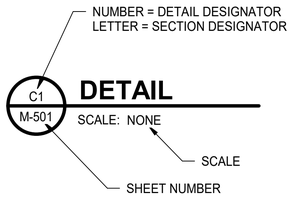
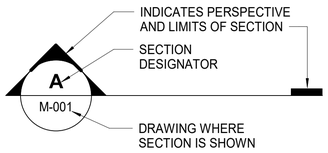
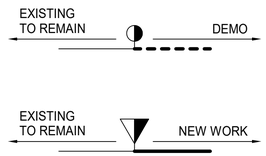
DETAIL/SECTION TITLE



SECTION CUT SYMBOL



CONSTRUCTION INTERFACE



PIPE LINE ABBREVIATIONS

CHWS	CHILLED WATER SUPPLY
CHWR	CHILLED WATER RETURN
COND	CONDENSATE DRAIN
CW	CITY WATER (DOMESTIC WATER)
FSL	FIRE SPRINKLER LINE
HWS	HOT WATER SUPPLY
HWR	HOT WATER RETURN
LCWS	LOW-CONDUCTIVITY WATER SUPPLY
LCWR	LOW-CONDUCTIVITY WATER RETURN

GENERAL ABBREVIATIONS

24X12	RECT. DUCT DIM. (INCHES)
12∅	ROUND DUCT DIM. (INCHES)
AFF	ABOVE FINISHED FLOOR
ACU	AIR CONDITIONING UNIT
ACS	AIR CONDITIONING SYSTEM
ACHPS	AC HEAT PUMP SYSTEM
AI	ANALOG INPUT
ALC	AUTOMATED LOGIC CONTROLS
AO	ANALOG OUTPUT
APD	AIR PRESSURE DROP
AV	ANALOG VALUE
BAS	BUILDING AUTOMATION SYSTEM
BFP	BACKFLOW PREVENTER
BHP	BRAKE HORSEPOWER
BI	BINARY INPUT
BO	BINARY OUTPUT
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
BV	BINARY VALUE
CCP	CHILLER CONTROL PANEL
CFM	CUBIC FEET PER MINUTE
CHW	CHILLED WATER
CL	CENTERLINE OF PIPE ELEVATION
CP	CONTROL PANEL
CPA	COMPRESSOR, AIR
CPD	COIL PRESSURE DROP (FLUID SIDE)
CV	CONTROL VALVE
CW	CITY WATER
(D)	DEMOLISH (REMOVE AND DISPOSE OF)
DB	DRY BULB
DCW	DOMESTIC COLD WATER
DDC	DIRECT DIGITAL CONTROL
DDCP	DIRECT DIGITAL CONTROL PANEL
DN	DOWN
DP	DIFFERENTIAL PRESSURE
DRG	DIFFUSER, REGISTER, & GRILLE
(E)	EXISTING-TO-REMAIN
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
ELEC	ELECTRICAL
EMT	ELECTRICAL METAL TUBING
ESP	EXTERNAL STATIC PRESSURE
ETR	EXISTING-TO-REMAIN
EWT	ENTERING WATER TEMPERATURE
EXIST	EXISTING
FACP	FIRE-ALARM CONTROL PANEL
FA	FIRE ALARM CONTROL SYSTEM LOOP
FC	FAIL-CLOSED
FE	FAN, EXHAUST
FFE	FILTERED-FAN, EXHAUST
FHE	HOOD EXHAUST FAN
FIP	FAIL-IN-PLACE
FM	FLOW METER
FO	FAIL-OPEN
FPI	FINS PER INCH
FR	FAN, RETURN
FS	FLOW SWITCH
FSL	FIRE SPRINKLER LINE
FT	FEET
FT.	FEET
HP	HORSEPOWER
I/O	HARD-WIRED INPUT/OUTPUT
ISO	ISOLATION
IN.	INCH
IN.W.C.	INCHES WATER COLUMN
LAT	LEAVING AIR TEMPERATURE
LCW	LOW-CONDUCTIVITY WATER
LWT	LEAVING WATER TEMPERATURE
MA	MIXED AIR
MAX	MAXIMUM
MAX.	MAXIMUM
MCC	MOTOR CONTROL CENTER
MCV	MOTORIZED CONTROL VALVE
MECH	MECHANICAL
MFR	MANUFACTURER
MHP	MOTOR HORSEPOWER
MIN	MINIMUM
MIN.	MINIMUM
(N)	NEW
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NO	NORMALLY OPEN
NPSH	NET POSITIVE SUCTION HEAD
NPSHR	NET POSITIVE SUCTION HEAD REQUIRED
NRTL	NATIONALLY-RECOGNIZED TESTING LABORATORY
NSR	NON-SPRING-RETURN
OA	OUTDOOR AIR
OB	OPPOSED BLADE
PB	PARALLEL BLADE
PCHW	PUMP, CHILLED WATER
POC	POINT OF CONNECTION
PRV	PRESSURE REDUCING VALVE
PS	POWER SUPPLY
PSIA	POUNDS, CHILLED WATER ABSOLUTE
PSIG	POUND PER SQUARE INCH GAUGE
RA	RETURN AIR
RCHS	CHILLER, SCREW
RPBFP	REDUCED PRESSURE BACKFLOW PREVENTER
RRV	REFRIGERANT RELIEF VENT
SCH	SCHEDULE
SA	SUPPLY AIR
SD	SMOKE DETECTOR
SDE	SEPARATOR, AIR
SF	SUPPLY FAN
SP	STATIC PRESSURE
SPEC	SPECIFICATION
SR	SPRING-RETURN
(T)	TEMPORARY (DURING CONSTRUCTION ONLY)
TA	TRANSFER AIR
TCA	COMPRESSED AIR TANK
TCHW	CHILLED WATER TANK, BUFFER
TCH	CHEMICAL TANK
TCHWX	EXPANSION TANK, CHILLED WATER
TCP	TEMPERATURE CONTROL PANEL
TEMP	TEMPERATURE
VAV	VARIABLE AIR VOLUME
VFD	VARIABLE FREQUENCY DRIVE
W.C.	WATER COLUMN
W.G.	WATER GAUGE
WB	WET BULB
XMFR	TRANSFORMER

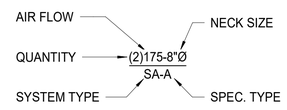
HVAC LEGEND

- RECTANGLUAR ELBOW WITH TURNING VANES
- RECTANGULAR RADIUS ELBOW
- CONTROL DAMPER, MOTOR OPERATED
- MANUAL BALANCE DAMPER
- SQUARE OR RECTANGULAR TO ROUND TRANSITION
- SUPPLY AIR OR OUTSIDE AIR DUCTWORK SECTION
- RETURN AIR DUCTWORK SECTION
- EXHAUST AIR DUCTWORK SECTION
- DUCT-MOUNTED ACCESS DOOR
- FIRE DAMPER
- THERMOSTAT
- DUCT-MOUNTED SMOKE DETECTOR

PIPE LINE ACCESSORIES

- BALL ISOLATION VALVE
- BUTTERFLY VALVE
- REDUCED PRESSURE BACKFLOW PREVENTER
- CHECK VALVE
- 3-WAY VALVE
- TRIPLE DUTY VALVE
- BALANCING VALVE
- RELIEF, SAFETY OR THERMAL RELIEF VALVE
- PNEUMATIC CONTROL VALVE
- ELECTRONIC CONTROL VALVE
- SUCTION DIFFUSER
- AUTOMATIC AIR VENT ASSEMBLY
- MANUAL AIR VENT - SEE SPECIFICATIONS FOR APPROPRIATE VALVE TYPE.
- FLEX CONNECTION
- PUMP
- PIPE TIE-IN POINT
- HOSE GATE VALVE DRAIN
- GLOBE VALVE
- PLUG VALVE
- THERMAL WELL
- THERMOMETER
- REDUCED PRESSURE BACKFLOW PREVENTION ASSEMBLY
- SELF CONTAINED PRESSURE REDUCING (REGULATING) VALVE
- PRESSURE GAUGE
- Y-TYPE STRAINER
- REMOVABLE CAP
- REDUCER (CONCENTRIC)
- REDUCER (ECCENTRIC)
- UNION
- BLIND FLANGE
- TEST CONNECTION
- COUPLING
- ANGLE VALVE
- REMOVABLE PLUG
- 120V/24 CONTROL POWER TRANSFORMER. DIV 26.
- ELECTRICAL DISCONNECT. DIV 26.

AIR DISTRIBUTION DEVICE IDENTIFICATION



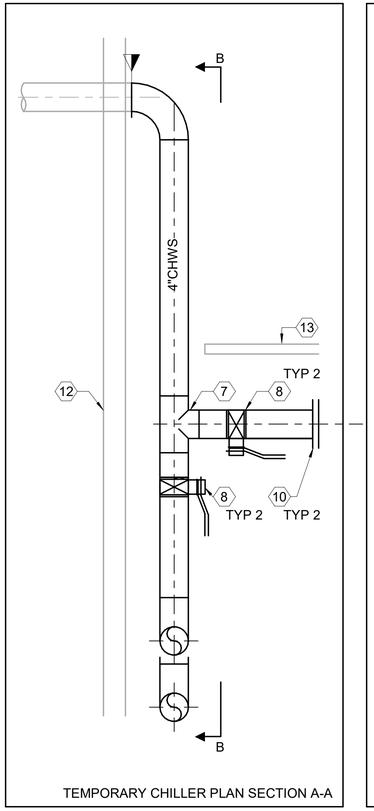
GENERAL NOTES:

1. LEGEND IS GENERAL IN NATURE AND MAY INDICATE MORE INFORMATION THAN IS APPLICABLE TO PROJECT. SEE DRAWINGS FOR SPECIFIC SYMBOLS AND ABBREVIATIONS.
2. FURNISH AND INSTALL ALL MATERIALS, VALVES, HANGERS, EQUIPMENT, ETC. AND PERFORM ALL LABOR REQUIRED TO INSTALL COMPLETE AND OPERABLE MECHANICAL SYSTEMS AS INDICATED ON THE DRAWINGS, AS SPECIFIED, AS REQUIRED BY CODE, AND AS REQUIRED BY STANDARDS.
3. INSTALL ALL MECHANICAL EQUIPMENT AND APPURTENANCES IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, CONTRACT DOCUMENTS, STANDARDS, AND APPLICABLE CODES AND REGULATIONS.
4. COORDINATE CONSTRUCTION OF ALL MECHANICAL WORK WITH OTHER TRADES SHOWN IN CONTRACT DOCUMENT DRAWINGS.
5. MAINTAIN A MINIMUM OF 6'-8" CLEARANCE TO UNDERSIDE OF PIPES, DUCTWORKS, CONDUITS, ETC. THROUGHOUT ACCESS ROUTES.
6. LOCATE ALL MECHANICAL EQUIPMENT FOR UNOBSTRUCTED ACCESS TO UNIT ACCESS PANELS, CONTROLS, AND VALVING. MAINTAIN 4'-0" CLEAR DIRECTLY IN FRONT OF EQUIPMENT ELECTRICAL PANELS.
7. ALL ELEVATIONS ARE ABOVE FINISHED FLOOR TO BOTTOM OF DUCT, DUCT INSULATION, PIPE, OR PIPE INSULATION UNLESS NOTED OTHERWISE.
8. DUCT DIMENSIONS INDICATED REFER TO SHEET METAL DIMENSIONS. AIR OPENING SIZE AND SHEET METAL SIZE MUST BE THE SAME.
9. INSTALL WALL-MOUNTED TEMPERATURE CONTROLS AT 48" ABOVE FINISHED FLOOR UNLESS OTHERWISE INDICATED. COORDINATE INSTALLATION WITH OTHER WALL-MOUNTED DEVICES TO INSTALL ALL DEVICES AT SAME ELEVATION. COORDINATE WITH ARCHITECTURAL WALL FINISHES.
10. ALL EXISTING HVAC COMPONENTS SHOWN ON DRAWINGS ARE SCHEMATIC AND ARE BASED ON SITE SURVEYS AND AVAILABLE AS-BUILT DRAWINGS AND MAY NOT REFLECT EXACT EXISTING CONDITIONS. SUBCONTRACTOR MUST FIELD VERIFY EXISTING CONDITIONS ON JOB SITE. SUBCONTRACTOR MUST REROUTE NEW WORK TO ACCOMMODATE EXISTING CONDITIONS.
11. DESIGN DRAWINGS SHOW THE SUGGESTED EQUIPMENT LAYOUT. VARIATIONS IN EQUIPMENT LOCATIONS ARE ACCEPTABLE TO ACCOMMODATE EXISTING CONDITIONS PROVIDED THAT THE DESIGN INTENT IS MET, PROPER CLEARANCE AND ACCESS IS PROVIDED AROUND THE EQUIPMENT, AND SIGNIFICANT DEVIATIONS FROM THE DESIGN DRAWINGS HAVE BEEN APPROVED BY THE ENGINEER
12. ALL NEW PENETRATIONS THROUGH EXISTING WALLS AND FLOORS MUST BE NEATLY CORE-DRILLED TO MINIMIZE OVERSIZED AND SPALLING.
13. SUBCONTRACTOR MUST INSTALL NEW DUCTWORK CLEAR OF FIRE SPRINKLER HEADS, NEW AND EXISTING, AS REQUIRED BY NFPA 13 STANDARDS.
14. ALL NEW MECHANICAL SYSTEM INSTALLATIONS MUST NOT INTERFERE WITH EXISTING EQUIPMENT, ACCESS TO CONTROL AND ACCESS FOR MAINTENANCE.
15. WHEN DUCTWORK AND PIPING INSULATION SHOWS EVIDENCE OF "WET" INSULATION IMMEDIATELY AFTER INSTALLATION, THE DAMAGED INSULATION MUST BE REMOVED, THE PIPE AND/OR DUCT SURFACES MUST BE CLEANED AND DRIED, AND NEW INSULATION MUST BE INSTALLED.
16. MAKE TEMPORARY ALTERATIONS AND CONNECTIONS AS REQUIRED TO EXECUTE WORK SO THAT ALL SERVICES IN THE BUILDING REMAIN OPERATIONAL WITH MINIMUM POSSIBLE INTERRUPTION. TEMPORARY SHUTDOWNS MUST BE SEGREGATED AND MUST BE OF THE SHORTEST DURATION FEASIBLE. COORDINATE SHUTDOWN SCHEDULE . ALL SERVICES MUST BE KEPT IN CONTINUOUS OPERATION UNLESS PERMISSION IS OTHERWISE GRANTED .
17. ALL NEW MECHANICAL EQUIPMENT WHETHER PURCHASED, MANUFACTURED ONSITE, RENTED, OR BORROWED, THAT MAY PRESENT A SIGNIFICANT RISK TO PERSONS OR PROPERTY SHALL BE "LISTED" BY A NATIONALLY-RECOGNIZED TESTING LABORATORY (NRTL), APPROVED FOR USE BY AN NRTL FIELD EVALUATION ENGINEER, OR APPROVED FOR USE BY AN AUTHORITY HAVING JURISDICTION (AHJ) FIELD REPRESENTATIVE AND LABELED PRIOR TO USE.
18. ALL FIREWALL PENETRATIONS MUST BE MADE WITH A UL LISTED AND APPROVED FIREWALL PENETRATION SYSTEM/ASSEMBLY.
19. PRIOR TO ANY DEMOLITION ACTIVITIES, SUBCONTRACTOR MUST COORDINATE TO REVIEW FACILITY ES&H DOCUMENTS, EQUIPMENT TO BE REMOVED, MATERIALS TO BE REMOVED OR DISTURBED, AND IDENTIFY A PLAN PRIOR TO COMMENCING THE WORK. ITEMS TO REVIEW INCLUDE BUT ARE NOT LIMITED TO THE FOLLOWING: NEW WORK IN DISTURBING EXISTING WALLS, FLOORS, ROOFS, OR CEILINGS; ALL CUTTING OR DRILLING; ALL DEMOLITION; REMOVAL AND DISPOSAL.
21. SURFACE-MOUNTED WIRING/CONDUIT IN ANY ROOM OTHER THAN A MECHANICAL OR ELECTRICAL ROOM IS PROHIBITED UNLESS OTHERWISE SPECIFIED OR APPROVED BY ENGINEER.
22. CONTROLS SUBCONTRACTOR MUST FURNISH AND INSTALL CONTROLLER ENCLOSURES. REFER TO STRUCTURAL AND ELECTRICAL DRAWINGS FOR CONTROL PANEL INSTALLATION DETAILS.
23. WHERE ITEMS ARE REMOVED FROM WALLS, SUBCONTRACTOR MUST PATCH AND PAINT WALLS AS NECESSARY TO MATCH SURROUNDING FINISH UNLESS THE AREA IS SMALL AND CAN BE COVERED BY A SMALL WALL COVER PLATE (I.E. THERMOSTATS). FOR LARGER ITEMS (I.E. CONTROL PANELS), WALL MUST BE PATCHED AND PAINTED AS NECESSARY TO MATCH SURROUNDING FINISH.
24. WORKING IN PROJECT AREAS MAY REQUIRE AN ESCORT. IT IS THE RESPONSIBILITY OF THE MECHANICAL SUBCONTRACTOR TO DETERMINE THESE PROTOCOLS PRIOR TO BID AND INCLUDE ANY COSTS ASSOCIATED WITH COMPLYING WITH THESE PROTOCOLS IN THEIR BID.
25. DELEGATED DESIGN: FIRE SUPPRESSION SYSTEM NEW WORK INCLUDING FIRE SPRINKLER PIPING, HEADS, VALVES, HANGERS, SEISMIC RESTRAINT BRACKETS, DRAINS, ESCUTCHEONS, WALL PLATES AND TEST FACILITIES NECESSARY FOR A FULLY FUNCTIONING WET-PIPE AUTOMATIC SPRINKLER SYSTEM SHALL BE PROVIDED BY THE DELEGATED DESIGN SUBCONTRACTOR. WORK SHOWN ON DRAWINGS IS ESTIMATE OF FIRE SUPPRESSION SCOPE OF WORK. PROVIDE A COMPLETE DESIGN FOR AFFECTED AREAS; DEVIATION FROM DESIGN DRAWING SPRINKLER SYSTEM LAYOUT IS PERMITTED AS REQUIRED TO PROVIDE A COMPLETE AND FUNCTIONING FIRE SUPPRESSION SYSTEM. DEVIATIONS TO SPRINKLER MAIN AND SPRINKLER HEADS SHALL BE COORDINATED WITH ELECTRICAL, MECHANICAL, STRUCTURAL, AND ARCHITECTURAL CONSTRUCTION DOCUMENTS PRIOR TO SUBMISSION. DELEGATED DESIGN DRAWINGS SHALL BE SUBMITTED TO FIRE PROTECTION ENGINEERING AND BURNS & MCDONNELL CONSTRUCTION MANAGER FOR APPROVAL BEFORE PROCEEDING WITH AFFECTED WORK. REFER TO 21 00 00.
26. DEMOLITION AND NEW CONSTRUCTION OF FIRE SPRINKLER PIPING MUST BE PERFORMED BY A C16 LICENSED SUBCONTRACTOR. NOTIFY AND SUBMIT PERMIT REQUEST A MINIMUM OF TWO WEEKS BEFORE FIRE SPRINKLER DEMOLITION ACTIVITIES. PERFORM LOCAL IN-SERVICE PRESSURE TESTING ON NEW FIRE SPRINKLER PIPING AND SPRINKLER HEADS.
27. CLEAN AND FLUSH ALL NEW PIPING SYSTEMS IN ACCORDANCE WITH SPEC. 220111.13.
28. INSTALL AUTOMATIC AIR VENTS IN HYDRONIC PIPING SYSTEMS AT LOCATIONS INDICATED, AT ALL HIGH POINTS, AND ELSEWHERE AS NECESSARY TO ELIMINATE TRAPPED AIR. EXTEND VENT FROM AUTOMATIC AIR VENT TO NEAREST FLOOR DRAIN OR SOAK PIT.
29. SUBCONTRACTOR MUST SAMPLE CHILLED WATER FOR CHEMICAL TREATMENT ANALYSIS PRIOR TO CONSTRUCTION START. FORWARD REPORT AND ANY RECOMMENDATIONS FOR RESPONSE.
30. EQUIPMENT WITH 50 POUNDS OR MORE OF REFERIGERANT MUST BE TRACKED, INVENTORIED, AND MANAGED. COORDINATE DEMOLITION AND INSTALLATION REQUIREMENTS WITH CONTRUCTION MANAGER

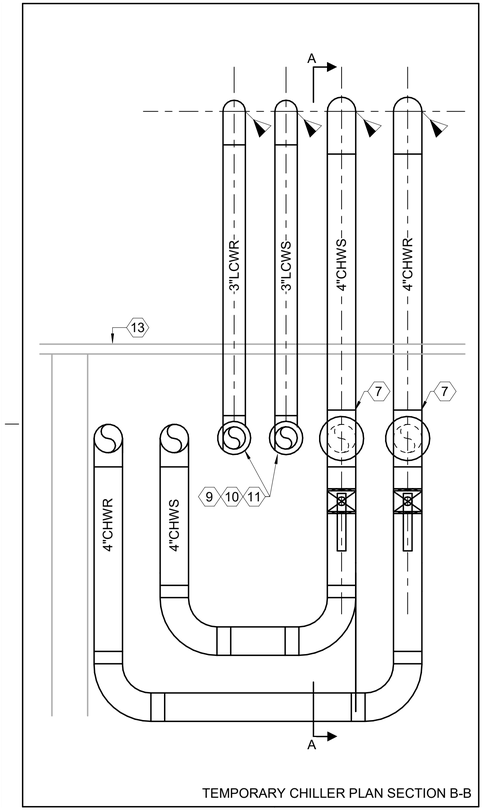
Sheet Title
MECHANICAL ABBREVIATIONS, LEGEND, SYMBOLS AND GENERAL NOTES

Dwg. No.
PLM2021-0432-0001D

Sht. No.
M-001



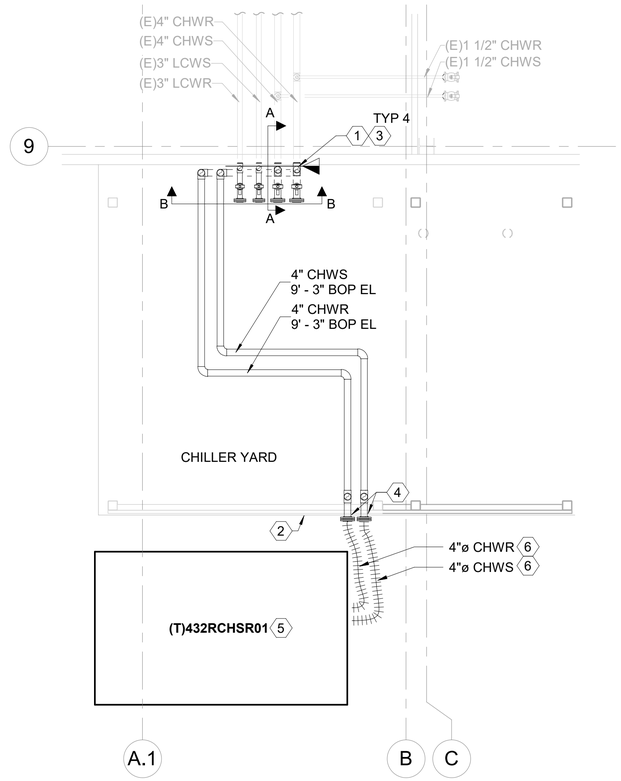
TEMPORARY CHILLER PLAN SECTION A-A



TEMPORARY CHILLER PLAN SECTION B-B

D1 M-002 LCW AND CHW PIPING SECTION VIEWS

SCALE: NO SCALE SHOWN



D5 M-002 TEMPORARY CHILLER PLAN

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

0 2' 4' 8'

1/4" = 1'-0"

GENERAL NOTES

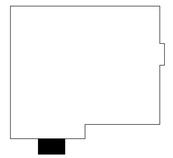
1. REFER TO M-001 FOR MECHANICAL ABBREVIATIONS, LEGEND, SYMBOLS, AND GENERAL NOTES.
2. TEMPORARY CHILLER WORK MUST BE SEQUENCED (RECOMMENDED BY KEYED NOTE ORDER) AND COMPLETED SUCH THAT BUILDING SERVICE IS NOT INTERUPTED FOR MORE THAN 48 HOURS.
3. REMOVE AND DISPOSE OF ALL EXISTING EXTERIOR CHW AND LCW PIPING, FITTINGS AND APPURTENANCES SERVING EXISTING CHILLER AS REQUIRED TO PERFORM NEW WORK.
4. EXISTING CHILLED WATER MAKEUP WATER CONNECTION, PRV, BACKFLOW PREVENTER, AND EXPANSION TANK MUST REMAIN CONNECTED TO CHILLED WATER SYSTEM WHILE TEMPORARY CHILLER IS IN OPERATION.
5. SUBCONTRACTOR MUST SAMPLE CHILLED WATER FOR CHEMICAL TREATMENT ANALYSIS PRIOR TO CONSTRUCTION START. FORWARD REPORT AND ANY RECOMMENDATIONS FOR RESPONSE.
6. PROVIDE LOCKOUT-TAGOUT PLAN FOR APPROVAL PRIOR TO DEMOLITION START.

KEYED NOTES

1. EXISTING LCW AND CHW PIPING PENETRATIONS THROUGH EXTERIOR WALL TO REMAIN.
2. EXISTING CHILLER SHELTER WALL TO REMAIN.
3. INSTALL SELECT CHWS, CHWR, LCWS, & LCWR PIPING AND LINE-SIZE ISOLATION VALVES TO EXTENTS INDICATED IN D1 / M-002 (SEE KEYED NOTES 7 THROUGH 13) WITHIN FIRST SYSTEM SHUTDOWN AT BEGINNING OF CONSTRUCTION PROJECT. ALL WORK REQUIRING CHILLED WATER SYSTEM SHUTDOWN MUST BE ACCOMPLISHED IN THIS OUTAGE. REFER TO M-413 FOR ADDITIONAL WORK REQUIRED DURING FIRST SHUTDOWN. WORK SHALL BE ACCOMPLISHED WITHOUT DRAINING FULL SYSTEM. FREEZING PIPE OR USING HOT TAP PIPE PLUG INSERTION SOLUTION IS ACCEPTABLE.
4. EXTEND NEW CHWS AND CHWR PIPING THROUGH EXISTING CHILLER SHELTER WALL TO TEMPORARY CHILLER CONNECTIONS WITH BLIND FLANGED TERMINATIONS AT 12" ABOVE GRADE. APPLY SEALANT AROUND NEW PIPE PENETRATIONS.
5. FURNISH, INSTALL, AND STARTUP TEMPORARY 80 TON (NOMINAL) AIR-COOLED CHILLER (WITH INTEGRAL PUMP PACKAGE). RETURN RENTAL CHILLER ONLY AFTER OWNER AND ENGINEER ACCEPTANCE OF NEW WATER-COOLED CHILLER AND CHILLED WATER PUMPS.
6. FURNISH AND INSTALL FLEXIBLE 4" CHWS AND CHWR HOSES TO TEMPORARY CHILLER.

KEYED NOTES CONTINUED; DETAIL D1 ONLY

7. FURNISH AND INSTALL (2) NEW 4"ø PIPING TEES FOR CHWS AND CHWR CONNECTIONS TO TEMPORARY CHILLER AND NEW CHILLER.
8. FURNISH AND INSTALL NEW 4"ø CHW ISOLATION BUTTERFLY VALVE.
9. FURNISH AND INSTALL NEW 3"ø LCW ISOLATION BUTTERFLY VALVE.
10. FURNISH AND INSTALL TEMPORARY BLIND FLANGE CONNECTION.
11. FOR PERMANENT LCW CONNECTIONS TO CHILLER.
12. BUILDING EXTERIOR.
13. EXISTING STEEL CHILLER YARD STRUCTURE.



