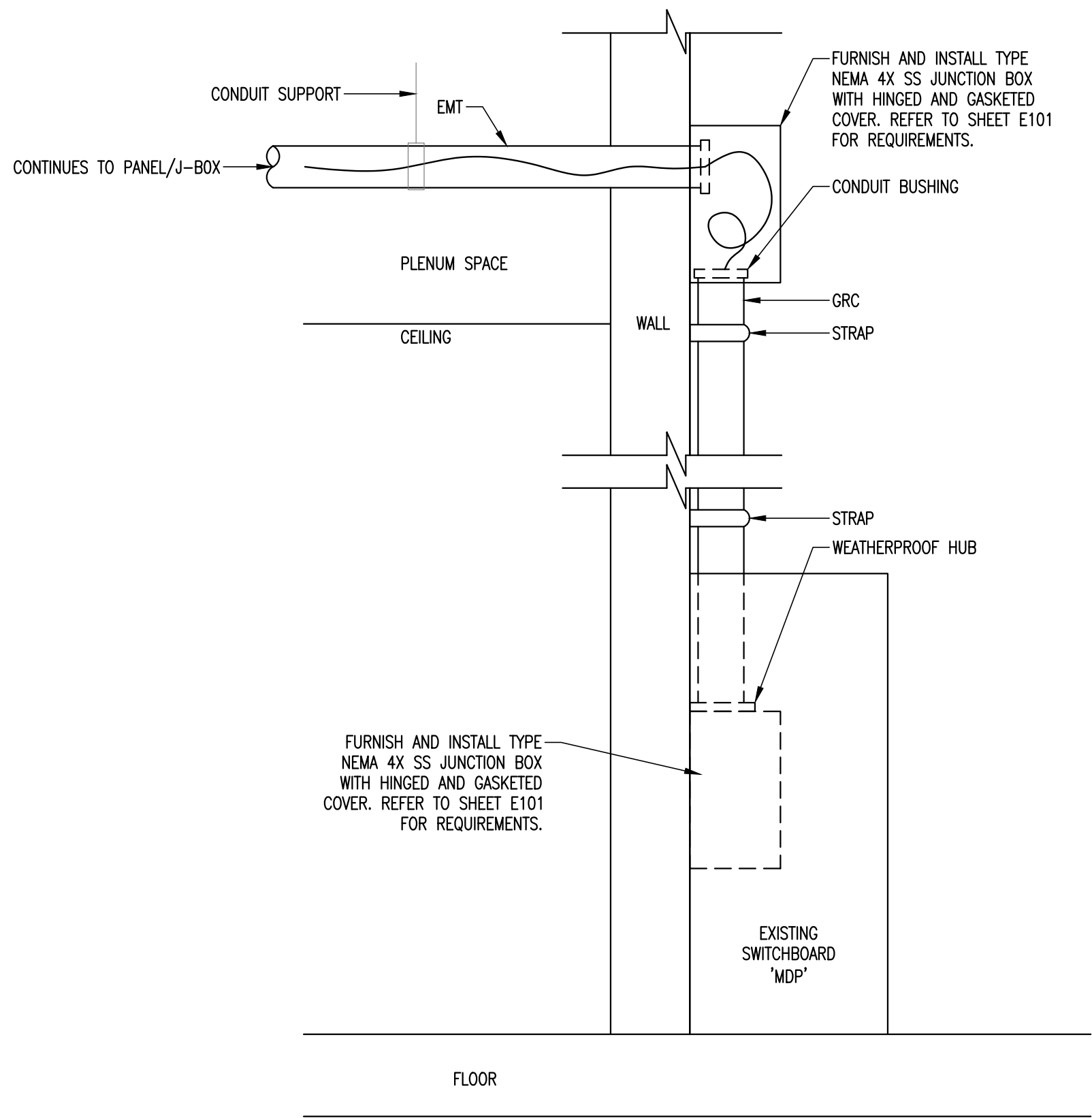
VOLTAGE: 208Y/120 VOLT 3 PHASE 3 WIRE										LOCATION: KITCHEN MECHANICAL ROOM			
30A MAIN BREAKER										MOUNTING: SURFACE, NEMA 1			
BUSES: MAIN - 50A; NO NEUTRAL; EQUIPMENT GROUND													
VA-L	VA-R	VA-O	LOAD	BKR	CKT	PH	CKT	BKR	LOAD	VA-L	VA-R	VA-O	
0	0	1083	AHU-51 FAN 1	20/3	1	A	2	20/3	AHU-51 FAN 2	0	0	1083	
0	0	1083	"	-	3	B	4	-	"	0	0	1083	
0	0	1083	"	-	5	C	6	-	"	0	0	1083	
0	0		SPACE		7	A	8		SPACE	0	0		
0	0		SPACE		9	B	10		SPACE	0	0		
VA-O (OTHER)				6496	CONNECTED					6496	DEMAND		
VA: TOTAL				6496	CONNECTED					6496	DEMAND		
AMPS: TOTAL				18	CONNECTED					18	DEMAND		
L	R	O	TOTAL										
0	0	2165	VA CONNECTED TO A PHASE	2165	VA =	18	AMPS CONNECTED TO A PHASE @ 120 VOLTS						
0	0	2165	VA CONNECTED TO B PHASE	2165	VA =	18	AMPS CONNECTED TO B PHASE @ 120 VOLTS						
0	0	2165	VA CONNECTED TO C PHASE	2165	VA =	18	AMPS CONNECTED TO C PHASE @ 120 VOLTS						
0	0	6496	TOTAL	6496	VA								