KEY PLAN

HYDRONIC PIPING MATERIAL SCHEDULE

PIPING SYSTEM	SIZE	MATERIAL SPECIFICATION	SHUTOFF VALVE
CHILLED WATER SUPPLY & RETURN	2" AND SMALLER	COPPER, TYPE L, ASTM B88, SOLDERED JOINTS	BALL VALVE, BRONZE ALLOY BODY, THREE PIECE FULL PORT, SOLDER ENDS
	2-1/2" - 3"	COPPER, TYPE L, ASTM B88, BRAZED JOINTS	BUTTERFLY VALVE, CARBON STEEL BODY, CLASS 150 FLANGE OR LUG STYLE
	4" AND LARGER	CARBON STEEL, SCHEDULE 40, ASTM A53 GRADE B, WELDED JOINTS	
LOW CONDUCTIVITY WATER SUPPLY & RETURN	2" AND SMALLER	COPPER, TYPE L, ASTM B88, SOLDERED JOINTS	BALL VALVE, BRONZE ALLOY BODY, THREE PIECE FULL PORT, SOLDER ENDS
	2-1/2" - 3"	COPPER, TYPE L, ASTM B88, BRAZED JOINTS	BUTTERFLY VALVE, CARBON STEEL BODY, CLASS 150 FLANGE OR LUG STYLE
	4" AND LARGER	CARBON STEEL, SCHEDULE 40, ASTM A53 GRADE B, WELDED JOINTS	
HEATING HOT WATER SUPPLY & RETURN	2" AND SMALLER	COPPER, TYPE L, ASTM B88, SOLDERED JOINTS	BALL VALVE, BRONZE ALLOY BODY, THREE PIECE FULL PORT, SOLDER ENDS
	2-1/2" - 3"	COPPER, TYPE L, ASTM B88, BRAZED JOINTS	BUTTERFLY VALVE, CARBON STEEL BODY, CLASS 150 FLANGE OR LUG STYLE

TEMPORARY CHILLER SCHEDULE (RCHSR)

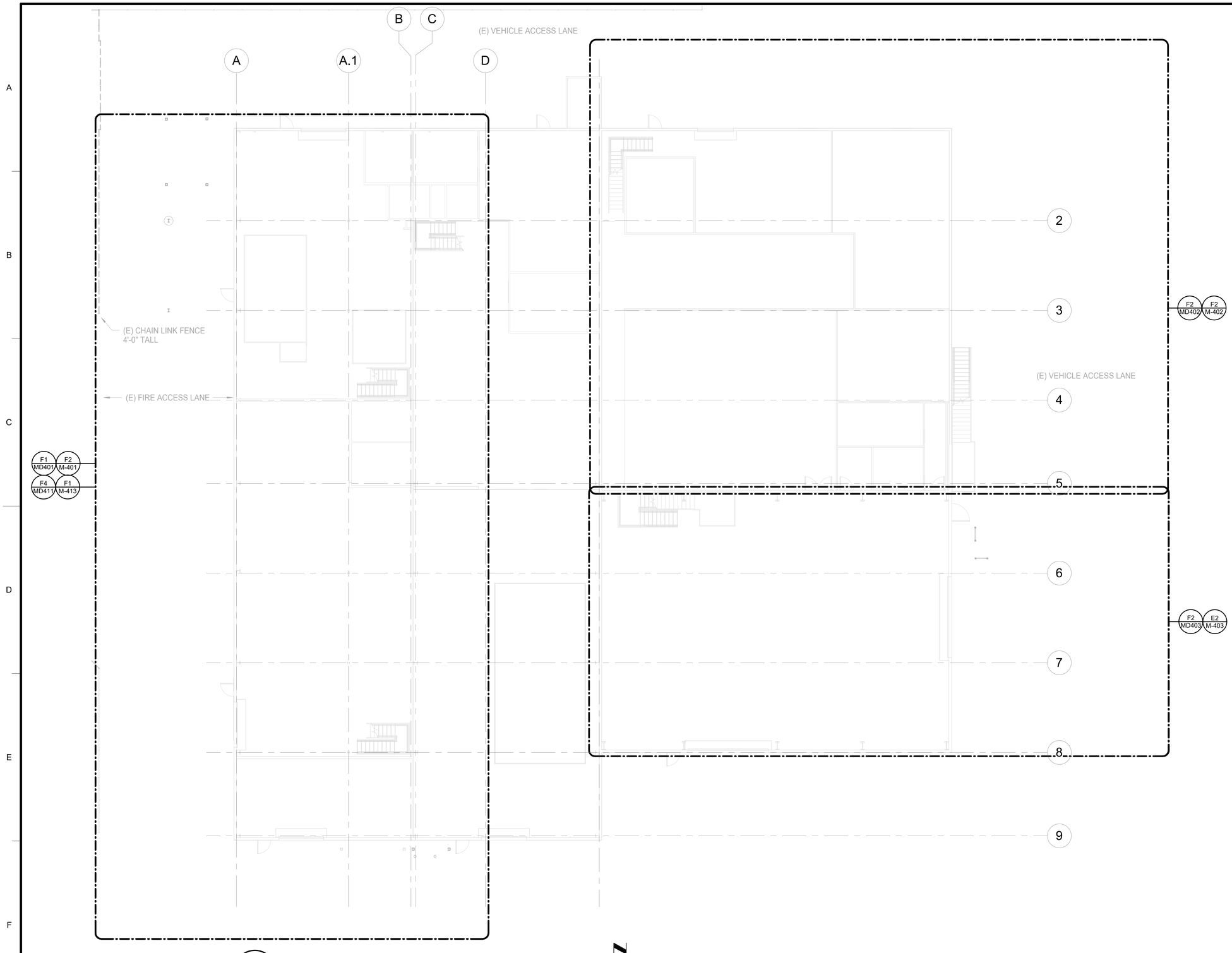
TAG NO.	NOMINAL COOLING CAPACITY (TONS)	EVAPORATOR				COMPRESSOR			ELECTRICAL				INSTALLED WEIGHT (LBS.)	BASIS OF DESIGN		NOTES
		FLUID TYPE	DESIGN FLOW (GPM)	EWT (DEG. F.)	LWT (DEG. F.)	TYPE	QUANTITY / CIRCUITS	REF TYPE	V	PH	MCA	MOCP		MFR	MODEL	
(T)432RCHSR01	80	WATER	192	55	45	SCROLL	1	R-134A	460	3	189	200	10300	TRANE	CGAM	ALL

NOTES:
1. UNIT IS TEMPORARY AND SHOULD BE USED ONLY TO PROVIDE CHILLED WATER BEFORE INSTALLATION AND STARTUP OF NEW CHILLER.
2. PROVIDE UNIT WITH INTEGRAL CIRCUIT BREAKER FOR OVERCURRENT PROTECTION AND DISCONNECTING MEANS.
3. PROVIDE UNIT WITH INTEGRAL PUMP PACKAGE.
4. PROVIDE UNIT WITH TRAILER AND TEMPORARY POWER CABLE AND HOSES OF SUFFICIENT LENGTH FOR INSTALLATION.

Sheet Title
MECHANICAL TEMPORARY CHILLER PLAN

Dwg. No.
PLM2021-0432-0002D

Sht. No.
M-002



F1 M-101 **MECHANICAL 1ST FLOOR OVERALL PLAN**

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

0 8' 16' 24'

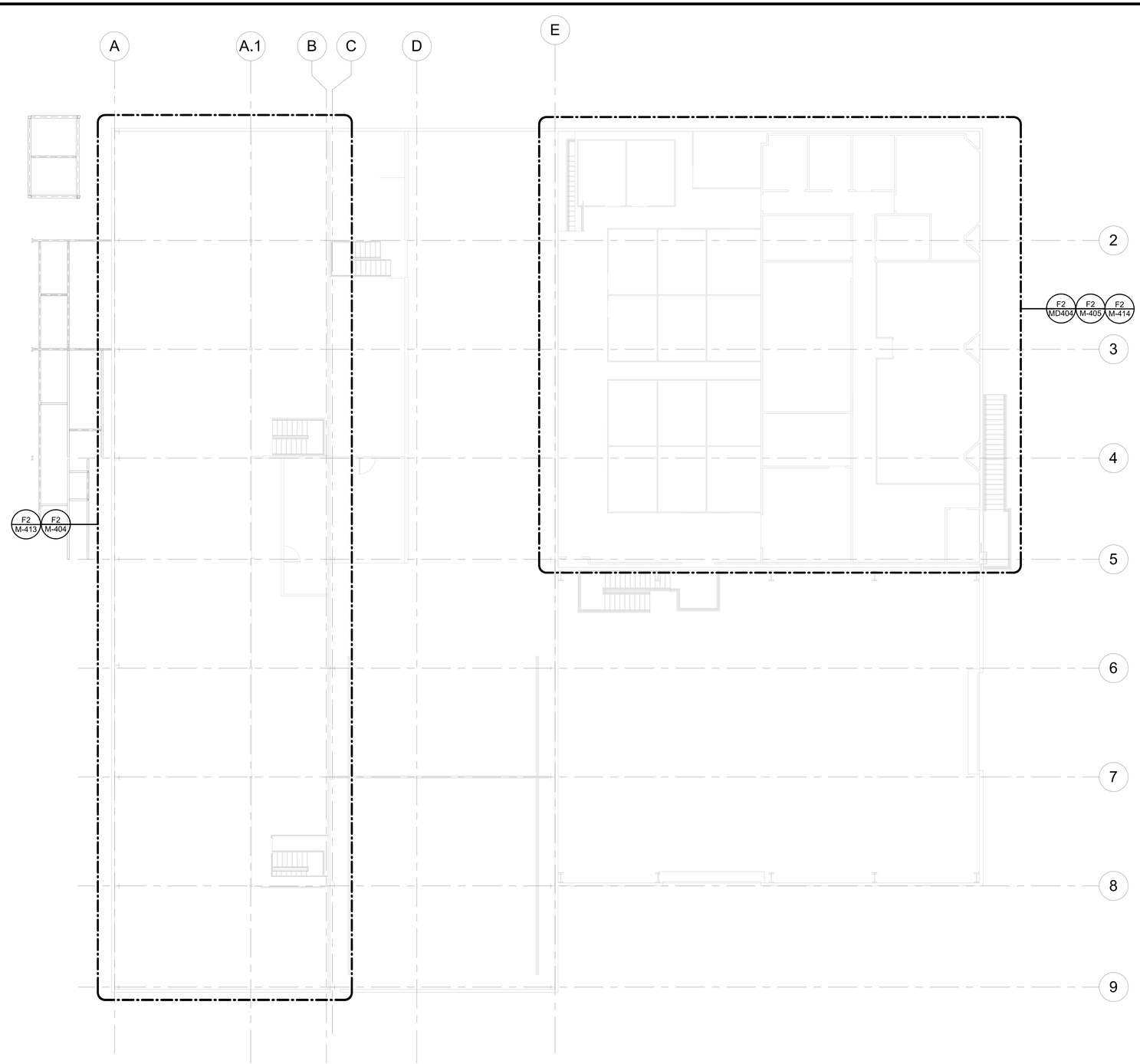
3/32" = 1'-0"

KEY PLAN

Sheet Title
MECHANICAL 1ST FLOOR OVERALL PLAN

Dwg. No.
PLM2021-0432-0003D

Sht. No.
M-101



F2 / M-102 **MECHANICAL 2ND FLOOR OVERALL PLAN**

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

0 8' 16' 24'

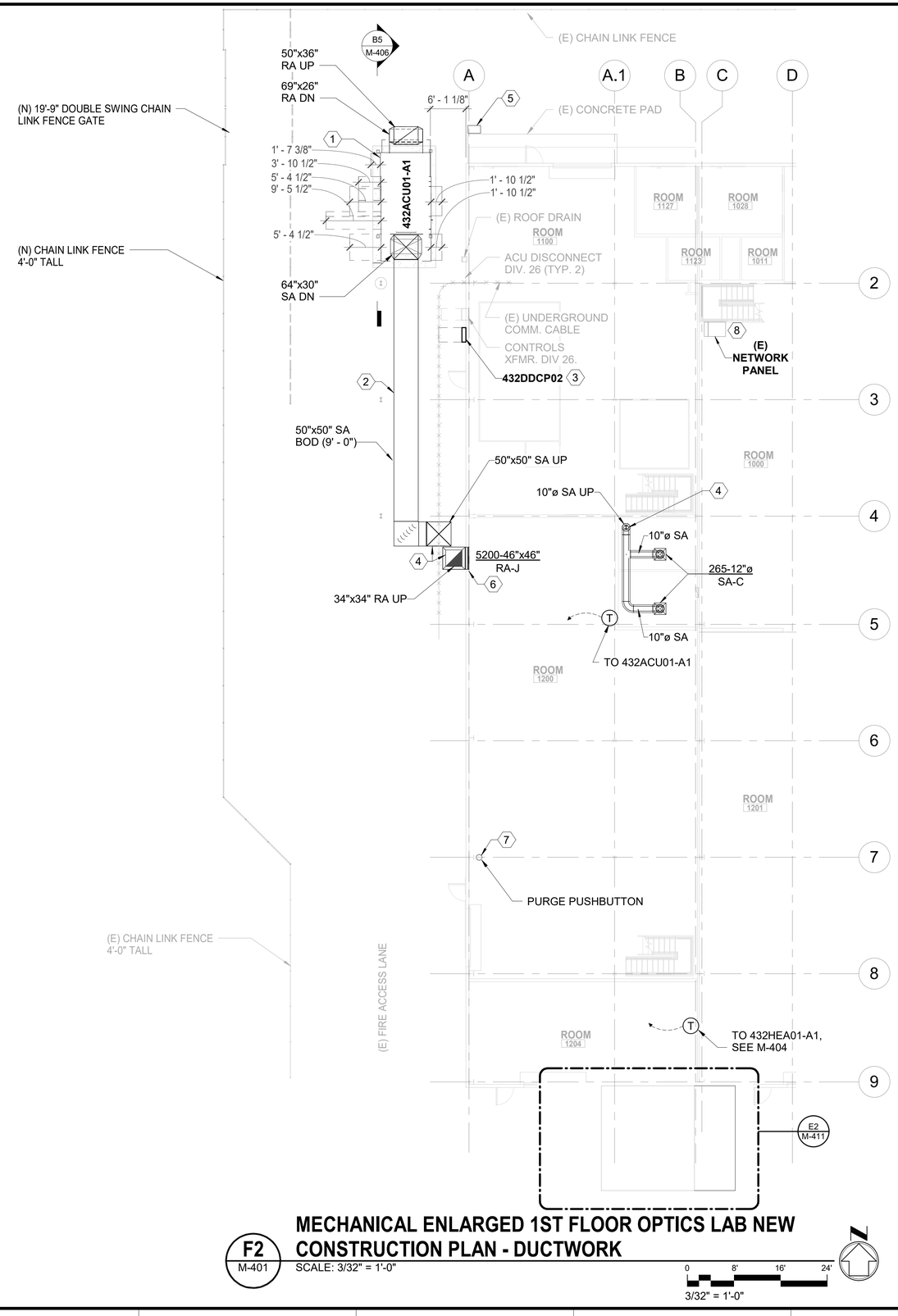
3/32" = 1'-0"

KEY PLAN

Sheet Title
MECHANICAL 2ND FLOOR OVERALL PLAN

Dwg. No.
PLM2021-0432-0004D

Sht. No.
M-102



MECHANICAL ENLARGED 1ST FLOOR OPTICS LAB NEW CONSTRUCTION PLAN - DUCTWORK

F2 / M-401

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

0 8' 16' 24'

3/32" = 1'-0"

KEYED NOTES

1. FURNISH AND INSTALL NEW HYDRONIC AIR HANDLING UNIT AT GRADE WITH NEW CONCRETE HOUSEKEEPING PAD. REFER TO S-402 FOR CONCRETE PAD AND FOR UNIT ANCHORAGE.
2. SECURE NEW SUPPLY AIR DUCTWORK TO NEW DUCT SUPPORT FRAMES. ROUTE WITH RETURN DUCT, RETURN STACKED ON TOP OF SUPPLY. REFER TO S-403.
3. FURNISH AND INSTALL NEW ALC UNIT CONTROLLER MOUNTED IN NEMA 4X RATED ENCLOSURE TO SERVE 432ACU01-A1. DAISY-CHAIN NEW 432DDCP01 WITH 432DDCP02 AND FURNISH AND INSTALL NEW HOME-RUN NETWORK CONNECTION TO EXISTING YELLOW NETWORK SWITCH IN ROOM 1000 AT GRIDLINE 4-C. REFER TO M-700 SERIES CONTROL DRAWINGS FOR ADDITIONAL CONTROLS REQUIREMENTS.
4. TO M-404.
5. FURNISH AND INSTALL NEW UNDERGROUND CONDENSATE SOAK PIT IN THIS LOCATION, REFER TO DETAIL D6 / M-505. EXTEND 432ACU01-A1 CONDENSATE TO THIS LOCATION, REFER TO DETAIL D3 / M-505. COORDINATE WITH EXISTING UNDERGROUND UTILITIES, REFER TO C-101.
6. ROUTE NEW RETURN DUCTWORK THROUGH NEW LOW-LEVEL WALL PENETRATION, INSTALL RETURN GRILLE AT 1" AFF TO CLEAR EXISTING STRUCTURAL FRAMING. REFER TO C6 / A-501. SUPPORT ELBOW AT GRILLE USING DURABLOCK SUPPORT ON CONCRETE PAD. REFER TO B5 / S-501.
7. INSTALL DEVICE ON EXISTING COLUMN.
8. EXISTING YELLOW NETWORK SWITCH.

GENERAL NOTES

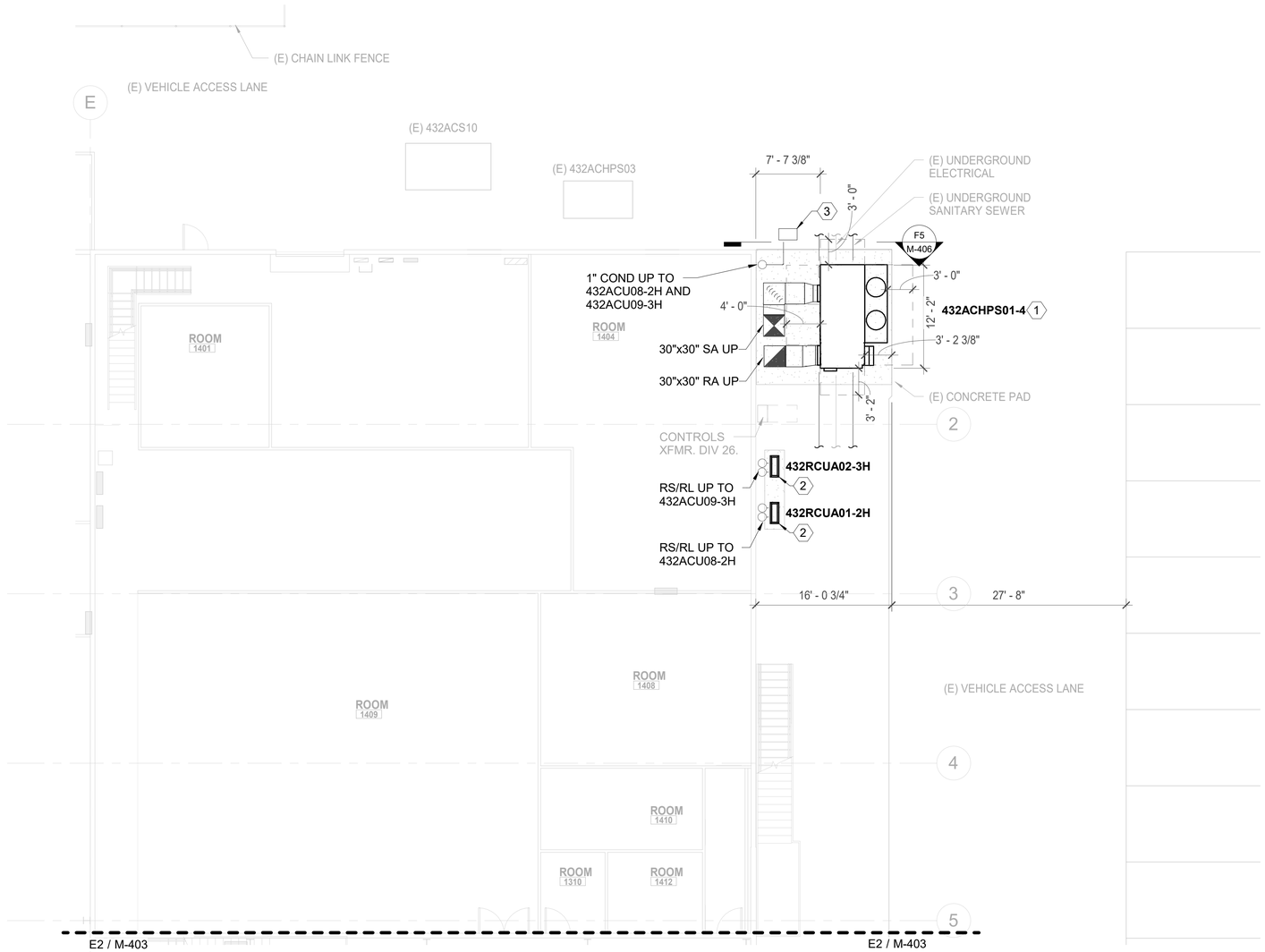
1. REFER TO M-001 FOR MECHANICAL ABBREVIATIONS, LEGEND, SYMBOLS, AND GENERAL NOTES.
2. COMPONENTS SHOWN HALF-TONE ON THIS DRAWING ARE ITEMS TO REMAIN; BOLD COMPONENTS ARE NEW.
3. DASHED REGIONS AROUND EQUIPMENT INDICATE CLEARANCE REQUIRED FOR EQUIPMENT ACCESS AND MAINTENANCE.
4. INSTALL NEW 432ACU01-A1 CLEAR OF EXISTING FIRE LANE - MAINTAIN 24' CLEAR FOR FIRE LANE. COORDINATE REQUIRED LOCATION FOR ACU UNIT WITH SUBCONTRACTORS RESPOSIBLE FOR CIVIL WORK.
5. REFER TO STRUCTURAL DRAWINGS FOR DUCT SUPPORT AND EQUIPMENT ANCHORAGE DETAILS.
6. ALL INDOOR SUPPLY DUCT CONNNECTED TO 432ACU01-A1 MUST BE DOUBLE-WALL INSULATED DUCT. EXTERIOR DUCT MUST BE SINGLE-WALL, WRAPPED.
7. COORDINATE INSTALLATION OF NEW 432ACU01 AND HOUSEKEEPING PAD WITH CONSTRUCTION MANAGER. INTENT IS TO AVOID DISTURBING EXISTING COMM. CABLING WITH INSTALLATION PROCESS. HAND EXCAVATE EXCAVATION AREA WITHIN 5' OF EXISTING COMM. CABLING.
8. FURNISH AND INSTALL NEW BOLLARDS AROUND 432ACU01-A1 AND REMOVABLE BOLLARDS ON ACCESS SIDE. REFER TO C-101 AND C-502.
9. INSTALL ALL NEW CONTROL PANELS ON NEW, FREE-STANDING UNISTRUT SUPPORT STANDS. REFER TO S-512. FURNISH AND INSTALL REQUIRED ELECTRICAL CLEARANCES PER NEC.
10. INSTALLATION OF NEW INTERIOR DUCTWORK AND AIR TERMINALS WILL REQUIRE A DETAILED WORK PLAN DEVELOPED WITH INPUT FROM CONSTRUCTION MANAGER, SUBCONTRACTORS, AND FACILITY END-USERS. SUBCONTRACTOR MUST REVIEW EXISTING CONDITIONS AND DISCUSS ACCEPTABLE MEANS AND METHODS FOR NEW INSTALLATION WITH CONSTRUCTION MANAGER PRIOR TO BID. USAGE CONTINUITY OF END-USER LAB EQUIPMENT IN PROJECT AREA WILL REQUIRE COMPLETE INSTALLATION OF NEW COMPONENTS OVER A LONG WEEKEND, INCLUDE COSTS TO ACCOMPLISH THIS IN BID. CONSTRUCTION MANAGER TO COORDINATE TEMPORARY LAB EQUIPMENT REMOVAL

KEY PLAN

Sheet Title
MECHANICAL ENLARGED 1ST FLOOR OPTICS LAB NEW CONSTRUCTION PLAN - DUCTWORK

Dwg. No.
PLM2021-0432-0012D

Sht. No.
M-401



F2 MECHANICAL ENLARGED 1ST FLOOR NORTHEAST NEW CONSTRUCTION PLAN

M-402

SCALE: 1/8" = 1'-0"

0 4' 8' 16'

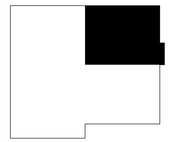
1/8" = 1'-0"

GENERAL NOTES

1. REFER TO M-001 FOR MECHANICAL ABBREVIATIONS, LEGEND, SYMBOLS, AND GENERAL NOTES.
2. COMPONENTS SHOWN HALF-TONE ON THIS DRAWING ARE ITEMS TO REMAIN; BOLD COMPONENTS ARE NEW.
3. DASHED REGIONS AROUND EQUIPMENT INDICATE CLEARANCE REQUIRED FOR EQUIPMENT ACCESS AND MAINTENANCE.
4. REFER TO STRUCTURAL DRAWINGS FOR DUCT SUPPORT AND EQUIPMENT ANCHORAGE DETAILS.

KEYED NOTES

1. FURNISH AND INSTALL NEW PACKAGED HEAT PUMP UNIT AT GRADE ON EXISTING CONRETE PAD. REFER TO STRUCTURAL B1 / S-514 FOR UNIT ANCHORAGE TO EXISTING CONCRETE PAD AND B1 / S-515 FOR INSTALLATION DETAILS.
2. FURNISH AND INSTALL NEW SPLIT SYSTEM HEAT PUMP CONDENSING UNIT AT GRADE WITH NEW CONCRETE HOUSEKEEPING PAD. REFER TO B1 / S-514 FOR UNIT ANCHORAGE. INSTALL TO MAINTAIN MFR'S RECOMMENDED UNIT CLEARANCES. REFER TO DETAIL D1 ON M-504. REFER TO M-414 FOR CONTINUATION OF REFRIGERANT PIPING TO INDOOR UNITS.
3. FURNISH AND INSTALL NEW UNDERGROUND CONDENSATE SOAK PIT IN THIS LOCATION, REFER TO DETAIL D6 / M-505. EXTEND 432ACHPS01 CONDENSATE TO THIS LOCATION, REFER TO DETAIL D3 / M-505.

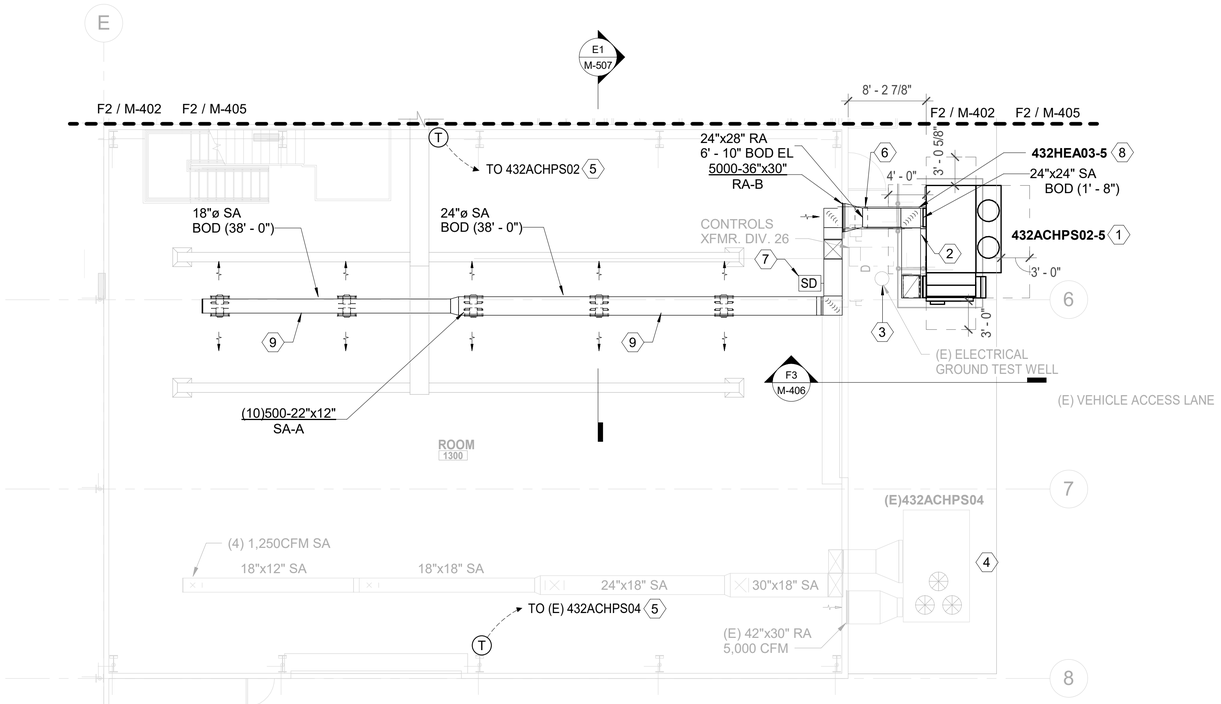


KEY PLAN

Sheet Title
MECHANICAL ENLARGED 1ST FLOOR NORTHEAST NEW CONSTRUCTION PLAN

Dwg. No.
PLM2021-0432-0013D

Sht. No.
M-402



E2 MECHANICAL ENLARGED 1ST FLOOR HIGH BAY NEW CONSTRUCTION PLAN - DUCTWORK

M-403

SCALE: 1/8" = 1'-0"

0 4' 8' 16'

1/8" = 1'-0"

KEYED NOTES

8. FURNISH AND INSTALL NEW DUCT-MOUNTED ELECTRIC RESISTANCE HEATING COIL.

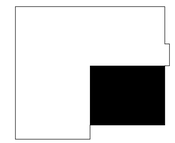
9. ROUTE NEW DUCTWORK IN HIGH BAY ABOVE ABOVE EXISTING LIGHTS AND BRIDGE CRANE AND BELOW EXISTING DUCTWORK.

GENERAL NOTES

1. REFER TO M-001 FOR MECHANICAL ABBREVIATIONS, LEGEND, SYMBOLS, AND GENERAL NOTES.
2. COMPONENTS SHOWN HALF-TONE ON THIS DRAWING ARE ITEMS TO REMAIN; BOLD COMPONENTS ARE NEW. REFER TO MD403 FOR DEMOLITION OF EXISTING DUCTWORK AFTER NEW DUCTWORK IS INSTALLED.
3. DASHED REGIONS AROUND EQUIPMENT INDICATE CLEARANCE REQUIRED FOR EQUIPMENT ACCESS AND MAINTENANCE.
4. INSTALL NEW 432ACHPS02 CLEAR OF EXISTING VEHICLE ACCESS LANE AND EXISTING, EXTERIOR FACILITY DOORS AS INDICATED. COORDINATE REQUIRED LOCATION FOR ACHPS UNIT WITH SUBCONTRACTOR RESPONSIBLE FOR INSTALLING CONCRETE PAD.
5. REFER TO STRUCTURAL DRAWINGS FOR DUCT SUPPORT AND EQUIPMENT ANCHORAGE DETAILS.
6. HIGH BAY CONTAINS AN EXISTING BRIDGE CRANE THAT SPANS THE ENTIRE HIGH BAY AREA AND IS INSTALLED AT APPROXIMATELY 34' AFF. ALL NEW DUCTWORK MUST NOT INTERRUPT THIS PATH OF TRAVEL.
7. FURNISH AND INSTALL NEW BOLLARDS AROUND 432ACHPS02. REFER TO C-101 AND C-502.
8. NEW DUCTWORK MUST BE INSTALLED PRIOR TO DEMOLITION OF EXISTING DUCTWORK TO LIMIT DURATION OF SYSTEM OUTAGE.
9. INSTALL MANUAL VOLUME DAMPER AT EACH SUPPLY AIR DIFFUSER, IN BRANCH DUCTWORK IMMEDIATELY UPSTREAM OF DIFFUSER CONNECTION.

KEYED NOTES

1. FURNISH AND INSTALL NEW PACKAGED HEAT PUMP UNIT AT GRADE WITH NEW CONCRETE HOUSEKEEPING PAD. REFER TO STRUCTURAL B1 / S-515 FOR CONCRETE PAD DETAILS AND B1 / S-514 FOR UNIT ANCHORAGE TO NEW CONCRETE PAD.
2. ROUTE DUCTWORK TO FURNISH AND INSTALL MFR'S RECOMMENDED MAINTENANCE CLEARANCES. COORDINATE DUCTWORK LAYOUT WITH SUBCONTRACTOR RESPONSIBLE FOR COLUMN DUCTWORK SUPPORTS. STACK RETURN DUCT ON TOP OF SUPPLY DUCT THROUGH WALL.
3. MAINTAIN MINIMUM 3'-0" CLEAR NORTH AND SOUTH OF EXISTING ELECTRICAL GROUND TEST WELL AND MINIMUM 6'-0" CLEAR OVERHEAD.
4. FURNISH AND INSTALL NEW TRANE BCI-R BACnet COMMUNCATION MODULE IN EXISTING 432ACHPS04 TRANE VOYAGER (RTRM CONTROL MODULE) TO ACCOMMODATE CONNECTION OF EXISTING UNIT TO NEW ALC BAS VIA BACnet/MSTP AS SHOWN ON CONTROL DRAWINGS. REFER TO M-703.
5. REPLACE EXISTING 7-WIRE WALL THERMOSTAT WITH NEW 10K TYPE II BARE SENSOR AND CONNECT TO EXISTING 432ACHPS04 TRANE VOYAGER.
6. FURNISH AND INSTALL NEW UNDERGROUND CONDENSATE SOAK PIT IN THIS LOCATION, REFER TO DETAIL D6 ON M-505. EXTEND 432ACHPS02 CONDENSATE TO THIS LOCATION, REFER TO DETAIL D3 ON M-505.
7. EXISTING, RE-USED, SD FURNISHED INSTALLED AND WIRED BY CONTROLS SUBCONTRACTOR. REFER TO MD404. WIRE DEVICE TO EXISTING ADDRESSABLE FIRE ALARM CONTROL LOOP IN SECOND FLOOR OFFICE AREA (REFER TO M-405) AND WIRE FIRE ALARM CONTROL LOOP TO 432ACHPS02 SUPPLY FAN MOTORS. INSTALL DEVICE 48" AFF.



KEY PLAN

Sheet Title

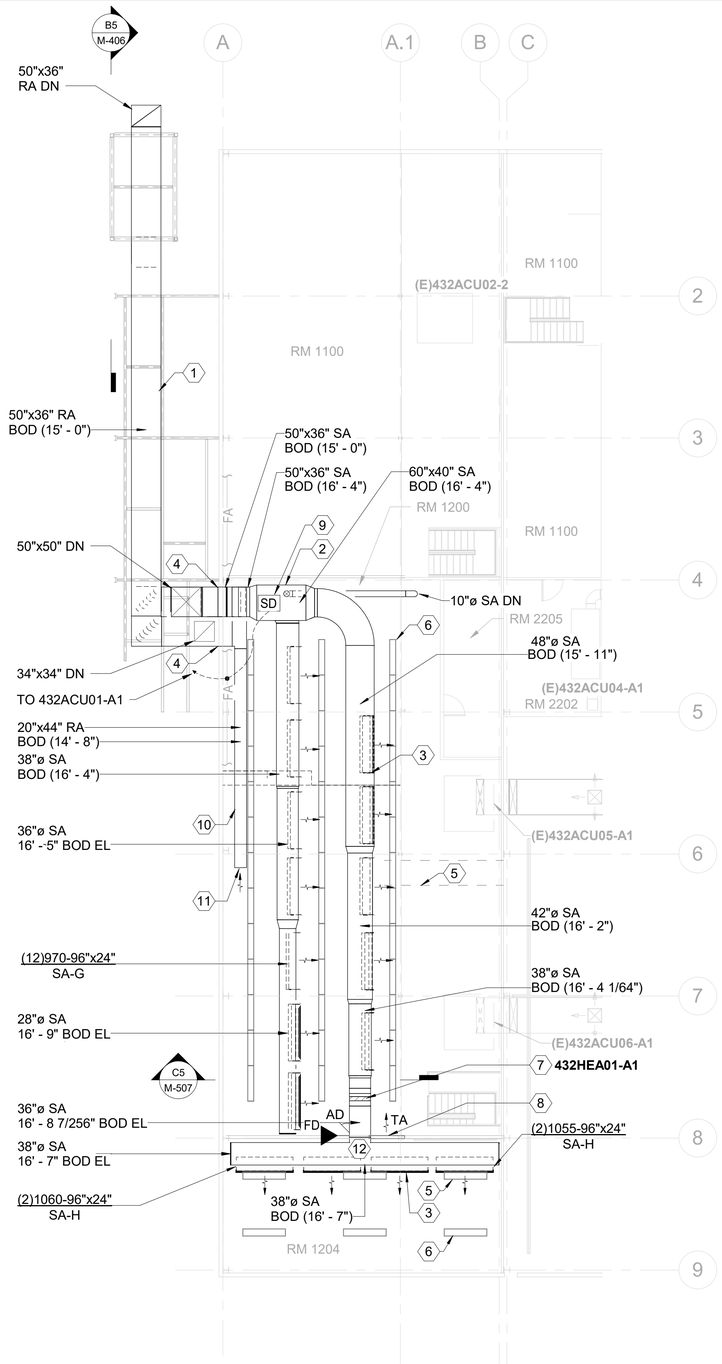
MECHANICAL ENLARGED 1ST FLOOR HIGH BAY NEW CONSTRUCTION PLAN - DUCTWORK

Dwg. No.

PLM2021-0432-0014D

Sht. No.

M-403



KEYED NOTES

11. PROVIDE RETURN AIR OPENING WITH WIRE MESH BIRDSCREEN.
12. REFER TO M-502 FOR FIRE DAMPER REQUIREMENTS.

GENERAL NOTES

1. REFER TO M-001 FOR MECHANICAL ABBREVIATIONS, LEGEND, SYMBOLS, AND GENERAL NOTES.
2. COMPONENTS SHOWN HALF-TONE ON THIS DRAWING ARE ITEMS TO REMAIN; BOLD COMPONENTS ARE NEW.
3. REFER TO STRUCTURAL DRAWINGS FOR DUCT SUPPORT AND EQUIPMENT ANCHORAGE DETAILS.
4. COORDINATE INSTALLATION OF NEW DUCTWORK THROUGH OPTICS LAB AREA WITH EXISTING UTILITIES AND OBSTACLES, REROUTE DUCTWORK AS NECESSARY TO AVOID EXISTING UTILITIES AND OBSTACLES.
5. BOTTOM OF DUCT ELEVATIONS ON THIS DRAWING ARE RELATIVE TO 1ST FLOOR LAB FLOOR.
6. INSTALLATION OF NEW INTERIOR DUCTWORK AND AIR TERMINALS WILL REQUIRE A DETAILED WORK PLAN DEVELOPED WITH INPUT FROM CONSTRUCTION MANAGER, SUBCONTRACTORS, AND FACILITY END-USERS. SUBCONTRACTOR MUST REVIEW EXISTING CONDITIONS AND DISCUSS ACCEPTABLE MEANS AND METHODS FOR NEW INSTALLATION WITH CONSTRUCTION MANAGER PRIOR TO BID. USAGE CONTINUITY OF END-USER LAB EQUIPMENT IN PROJECT AREA WILL REQUIRE COMPLETE INSTALLATION OF NEW COMPONENTS OVER A LONG WEEKEND, INCLUDE COSTS TO ACCOMPLISH THIS IN BID. CONSTRUCTION MANAGER TO COORDINATE TEMPORARY LAB EQUIPMENT REMOVAL
7. INSTALL MANUAL VOLUME DAMPER AT EACH SUPPLY AIR DIFFUSER, IN BRANCH DUCTWORK IMMEDIATELY UPSTREAM OF DIFFUSER CONNECTION, AND ELSEWHERE AS INDICATED.

KEYED NOTES

1. SECURE NEW RETURN AIR DUCTWORK TO NEW DUCT SUPPORT FRAMES. ROUTE WITH SUPPLY DUCT, RETURN STACKED ON TOP OF SUPPLY. REFER TO S-403.
2. ALL INDOOR SUPPLY DUCT CONNECTED TO 432ACU01-A1 MUST BE DOUBLE-WALL INSULATED DUCT.
3. REFER TO DIFFUSER DETAIL C5 ON M-507, TYPICAL OF ALL NEW DIFFUSERS IN LAB AREAS.
4. INSTALL SUPPLY AND RETURN AIR DUCTS TIGHT TOGETHER THROUGH WALL OPENING AND INSULATE AROUND SET OF DUCTS WITH NO GAP IN BETWEEN DUCTS. SEAL WALL OPENING AROUND NEW DUCTWORK. REFER TO A-501 FOR WALL SEAL REQUIREMENTS.
5. DASHED LINE INDICATES LOCATION OF EXISTING HOIST LIFTING AREA AND PATH OF TRAVEL. ALL NEW MEP COMPONENTS MUST NOT INTERRUPT HOIST LIFTING AREA OR PATH OF TRAVEL.
6. EXISTING LIGHT FIXTURE TO REMAIN AS IS, TYPICAL.
7. FURNISH AND INSTALL NEW DUCT-MOUNTED ELECTRIC RESISTANCE HEATING COIL.
8. EXISTING 60"x48" TRANSFER AIR GRILLE TO REMAIN AS IS.
9. EXISTING, RE-USED, SD FURNISHED INSTALLED AND WIRED BY CONTROLS SUBCONTRACTOR. REFER TO MD401. WIRE DEVICE TO EXISTING ADDRESSABLE FIRE ALARM CONTROL LOOP AND WIRE FIRE ALARM CONTROL LOOP TO 432ACU01-A1 SUPPLY FAN MOTORS.
10. INDOOR RETURN AIR DUCT IN OPTICS LAB TO BE UNINSULATED.

KEY PLAN

Sheet Title
MECHANICAL ENLARGED 2ND FLOOR OPTICS LAB NEW CONSTRUCTION PLAN - DUCTWORK

Dwg. No.
PLM2021-0432-0015D

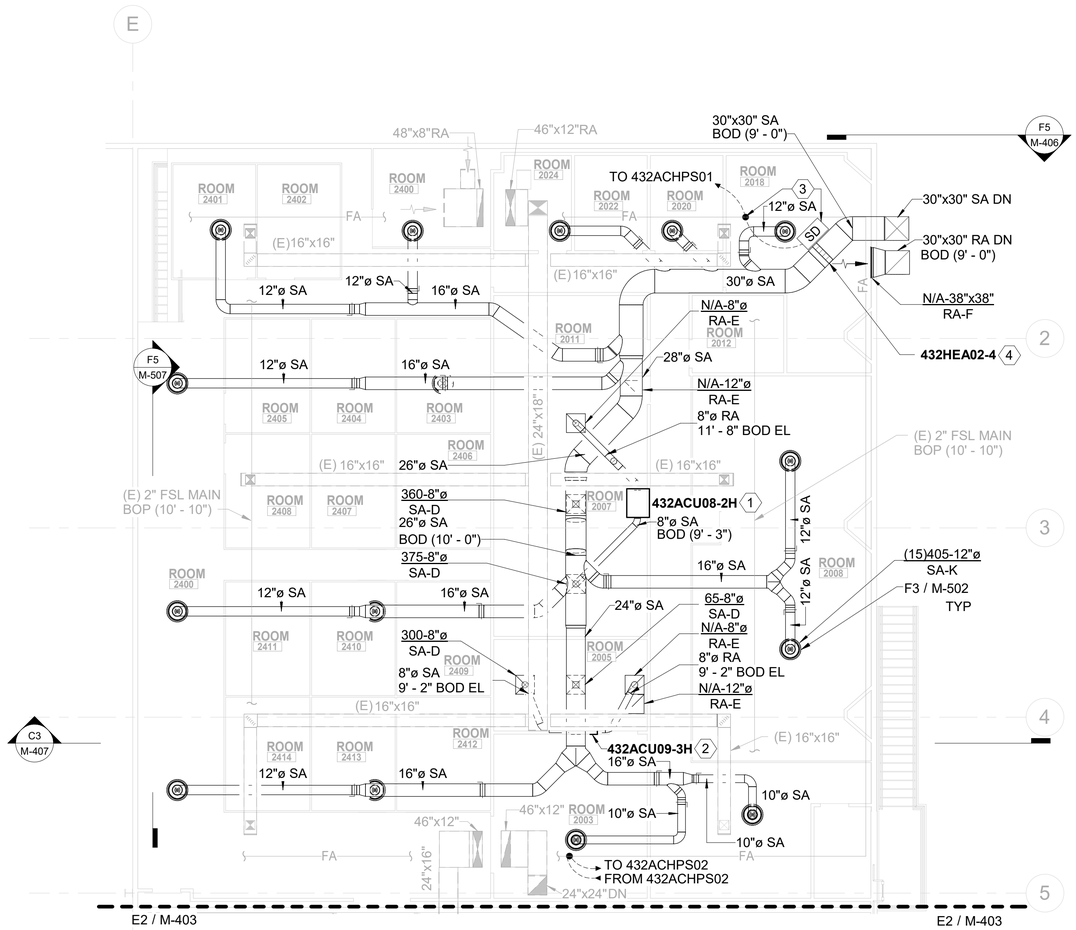
Sht. No.
M-404

F2 / M-404 MECHANICAL ENLARGED 2ND FLOOR OPTICS LAB NEW CONSTRUCTION PLAN - DUCTWORK

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

0 8' 16' 24'

3/32" = 1'-0"



MECHANICAL ENLARGED 2ND FLOOR OPEN OFFICE NEW CONSTRUCTION PLAN - DUCTWORK

F2 / M-405

SCALE: 1/8" = 1'-0"

0 4' 8' 16'

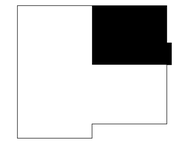
1/8" = 1'-0"

GENERAL NOTES

1. REFER TO M-001 FOR MECHANICAL ABBREVIATIONS, LEGEND, SYMBOLS, AND GENERAL NOTES.
2. COMPONENTS SHOWN HALF-TONE ON THIS DRAWING ARE ITEMS TO REMAIN; BOLD COMPONENTS ARE NEW. REFER TO MD404 FOR DEMOLITION OF EXISTING DUCTWORK AFTER NEW DUCTWORK IS INSTALLED.
3. DASHED REGIONS AROUND EQUIPMENT INDICATE CLEARANCE REQUIRED FOR EQUIPMENT ACCESS AND MAINTENANCE.
4. NEW DUCTWORK MUST BE INSTALLED PRIOR TO DEMOLITION OF EXISTING DUCTWORK TO LIMIT DURATION OF SYSTEM OUTAGE.
5. INSTALL MANUAL VOLUME DAMPER AT EACH SUPPLY AIR DIFFUSER, IN BRANCH DUCTWORK IMMEDIATELY UPSTREAM OF DIFFUSER CONNECTION, AND ELSEWHERE AS INDICATED.
6. REFER TO M-414 FOR SYSTEM THERMOSTATS.
7. EXISTING FIRE SPRINKLER PIPING TO REMAIN AS IS. NEW DUCTWORK MUST BE ROUTED TO AVOID CONFLICTS WITH EXISTING FIRE SPRINKLER PIPING.

KEYED NOTES

1. FURNISH AND INSTALL NEW SPLIT SYSTEM DX FAN COIL UNIT. INTERLOCK WITH 432RCUA02-2H. INSTALL UNIT ABOVE EXISTING TO REMAIN CEILING, SUSPENDED FROM ROOF STRUCTURE. POSITION UNIT TO BE ACCESSIBLE FOR MAINENANCE FROM CORRIDOR. REFER TO S-514.
2. FURNISH AND INSTALL NEW SPLIT SYSTEM DX FAN COIL UNIT. INTERLOCK WITH 432RCUA03-3H. INSTALL UNIT ABOVE EXISTING TO REMAIN CEILING, SUSPENDED FROM ROOF STRUCTURE. POSITION UNIT TO BE ACCESSIBLE FOR MAINENANCE FROM CORRIDOR. REFER TO S-514.
3. EXISTING, RE-USED, SD FURNISHED INSTALLED AND WIRED BY CONTROLS SUBCONTRACTOR. REFER TO MD404. WIRE DEVICE TO EXISTING ADDRESSABLE FIRE ALARM CONTROL LOOP AND WIRE FIRE ALARM CONTROL LOOP TO 432ACHPS01 SUPPLY FAN MOTORS.
4. FURNISH AND INSTALL NEW DUCT-MOUNTED ELECTRIC RESISTANCE HEATING COIL.

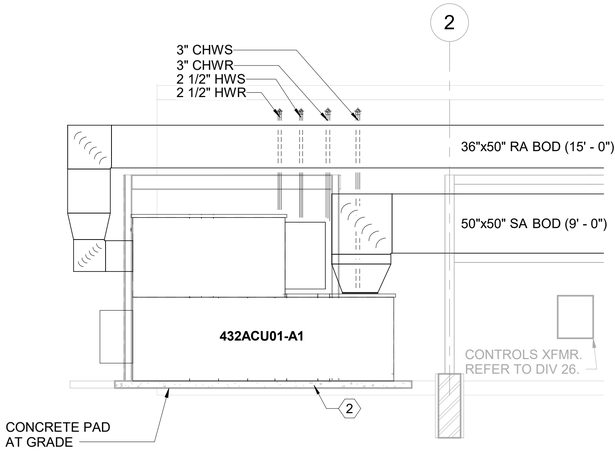


KEY PLAN

Sheet Title
MECHANICAL ENLARGED 2ND FLOOR OPEN OFFICE NEW CONSTRUCTION PLAN - DUCTWORK

Dwg. No.
PLM2021-0432-0016D

Sht. No.
M-405

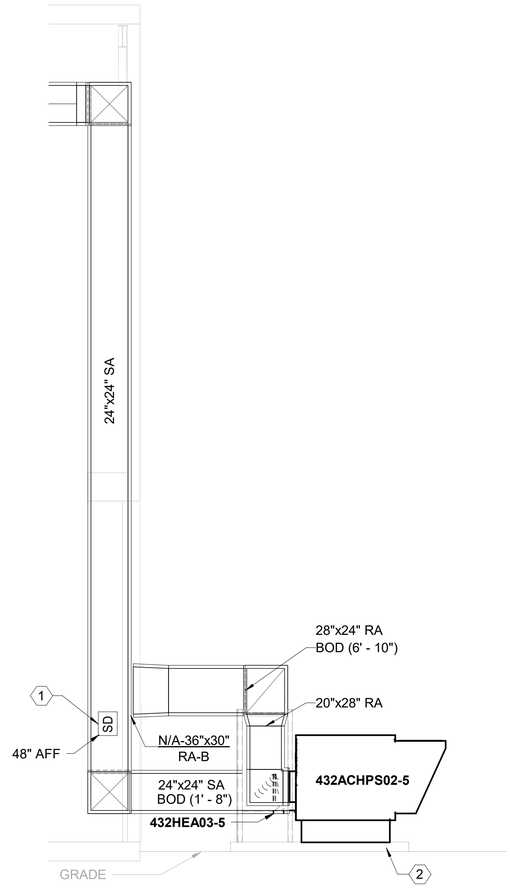


B5 M-406 **432ACU01-A1 DUCTWORK SECTION**

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

0 4' 8' 12'

3/16" = 1'-0"

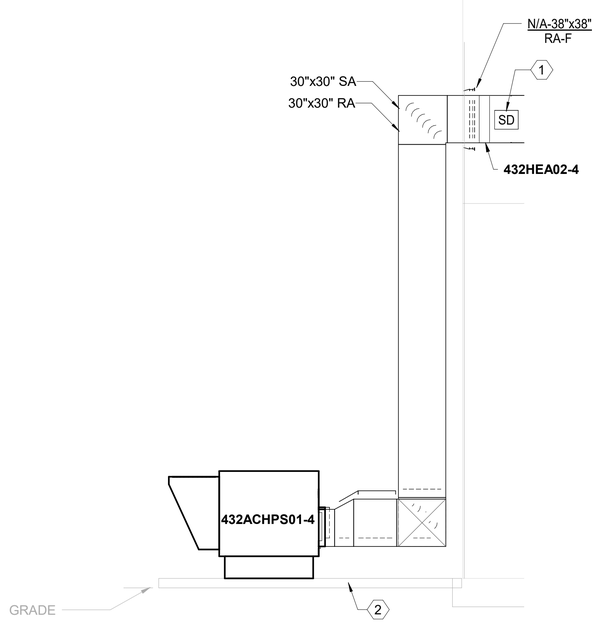


F3 M-406 **432ACHPS02-5 DUCTWORK SECTION**

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

0 2' 4' 8'

1/4" = 1'-0"



F5 M-406 **432ACHPS01-4 DUCTWORK SECTION**

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

0 2' 4' 8'

1/4" = 1'-0"

GENERAL NOTES

1. REFER TO M-001 FOR MECHANICAL ABBREVIATIONS, LEGEND, SYMBOLS, AND GENERAL NOTES.
2. DASHED REGIONS AROUND EQUIPMENT INDICATE CLEARANCE REQUIRED FOR EQUIPMENT ACCESS AND MAINTENANCE.
3. REFER TO STRUCTURAL DRAWINGS FOR DUCT SUPPORT AND EQUIPMENT ANCHORAGE DETAILS.

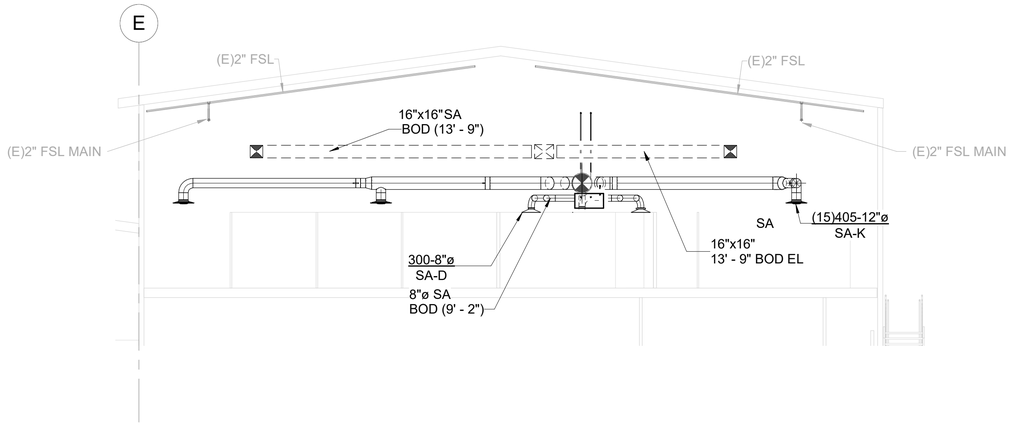
KEYED NOTES

1. EXISTING, RE-USED SMOKE DETECTOR DEVICE. INSTALLED AND WIRED BY CONTROLS SUBCONTRACTOR
2. CONRETE HOUSEKEEPING PAD. REFER TO S-402 FOR UNIT ANCHORAGE.

Sheet Title
MECHANICAL ENLARGED EQUIPMENT ELEVATIONS - DUCTWORK

Dwg. No.
PLM2021-0432-0017D

Sht. No.
M-406



C3 MECHANICAL ENLARGED 2ND FLOOR NORTHEAST NEW CONSTRUCTION SECTION (OPEN OFFICE)

M-407

SCALE: 1/8" = 1'-0"

0 4' 8' 16'

1/8" = 1'-0"

GENERAL NOTES

1. REFER TO M-001 FOR MECHANICAL ABBREVIATIONS, LEGEND, SYMBOLS, AND GENERAL NOTES.
2. COMPONENTS SHOWN HALF-TONE ON THIS DRAWING ARE ITEMS EXISTING TO REMAIN; BOLD COMPONENTS ARE NEW; DASHED COMPONENTS ARE EXISTING TO BE DEMOLISHED.
3. DASHED REGIONS AROUND EQUIPMENT INDICATE CLEARANCE REQUIRED FOR EQUIPMENT ACCESS AND MAINTENANCE.
4. NEW DUCTWORK SHALL BE INSTALLED PRIOR TO DEMOLITION OF EXISTING DUCTWORK TO LIMIT DURATION OF SYSTEM OUTAGE. REFER TO M-407.
5. EXISTING FIRE SPRINKLER PIPING TO REMAIN AS IS. NEW DUCTWORK MUST BE ROUTED TO AVOID CONFLICTS WITH EXISTING FIRE SPRINKLER PIPING.