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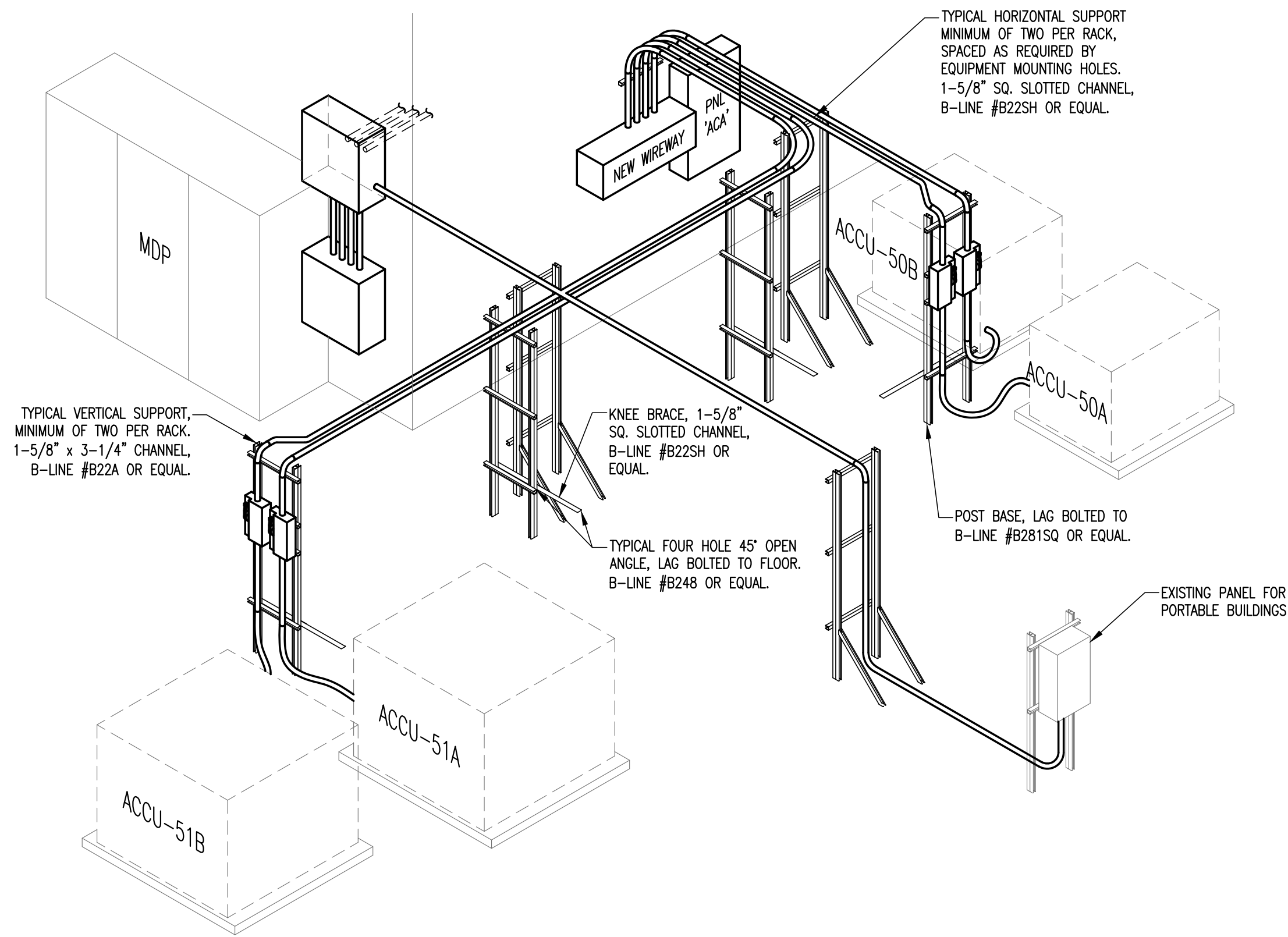
AHU CONNECTION SCHEDULE				ACCU CONNECTION SCHEDULE			
CIRCUIT DESIGNATION				CIRCUIT DESIGNATION			
RTU SCHEDULE			DISCONNECTING MEANS AND/OR	RTU SCHEDULE			DISCONNECTING MEANS AND/OR
UNIT MARK	CIRCUIT	NOTES	TAP CONDUCTOR SIZE	UNIT MARK	CIRCUIT	NOTES	TAP CONDUCTOR SIZE
AHU-1	C-1/3	1	30A/15AF/2P DISC. SWITCH, NEMA 1 - 2#10,1#10G	ACCU-1	ACB-1/3	1	30A/30AF/2P DISC. SWITCH, NEMA 3R - 2#10,1#10G
AHU-2	C-22/24	1	30A/15AF/2P DISC. SWITCH, NEMA 1 - 2#10,1#10G	ACCU-2	C-22/24	1	30A/30AF/2P DISC. SWITCH, NEMA 3R - 2#10,1#10G
AHU-3	C-1/3	1	30A/15AF/2P DISC. SWITCH, NEMA 1 - 2#10,1#10G	ACCU-3	ACB-5/7	1	30A/30AF/2P DISC. SWITCH, NEMA 3R - 2#10,1#10G
AHU-4	C-22/24	1	30A/15AF/2P DISC. SWITCH, NEMA 1 - 2#10,1#10G	ACCU-4	C-22/24	1	30A/30AF/2P DISC. SWITCH, NEMA 3R - 2#10,1#10G
AHU-5	C-5/7	1	30A/15AF/2P DISC. SWITCH, NEMA 1 - 2#10,1#10G	ACCU-5	C-5/7	1	30A/30AF/2P DISC. SWITCH, NEMA 3R - 2#10,1#10G
AHU-6	C-5/7	1	30A/15AF/2P DISC. SWITCH, NEMA 1 - 2#10,1#10G	ACCU-6	C-5/7	1	30A/30AF/2P DISC. SWITCH, NEMA 3R - 2#10,1#10G
AHU-7	C-18/20	1	30A/15AF/2P DISC. SWITCH, NEMA 1 - 2#10,1#10G	ACCU-7	C-18/20	1	30A/30AF/2P DISC. SWITCH, NEMA 3R - 2#10,1#10G
AHU-8	C-18/20	1	30A/15AF/2P DISC. SWITCH, NEMA 1 - 2#10,1#10G	ACCU-8	C-18/20	1	30A/30AF/2P DISC. SWITCH, NEMA 3R - 2#10,1#10G
AHU-9	C-21/23	1	30A/15AF/2P DISC. SWITCH, NEMA 1 - 2#10,1#10G	ACCU-9	C-21/23	1	30A/30AF/2P DISC. SWITCH, NEMA 3R - 2#10,1#10G
AHU-10	C-21/23	1	30A/15AF/2P DISC. SWITCH, NEMA 1 - 2#10,1#10G	ACCU-10	C-21/23	1	30A/30AF/2P DISC. SWITCH, NEMA 3R - 2#10,1#10G
AHU-11	C2/4	1	30A/15AF/2P DISC. SWITCH, NEMA 1 - 2#10,1#10G	ACCU-11	ACC-1/3	1	30A/30AF/2P DISC. SWITCH, NEMA 3R - 2#10,1#10G
AHU-12	H-6/8	1	30A/15AF/2P DISC. SWITCH, NEMA 1 - 2#10,1#10G	ACCU-12	H-6/8	1	30A/30AF/2P DISC. SWITCH, NEMA 3R - 2#10,1#10G