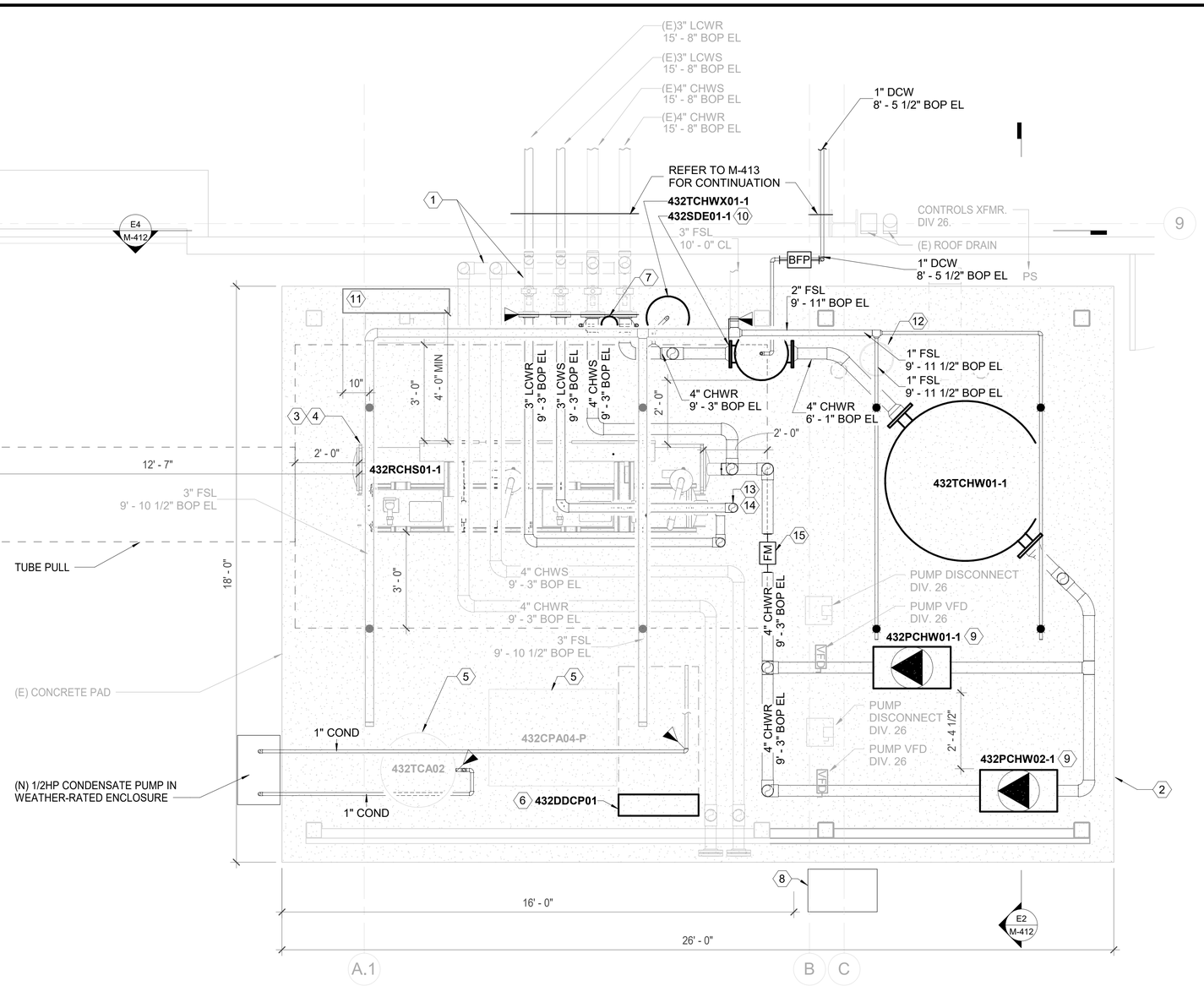
Sheet Title
MECHANICAL ENLARGED ELEVATIONS

Dwg. No.
PLM2021-0432-0018D

Sht. No.
M-407

A B C D E F

1 2 3 4 5 6 7 8



E2 MECHANICAL ENLARGED 1ST FLOOR CHILLER YARD PLAN

M-411

SCALE: 1/2" = 1'-0"

0 1' 2' 4'

1/2" = 1'-0"

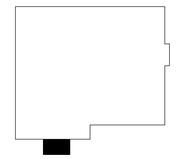
KEYED NOTES

1. INSTALL SELECT PIPING AND LINE-SIZE ISOLATION VALVES WITHIN FIRST SYSTEM SHUTDOWN AT BEGINNING OF CONSTRUCTION PROJECT. REFER TO M-002.
2. EXISTING CONCRETE PAD TO BE EXTENDED AS PART OF THIS PROJECT TO SUPPORT NEW MECHANICAL EQUIPMENT INSTALLED OUTSIDE OF EXISTING SHELTER. NEW SHELTER TO BE INSTALLED OVER NEW CONCRETE PAD EXTENSION. REFER TO S-401 AND A-401 FOR ADDITIONAL REQUIREMENTS.
3. FURNISH AND INSTALL NEW WATER-COOLED CHILLER, PIPING, AND APPURTENANCES. INSTALL CHILLER ON EXISTING CONCRETE PAD. LOCATE CHILLER ACCESSORIES AS INDICATED. REFER TO F1 / M-506 FOR REQUIRED CHILLER PIPING, VALVES, AND ACCESSORIES.
4. REFER TO S-514 FOR CHILLER ANCHORAGE.
5. EQUIPMENT INCLUDING ALL PIPING, UTILITIES, AND APPURTENANCES IS EXISTING TO REMAIN. PROTECT IN PLACE FOR DURATION OF CONSTRUCTION.
6. FURNISH AND INSTALL NEW ALC DDC CONTROLLERS AND G5CE ROUTER IN NEMA 4X RATED ENCLOSURE TO SERVE ALL HVAC EQUIPMENT IN PROJECT SCOPE. DAISY-CHAIN NEW 432DDCP01 WITH 432DDCP02 AND FURNISH AND INSTALL NEW HOME-RUN NETWORK CONNECTION TO EXISTING YELLOW NETWORK SWITCH IN ROOM 1000 AT GRIDLINE 4-C. REFER TO M-700 SERIES CONTROL DRAWINGS FOR ADDITIONAL CONTROLS REQUIREMENTS.
7. 432TCH01-1. FURNISH AND INSTALL NEW CHEMICAL SHOT FEEDER TANK. REFER TO M-505 FOR INSTALLATION DETAILS.
8. FURNISH AND INSTALL NEW UNDERGROUND CONDENSATE SOAK PIT, REFER TO D6 / M-505 AND C6 / M-503. EXTEND AUTOMATIC AIR VENT AND MAKEUP WATER BFP DRAINS TO THIS LOCATION.
9. REFER TO F1 / M-506 FOR PIPELINE ACCESSORIES REQUIRE AT PUMPS.
10. REFER TO F4 / S-514 FOR AIR SEPARATOR INSTALLATION DETAIL.
11. CHILLER ELECTRICAL DISCONNECT. REFER TO E-401 AND COORDINATE WITH CHILLER INSTALLATION.
12. EXIST GROUND TESTING WELL TO REMAIN AS IS.
13. FURNISH AND INSTALL HEAD PRESSURE CONTROL VALVE ON VERITICAL PIPING. REFER TO M-506.
14. FURNISH AND INSTALL 3/4" NORMALLY-CLOSED 2-WAY ELECTRONIC BYPASS LCW CONTROL VALVE FOR LCW FREEZE PROTECTION.
15. FURNISH AND INSTALL INLINE DUAL TURBINE CHILLED WATER FLOW METER, ONICON F-1200. REFER TO M-506. INSTALL FLOW METER IN ACCORDANCE WITH MFR'S UPSTREAM AND DOWNSTREAM CLEARANCE RECOMMENDATIONS.

GENERAL NOTES

1. REFER TO M-001 FOR MECHANICAL ABBREVIATIONS, LEGEND, SYMBOLS, AND GENERAL NOTES.
2. COMPONENTS SHOWN HALF-TONE ON THIS DRAWING ARE ITEMS TO REMAIN; BOLD COMPONENTS ARE NEW.
3. DASHED REGIONS AROUND EQUIPMENT INDICATE CLEARANCE REQUIRED FOR EQUIPMENT ACCESS AND MAINTENANCE.
4. INSTALL ALL NEW CONTROL PANELS ON NEW, FREE-STANDING UNISTRUT SUPPORT STANDS. REFER TO S-512. FURNISH AND INSTALL REQUIRED ELECTRICAL CLEARANCES PER NEC.
5. CROSS-REFERENCE THIS DRAWING WITH M-412 SECTION VIEWS TO UNDERSTAND 3D ARRANGEMENT OF ELEMENTS WITHIN THIS AREA.
6. NEW RCHS CHILLER, PCHW PUMPS, AND CHILLED WATER SYSTEM APPURTENANCES IN EQUIPMENT YARD ARE EXPOSED TO OUTDOOR ELEMENTS ON TWO OF FOUR SIDES.

   INSTALL IN FUTURE PROJECT NEW WALL(S) ON CHILLER SHELTER TO QUALIFY CHILLER INSTALLATION AREA AS AN INDOOR SPACE SUITABLE FOR EQUIPMENT UL LISTED ONLY FOR INDOOR INSTALLATION.
7. EXISTING FIRE SPRINKLER PIPING SERVING EXISTING EQUIPMENT AREA TO REMAIN. INSTALL NEW EQUIPMENT TO AVOID DISTURBING EXISTING FIRE SPRINKLER PIPING AND HEADS. INSTALL NEW FIRE SPRINKLER PIPING AND SPRINKLER HEADS AS INDICATED.
8. REFER TO M-001 AND SPEC. 21 00 00 FOR FIRE SPRINKLER DELEGATED DESIGN SUBMITTAL INFORMATION.



KEY PLAN

Des: C. DERKS	10/6/2021
Dwn: E. FERNANDEZ	10/6/2021
Chk: J. ALLEN	10/6/2021
PFN: 432-2021-001	Software: REVIT 2020

Sheet Title

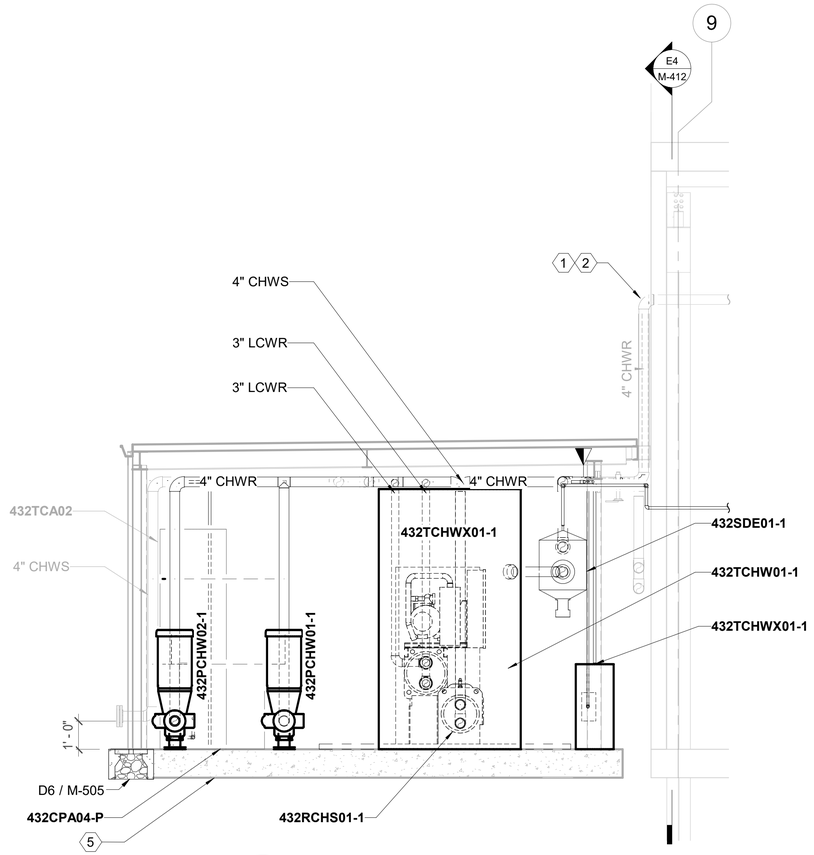
MECHANICAL ENLARGED 1ST FLOOR CHILLER YARD PLAN - PIPING

Dwg. No.

PLM2021-0432-0019D

Sht. No.

M-411

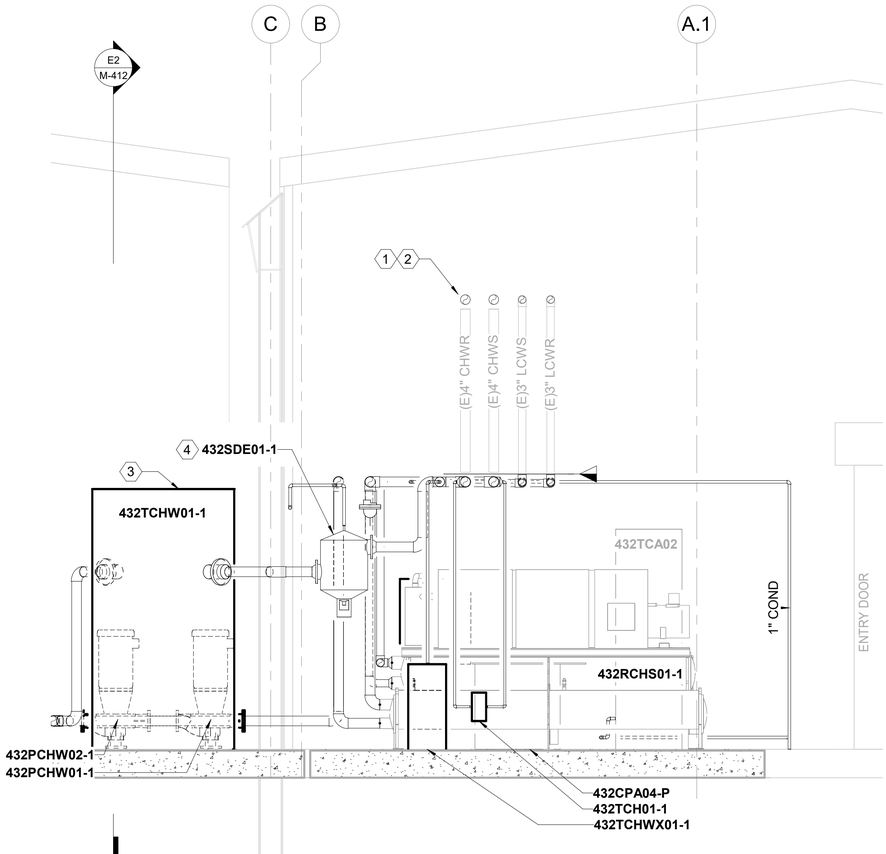


E2 M-412 **CHILLER YARD SECTION E2**

SCALE: 3/8" = 1'-0"

0 1' 2' 4' 6'

3/8" = 1'-0"



E4 M-412 **CHILLER YARD SECTION E4**

SCALE: 3/8" = 1'-0"

0 1' 2' 4' 6'

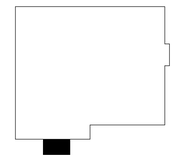
3/8" = 1'-0"

GENERAL NOTES

1. REFER TO M-001 FOR MECHANICAL ABBREVIATIONS, LEGEND, SYMBOLS, AND GENERAL NOTES.
2. CROSS-REFERENCE THIS DRAWING WITH M-411 PLAN VIEW TO UNDERSTAND 3D ARRANGEMENT OF ELEMENTS WITHIN THIS AREA.

KEYED NOTES

1. INSTALL SELECT PIPING AND LINE-SIZE ISOLATION VALVES WITHIN FIRST SYSTEM SHUTDOWN AT BEGINNING OF CONSTRUCTION PROJECT. REFER TO M-002.
2. EXISTING LCW AND CHW PIPING PENETRATIONS THROUGH EXTERIOR WALL TO REMAIN.
3. FURNISH AND INSTALL BUFFER TANK 432TCHW01-1 WITH AUTOMATIC AIR VENT AND FULL PORT NORMALLY OPEN QUARTER TURN ISOLATION BALL VALVE. ROUTE CONDENSATE TO DRAIN.
4. FURNISH AND INSTALL AIR AND DIRT SEPARATOR WITH FULL PORT NORMALLY OPEN QUARTER TURN ISOLATION BALL VALVE ON MAKE-UP WATER CONNECTION AND QUARTER TURN BLOW-DOWN BALL VALVE ON DRAIN CONNECTION WITH FLEX TUBING TERMINATING AT 0'-6" AFF. FURNISH AND INSTALL SEPARATE LABEL FOR DRAIN VALVE CONNECTION WITH TEXT: "DIRT CLEANOUT" ON PIPING.
5. CONCRETE PAD. REFER TO S-401.



KEY PLAN

Sheet Title

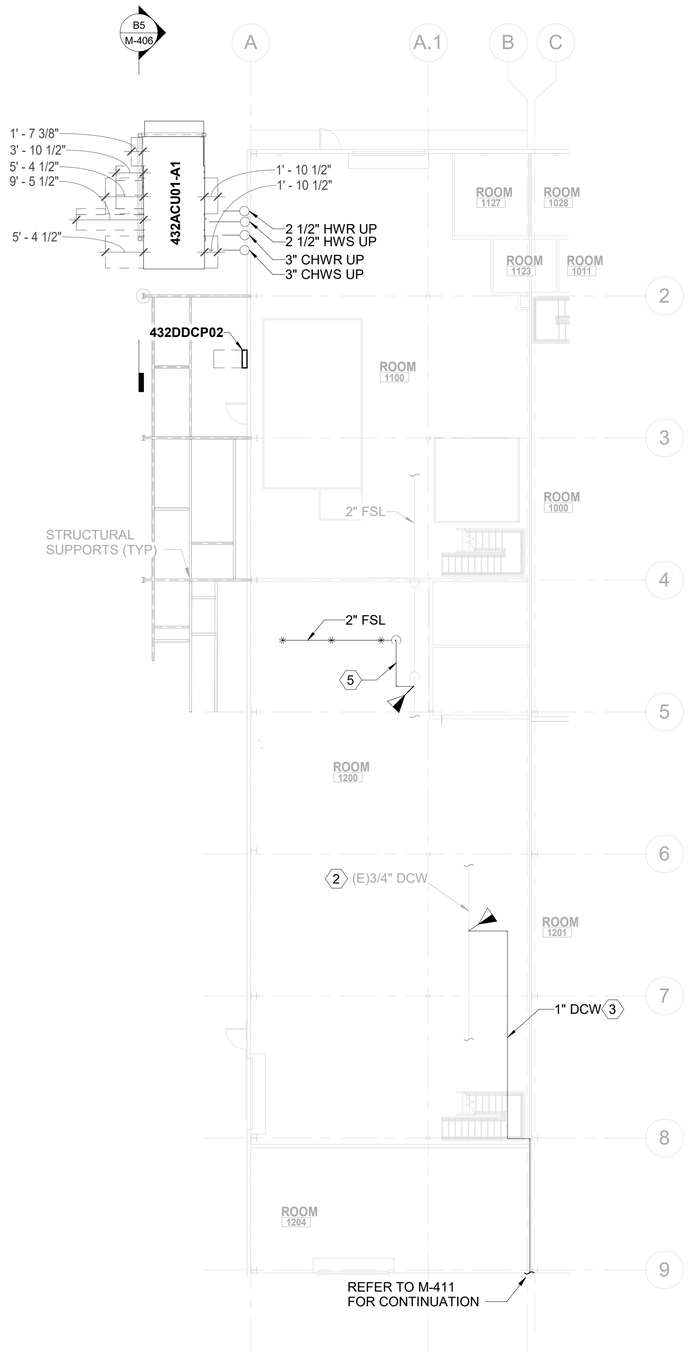
MECHANICAL ENLARGED CHILLER YARD SECTIONS - PIPING

Dwg. No.

PLM2021-0432-0020D

Sht. No.

M-412



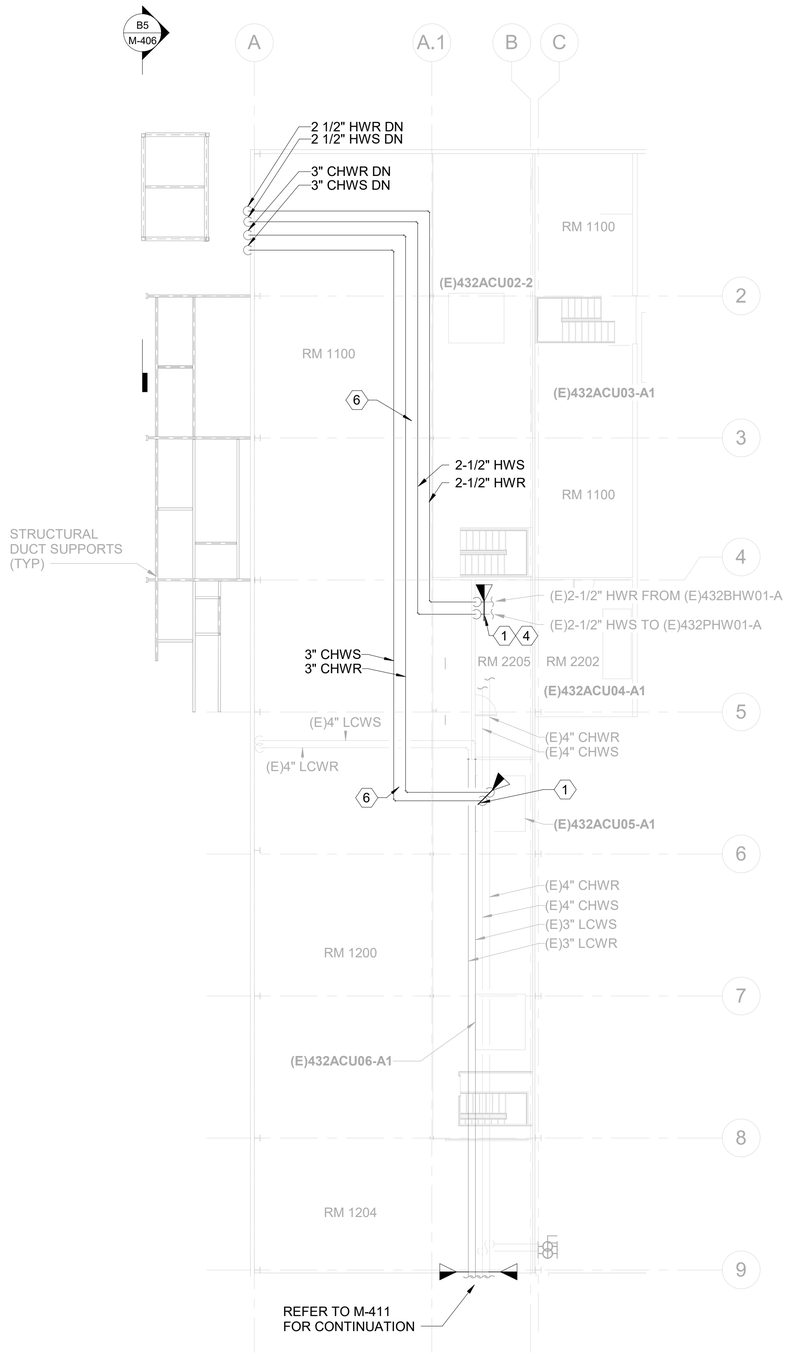
F1 M-413

MECHANICAL ENLARGED 1ST FLOOR OPTICS LAB NEW CONSTRUCTION PLAN - PIPING

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

0 8' 16' 24'

3/32" = 1'-0"



F2 M-413

MECHANICAL ENLARGED 2ND FLOOR OPTICS LAB NEW CONSTRUCTION PLAN - PIPING

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

0 8' 16' 24'

3/32" = 1'-0"

GENERAL NOTES

1. REFER TO M-001 FOR MECHANICAL ABBREVIATIONS, LEGEND, SYMBOLS, AND GENERAL NOTES.
2. COMPONENTS SHOWN HALF-TONE ON THIS DRAWING ARE ITEMS TO REMAIN; BOLD COMPONENTS ARE NEW.
3. DASHED REGIONS AROUND EQUIPMENT INDICATE CLEARANCE REQUIRED FOR EQUIPMENT ACCESS AND MAINTENANCE.
4. REFER TO M-401 FOR HVAC EQUIPMENT INSTALLATION.
5. INSTALLATION OF NEW INTERIOR PIPING WILL REQUIRE A DETAILED WORK PLAN DEVELOPED WITH INPUT FROM CONSTRUCTION MANAGER, SUBCONTRACTORS, AND FACILITY END-USERS. SUBCONTRACTOR MUST REVIEW EXISTING CONDITIONS AND DISCUSS ACCEPTABLE MEANS AND METHODS FOR NEW INSTALLATION WITH CONSTRUCTION MANAGER PRIOR TO BID. USAGE CONTINUITY OF END-USER LAB EQUIPMENT IN PROJECT AREA WILL REQUIRE COMPLETE INSTALLATION OF NEW COMPONENTS OVER A LONG WEEKEND, INCLUDE COSTS TO ACCOMPLISH THIS IN BID. CONSTRUCTION MANAGER TO COORDINATE TEMPORARY LAB EQUIPMENT REMOVAL
6. CLEAN AND FLUSH ALL NEW PIPING SYSTEMS IN ACCORDANCE WITH SPEC. 220111.13.
7. INSTALL AUTOMATIC AIR VENTS AT ALL HIGH POINTS, AND ELSEWHERE AS NECESSARY TO ELIMINATE TRAPPED AIR. EXTEND VENT FROM AUTOMATIC AIR VENT TO NEAREST FLOOR DRAIN OR SOAK PIT.

KEYED NOTES

1. INSTALL NEW BRANCH LINE-SIZE ISOLATION VALVES WITHIN FIRST SYSTEM SHUTDOWN AT BEGINNING OF CONSTRUCTION PROJECT TO FACILITATE INSTALLATION OF REMAINING NEW PIPING WITHOUT AN ADDITIONAL SHUTDOWN. WORK SHALL BE ACCOMPLISHED WITHOUT DRAINING FULL SYSTEM. FREEZING PIPE OR USING HOT TAP PIPE PLUG INSERTION SOLUTION IS ACCEPTABLE.
2. EXISTING CW INSTALLED UNDER MEZZANINE.
3. EXTEND NEW CW UNDER EXISTING STAIR LANDING AND THROUGH INTERIOR AND EXTERIOR WALL AS INDICATED TO TIE-IN POINT SHOWN ON M-411.
4. REFER TO M-802 FOR HEATING WATER TIE-IN POINTS WITHIN BOILER ROOM. RE-USE EXISTING WALL OPENINGS, ENLARGE EXISTING OPENINGS AS NECESSARY.
5. FURNISH AND INSTALL NEW FIRE SPRINKLER PIPING FROM MAIN TIE-IN, THREE SPRINKLER HEADS IN LOCATION IDENTICAL TO EXISTING SYSTEM, AND ALL APPURTENANCES. SIZE TO MATCH EXISITING SYSTEM BRANCH PIPING. REFER TO MD411 FOR EXISTING SPRINKLER SYSTEM.
6. ROUTE NEW PIPING WITHIN 18" OF BUILDING ROOF STRUCTURE.

KEY PLAN

Sheet Title

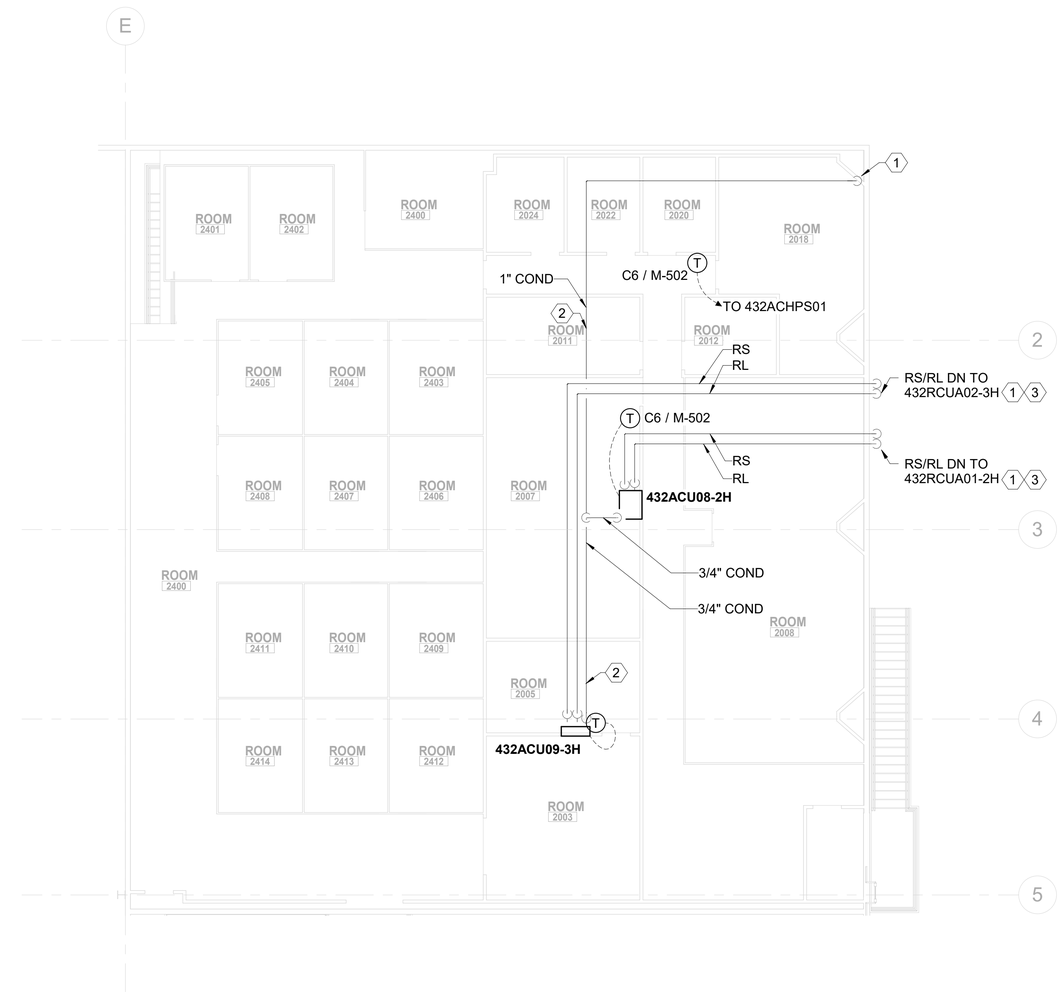
MECHANICAL ENLARGED 1ST AND 2ND FLOOR OPTICS LAB NEW CONSTRUCTION PLANS - PIPING

Dwg. No.

PLM2021-0432-0021D

Sht. No.

M-413



F2
M-414

MECHANICAL ENLARGED OPEN OFFICE NEW CONSTRUCTION PLAN - PIPING

SCALE: 1/8" = 1'-0"

0 4' 8' 16'

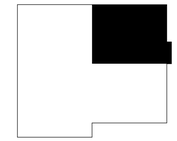
1/8" = 1'-0"

GENERAL NOTES

1. REFER TO M-001 FOR MECHANICAL ABBREVIATIONS, LEGEND, SYMBOLS, AND GENERAL NOTES.
2. COMPONENTS SHOWN HALF-TONE ON THIS DRAWING ARE ITEMS TO REMAIN; BOLD COMPONENTS ARE NEW.
3. GRAVITY PIPING MUST BE SLOPED IN DIRECTION OF FLOW AT 1/4" PER FOOT.

KEYED NOTES

1. REFER TO M-402 FOR CONTINUATION.
2. ROUTE HEADERED CONDENSATE DRAIN TO NEW CONDENSATE SOAK PIT AT GRADE. SLOPE ALL HORIZONTAL CONDENSATE PIPING DOWNWARD IN THE DIRECTION OF FLOW WITH 1% SLOPE. INSTALL HORIZONTAL PIPING MAXIMUM 24" ABOVE CONDENSATE PUMPS.
3. REFER TO DETAIL D1 ON M-504.

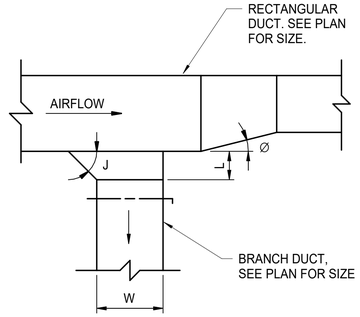


KEY PLAN

Sheet Title
MECHANICAL ENLARGED 2ND FLOOR OPEN OFFICE NEW CONSTRUCTION PLAN - PIPING

Dwg. No.
PLM2021-0432-0022D

Sht. No.
M-414



J = 45°

L = 1/4 W, 4" MIN.

∅ = 20° MAX.

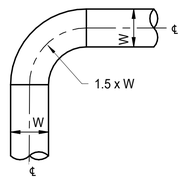
NOTES:

1. TAKEOFF ON BOTH SIDES OR SINGLE SIDE AS REQUIRED BY PLANS.
2. SEE SMACNA MANUAL FOR TAP-IN DETAILS.
3. WHEN FITTING HAS ONLY ONE SIDE SLOPED FOR A SINGLE SIDE TAKE-OFF, THE TAP-IN MUST BE INSTALLED IN SLOPED SIDE.
4. CLINCH LOCK CONNECTION TO DUCT MUST HAVE CORNER SEALS. (SEE SMACNA MANUAL).
5. EXTRACTORS, SCOOPS, DEFLECTORS OR DAMPERS THAT PROTRUDE INTO THE MAIN DUCT MUST NOT BE USED. BALANCING DAMPERS MUST BE LOCATED TO PREVENT PROTRUSION INTO THE MAIN DUCT AND TO FURNISH AND INSTALL STABLE AIR FLOW AND MINIMAL NOISE WHEN ADJUSTED.

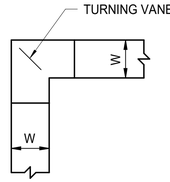
C1 BRANCH DUCT TAKE-OFF

C1 / M-501

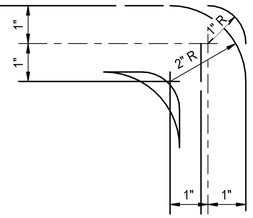
SCALE: NO SCALE SHOWN



ROUND 90 ELBOW



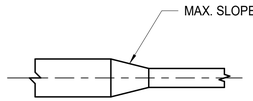
RECTANGULAR 90 ELBOW



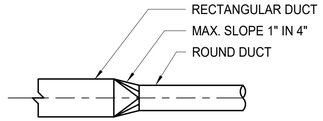
TURNING VANES DETAIL

NOTE:

1. USE THIS DESIGN WHERE SQUARE 90°ELBOWS ARE SHOWN ON DRAWINGS OR IF SPACE DOES NOT PERMIT ROUND 90° ELBOWS.



RECTANGULAR TRANSITION

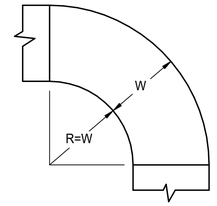


RECTANGULAR TO ROUND TRANSITION

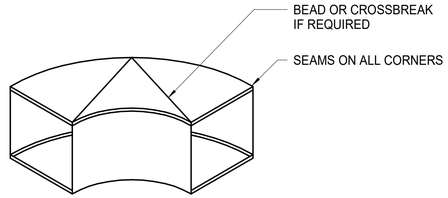
C3 LOW VELOCITY DUCT LAYOUT

C3 / M-501

SCALE: NO SCALE SHOWN



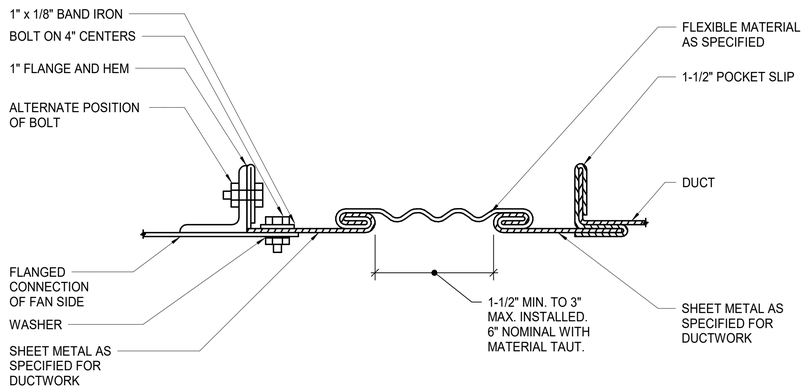
STANDARD RADIUS ELBOW
R=W. CENTERLINE R= 1 1/2 W
ALSO CALLED FULL RADIUS ELBOW.



C7 STANDARD RADIUS ELBOW AIR DUCT

C7 / M-501

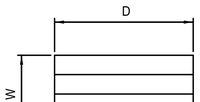
SCALE: NO SCALE SHOWN



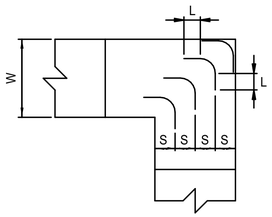
F3 RECTANGULAR FLEXIBLE CONNECTION

F3 / M-501

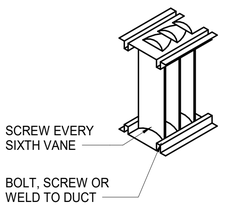
SCALE: NO SCALE SHOWN



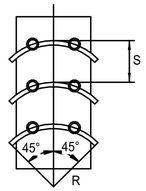
S= D/6 (MIN.2")
W/S= NO. OF SPACES
R= 1 1/4 S
L= 3/4 S



BLADES IN TRANSITION ELBOWS MUST BE DETERMINED ACCORDING TO SMALLEST WIDTH OF ELBOW.



SINGLE VANE SCH.			
	R	S	GA
SMALL	51	38	24
LARGE	114	83	22



F6 RECTANGULAR DUCT ELBOW TURNING VANES

F6 / M-501

SCALE: NO SCALE SHOWN

Sheet Title

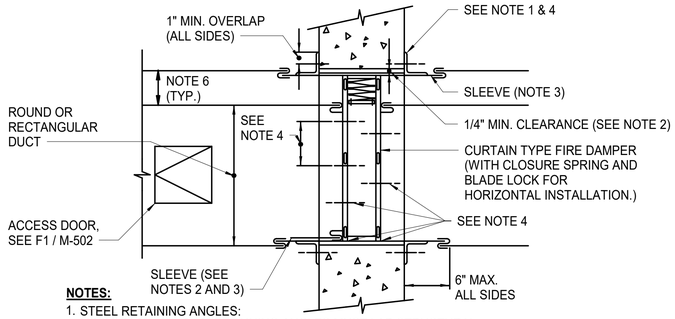
MECHANICAL DETAILS

Dwg. No.

PLM2021-0432-0023D

Sht. No.

M-501

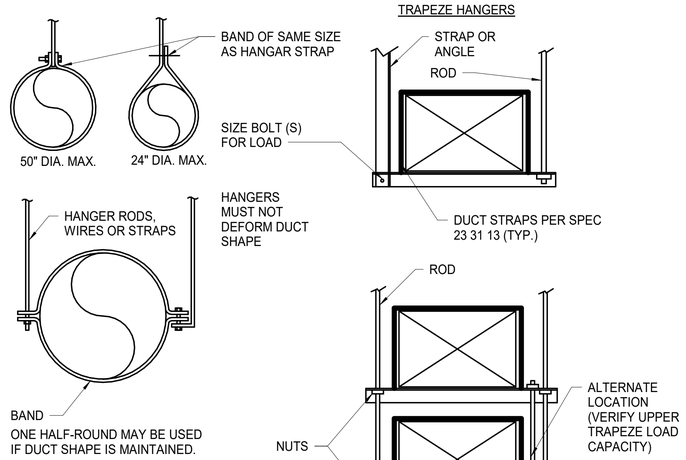


NOTES:

1. STEEL RETAINING ANGLES:
   MINIMUM 3" x 3" x 3/16" RETAINING ANGLES MUST LAP STRUCTURAL OPENING 1" MINIMUM AND COVER CORNERS OF OPENINGS.
2. CLEARANCE, DAMPER SLEEVE TO WALL OPENING:
   1/8" PER LINEAR FOOT. 1/4" MINIMUM.
3. STEEL SLEEVE:
   SLEEVE GAUGE SHALL BE MINIMUM 14 GAUGE UNLESS USING APPROVED BREAKWAY CONNECTIONS PER SMACNA FIRE, SMOKE, AND RADIATION DAMPER GUIDE, FIGURE 5-2. IF APPROVED BREAKAWAY CONNECTIONS ARE USED THEN SLEEVE GAUGE SHALL BE AT LEAST EQUAL TO THE GAUGE OF THE CONNECTING DUCT AND COMPLIANT WITH SPEC. 23 33 00 - 2.05.D.2. MINIMUM REQUIREMENTS.
4. SECURE RETAINING ANGLES TO SLEEVE, DAMPER TO SLEEVE AND MULTIPLE DAMPERS ON 8" CENTER WITH 1/4" BOLTS AND NUTS OR NO.10 STEEL SCREWS. MINIMUM TWO CONNECTIONS IN EACH SIDE.
5. THIS DETAIL SHOWN FOR REFERENCE ONLY, FIRE DAMPER MANUFACTURER'S INSTALLATION DETAILS AND INSTRUCTIONS AS TESTED AND APPROVED BY THE U.L. MUST BE USED IN LIEU OF THIS DETAIL WHERE APPLICABLE.
6. DIMENSION VARIES FROM 0" TO 6". PROVIDE UNOBSTRUCTED AIRFLOW WHEREVER POSSIBLE.
7. REFER TO SPEC. 23 33 00 FOR ADDITIONAL REQUIREMENTS.

C1 FIRE DAMPER W/ACCESS DOOR

M-502 — SCALE: NO SCALE SHOWN



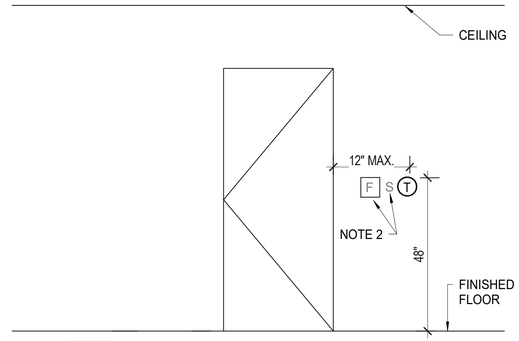
NOTE:

INSTALL SEISMIC BRACING PER ASCE 7 AND PROJECT SPECIFICATION 23 05 48. SUBMIT SHOP DRAWINGS AND CALCULATIONS FOR SUPPORTS, ANCHORAGE, AND BRACING FOR APPROVAL AS A DELEGATED DESIGN SUBMITTAL

REINFORCEMENT MAY BE USED FOR ATTACHMENT IF IT QUALIFIES FOR BOTH DUTIES DO NOT EXCEEED ALLOWABLE LOAD LIMITS

C3 DUCT & PIPE HANGERS

M-502 — SCALE: NO SCALE SHOWN



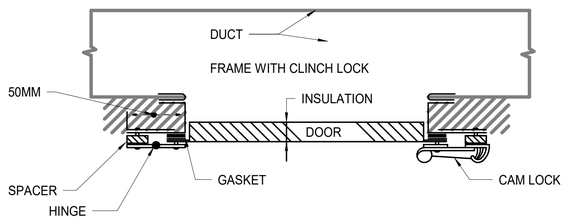
NOTES:

1. THERMOSTATS AND OTHER WALL-MOUNTED DEVICES MUST BE MOUNTED WITHIN 12" OF DOOR FRAME. WHERE DEVICES ARE SHOWN ADJACENT TO THE DOOR ON THE HINGE-SIDE OF THE DOOR, AND THE DOOR SWINGS IN A MANNER THAT MUST BLOCK THE DEVICE, MOUNT THE DEVICE 12" BEYOND THE DOOR SWING.
2. COORDINATE MOUNTING LOCATION WITH OTHER TRADES TO ENSURE A UNIFORM MOUNTING AND AESTHETICALLY-PLEASING APPEARANCE.
3. MOUNTING HEIGHT INDICATED IN LEGEND AND ON THE DRAWINGS MUST BE THE DISTANCE MEASURED FROM THE TOP OF THE DEVICE TO THE FINISHED FLOOR.

C6 TYPICAL DEVICE MOUNTING

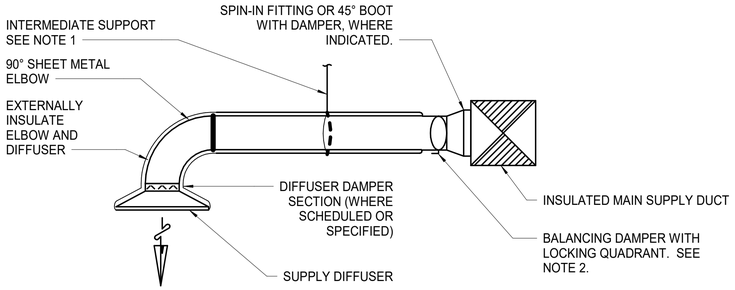
M-502 — SCALE: NO SCALE SHOWN

DOOR SIZE	MIN. NO. OF HINGES	MIN. NO. OF HANDLES	SHEET METAL GAUGE THICKNESS (mm)		
			DOOR	BACK	FRAME
16" x 16"	SINGLE CONTINUOUS	1	24	26	22



F1 ACCESS DOOR IN DUCTWORK

M-502 — SCALE: NO SCALE SHOWN

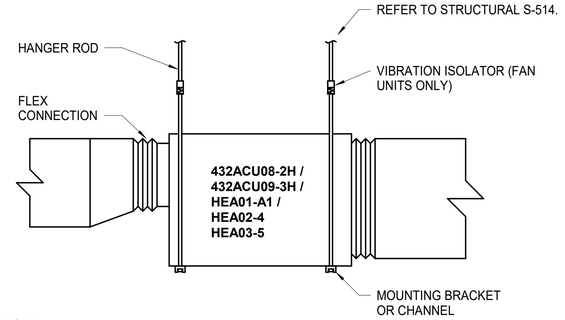


NOTES:

1. FURNISH AND INSTALL INTERMEDIATE SUPPORT, WHERE REQUIRED, TO PREVENT SAGGING. ALL BRANCH DUCTWORK MUST BE HARD DUCT. FLEX DUCT IS PROHIBITED.
2. FURNISH AND INSTALL 2" DUCT EXTENSION TO ALLOW OPERATION OF DAMPER WITHOUT DAMAGE TO INSULATION.

F3 DUCT CONNECTION TO DIFFUSER

M-502 — SCALE: NO SCALE SHOWN



NOTE:

1. INSTALL SEISMIC BRACING PER ASCE 7 AND PROJECT SPECIFICATION 23 05 48. SUBMIT SHOP DRAWINGS AND CALCULATIONS FOR SUPPORTS, ANCHORAGE, AND BRACING FOR APPROVAL AS A DELEGATED DESIGN SUBMITTAL.
2. REFER TO B4 / S-515 FOR ADDITIONAL REQUIREMENTS.

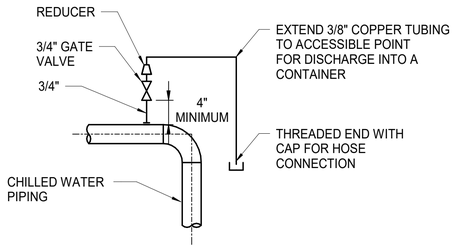
F6 DUCT-MOUNTED INLINE HVAC COMPONENT

M-502 — SCALE: NO SCALE SHOWN

Sheet Title
MECHANICAL DETAILS

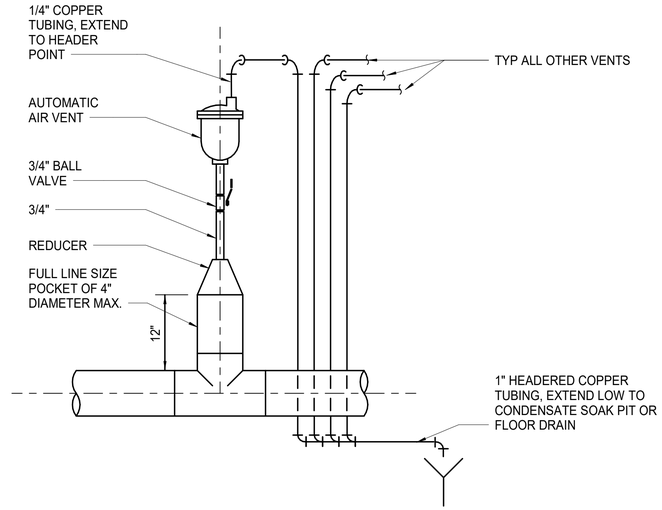
Dwg. No.
PLM2021-0432-0024D

Sht. No.
M-502



C3 MANUAL AIR VENT
M-503

SCALE: NO SCALE SHOWN

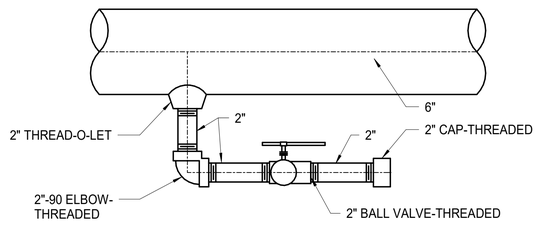


NOTE:

1. ALL AV 1/4" VENT TUBING IN SAME AREA MUST HEADER INTO 1" LINE AT FLOOR. HEADERED LINE MUST ROUTE TO (N) SOAK PIT OR (E) FLOOR DRAIN AS COMBINED DRAIN LINE.

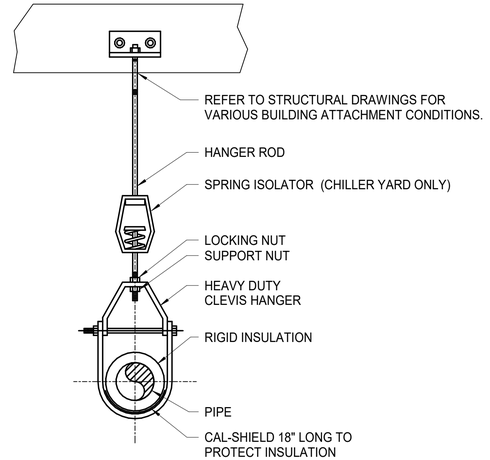
C6 AUTOMATIC AIR VENT
M-503

SCALE: NO SCALE SHOWN



F3 LINE DRAIN AT CHILLER
M-503

SCALE: NO SCALE SHOWN



NOTES:

1. ALL CHILLED WATER PIPE HANGERS IN CHILLER YARD MUST INCLUDE SPRING-TYPE VIBRATION ISOLATION ASSEMBLY REFER TO 23 05 48; PIPE HANGERS FOR ALL OTHER SYSTEMS DO NOT REQUIRE VIBRATION ISOLATION.
2. REFER TO SPEC. SECTION 23 05 48 FOR PIPE SWAY BRACING.
3. INSTALL SEISMIC BRACING PER ASCE 7 AND PROJECT SPECIFICATION 23 05 48. SUBMIT SHOP DRAWINGS AND CALCULATIONS FOR SUPPORTS, ANCHORAGE, AND BRACING FOR APPROVAL AS A DELEGATED DESIGN SUBMITTAL.

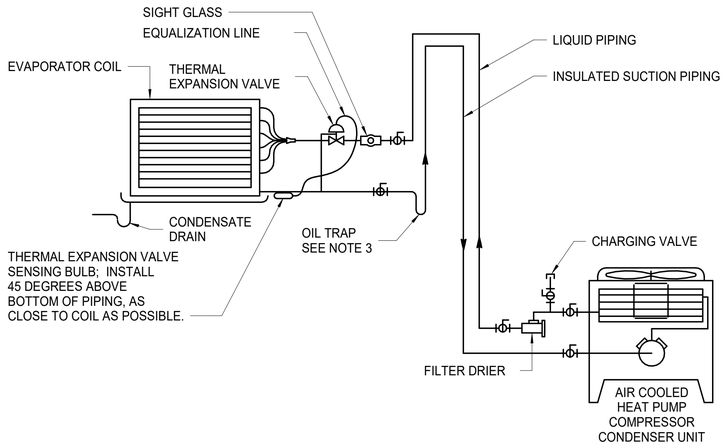
F6 PIPE HANGER-CLEVIS TYPE
M-503

SCALE: NO SCALE SHOWN

Sheet Title
MECHANICAL DETAILS

Dwg. No.
PLM2021-0432-0025D

Sht. No.
M-503

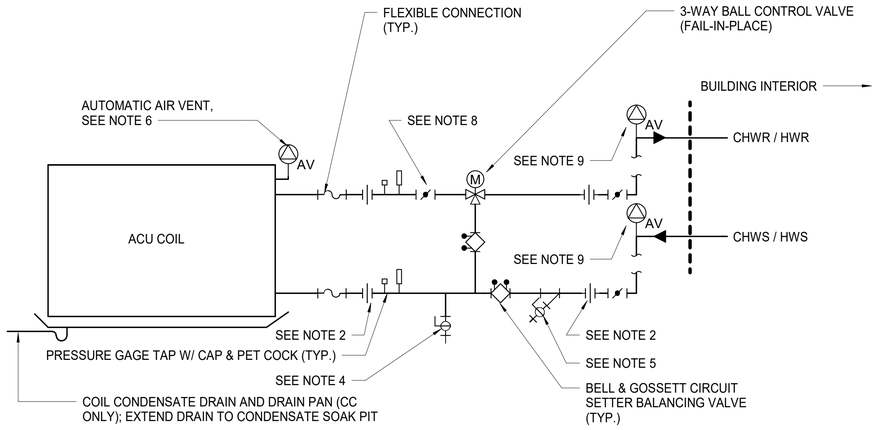


NOTES:

1. SUBCONTRACTOR IS RESPONSIBLE FOR DETERMINING REFRIGERANT LIQUID AND SUCTION PIPE SIZES AND ROUTING. ALL REFRIGERANT PIPING MUST BE SIZED AND INSTALLED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
2. SLOPE SUCTION GAS PIPING IN DIRECTION OF FLOW: 1/2" PER 10 FEET.
3. FURNISH AND INSTALL OIL TRAP WHERE VERTICAL LIFT EXCEEDS 8'-0". FURNISH AND INSTALL ADDITIONAL INTERMEDIATE OIL TRAP EVERY 18'-0" OF VERTICAL RISE.
4. FURNISH AND INSTALL THERMOPLASTIC ELASTOMERIC CUSHIONS RATED FOR NO LESS THAN 275 DEGREES F AT ALL ANCHORS.
5. FURNISH AND INSTALL ACR CLEAN AND DEHYDRATED HARD K OR L COPPER PIPING. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
6. SYSTEM IS A HEAT PUMP TYPE SPLIT SYSTEM. INSULATE BOTH SUCTION AND LIQUID PIPING WITH ARMAFLEX SHIELD OR EQUAL INSULATION. PAINT ALL EXTERIOR REFRIGERANT PIPE INSULATION WITH ARMAFLEX WB FINISH PAINT - WHITE OR EQUAL.
7. SOME DEVICES SHOWN ARE NOT REQUIRED FOR ALL SPLIT SYSTEMS. ADHERE TO MANUFACTURER PIPING INSTALLATION INSTRUCTIONS WHERE THERE IS A DISCREPANCY.