AHU-13	H-5/7	1	30A/15AF/2P DISC. SWITCH, NEMA 1 - 2#10,1#10G	ACCU-13	H-5/7	1	30A/30AF/2P DISC. SWITCH, NEMA 3R - 2#10,1#10G
AHU-14	H-6/8	1	30A/15AF/2P DISC. SWITCH, NEMA 1 - 2#10,1#10G	ACCU-14	H-6/8	1	30A/30AF/2P DISC. SWITCH, NEMA 3R - 2#10,1#10G
AHU-15	H-5/7	1	30A/15AF/2P DISC. SWITCH, NEMA 1 - 2#10,1#10G	ACCU-15	H-5/7	1	30A/30AF/2P DISC. SWITCH, NEMA 3R - 2#10,1#10G
AHU-16	H-9/11	1	30A/15AF/2P DISC. SWITCH, NEMA 1 - 2#10,1#10G	ACCU-16	H-9/11	1	30A/30AF/2P DISC. SWITCH, NEMA 3R - 2#10,1#10G
AHU-17	H-2/4	1	30A/15AF/2P DISC. SWITCH, NEMA 1 - 2#10,1#10G	ACCU-17	H-2/4	1	30A/30AF/2P DISC. SWITCH, NEMA 3R - 2#10,1#10G
AHU-18	H-9/11	1	30A/15AF/2P DISC. SWITCH, NEMA 1 - 2#10,1#10G	ACCU-18	H-9/11	1	30A/30AF/2P DISC. SWITCH, NEMA 3R - 2#10,1#10G
AHU-19	H-2/4	1	30A/15AF/2P DISC. SWITCH, NEMA 1 - 2#10,1#10G	ACCU-19	H-2/4	1	30A/30AF/2P DISC. SWITCH, NEMA 3R - 2#10,1#10G
AHU-20	H-10/12	1	30A/15AF/2P DISC. SWITCH, NEMA 1 - 2#10,1#10G	ACCU-20	H-10/12	1	30A/30AF/2P DISC. SWITCH, NEMA 3R - 2#10,1#10G
AHU-21	H-1/3	1	30A/15AF/2P DISC. SWITCH, NEMA 1 - 2#10,1#10G	ACCU-21	H-1/3	1	30A/30AF/2P DISC. SWITCH, NEMA 3R - 2#10,1#10G
AHU-22	H-28/30	1	30A/15AF/2P DISC. SWITCH, NEMA 1 - 2#10,1#10G	ACCU-22	H-28/30	1	30A/30AF/2P DISC. SWITCH, NEMA 3R - 2#10,1#10G
AHU-23	H-27/29	1	30A/15AF/2P DISC. SWITCH, NEMA 1 - 2#10,1#10G	ACCU-23	H-27/29	1	30A/30AF/2P DISC. SWITCH, NEMA 3R - 2#10,1#10G
AHU-24	H-28/30	1	30A/15AF/2P DISC. SWITCH, NEMA 1 - 2#10,1#10G	ACCU-24	H-28/30	1	30A/30AF/2P DISC. SWITCH, NEMA 3R - 2#10,1#10G
AHU-25	H-27/29	1	30A/15AF/2P DISC. SWITCH, NEMA 1 - 2#10,1#10G	ACCU-25	H-27/29	1	30A/30AF/2P DISC. SWITCH, NEMA 3R - 2#10,1#10G
AHU-26	H-32/34	1	30A/15AF/2P DISC. SWITCH, NEMA 1 - 2#10,1#10G	ACCU-26	H-32/34	1	30A/30AF/2P DISC. SWITCH, NEMA 3R - 2#10,1#10G
AHU-27	H-31/33	1	30A/15AF/2P DISC. SWITCH, NEMA 1 - 2#10,1#10G	ACCU-27	H-31/33	1	30A/30AF/2P DISC. SWITCH, NEMA 3R - 2#10,1#10G
AHU-28	H-32/34	1	30A/15AF/2P DISC. SWITCH, NEMA 1 - 2#10,1#10G	ACCU-28	H-32/34	1	30A/30AF/2P DISC. SWITCH, NEMA 3R - 2#10,1#10G
AHU-29	H-31/33	1	30A/15AF/2P DISC. SWITCH, NEMA 1 - 2#10,1#10G	ACCU-29	H-31/33	1	30A/30AF/2P DISC. SWITCH, NEMA 3R - 2#10,1#10G
AHU-30	H-20/22	1	30A/15AF/2P DISC. SWITCH, NEMA 1 - 2#10,1#10G	ACCU-30	H-20/22	1	30A/30AF/2P DISC. SWITCH, NEMA 3R - 2#10,1#10G
AHU-31	H-19/21	1	30A/15AF/2P DISC. SWITCH, NEMA 1 - 2#10,1#10G	ACCU-31	H-19/21	1	30A/30AF/2P DISC. SWITCH, NEMA 3R - 2#10,1#10G
AHU-32	H-20/22	1	30A/15AF/2P DISC. SWITCH, NEMA 1 - 2#10,1#10G	ACCU-32	H-20/22	1	30A/30AF/2P DISC. SWITCH, NEMA 3R - 2#10,1#10G
AHU-33	H-19/21	1	30A/15AF/2P DISC. SWITCH, NEMA 1 - 2#10,1#10G	ACCU-33	H-19/21	1	30A/30AF/2P DISC. SWITCH, NEMA 3R - 2#10,1#10G
AHU-34	H-23/25	1	30A/15AF/2P DISC. SWITCH, NEMA 1 - 2#10,1#10G	ACCU-34	H-23/25	1	30A/30AF/2P DISC. SWITCH, NEMA 3R - 2#10,1#10G
AHU-35	H-14/16	1	30A/15AF/2P DISC. SWITCH, NEMA 1 - 2#10,1#10G	ACCU-35	H-14/16	1	30A/30AF/2P DISC. SWITCH, NEMA 3R - 2#10,1#10G
AHU-36	H-23/25	1	30A/15AF/2P DISC. SWITCH, NEMA 1 - 2#10,1#10G	ACCU-36	H-23/25	1	30A/30AF/2P DISC. SWITCH, NEMA 3R - 2#10,1#10G
AHU-37	H-14/16	1	30A/15AF/2P DISC. SWITCH, NEMA 1 - 2#10,1#10G	ACCU-37	H-14/16	1	30A/30AF/2P DISC. SWITCH, NEMA 3R - 2#10,1#10G
AHU-38	H-24/26	1	30A/15AF/2P DISC. SWITCH, NEMA 1 - 2#10,1#10G	ACCU-38	H-24/26	1	30A/30AF/2P DISC. SWITCH, NEMA 3R - 2#10,1#10G
AHU-39	H-13/15	1	30A/15AF/2P DISC. SWITCH, NEMA 1 - 2#10,1#10G	ACCU-39	H-13/15	1	30A/30AF/2P DISC. SWITCH, NEMA 3R - 2#10,1#10G
AHU-40	H-41/43	1	30A/15AF/2P DISC. SWITCH, NEMA 1 - 2#10,1#10G	ACCU-40	H-41/43	1	30A/30AF/2P DISC. SWITCH, NEMA 3R - 2#10,1#10G