D1 / M-504 DX SPLIT SYSTEM PIPING - EVAPORATOR ABOVE COMPRESSOR

SCALE: NO SCALE SHOWN



NOTES:

1. INDIVIDUAL PIPE SIZES MUST BE THE SAME SIZE AS THE COIL TAPS OR SIZED FOR MAXIMUM VELOCITY 4 FEET PER SECOND.
2. LOCATE FLANGES AND UNIONS TO ALLOW FOR REMOVAL OF COILS AND CONTROL VALVES. ARRANGE PIPING, VALVES, AND JOINTS TO PERMIT REMOVAL OF COIL FROM ACU. MAINTAIN 4'-0" CLEAR DIRECTLY IN FRONT OF UNIT ELECTRICAL PANELS AND FURNISH AND INSTALL SUFFICIENT CLEARANCE IN FRONT OF UNIT ACCESS PANELS FOR UNIT ACCESS.
3. ALL COILS MUST BE PIPED FOR COUNTERFLOW ARRANGEMENT; I.E. HOTTEST WATER ENTERS COIL NEAREST COIL FACE WHERE HOTTEST AIR LEAVES, COLDEST WATER ENTERS COIL NEAREST COIL FACE WHERE COLDEST AIR LEAVES.
4. FURNISH AND INSTALL 3/4" BALL VALVE WITH 3/4" HOSE CONNECTION FOR DRAINING AND FLUSHING. ALL COIL DRAIN CONNECTIONS MUST BE INSTALLED THROUGH HVAC UNIT CASING TO PERMIT COMPLETE DRAINAGE OF COILS FROM UNIT EXTERIOR. TYPICAL ALL DRAIN AND FLUSH CONNECTIONS.
5. FURNISH AND INSTALL STRAINER WITH 3/4" BALL VALVE WITH 3/4" HOSE CONNECTION FOR FLUSHING. TYPICAL ALL STRAINERS.
6. VENTS MUST BE INSTALLED THROUGH HVAC UNIT CASING TO PERMIT COMPLETE VENTING OF COILS FROM UNIT EXTERIOR. TYPICAL ALL VENT CONNECTIONS.
7. STRAIGHT LENGTHS OF UNOBSTRUCTED PIPE WITHOUT INLINE APPURTENANCES MUST BE INSTALLED UP AND DOWNSTREAM OF FLOW CONTROL BALANCING VALVES PER MFGR. INSTALLATION INSTRUCTIONS.
8. ALL ISOLATION VALVES 2" AND SMALLER MUST BE BALL VALVES. ISOLATION VALVES 2-1/2" AND LARGER MUST BE BUTTERFLY VALVES. REFER TO SPECIFICATION SECTION 23 05 23 - "GENERAL DUTY VALVES FOR HVAC PIPING" FOR MORE INFORMATION.
9. INSTALL AUTOMATIC AIR VENTS AT HIGHEST POINT IN SYSTEM.

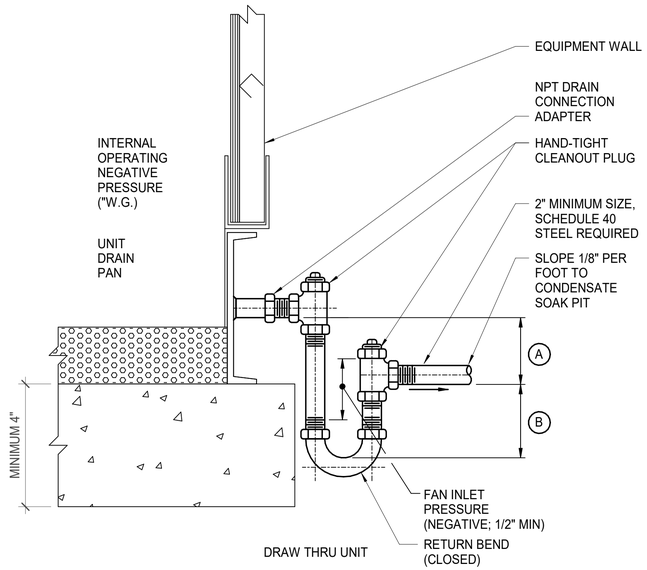
D5 / M-504 ACU SINGLE HYDRONIC COIL, 3-WAY CONTROL VALVE

SCALE: NO SCALE SHOWN

Sheet Title
MECHANICAL DETAILS

Dwg. No.
PLM2021-0432-0026D

Sht. No.
M-504



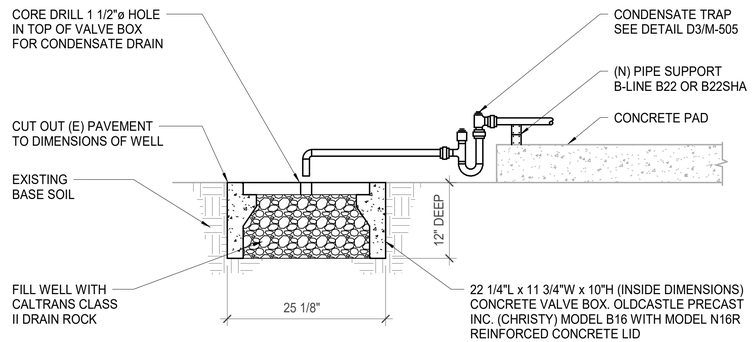
NOTES:

1. (A) DIMENSION EQUAL TO MAXIMUM FAN INLET PRESSURE (INCH WC) + 1/2" (MIN)
2. (B) DIMENSION EQUAL TO (A) /2 (MIN)

D3 EQUIPMENT CONDENSATE TRAP DRAIN

M-505

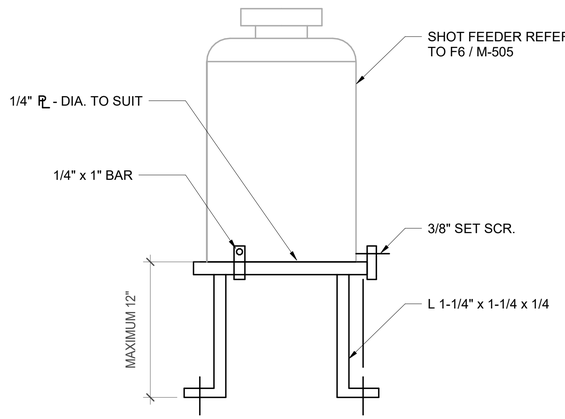
SCALE: NO SCALE SHOWN



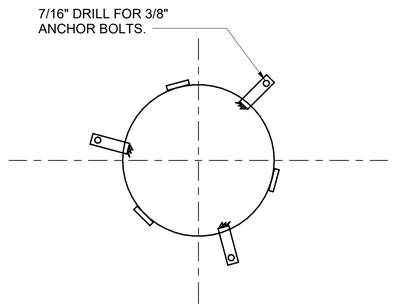
D6 CONDENSATE SOAK PIT

M-505

SCALE: NO SCALE SHOWN



ELEVATION

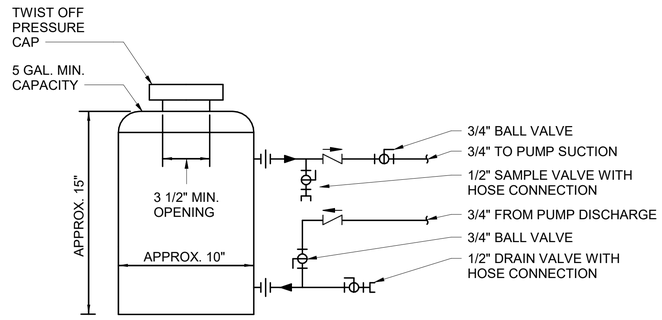


TOP VIEW

F3 SHOT FEEDER SUPPORT

M-505

SCALE: NO SCALE SHOWN



F6 SHOT FEEDER

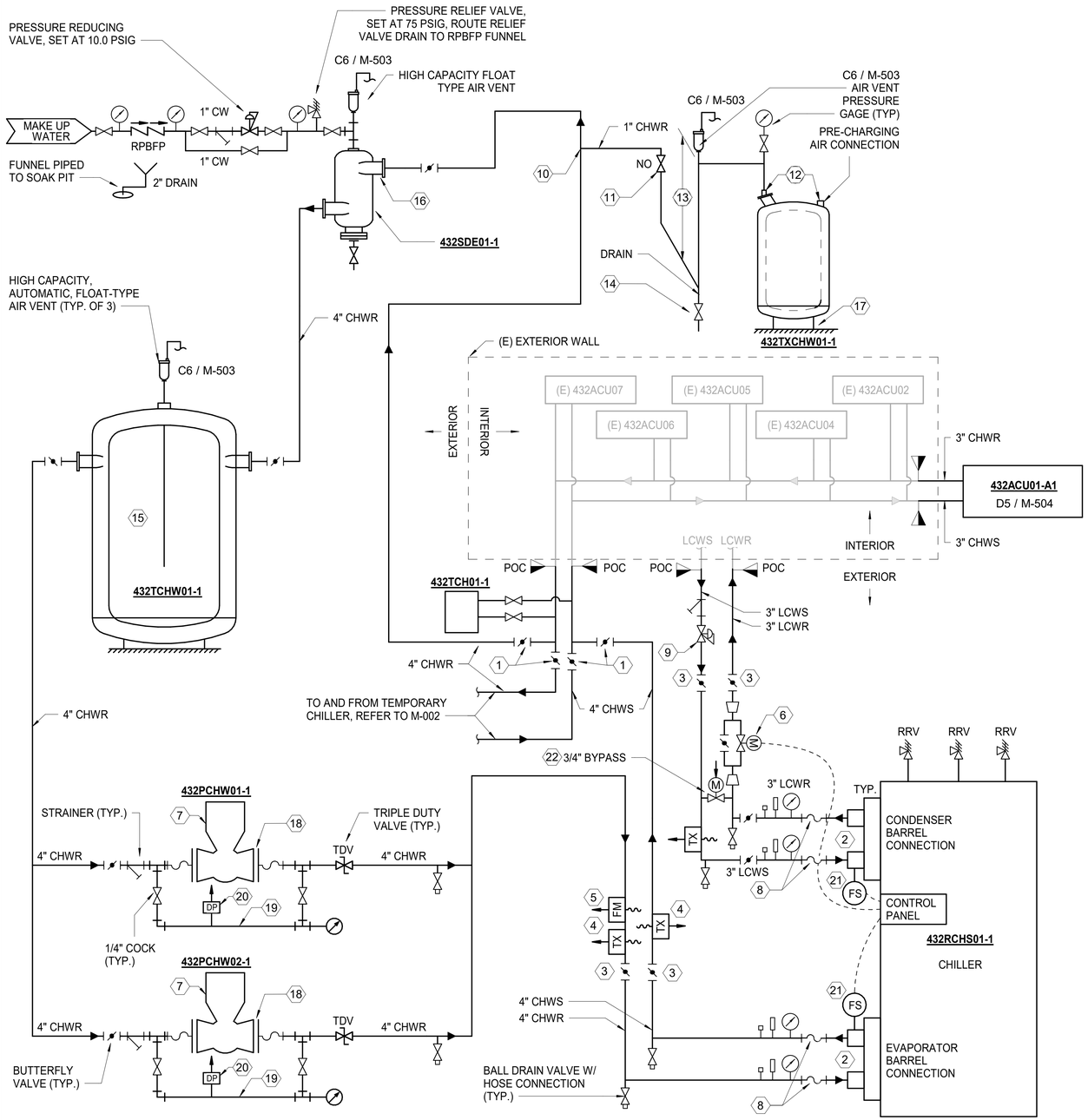
M-505

SCALE: NO SCALE SHOWN

Sheet Title
MECHANICAL DETAILS

Dwg. No.
PLM2021-0432-0027D

Sht. No.
M-505



NOTES:

1. REFER TO M-001 FOR MECHANICAL ABBREVIATIONS, SYMBOL LEGEND, AND GENERAL NOTES.
2. REFER TO M-701 FOR CONTROLS ABBREVIATIONS, SYMBOL LEGEND, AND GENERAL NOTES.
3. CLEAN AND FLUSH ALL NEW PIPING SYSTEMS IN ACCORDANCE WITH SPEC. 220111.13.
4. INSTALL AUTOMATIC AIR VENTS AT LOCATIONS INDICATED, AT ALL HIGH POINTS, AND ELSEWHERE AS NECESSARY TO ELIMINATE TRAPPED AIR. EXTEND VENT FROM AUTOMATIC AIR VENT TO NEAREST FLOOR DRAIN OR SOAK PIT.

KEYED NOTES:

1. INSTALL SELECT PIPING AND LINE-SIZE ISOLATION VALVES WITHIN FIRST SYSTEM SHUTDOWN AT BEGINNING OF CONSTRUCTION PROJECT. REFER TO M-002.
2. TYPICAL: CONNECTION TO THE CHILLER INLET AND OUTLET FOR CONDENSER AND EVAPORATOR IS 6" NPS GROOVED PIPE CONNECTION. ALL OTHER FITTINGS MUST BE WELDED, OR FLANGED AS SHOWN.
3. EVAPORATOR AND CONDENSER SPOOL PIECES MUST BE FABRICATED SO THAT WHEN REMOVED, THERE IS A CLEAR PATH FOR THE CONDENSER AND EVAPORATOR TUBE BUNDLES TO BE REMOVED FOR MAINTENANCE. SPOOL PIECES MUST MATE TO THE THREADED LUG STYLE ISOLATION VALVE FLANGE CONNECTIONS.
4. CHILLED WATER SUPPLY AND RETURN TEMPERATURE SENSORS AND ALL INTERCONNECTING WIRING AND CONDUIT MUST BE FURNISHED AND INSTALLED BY THE SUBCONTRACTOR. POINTS ARE AVAILABLE FOR VIEWING IN THE ALC DDC, BUT WILL NOT BE USED FOR CONTROL OF THE CHILLER.
5. CHILLED WATER FLOW METER, ONICON F-1200, AND ALL INTERCONNECTING WIRING AND CONDUIT MUST BE FURNISHED AND INSTALLED BY THE SUBCONTRACTOR. POINT IS AVAILABLE FOR VIEWING IN THE ALC DDC, BUT WILL NOT BE USED FOR CONTROL OF THE CHILLER.
6. HEAD PRESSURE CONTROL VALVE: ELECTRONIC REFRIGERANT PRESSURE ACTUATED LCW CONTROL VALVE PLUS ACTUATOR (FURNISHED BY CHILLER VENDOR) MUST BE INSTALLED BY SUBCONTRACTOR AND COMMISSIONED BY SUBCONTRACTOR AND CHILLER MANUFACTURER. VALVE MUST BE ELECTRONICALLY ACTUATED BY CHILLER CONTROLLER IN RESPONSE TO REFRIGERANT PRESSURE. FOLLOW VALVE MANUFACTURER'S INSTRUCTIONS FOR VALVE INSTALLATION. ISOLATION VALVES MUST BE FURNISHED AND INSTALLED ON EITHER SIDE OF THE CONTROL VALVE TO FACILITATE MAINTENANCE OR REPLACEMENT OF THE VALVE. FURNISH AND INSTALL WIRED CONNECTION, WIRING AND CONDUIT, FROM CHILLER CONTROL PANEL TO THE CONTROL VALVE.
7. INSTALL PUMP DEAD LEVEL. PUMP MUST NOT TOUCH OR REST ON ANY PART OF THE BUILDING STRUCTURE. INSTALL PUMP SO THAT IT CAN BE REMOVED WITHOUT DISMANTLING OR FORCING ADJACENT PIPE. BEFORE START-UP, LUBRICATE PUMP IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS. (DO NOT RUN PUMP DRY). PARALLEL PUMPS ARE 100% REDUNDANT. SUPPORT PUMPS PER S-514.
8. FURNISH AND INSTALL STAINLESS STEEL BRAIDED FLANGED FLEX CONNECTORS ONTO CHW AND LCW PIPING CONNECTION POINTS. FLEX CONNECTORS MUST BE INSTALLED IN A HORIZONTAL ORIENTATION.
9. FURNISH AND INSTALL PRV TO REDUCE LCW WATER PRESSURE FROM 90 PSIG TO 40 PSIG.
10. CONNECT TO SIDE OF MAIN. AVOID TOP OR BOTTOM CONNECTION TO PREVENT AIR OR DEBRIS FROM ENTERING PIPE TO TANK.
11. SHUT-OFF VALVE (LOCKED NORMALLY OPEN)
12. TANK CONNECTION LOCATIONS MAY VARY DEPENDING ON TANK SIZE AND MODEL.
13. FURNISH AND INSTALL 12" MIN. DROP FOR ANTI-THERMOSYPHON LOOP TO PREVENT HEATING OF TANK.
14. DRAIN VALVE REQUIRED TO PROPERLY PRECHARGE TANK.
15. TANK CONNECTION LOCATIONS MAY VARY DEPENDING ON TANK SIZE AND MODEL.
16. SUPPORT AIR SEPARATOR PER S-514.
17. SUPPORT EXPANSION TANK PER S-514.
18. UNION TYPE PIPE CONNECTION PIPE SO PUMP CAN BE REMOVED FOR SERVICE.
19. 1/4" TYPE L COPPER TUBING FOR GAUGE CONNECTIONS.
20. DP TRANSMITTER SHALL BE WIRED TO ALC SYSTEM FOR USE IN MONITORING THE STATUS OF CHILLED WATER PUMP. INSTALL DEVICE ON UNISTRUT STAND FOR VFD PROVIDED BY ELECTRICAL.
21. IFM EFFECTOR FLOW SWITCH FURNISHED BY CHILLER VENDOR. SUBCONTRACTORS MUST INSTALL AND WIRE DEVICE, INCLUDING PIPE SPOOL PIECE AS NECESSARY, IF DEVICE IS SHIPPED LOOSE BY CHILLER VENDOR FOR FIELD INSTALLATION.
22. NORMALLY-CLOSED 2-WAY ELECTRONIC LCW BYPASS CONTROL VALVE FOR LCW FREEZE PROTECTION.

F1 CHILLER YARD DETAILS AND CHILLER CONTROLS APPURTENANCES

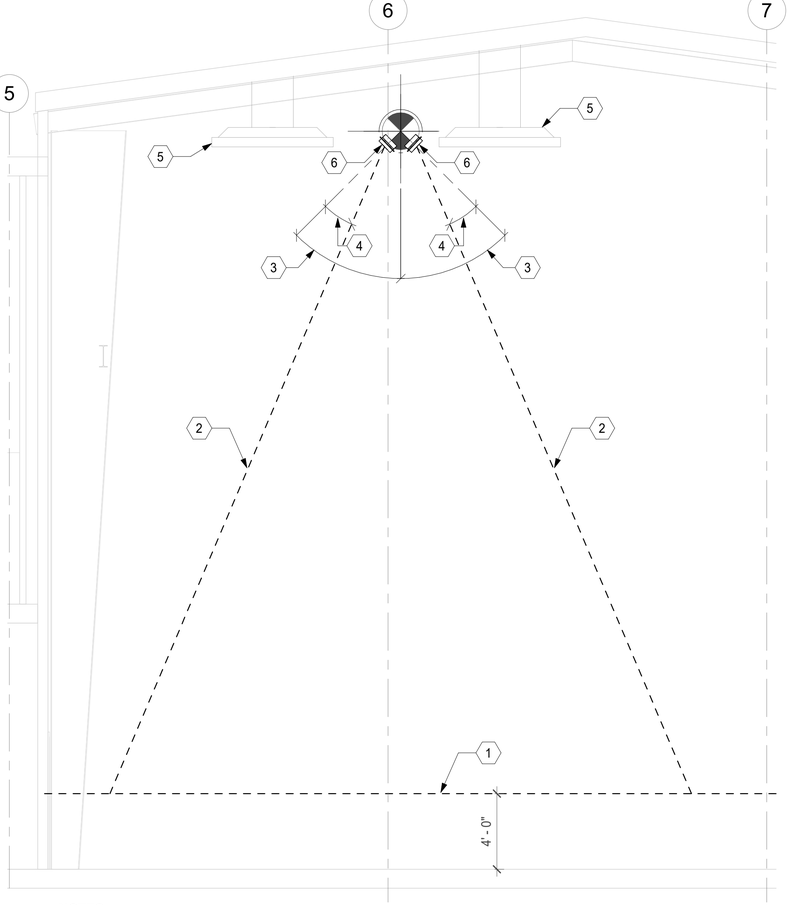
M-506

SCALE: NO SCALE SHOWN

Sheet Title
MECHANICAL DETAILS

Dwg. No.
PLM2021-0432-0028D

Sht. No.
M-506



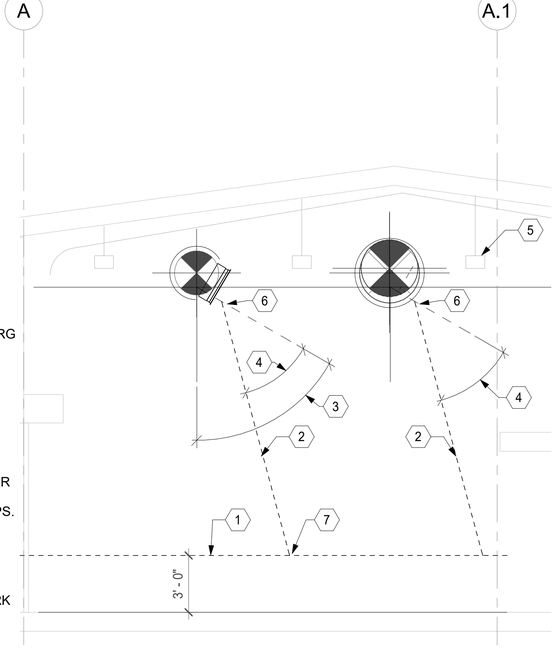
NOTES:

1. WORK PLANE (48" AFF)
2. CENTER OF AIRFLOW PATH
3. INSTALLATION ANGLE FROM PLUMB. REFER TO DRG SCHEDULE.
4. DIFFUSER DEFLECTION ANGLE. REFER TO DRG SCHEDULE.
5. EXISTING LIGHTING TO REMAIN.
6. MOUNT DIFFUSER ON DUCTWORK AT ANGLE SCHEDULED. CONSTRUCT DUCT TAP TO ACCOMMODATE DUCT-MOUNTED VOLUME DAMPER AND TO ACCOMMODATE INSTALLATION OF BASIS OF DESIGN DIFFUSER. SUPPORT DIFFUSER TAKEOFFS WITH DEDICATED STRAP HANGER SUPPORTS AS NECESSARY TO PREVENT SAG.

E1 TYPICAL DIFFUSER INSTALLATION - HIGH BAY

M-507 SCALE: 1/4" = 1'-0"

0 2' 4' 8'
1/4" = 1'-0"



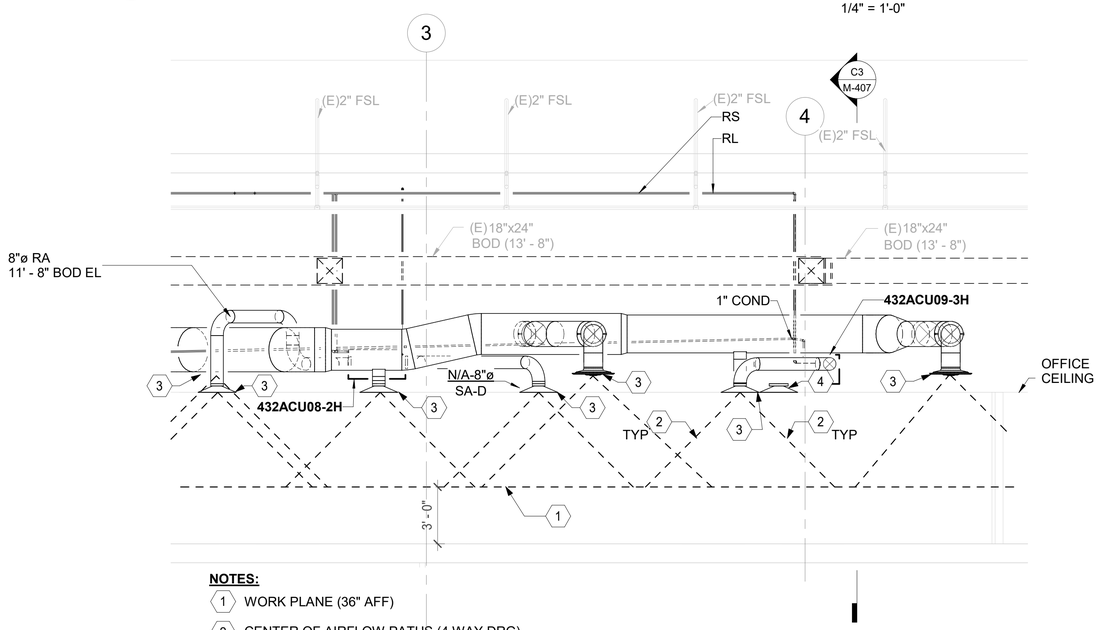
NOTES:

1. WORK PLANE (36" AFF)
2. CENTER OF AIRFLOW PATH
3. INSTALLATION ANGLE FROM PLUMB. REFER TO DRG SCHEDULE.
4. DIFFUSER DEFLECTION ANGLE. REFER TO DRG SCHEDULE.
5. EXISTING LIGHTING TO REMAIN.
6. MOUNT DIFFUSER ON DUCTWORK AT ANGLE SCHEDULED. CONSTRUCT DUCT TAP TO ACCOMMODATE DUCT-MOUNTED VOLUME DAMPER AND TO ACCOMMODATE INSTALLATION OF BASIS OF DESIGN DIFFUSER. USE LOW-LOSS 45DEG.TAPS. SUPPORT DIFFUSER TAKEOFFS WITH DEDICATED STRAP HANGER SUPPORTS AS NECESSARY TO PREVENT SAG.
7. BASIS OF DESIGN DIFFUSERS ARE SELECTED TO PRODUCE MAXIMUM VELOCITY OF 50FPM AT WORK PLANE WITH BLADE DEFLECTION SCHEDULED. REFER TO DRG SCHEDULE.

C5 TYPICAL DIFFUSER INSTALLATION - OPTICS LAB

M-507 SCALE: 1/4" = 1'-0"

0 2' 4' 8'
1/4" = 1'-0"



NOTES:

1. WORK PLANE (36" AFF)
2. CENTER OF AIRFLOW PATHS (4 WAY DRG)
3. MOUNT DIFFUSER ON DUCTWORK AT ANGLE SCHEDULED. DIFFUSERS MUST BE SIZED FOR THROWS FROM DUCT TO WORK PLANE AT NO GREATER THAN 100FPM. REFER TO DRG SCHEDULE.
4. HARD LID CEILING FOR ROOMS 2005 AND 2007 EXCLUSIVELY.

F5 TYPICAL DIFFUSER INSTALLATION - OFFICE

M-507 SCALE: 1/4" = 1'-0"

0 2' 4' 8'
1/4" = 1'-0"

Sheet Title
MECHANICAL DETAILS

Dwg. No.
PLM2021-0432-0029D

Sht. No.
M-507

WATER COOLED CHILLER SCHEDULE (RCHS)

TAG NO.	NOMINAL COOLING CAPACITY (TONS)	NON-STANDARD PART-LOAD VALUE (INPLV)	EVAPORATOR							CONDENSER						COMPRESSOR				ELECTRICAL				INSTALLED WEIGHT (LBS.)	BASIS OF DESIGN		NOTES
			FLUID TYPE	DESIGN FLOW (GPM)	MIN FLOW (GPM)	EWT (DEG. F.)	LWT (DEG. F.)	MAX. WATER PRESSURE DROP (FT. H2O)	FOULING FACTOR	FLUID TYPE	DESIGN LCW FLOWRATE (GPM)	EWT (DEG. F.)	LWT (DEG. F.)	MAX.WPD (FT. H2O)	FOULING FACTOR	TYPE	QUANTITY / CIRCUITS	REF TYPE	MAX. CHARGE (LBS.)	V	PH	MCA	MOCP		MFR	MODEL	
432RCHS01-1	90	0.5816	WATER	220	92	53	43	19.1	0.0001	LCW	291	85	95	24.5	0.005000	SCREW	2	R-134A	194	460	3	108	150	5800	TRANE	RTWD090	ALL

NOTES:
1. OPERATING FLUID IS WATER.
2. PROVIDE WITH INTEGRAL CONTROLS PACKAGE AND CONTROL PANEL WITH BACnet/MSTP INTERFACE TO ALC DDC SYSTEM.
3. PROVIDE WITH LOCKABLE DISCONNECT AND SINGLE POINT POWER CONNECTION BY DIV 26, 65K SCC.
4. PROVIDE WITH INTEGRAL EVAPORATOR AND CONDENSER FLOW SWITCHES, FACTORY-INSTALLED.
5. PROVIDE WITH (1) 2-WAY BUTTERFLY-TYPE (LUG-STYLE) LCW CONTROL VALVES PLUS VALVE ACTUATORS FOR FIELD-INSTALLATION.
6 OIL PUMP STARTER SHALL BE BY MANUFACTURER AND DISCONNECT SHALL BE BY DIVISION 26.
7. PROVIDE NRTL 'LISTED' EQUIPMENT INCLUDING 'LISTED' ELECTRICAL PANEL.