AHU-41	H-37/39	1	30A/15AF/2P DISC. SWITCH, NEMA 1 - 2#10,1#10G	ACCU-41	H-37/39	1	30A/30AF/2P DISC. SWITCH, NEMA 3R - 2#10,1#10G
AHU-42	H-41/43	1	30A/15AF/2P DISC. SWITCH, NEMA 1 - 2#10,1#10G	ACCU-42	H-41/43	1	30A/30AF/2P DISC. SWITCH, NEMA 3R - 2#10,1#10G
AHU-43	H-37/39	1	30A/15AF/2P DISC. SWITCH, NEMA 1 - 2#10,1#10G	ACCU-43	H-37/39	1	30A/30AF/2P DISC. SWITCH, NEMA 3R - 2#10,1#10G
AHU-44	H-42/44	1	30A/15AF/2P DISC. SWITCH, NEMA 1 - 2#10,1#10G	ACCU-44	H-42/44	1	30A/30AF/2P DISC. SWITCH, NEMA 3R - 2#10,1#10G
AHU-45	H-38/40	1	30A/15AF/2P DISC. SWITCH, NEMA 1 - 2#10,1#10G	ACCU-45	H-38/40	1	30A/30AF/2P DISC. SWITCH, NEMA 3R - 2#10,1#10G
AHU-46	H-42/44	1	30A/15AF/2P DISC. SWITCH, NEMA 1 - 2#10,1#10G	ACCU-46	H-42/44	1	30A/30AF/2P DISC. SWITCH, NEMA 3R - 2#10,1#10G
AHU-47	H-38/40	1	30A/15AF/2P DISC. SWITCH, NEMA 1 - 2#10,1#10G	ACCU-47	H-38/40	1	30A/30AF/2P DISC. SWITCH, NEMA 3R - 2#10,1#10G
AHU-48	C-9/11/13	1	30A/15AF/3P DISC. SWITCH, NEMA 1 - 3#10,1#10G	ACCU-48A	ACB-2/4	1	40A/2P CIRCUIT BREAKER - 2#8,1#10G
				ACCU-48B	ACB-6/8	1	40A/2P CIRCUIT BREAKER - 2#8,1#10G
AHU-49	C-15/17/19	1	30A/15AF/3P DISC. SWITCH, NEMA 1 - 3#10,1#10G	ACCU-49A	ACC-2/4	1	40A/2P CIRCUIT BREAKER - 2#8,1#10G
				ACCU-49B	ACC-5/7	1	40A/2P CIRCUIT BREAKER - 2#8,1#10G
AHU-50	ACA-1/3/5	1	30A/-/3P DISC. SWITCH, NEMA 1 - 3#10,1#10G	ACCU-50A	ACA-2/4/6	1	100A/-/3P DISC. SWITCH, NEMA 3R - 3#3,1#8G, 1-1/2°C
				ACCU-50B	ACA-8/10/12	1	100A/-/3P DISC. SWITCH, NEMA 3R - 3#3,1#8G, 1-1/2°C
AHU-51	P1-1/3/5	1	30A/-/3P DISC. SWITCH, NEMA 1 - 3#12,1#12G	ACCU-51A	ACA-14/16/18	1	200A/-/3P DISC. SWITCH, NEMA 3R - 3#1/0,1#6G, 2°C
	P1-2/4/6	1	30A/-/3P DISC. SWITCH, NEMA 1 - 3#12,1#12G	ACCU-51B	ACA-20/22/24	1	200A/-/3P DISC. SWITCH, NEMA 3R - 3#1/0,1#6G, 2°C
NOTES				NOTES			
1. REFER TO ELECTRICAL POWER PLANS FOR CONDUIT SIZE.				1. REFER TO ELECTRICAL POWER PLANS FOR CONDUIT SIZE.			

ALTERNATE BID #1

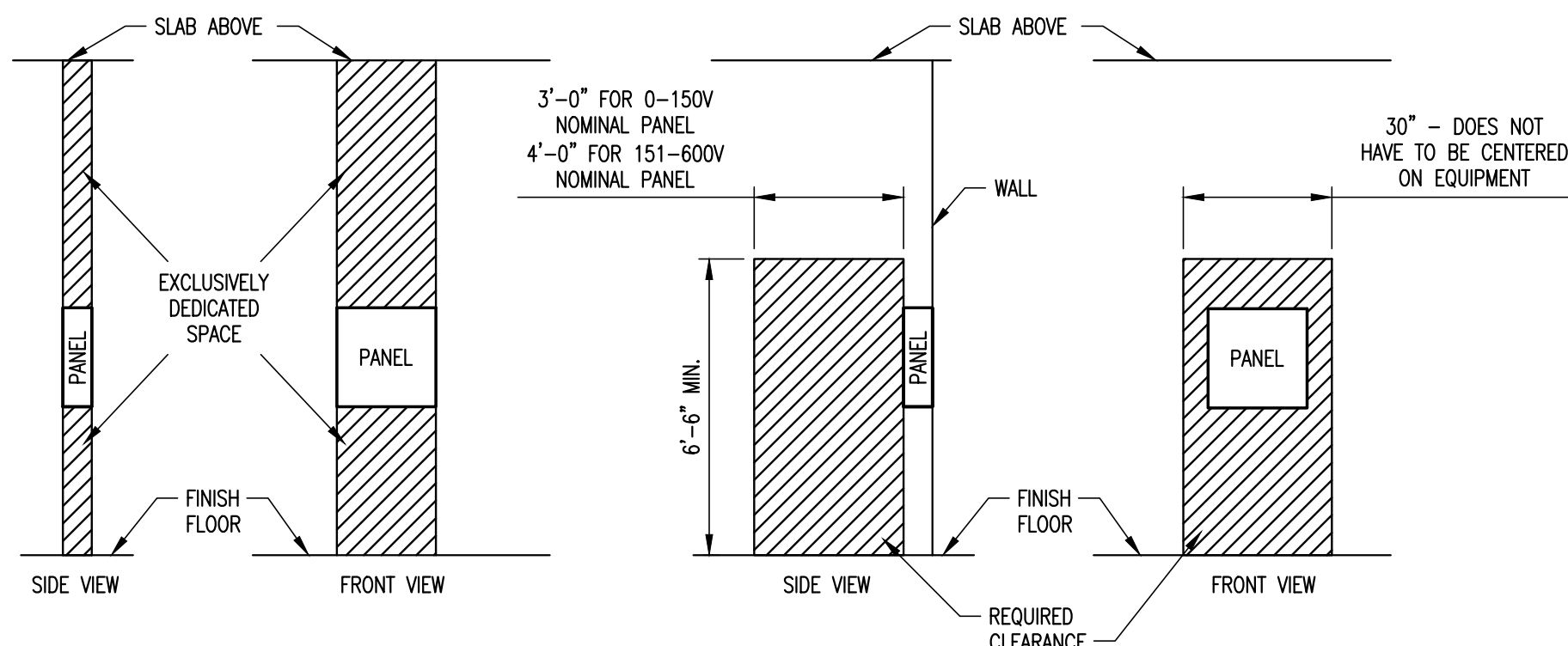
EDH CONNECTION SCHEDULE				
CIRCUIT DESIGNATION				
RTU SCHEDULE			DISCONNECTING MEANS AND/OR TAP CONDUCTOR SIZE	
UNIT MARK	CIRCUIT	NOTES		
EDH-1	C-9/11/13	1	100A/70AF/3P DISC. SWITCH, NEMA 1 - 3#4,1#8G, 1-1/4°C	
EDH-2	C-15/17/19	1	100A/90AF/3P DISC. SWITCH, NEMA 1 - 3#3,1#8G, 1-1/4°C	
EDH-3	ACA-13/15/17	1	60A/-/3P DISC. SWITCH, NEMA 1 - 3#6,1#10G, 1°C	
EDH-4	ACA-19/21/23	1	100A/70AF/3P DISC. SWITCH, NEMA 1 - 3#4,1#8G, 1-1/4°C	
NOTES				
1. FIELD VERIFY EXISTING DUCT HEATER RATING PRIOR TO INSTALLATION OF ELECTRICAL CONDUCTORS.				