VERTICAL SPLIT-CASE HVAC PUMP SCHEDULE

TAG NO.	TYPE	LOCATION	SERVICE	MAXIMUM FLUID TEMP. (°F)	MINIMUM FLUID TEMP. (°F)	CAPACITY (GPM)	SPEED CONTROL TYPE	HEAD (FT. W.C.)	SUCTION SIZE (IN.)	DISCHARGE SIZE (IN.)	IMPELLER SIZE (IN.)	PUMP EFFICIENCY (%)	MOTOR				STARTER / DISCONNECT PROVIDED BY	ELECTRICAL		APPROX WEIGHT (LBS)	BASIS OF DESIGN		NOTES
													RPM	HP	BHP	TYPE		VOLTS	PHASE		MFR	MODEL	
432PCHW01-1	SPLIT CASE VERTICAL INLINE CENTRIFUGAL	CHILLER YARD	CHILLED WATER	105	43	220	VFD	130	2.5	2.5	6.25	73.6	3600	15	9.64	TEFC	DIV 26	460	3	425	BELL & GOSSETT	2.5x2.5x7	ALL
432PCHW02-1	SPLIT CASE VERTICAL INLINE CENTRIFUGAL	CHILLER YARD	CHILLED WATER	105	43	220	VFD	130	2.5	2.5	6.25	73.6	3600	15	9.64	TEFC	DIV 26	460	3	425	BELL & GOSSETT	2.5x2.5x7	ALL

NOTES:
1. PUMPS ARE EACH SIZED FOR 100% DESIGN CHILLED WATER FLOWRATE.
2. OPERATING FLUID IS WATER.
3. DISCONNECT AND VFD SHALL BE FURNISHED AND INSTALLED BY DIVISION 26. DIV. 23 TO TEST AND ADJUST VFD AND PUMP TO MEET PROJECT DESIGN CONDITIONS.
4. MOUNT IN LINE WITH PIPING. REFER TO STRUCTURAL S-514 FOR SUPPORTS AND ANCHORAGE.
5. NPSHR SHALL BE A MAXIMUM OF 10 FT. WC.
6. PUMP SHALL BE INSTALLED TO MFR'S RECOMMENDATIONS AND ORIENTATION.
7. INSULATE PUMP PER SPEC. SECTION 20 07 00.

TANK SCHEDULE

TAG NO.	TYPE	ORIENTATION	LOCATION	SYSTEM	MIN. TANK VOLUME (GAL)	MIN. TANK ACCEPTANCE VOLUME (GAL)	RELIEF VALVE SETPOINT (PSI)	DESIGN TEMP. (°F)	MIN. TEMP (°F)	COLD FILL PRESSURE (PSI)	MAX. WORKING PRESS. (PSI)	COLD WATER FILL SIZE (IN)	BASIS OF DESIGN		APPROX OPERATING WEIGHT (LBS)	NOTES
													MFR	MODEL		
432TCHWX01-1	BLADDER EXPANSION TANK	VERITCAL	CHILLER YARD	CHILLED WATER	16.63	8.7	79	105	45	18	75	1	BELL & GOSSETT	B-85LA	95	1,2,3,4
432TCHW01-1	BUFFER TANK	VERITCAL	CHILLER YARD	CHILLED WATER	1050	1050	N/A	105	45	18	150	1	TACO	BTH	2260	1,2,3,5,6

NOTES:
1. TANK SHALL BE PROVIDED WITH FLANGED CONNECTIONS.
2. REFER TO STRUCTURAL S-514 FOR SUPPORTS AND ANCHORAGE.
3. TANK SHALL BE ASME-RATED.
4. PRE-CHARGE TANK TO 14 PSIG.
5. INSULATE TANK PER SPEC. SECTION 20 07 00.
6. PROVIDE WITH HIGH FLANGE CONNECTIONS.

AIR SEPARATOR SCHEDULE

TAG NO.	LOCATION	SYSTEM	DESIGN FLOWRATE (GPM)	MAX ALLOWABLE PRESSURE DROP (FT W.G.)	CONNECTION TYPE	CONNECTION SIZE (IN)	MAX PRESSURE (PSIG)	BASIS OF DESIGN		WEIGHT (LBS)	NOTES
								MFR	MODEL		
432SDE01-1	CHILLER YARD	CHW	220	0.82	FLANGE	4	125	BELL & GOSSETT	SRS 4FB	250	ALL

NOTES:
1. OPERATING FLUID IS WATER.
2. AIR SEPARATOR SHALL BE THE TANGENTIAL TYPE WITHOUT STRAINER.
3. PROVIDE WITH MANUAL BLOWDOWN VALVE TO FACILIATE ROUTINE CLEANING.
4. INSULATE AIR SEPARATOR PER SPEC. SECTION 20 07 00.

Sheet Title
MECHANICAL SCHEDULES - WATERSIDE

Dwg. No.
PLM2021-0432-0030D

Sht. No.
M-601

AIR CONDITIONING UNIT SCHEDULE (1/2)

TAG	SUPPLY FAN			COOLING COIL													HEATING COIL									FILTER		
	DESIGN AIRFLOW - COOLING MODE (CFM)	DESIGN AIRFLOW - HEATING MODE (CFM)	DESIGN MIN. OUTDOOR AIRLFOW (CFM)	EAT DB (°F)	EAT WB (°F)	LAT DB (°F)	LAT WB (°F)	MAX. GPM	EWT (°F)	LWT (°F)	NET TOTAL CAPACITY (MBH)	SENSIBLE CAPACITY (MBH)	APD (IN. W.G.)	WPD (FT. W.G.)	ROWS	FPI	EER	HEATING CAPCITY (MBH)	EAT (°F)	MAX LAT (°F)	EWT (°F)	LWT (°F)	FLOW (GPM)	MAX. WPD (FT. WC)	ROWS	FPI	MERV		APD (IN. W.G.)
																										PRE	FINAL	
432ACU01-A1	16,400	16,400	980	80	67	55	54.42	127.0	45	55	637.45	451.95	0.535	16.33	4	11	N/A	241.5	64.8	78.7	140	117	21	10	1	7	8	15	2
432ACHPS01-4	6,500	4,400	1,260	80	67	57.2	55.1	N/A	N/A	N/A	218.4	157.9	0.44	N/A	6	14	8.4	118.5	56.2	95	N/A	N/A	N/A	N/A	6	14	8	15	0.65
432ACHPS02-5	5,000	3,600	450	80	67	58.2	56.4	N/A	N/A	N/A	187.1	127.2	0.3	N/A	6	14	8.4	112	63.5	95	N/A	N/A	N/A	N/A	6	14	8	15	0.65

AIR CONDITIONING UNIT SCHEDULE (2/2)

TAG	SUPPLY FAN				RELIEF FAN					CONDENSER COIL		ELECTRICAL								APPROX. UNIT WEIGHT (LBS)	BASIS OF DESIGN		NOTES
	TOTAL STATIC (IN W.G.)	EXTERNAL STATIC (IN W.C.)	MHP / QTY	TOTAL BHP	MAX. AIRFLOW (CFM)	MHP / QTY	TOTAL BHP	TOTAL STATIC (IN. W.C.)	EXTERNAL STATIC (IN. W.C.)	ROWS	FPI	CIRCUIT 1				CIRCUIT 2					MFR	MODEL	
												V	PH	MCA	MOCP	V	PH	MCA	MOCP				
432ACU01-A1	4.76	3.25	10 / 4	19.29	16400	3 / 4	8.01	1.80	0.5	N/A	N/A	460	3	20.4	25	460	3	59.5	70	9892	TRANE	CLIMATE CHANGER	2, 3, 4, 6, 8, 9,10,11
432ACHPS01-4	4.58	3.25	7.5 / 1	5.7	6000	3 / 1	2.6	0.75	0.5	3	12	460	3	54.4	60	N/A	N/A	N/A	N/A	3331	TRANE	HORIZON	1, 3, 4, 5, 7, 8, 9,10,11
432ACHPS02-5	4.10	3.25	7.5 / 1	5.7	5500	5 / 1	2.75	0.75	0.5	3	12	460	3	52.4	60	N/A	N/A	N/A	N/A	3384	TRANE	HORIZON	1, 3, 4, 5, 7, 8, 9,10,11

NOTES:
1. PROVIDE WITH MANUFACTURER'S DISCONNECT, VFD'S WITH BACnet/MSTP CONNECTION, AND SINGLE POINT POWER CONNECTION.
2. PROVIDE WITH MANUFACTURER'S DISCONNECT, VFD'S WITH BACnet/MSTP CONNECTION, AND DUAL POINT POWER CONNECTION. POWER EXHAUST ECONOMIZER REQUIRES SEPARATE CIRCUIT.
3. PROVIDE AHU WITH MANUFACTURER'S INTEGRAL 0-100% MODULATING POWER EXHAUST ECONOMIZER.
4. EXTERNAL STATIC PRESSURE DROP VALUES IN SCHEDULE INCLUDES 2 IN. W.G. ALLOWANCE PER UNIT FOR DIRTY FILTERS.
5. R-410A IS THE REFRIGERANT.
6. WATER IS THE COOLING AND HEATING MODE OPERATING FLUID.
7. PROVIDE WITH INTEGRAL CONTROLS PACKAGE AND UNIT CONTROLLER WITH TRANE BCI, INTEGRATE WITH ALC BUILDING AUTOMATION SYSTEM VIA BACnet/MSTP CONNECTION.
8. PROVIDE UNIT WITH 2" PLEATED MERV 8 PRE-FILTER. PROVIDE UNIT WITH 12 IN. DEEP SIDE LOAD BAG TYPE MERV 15 FILTER CARTRIDGE.
9. PROVIDE UNIT WITH MFR'S BASERAIL (MINIMUM 6 INCHES).
10. SMOKE DETECTOR(S) FURNISHED . EXCLUDE FACTORY-INSTALLED SMOKE DETECTOR(S).
11. PROVIDE WITH AIRFLOW MEASUREMENT FAN INLET RING FOR EACH SUPPLY AND EACH RELIEF FAN. PROVIDE WITH OUTSIDE AIRFLOW MEASUREMENT DEVICE.

COIL SCHEDULE

TAG NO.	TYPE	MAX DESIGN AIRFLOW (CFM)	EAT (°F)	LAT (°F)	AIR PRESSURE DROP (IN W.G.)	ELECTRICAL				NOTES
						POWER (kW)	V	PH	A	
432HEA01-A1	ELECTRIC RESISTIVE HEATING	4230	56	70	0.05	20	460	3	25.1	1,2
432HEA02-4	ELECTRIC RESISTIVE HEATING	1260	40	65	0.05	10	460	3	12.5	1,2
432HEA03-5	ELECTRIC RESISTIVE HEATING	1260	40	65	0.05	10	460	3	12.5	1,2,3

NOTES:
1. PROVIDE UNIT WITH ELECTRICAL DISCONNECT BY DIVISION 26.
2. PROVIDE UNIT WITH SILICON CONTROLLED RECTIFIER (SCR) CONTROLS HARD-WIRED TO ALC.
3. PROVIDE UNIT WITH NEMA 3R ENCLOSURE FOR OUTDOOR INSTALLATION.

DIFFUSER, REGISTER, & GRILLE SCHEDULE (DRG)

TAG	DESCRIPTION	TYPE	FACE SIZE (IN.)	MOUNTING - FROM PLUMB (°)	DAMPER	BLADE DEFLECTION (°)	BASIS OF DESIGN		NOTES
							MFR	MODEL	
A	SPIRAL DUCT GRILLE	SA	22x12	DUCT - 22	PARALLEL	0	PRICE	SDG	1, 3, 4
B	RETURN GRILLE	RA	36x30	WALL	NO	N/A	TITUS	350	1, 3
C	SQUARE CONE CEILING DIFFUSER	SA	24x24	DUCT	PARALLEL	N/A	PRICE	SCD	1, 2, 3
D	ALUMINUM SQUARE PLAQUE CEILING DIFFUSER	SA	24x24	SURFACE	PARALLEL	N/A	PRICE	ASPD	1, 2
E	ALUMINUM SQUARE PLAQUE CEILING DIFFUSER	RA	24x24	SURFACE	NO	N/A	PRICE	ASPD	1, 2
F	RETURN GRILLE	RA	38x38	WALL	NO	N/A	TITUS	350	1, 3
G	LOUVERED FACE SUPPLY GRILLE	SA	96x24	DUCT - 30	PARALLEL	15	PRICE	520	1, 3
H	LOUVERED FACE SUPPLY GRILLE	SA	96x24	DUCT - 0	PARALLEL	0	PRICE	520	1, 3
J	RETURN GRILLE	RA	46x46	WALL	NO	N/A	TITUS	350	1, 3
K	ROUND CONE CEILING DIFFUSER	SA	N/A	DUCT	PARALLEL	N/A	PRICE	RCD	1, 3

NOTES:
1. WHERE NOT NOTED, BRANCH DUCT SIZE SHALL BE THE SAME AS THE DIFFUSER NECK SIZE.
2. PROVIDE WITH 24" X 24" LAY-IN SURFACE MOUNT MODULE.
3. PROVIDE ALUMINUM OR STEEL AIR TERMINAL WITH PAINTABLE MILL FINISH.
4. PROVIDE WITH MFR'S AIR BAFFLE.

CONDENSING UNIT SCHEDULE (RCUA)

TAG NO.	INTERLOCK WITH	COOLING CAPACITY (BTU/H)	HEATING CAPACITY (BTU/H)	STAGE	COMPRESSOR TYPE	MIN. EFFICIENCY (EER)	RATED OUTDOOR DB (°F)	REFRIGERANT TYPE	UNIT ELECTRICAL			WEIGHT (LBS)	SIZE (H X W X D) (IN)	BASIS OF DESIGN		NOTES
									VOLT	PH.	MCA			MFR	MODEL	
432RCUA01-2H	432ACU08-2H	24000	24000	SINGLE	SCROLL	12.5	95	R-410A	208	1	19	150	38x38x14	TRANE/MITSUBISHI	TPEAD/TRUZ	ALL
432RCUA02-3H	432ACU09-3H	12000	12000	SINGLE	SCROLL	12.5	95	R-410A	208	1	11	140	32x12x24	TRANE/MITSUBISHI	TPEAD/TRUZ	ALL

NOTES:
1. PROVIDE UNIT WITH MFR'S LOCKABLE DISCONNECT AND SINGLE POINT POWER CONNECTION IN ACCORDANCE WITH DIVISION 26 SPECIFICATIONS.
2. PROVIDE CONDENSING UNIT WITH CONCRETE HOUSEKEEPING PAD. REFER TO STRUCTURAL S-402 FOR ANCHORAGE.
3. PROVIDE ALUMINUM JACKETING FOR EXTERIOR REFRIGERANT LINES.
4. HEAT PUMP UNIT SHALL BE CAPABLE OF OPERATION TO 30°F.
5. PROVIDE UNIT WITH ELECTRIC RESISTIVE DEFROST CYCLE CAPABILITY.

AIR CONDITIONING UNIT SCHEDULE (ACU)

TAG NO.	INTERLOCK WITH	SUPPLY FAN					POWER PROVIDED BY	COOLING COIL				NOTES
		FAN TYPE	TOTAL AIRFLOW (CFM)	MOTOR				COOLING COIL TYPE	TOTAL CAPACITY (MBH)	LAT DB (°F)	LAT WB (°F)	
				MCA	VOLTS	PHASE						
432ACU08-2H	432RCUA01-2H	BLOWER	1770	1	208	1	432RCUA01-2H	DIRECT EXPANSION	24	57	57	ALL
432ACU09-3H	432RCUA02-3H	BLOWER	400	1	208	1	432RCUA02-3H	DIRECT EXPANSION	12	57	57	ALL

NOTES:
1. UNIT POWER PROVIDED BY CONDENSING UNIT ON GRADE AT EXTERIOR OF BUILDING. REFER TO RCUA SCHEDULE.
2. PROVIDE UNIT WITH DUCTED SUPPLY AND DUCTED RETURN FOR UNIT.
3. PROVIDE UNIT WITH MFR'S CONDENSATE LIFT PUMP WITH INTERGRAL RESERVOIR TANK AND CHECK VALVE. PROVIDE POWER FOR UNIT BY INTERLOCKED CONDENSING UNIT.
4. PROVIDE FIELD-INSTALLED CONDENSATE DRAIN PAN AND CONDENSATE OVERFLOW SWITCH.
5. PROVIDE UNIT WITH MFR'S DISCONNECT.
6. PROVIDE UNIT WITH MFR'S HARDWIRED TOUCHSCREEN THERMOSTAT INTERFACE WITH BACnet/MSTP COMMUNICATION CAPABILITIES.

Sheet Title
MECHANICAL SCHEDULES - AIRSIDE

Dwg. No.
PLM2021-0432-0031D

Sht. No.
M-602

ABBREVIATIONS & ACRONYMS

2P	TWO-POSITION (CONTROL SIGNAL)
ADJ	ADJUSTABLE/ADJUSTMENT
AI	ANALOG INPUT
ALM	ALARM
AO	ANALOG OUTPUT
BI	BINARY INPUT
BLDG	BUILDING
BO	BINARY OUTPUT
BYP	BYPASS
C	COMMAND (MODULATING CONTROL SIGNAL)
CLD	CLOSED
CLG	COOLING
COM	COMMON
COV	CHANGE OF VALUE
CSR	CURRENT SENSING RELAY
CT	CURRENT TRANSFORMER/SWITCH
D	DAMPER
DB	DEADBAND
DDC	DIRECT DIGITAL CONTROL(LER)
DIFF	DIFFERENCE
DIR	DIRECT (CONTROL ACTION)
DIS	DISABLE
DISP	DISPLAY
EA	EXHAUST AIR
ECM	ELECTRICALLY COMMUTATED MOTOR
EF	EXHAUST FAN
ENA	ENABLE
F	FLOW
FACP	FIRE ALARM CONTROL PANEL
FL	FAIL IN LAST POSITION
FLT	FILTER
HL	HIGH LIMIT
HTG	HEATING
I/O	INPUT/OUTPUT
LDP	LOCAL DISPLAY PANEL
LL	LOW LIMIT
LVG	LEAVING
M	MOTOR or MAIN
M&C	MONITORING & CONTROL (SOFTWARE)
MS	MOTOR STARTER
N/A	NOT APPLICABLE
NC	NORMALLY CLOSED
NCI	NETWORK CONFIGURATION INPUT
NO	NORMALLY OPEN
NVI	NETWORK VARIABLE INPUT
NVO	NETWORK VARIABLE OUTPUT
OCC	OCCUPIED
ODT	ON DELAY TIMER
OL	OVERLOAD
OPN	OPEN
OVRD	OVERRIDE
P	PRESSURE
PID	PROPORTIONAL INTEGRAL DERIVATIVE (CONTROL)
PWR	POWER
R	RELAY
REV	REVERSE (CONTROL ACTION)
RM	ROOM
RQST	REQUEST
RST	RESET
RT	RATE
S	STATUS
SNVT	STANDARD NETWORK VARIABLE TYPE
SO	SHUT-OFF
SP	SETPOINT
SS	START/STOP COMMAND
STAT	THERMOSTAT
SYS	SYSTEM
SCHD	SCHEDULER
T	TEMPERATURE
TRB	TROUBLE
TSTAT	THERMOSTAT
UNOCC	UNOCCUPIED
VFD	VARIABLE FREQUENCY DRIVE
XFMR	TRANSFORMER
ZN	ZONE

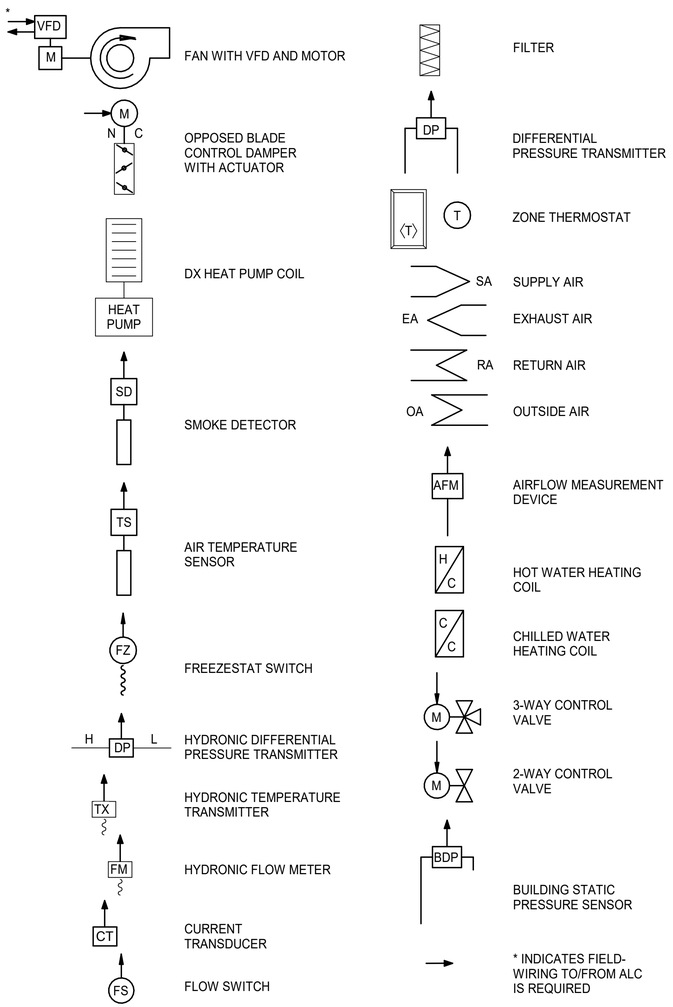
"HVAC CONTROLS" GENERAL NOTES:

1. THE CONTROL DIAGRAMS AND SCHEMATICS ILLUSTRATE THE FUNCTIONAL REQUIREMENTS AND CONTROL RELATIONSHIPS, ALL ACCESSORIES AND DEVICES MAY NOT BE SHOWN IN DETAIL
2. THE SPECIFICATIONS SHOULD BE CONSULTED FOR DETAILED REQUIREMENTS.
3. BUILDING CONTROL SYSTEM MUST BE COMPLETELY OPERATIONAL BEFORE BUILDING COMMISSIONING CAN TAKE PLACE

NOTES:

1. FOR GENERAL NOTES, SYMBOLS, AND ABBREVIATIONS REFER TO DRAWING M-001.
2. REFER TO ELECTRICAL FOR NEW LINE-VOLTAGE POWER EQUIPMENT, WIRING, AND CONDUIT.
3. LOW-VOLTAGE POWER WIRING AND CONDUIT FROM NEW 120V/24V POWER SUPPLIES, CONTROL WIRING AND CONDUIT FROM CONTROLLERS TO END CONTROL DEVICES, AND COMMUNICATION WIRING AND CONDUIT BETWEEN NETWORKED ALC EQUIPMENT MUST BE FURNISHED AND INSTALLED BY CONTROLS SUBCONTRACTOR FOR A COMPLETE AND OPERATING SYSTEM. REFER TO SPEC. SECTION 26 05 33.13 FOR LOW-VOLTAGE POWER, CONTROL, AND COMMUNICATION CONDUIT SPECIFICATIONS. REFER TO SPEC. SECTION 23 09 00 FOR LOW-VOLTAGE POWER, CONTROL, AND COMMUNICATION CONDUCTOR SPECIFICATIONS.
4. IT IS THE RESPONSIBILITY OF THE MECHANICAL SUBCONTRACTOR TO COORDINATE THE LOCATION OF ALL CONTROLS EQUIPMENT AND CONTROL DEVICES WITH THE CONTROLS SUBCONTRACTOR AND THE ELECTRICAL SUBCONTRACTOR AND NOTIFY THE CONTROLS SUBCONTRACTOR AND ELECTRICAL SUBCONTRACTOR OF CONDUIT ROUTING PREFERENCES AND POWER SUPPLY LOCATION PREFERENCES.
5. CONTROLS SUBCONTRACTOR MUST FURNISH AND INSTALL WIRE AND CONDUIT FOR ALL SMOKE DETECTORS: FROM DEVICE TO FIRE ALARM CONTROL SYSTEM ADDRESSABLE LOOP, FROM DEVICE TO ALC, AND FROM FIRE ALARM CONTROL LOOP TO FAN MOTOR.
6. CONTROLS SUBCONTRACTOR MUST FURNISH AND INSTALL WIRE AND CONDUIT REQUIRED TO CONNECT INDIVIDUAL MODULES OF FIELD-ASSEMBLED EQUIPMENT.
7. ALL CONTROL DEVICES EXPOSED TO WEATHER MUST BE INSTALLED IN WEATHERPROOF ENCLOSURES.