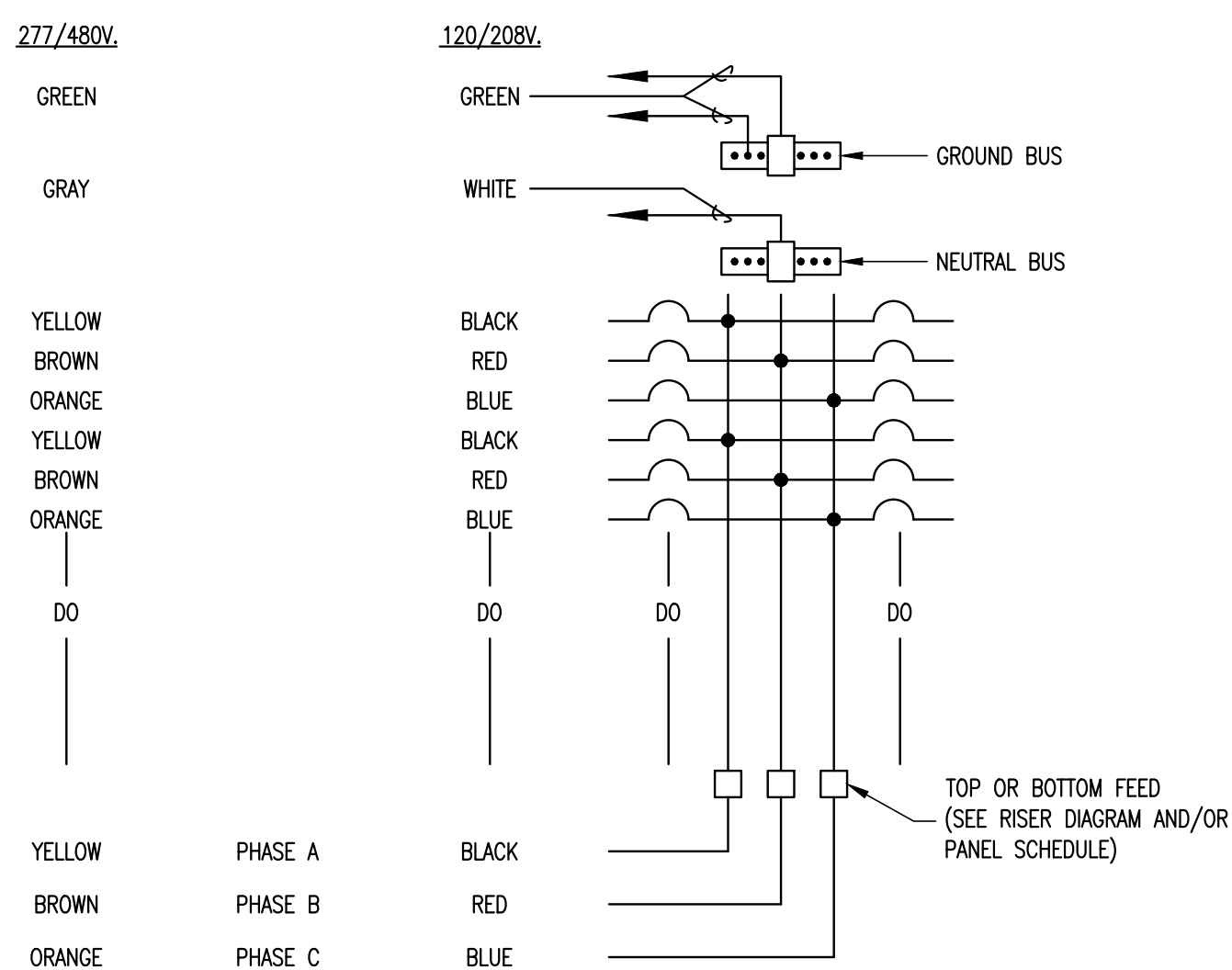
05 CONDUIT RISER AT SWITCHBOARD 'MDP'
N.T.S.



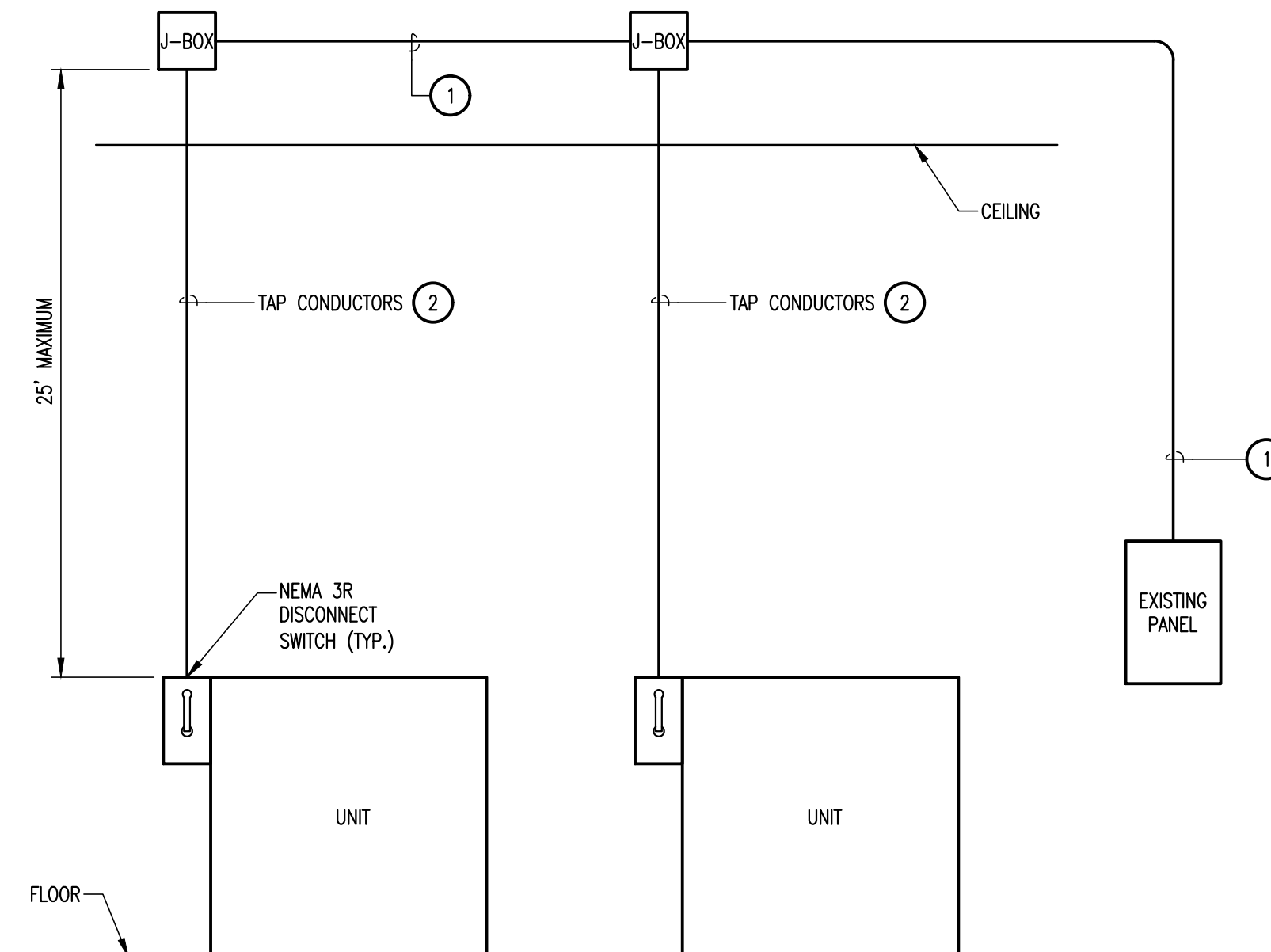
**02 FREE STANDING EQUIPMENT RACK CONSTRUCTION
& CONDUIT ROUTING DETAIL - ALTERNATE BID #1**
N.T.S.



**04 TYPICAL PANELBOARD REQUIRED
CLEARANCE**
N.T.S.



03 TYPICAL PANEL COLOR CODE
N.T.S.



01 TYPICAL TAP RULE FOR TWO UNITS
N.T.S.

GENERAL NOTES:

- A. ALL CONDUIT SUPPORTS AND HARDWARE SHALL BE OF STAINLESS STEEL MATERIAL.

KEY NOTES:

1. SIZE FEEDER BASED ON PANEL BRANCH CIRCUIT BREAKER SIZE. SUM OF THE LOADS CONNECTED TO THE FEEDER SHALL NOT EXCEED THE RATING OF THE OVERCURRENT PROTECTIVE DEVICE CAPACITY.
2. PROVIDE SHORT-CIRCUIT AND OVERCURRENT PROTECTION FOR TAP CONDUCTORS AS PER NEC.

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Revision No.	Date	Description



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Scale:	AS NOTED
Sheet Title	ELECTRICAL DETAILS

E204
Sheet Number