HVAC CONTROL SYMBOL LEGEND



CONTROLS CONDUIT SCHEDULE

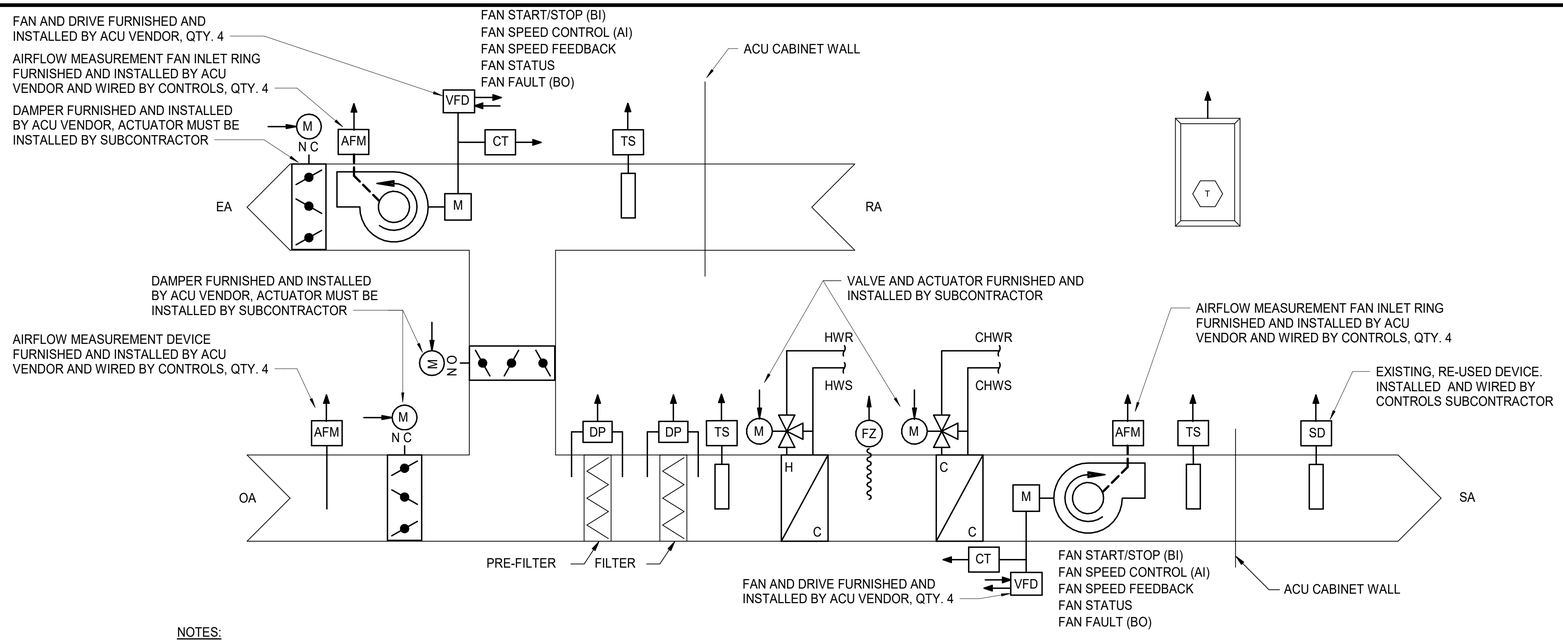
CONDUCTOR TYPE	EXPOSED - NOT SUBJECT TO DAMAGE	EXPOSED - SUBJECT TO DAMAGE	CONCEALED	
	MECH/ELEC/FIRE RISER ROOMS	ROOF & ELSEWHERE 0-36" AFF	CEILING PLENUM	WALL PLENUM
LOW-VOLTAGE POWER/CONTROL WIRE	EMT OR RMC	RMC	NO CONDUIT REQUIRED	EMT OR RMC
ETHERNET WIRE/CABLE	EMT OR RMC	RMC	EMT	EMT OR RMC
OTHER COMMUNICATION WIRE/CABLE	EMT OR RMC	RMC	INNERDUCT OR EMT	EMT OR RMC
LINE-VOLTAGE POWER WIRING	PROVIDED BY DIV. 26; REFER TO ELECTRICAL	PROVIDED BY DIV. 26; REFER TO ELECTRICAL	PROVIDED BY DIV. 26; REFER TO ELECTRICAL	PROVIDED BY DIV. 26; REFER TO ELECTRICAL

NOTES:
1) ALL CONDUCTORS INSTALLED IN A WALL CAVITY OR CEILING PLENUM SHALL BE PLENUM-RATED.
2) ALL CONDUCTORS INSTALLED IN CEILING PLENUM SHALL BE TIED OFF TO NEW OR EXISTING SUPPORTS; NOT LAID ON CEILING TILES.
3) ALL CONDUIT SHOWN HERE SHALL BE FURNISHED AND INSTALLED BY CONTROLS SUBCONTRACTOR UNLESS OTHERWISE SPECIFIED EITHER IN THIS TABLE OR ON A PLAN.
4) REFER TO SPEC. SECTION 26 05 33.13 FOR LOW-VOLTAGE POWER, CONTROL, AND COMMUNICATION CONDUIT SPECIFICATIONS. REFER TO SPEC. SECTION 23 09 00 FOR LOW-VOLTAGE POWER, CONTROL, AND COMMUNICATION CONDUCTOR SPECIFICATIONS.
5) SUBCONTRACTOR SHALL SUBMIT REQUEST FOR APPROVAL TO INSTALL EXPOSED CONDUIT IN FINISHED AREAS. CONDUIT REQUIRED FOR EXPOSED, FINISHED AREAS IS RIGID METAL CONDUIT UNLESS APPROVAL IS PROVIDED BY ENGINEER TO USE EMT. SUBCONTRACTOR SHALL PAINT EXPOSED CONDUIT IN FINISHED AREAS TO MATCH COLOR OF ADJACENT SURFACE.
6) MAINTAIN 6 INCHES (MIN.) CLEARANCE BETWEEN CONDUIT AND OTHER MECH. PIPING AND TUBING. MAINTAIN 1 INCH (MIN.) CLEARANCE BETWEEN CONDUIT AND DUCTWORK. OFFSETS APPLY TO SURFACE OF INSULATION ON INSULATED PIPING.
7) NEW HORIZONTAL CONDUIT RUNS SHALL BE ROUTED OVERHEAD AND AS CLOSE TO STRUCTURE AS POSSIBLE. DO NOT FLOOR-MOUNT NEW CONDUIT.
8) OUTER CASING OF ALL NEW CONDUIT PENETRATING FLOOR OR CEILING SHALL BE SEALED.
9) FLEX CONDUIT IS ALLOWED AT ALL DEVICE TERMINATIONS.

Sheet Title
MECHANICAL CONTROLS LEGEND AND GENERAL NOTES

Dwg. No.
PLM2021-0432-0032D

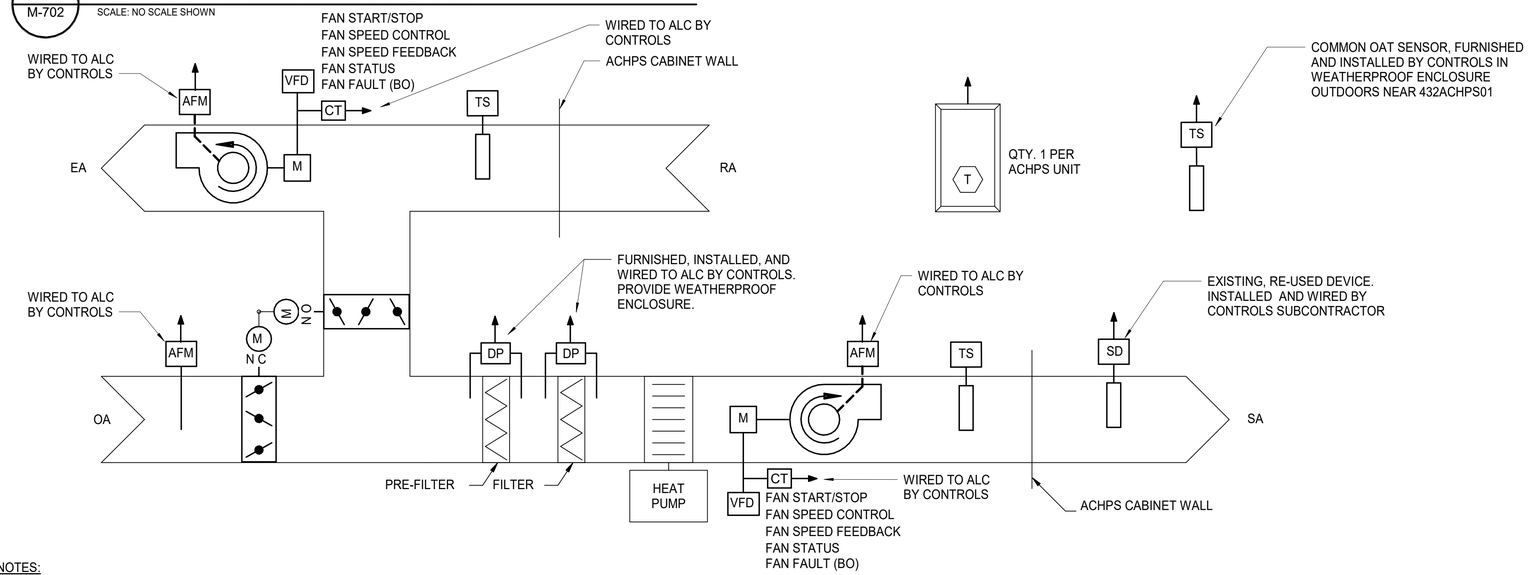
Sht. No.
M-701



NOTES:
1. UNIT MUST BE FURNISHED AND INSTALLED WITHOUT DDC CONTROLS PACKAGE. ALL CONTROLS EQUIPMENT SHOWN IN THIS DIAGRAM MUST BE FURNISHED, INSTALLED, AND WIRED BY CONTROLS SUBCONTRACTOR UNLESS OTHERWISE NOTED.
2. WHERE LOW-VOLTAGE POWER IS REQUIRED FOR FIELD-INSTALLED DEVICES, FURNISH AND INSTALL NEW WIRING AND CONDUIT FROM NEAREST DIV. 26 LOW-VOLTAGE CONTROL POWER TRANSFORMER TO NEW HVAC EQUIPMENT.
3. INSTALL ALL CONTROL DEVICES EXPOSED TO WEATHER IN WEATHERPROOF ENCLOSURE. PROVIDE MINIMUM NEMA 3R ACTUATORS.
4. REFER TO CONTROL POINTS ON M-705 FOR ADDITIONAL REQUIREMENTS.
5. PROVIDE ALL VFD'S WITH BACnet/MSTP COMMUNICATION CAPABILITIES.

C1 M-702 — 432ACU01-A1 CONTROL DIAGRAM

SCALE: NO SCALE SHOWN



NOTES:
1. UNIT MUST BE FURNISHED AND INSTALLED WITH DDC CONTROLS PACKAGE. ALL CONTROLS EQUIPMENT SHOWN BETWEEN CABINET WALLS IS FURNISHED AND INSTALLED BY ACHPS VENDOR UNLESS OTHERWISE SPECIFIED. ALL EXTERNAL CONTROL DEVICES ARE FURNISHED, INSTALLED, AND WIRED BY CONTROLS SUBCONTRACTOR. INTEGRAL ACHPS CONTROLLER MUST INTERFACE WITH ALC DDC CONTROL SYSTEM VIA BACNET/MSTP COMMUNCATION.
2. WHERE LOW-VOLTAGE POWER IS REQUIRED FOR FIELD-INSTALLED DEVICES, FURNISH AND INSTALL NEW WIRING AND CONDUIT FROM NEAREST DIV. 26 LOW-VOLTAGE CONTROL POWER TRANSFORMER TO NEW HVAC EQUIPMENT.
3. REFER TO CONTROL POINTS ON M-705 FOR ADDITIONAL REQUIREMENTS.
4. PROVIDE ALL VFD'S WITH BACnet/MSTP COMMUNICATION CAPABILITIES.

F1 M-702 — 432ACHPS01-4 & 432ACHPS02-5 CONTROL DIAGRAM

SCALE: NO SCALE SHOWN

GENERAL NOTES

1. REFER TO M-701 FOR CONTROLS ABBREVIATIONS, SYMBOL LEGEND, AND GENERAL NOTES.

Sheet Title
MECHANICAL AIR HANDLING UNIT CONTROL DIAGRAMS

Dwg. No.
PLM2021-0432-0033D

Sht. No.
M-702

SEQUENCES OF OPERATION

432ACU01-A1

UNIT MUST BE FURNISHED WITHOUT DDC CONTROLS PACKAGE AND HAVE ALL FUNCTIONS AND COMMANDS CONTROLLED BY LOCAL FIELD-INSTALLED ALC CONTROLLER AS DESCRIBED BELOW.

RUN CONDITIONS - SCHEDULED:
THE UNIT MUST RUN ACCORDING TO A USER DEFINABLE TIME SCHEDULE CONFIGURABLE OVER ALC IN THE FOLLOWING MODES:
- OCCUPIED MODE, MONDAY THROUGH FRIDAY 6AM TO 6PM (ADJ.): THE UNIT MUST MAINTAIN A ZONE TEMPERATURE CORRESPONDING TO
  - A 70°F (ADJ.) COOLING SETPOINT
  - A 68°F (ADJ.) HEATING SETPOINT

- UNOCCUPIED MODE (NIGHT SETBACK): THE UNIT MUST MAINTAIN A ZONE TEMPERATURE CORRESPONDING TO
  - A 80°F (ADJ.) COOLING SETPOINT.
  - A 55°F (ADJ.) HEATING SETPOINT.

ALARMS MUST BE PROVIDE OVER ALC AS FOLLOWS:
- HIGH ZONE TEMP: IF THE ZONE TEMPERATURE IS GREATER THAN THE COOLING SETPOINT BY 5°F (ADJ.)
- LOW ZONE TEMP: IF THE ZONE TEMPERATURE IS LESS THAN THE HEATING SETPOINT BY 5°F (ADJ.)

PURGE MODE:
WHEN PUSHBUTTON FOR PURGE ACTIVATION IS PRESSED IN ROOM, THE UNIT SHALL BE COMMANDED ON AND ENTER 100% ECONOMIZER MODE. OUTSIDE AIR DAMPER SHALL BE COMMANDED FULLY OPEN, EXHAUST AIR DAMPER SHALL BE COMMANDED FULLY OPEN, AND RETURN AIR DAMPER SHALL BE COMMANDED FULLY CLOSED. HEATING MODE SHALL BE ALLOWED DURING 100% ECONOMIZER ONLY DURING ACTIVE PURGE MODE - HEATING CONTROL VALVE SHALL MODULATE TO MAINTAIN MINIMUM 50 DEG. F.

THE UNIT SHALL REMAIN IN PURGE MODE FOR 30 MINUTES (ADJ.) AFTER WHICH THE UNIT SHALL RETURN TO PREVIOUS OPERATING MODE.

FREEZE PROTECTION:
THE UNIT MUST REMAIN RUNNING, BUT GENERATE AN ALARM IF THE AIR TEMPERATURE AT FREEZESTAT IS SENSED TO BE LESS THAN 35°F (ADJ.).
THE COOLING COIL VALVE MUST OPEN TO 50% (ADJ.) WHENEVER THE FREEZESTAT IS ON. THE HEATING COIL VALVE MUST OPEN TO 100% (ADJ.) WHENEVER THE FREEZESTAT IS ON. LEAD CHILLED WATER PUMP SHALL BE ENABLED UNTIL FREEZESTAT ALARM IS CLEARED IF PUMP STATUS IS OFF. PUMP SHALL DISABLE IF ONLY COMMANDED ON BY FREEZESTAT ALARM. FREEZESTAT SHALL AUTOMATICALLY RESET WHEN AIR TEMPERATURE AT FREEZESTAT IS GREATER THAN 40°F (ADJ.) FOR 5 MINUTES (ADJ.).

SMOKE DETECTION:
THE UNIT MUST SHUT DOWN AND GENERATE AN ALARM UPON RECEIVING A SHUTDOWN COMMAND FROM BUILDING FIRE ALARM CONTROL SYSTEM. SUPPLY AIR SMOKE DETECTOR STATUS MUST BE MONITORED BY FIRE ALARM CONTROL SYSTEM AND BAS.

OPTIMAL START:
THE UNIT MUST USE AN OPTIMAL START ALGORITHM FOR MORNING START-UP. THIS ALGORITHM MUST MINIMIZE THE UNOCCUPIED WARM-UP OR COOL-DOWN PERIOD WHILE STILL ACHIEVING COMFORT CONDITIONS BY THE START OF SCHEDULED OCCUPIED PERIOD.

SUPPLY FANS:
FOUR SUPPLY FANS WITH INDIVIDUAL VARIABLE-SPEED MOTORS ARE PROVIDED FOR N+1 REDUNDANCY. ALL SUPPLY FANS MUST RUN AT IDENTICAL CONSTANT SPEED (ADJ.) ANYTIME THE UNIT IS COMMANDED TO RUN. SUPPLY FANS MUST RUN AT SPEED CORRESPONDING TO DESIGN AIRFLOW SETPOINT (16,400 CFM) (SPEED VALUES ACTIVELY COMMUNICATED IN RESPONSE TO MEASURED SUPPLY AIRFLOW) ANYTIME THE UNIT IS COMMANDED TO RUN, UNLESS SHUTDOWN ON SAFETIES.

ALARMS MUST BE PROVIDED OVER ALC AS FOLLOWS:
- HIGH SUPPLY AIR FLOWRATE: IF THE SUPPLY AIR FLOWRATE IS 5% (ADJ.) GREATER THAN DESIGN AIRFLOW SETPOINT (16,400 CFM).
- LOW SUPPLY AIR FLOWRATE: IF THE SUPPLY AIR FLOWRATE IS 5% (ADJ.) LESS THAN DESIGN AIRFLOW SETPOINT (16,400 CFM).

ZONE TEMPERATURE SETPOINT ADJUST:
THE OCCUPANT MUST BE ABLE TO ADJUST THE ZONE TEMPERATURE HEATING AND COOLING SETPOINTS AT THE ZONE SENSOR.

OCCUPANT ZONE SETPOINT CONTROL RANGE:
- +/-2°F (ADJ.) AROUND SETPOINT

ZONE UNOCCUPIED OVERRIDE:
A TIMED LOCAL OVERRIDE CONTROL MUST ALLOW AN OCCUPANT TO OVERRIDE THE SCHEDULE AND PLACE THE UNIT INTO AN OCCUPIED MODE FOR AN ADJUSTABLE PERIOD OF TIME, INITIALLY 1 HOUR (ADJ.) AT THE EXPIRATION OF THIS TIME, CONTROL OF THE UNIT MUST AUTOMATICALLY RETURN TO THE SCHEDULE.

COOLING MODE:
THE ALC CONTROLLER MUST MEASURE THE ZONE TEMPERATURE AND MUST MODULATE ACU-01 SUPPLY AIR TEMPERATURE SETPOINT TO MAINTAIN ACTIVE ZONE TEMPERATURE SETPOINT. ACU-01 SUPPLY AIR TEMPERATURE SETPOINT MUST INCREASE AS THE ZONE TEMPERATURE DROPS BELOW THE ACTIVE ZONE TEMPERATURE SETPOINT OR DECREASE AS THE ZONE TEMPERATURE RISES ABOVE THE ACTIVE ZONE TEMPERATURE SETPOINT.

THE ALC CONTROLLER MUST MEASURE ACU-01 SUPPLY AIR TEMPERATURE AND MODULATE ACU-01 COOLING COIL VALVE TO MAINTAIN ACU-01 SUPPLY AIR TEMPERATURE SETPOINT.

ACU-01 COOLING SHALL BE ENABLED WHENEVER:
- OUTSIDE AIR TEMPERATURE IS GREATER THAN 60°F (ADJ.).
- AND THE SUPPLY AIR TEMPERATURE IS ABOVE ACTIVE SUPPLY AIR TEMPERATURE SETPOINT.
- AND ACU-01 FAN STATUS IS ON.
- AND ACU-01 HEATING IS NOT ACTIVE.

HEATING MODE:
THE ALC CONTROLLER MUST MEASURE THE ZONE TEMPERATURE AND MUST MODULATE ACU-01 SUPPLY AIR TEMPERATURE SETPOINT TO MAINTAIN ACTIVE ZONE TEMPERATURE SETPOINT. ACU-01 SUPPLY AIR TEMPERATURE SETPOINT MUST DECREASE AS THE ZONE TEMPERATURE RISES ABOVE THE ACTIVE ZONE TEMPERATURE SETPOINT OR INCREASE AS THE ZONE TEMPERATURE DROPS BELOW THE ACTIVE ZONE TEMPERATURE SETPOINT.

THE ALC CONTROLLER MUST MEASURE ACU-01 SUPPLY AIR TEMPERATURE AND MODULATE ACU-01 HEATING COIL VALVE TO MAINTAIN ACU-01 SUPPLY AIR TEMPERATURE SETPOINT.

ACU-01 HEATING SHALL BE ENABLED WHENEVER:
- OUTSIDE AIR TEMPERATURE IS LESS THAN 58°F (ADJ.).AND THE SUPPLY AIR TEMPERATURE IS ABOVE ACTIVE SUPPLY AIR TEMPERATURE SETPOINT.
- AND THE SUPPLY AIR TEMPERATURE IS BELOW ACTIVE SUPPLY AIR TEMPERATURE SETPOINT.
- AND ACU-01 FAN STATUS IS ON.
- AND ACU-01 COOLING IS NOT ACTIVE.

ECONOMIZER:
THE ALC CONTROLLER MUST MEASURE THE MIXED AIR TEMPERATURE AND MODULATE THE ECONOMIZER DAMPERS IN SEQUENCE TO MAINTAIN A MIXED AIR TEMPERATURE SETPOINT 2°F (ADJ.) LESS THAN THE SUPPLY AIR TEMPERATURE SETPOINT. THE OUTSIDE AIR DAMPER MUST MAINTAIN A MINIMUM ADJUSTABLE POSITION CORRESPONDING TO DESIGN MINIMUM OUTSIDE AIRFLOW (980 CFM) (ADJ.) WHENEVER OCCUPIED. AIRFLOW MONITORING STATION SHALL BE USED TO VERIFY OUTSIDE AIR FLOWRATE.

THE ECONOMIZER SHALL BE ENABLED WHENEVER:
- OUTSIDE AIR TEMPERATURE IS AT LEAST 3°F (ADJ.) LESS THAN THE RETURN AIR TEMPERATURE FOR 5 MINUTES (ADJ.)
- AND THE OUTSIDE AIR TEMPERATURE IS LESS THAN 75°F (ADJ.)

THE ECONOMIZER SHALL BE DISABLED WHENEVER:
- FREEZESTAT IS ON
- OR LOSS OF SUPPLY FAN STATUS
- OR OUTSIDE AIR TEMPERATURE IS AT LEAST 3°F (ADJ.) MORE THAN THE RETURN AIR TEMPERATURE FOR 5 MINUTES (ADJ.)
- OR MIXED AIR TEMPERATURE IS LESS THAN 35°F (ADJ.)
- AND OUTSIDE AIR TEMPERATURE IS MORE THAN 78°F (ADJ.)

HEATING MUST BE DISABLED WHEN ECONOMIZER MODE IS ACTIVE - UNLESS PURGE MODE IS ACTIVATED, SEE PURGE MODE.

THE ECONOMIZER MUST CLOSE WHENEVER THE FREEZESTAT IS ON - UNLESS PURGE MODE IS ACTIVATED, SEE PURGE MODE.

THE OUTSIDE AIR DAMPER MUST CLOSE, THE EXHAUST AIR DAMPER MUST CLOSE, AND THE RETURN AIR DAMPER MUST OPEN WHEN THE UNIT IS OFF.

WHEN OPTIMAL START UP MODE IS ACTIVE, THE OUTSIDE AIR DAMPER MUST MODULATE TO FULLY CLOSED AND THE RETURN AIR DAMPER MUST MODULATE TO FULLY OPEN.

BUILDING PRESSURIZATION CONTROL:
THE ALC CONTROLLER MUST MEASURE THE OUTSIDE AIR FLOWRATE AND RELIEF AIR FLOWRATE AND MODULATE THE RELIEF AIR FANS SO THAT RELIEF AIR FLOWRATE ALWAYS EQUALS OUTSIDE AIR FLOWRATE.

RELIEF FANS MUST BE ENABLED WHEN THE SUPPLY FAN STATUS IS PROVEN ON AND RELIEF FANS MUST TURN OFF WHEN THE UNIT IS OFF.

ALARMS MUST BE PROVIDED OVER ALC AS FOLLOWS:
- HIGH RELIEF AIR FLOWRATE: IF THE RELIEF AIR FLOWRATE IS 5% (ADJ.) GREATER THAN OUTSIDE AIR FLOWRATE.
- LOW RELIEF AIR FLOWRATE: IF THE RELIEF AIR FLOWRATE IS 5% (ADJ.) LESS THAN OUTSIDE AIR FLOWRATE.

FILTER DIFFERENTIAL PRESSURE MONITOR:
THE ALC CONTROLLER MUST MONITOR THE DIFFERENTIAL PRESSURE ACROSS INDIVIDUAL FILTER SECTIONS.
ALARMS MUST BE PROVIDED OVER ALC AS FOLLOWS:
- PRE-FILTER CHANGE REQUIRED: FILTER DIFFERENTIAL PRESSURE EXCEEDS 1.0 IN. W.C. (ADJ.)
- FINAL FILTER CHANGE REQUIRED: FILTER DIFFERENTIAL PRESSURE EXCEEDS 1.0 IN. W.C. (ADJ.)

SUPPLY AIR TEMPERATURE MONITORING:
THE ALC CONTROLLER MUST MONITOR THE SUPPLY AIR TEMPERATURE.

ALARMS MUST BE PROVIDED OVER ALC AS FOLLOWS:
- MODERATE HIGH SUPPLY AIR TEMP: IF THE SUPPLY AIR TEMPERATURE IS 5°F (ADJ.) GREATER THAN SETPOINT FOR MORE THAN 10 MINUTES (ADJ.)
- MODERATE LOW SUPPLY AIR TEMP: IF THE SUPPLY AIR TEMPERATURE IS 5°F (ADJ.) LESS THAN SETPOINT FOR MORE THAN 10 MINUTES (ADJ.)
- HIGH SUPPLY AIR TEMP: IF THE SUPPLY AIR TEMPERATURE IS GREATER THAN 108°F (ADJ.)
- HIGH SUPPLY AIR TEMP: IF THE SUPPLY AIR TEMPERATURE IS LESS THAN 45°F (ADJ.).

FAN STATUS MONITORING:
THE ALC CONTROLLER MUST MONITOR THE FAN STATUS, ALL SUPPLY AND ALL RELIEF.

ALARMS MUST BE PROVIDED OVER ALC AS FOLLOWS:
- FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
- FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.

SHELTER IN PLACE (ALC COMMAND):
THE OUTSIDE AIR DAMPER MUST CLOSE, RELIEF FANS MUST DISABLE, AND UNIT MUST ENTER 100% RECIRCULATION MODE WHEN SYSTEM STATUS IS SHELTER IN PLACE, COMMANDED BY ALC BAS.

432ACHPS01-4 / 432ACHPS02-5 / 432ACHPS04, PACKAGED HEAT PUMP UNITS

432ACHPS04 IS EXISTING TO REMAIN AND MAY NOT BE CAPABLE OF EVERY CONTROL FUNCTION IDENTIFIED HERE DUE TO LIMITATIONS OF EXISTING 432ACHPS04 CONTROLS CONFIGURATION. CONTROLS INTENT WITH 432ACHPS04 IS TO INCORPORATE AS MUCH OF THIS PROGRAMMING AS POSSIBLE WITHOUT SIGNIFICANT EQUIPMENT MODIFICATIONS TO ALLOW 432ACHPS02 AND 432ACHPS04 TO COOPERATE AND OPERATE IN UNISON WHERE POSSIBLE.

NEW ACHPS UNITS MUST BE PROVIDED WITH DDC CONTROLS PACKAGE AND HAVE SOME FUNCTIONS AND COMMANDS CONTROLLED BY ALC AND SOME FUNCTIONS CONTROLLED BY FACTORY-INSTALLED, INTEGRAL UNIT CONTROLLER AS DESCRIBED BELOW.

RUN CONDITIONS - SCHEDULED:
THE UNIT MUST RUN ACCORDING TO A USER DEFINABLE TIME SCHEDULE CONFIGURABLE OVER ALC IN THE FOLLOWING MODES:
- OCCUPIED MODE, MONDAY THROUGH FRIDAY 6AM TO 6PM (ADJ.): THE UNIT MUST MAINTAIN
  - A 72°F (ADJ.) COOLING SETPOINT
  - A 70°F (ADJ.) HEATING SETPOINT

- UNOCCUPIED MODE (NIGHT SETBACK): THE UNIT MUST MAINTAIN
  - A 85°F (ADJ.) COOLING SETPOINT.
  - A 55°F (ADJ.) HEATING SETPOINT.

ALARMS MUST BE PROVIDED OVER ALC AS FOLLOWS:
- HIGH ZONE TEMP: IF THE ZONE TEMPERATURE IS GREATER THAN THE COOLING SETPOINT BY A USER DEFINABLE AMOUNT (ADJ.).
- LOW ZONE TEMP: IF THE ZONE TEMPERATURE IS LESS THAN THE HEATING SETPOINT BY A USER DEFINABLE AMOUNT (ADJ.).

SMOKE DETECTION:
THE UNIT MUST SHUT DOWN AND GENERATE AN ALARM UPON RECEIVING A SHUTDOWN COMMAND FROM BUILDING FIRE ALARM CONTROL SYSTEM. SUPPLY AIR AND RETURN AIR SMOKE DETECTOR STATUS MUST BE MONITORED BY FIRE ALARM CONTROL SYSTEM AND BAS.

ZONE TEMPERATURE SETPOINT ADJUST:
THE OCCUPANT MUST BE ABLE TO ADJUST THE ZONE TEMPERATURE HEATING AND COOLING SETPOINTS AT THE ZONE SENSOR.

OCCUPANT ZONE SETPOINT CONTROL RANGE:
- +/-2°F (ADJ.) AROUND SETPOINT

ZONE OPTIMAL START:
THE UNIT MUST USE AN OPTIMAL START ALGORITHM FOR MORNING START-UP. THIS ALGORITHM MUST MINIMIZE THE UNOCCUPIED WARM-UP OR COOL-DOWN PERIOD WHILE STILL ACHIEVING COMFORT CONDITIONS BY THE START OF SCHEDULED OCCUPIED PERIOD.

ZONE UNOCCUPIED OVERRIDE:
A TIMED LOCAL OVERRIDE CONTROL MUST ALLOW AN OCCUPANT TO OVERRIDE THE SCHEDULE AND PLACE THE UNIT INTO AN OCCUPIED MODE FOR AN ADJUSTABLE PERIOD OF TIME, INITIALLY 1 HOUR (ADJ.) AT THE EXPIRATION OF THIS TIME, CONTROL OF THE UNIT MUST AUTOMATICALLY RETURN TO THE SCHEDULE.

SMOKE DETECTION:
THE UNIT MUST SHUT DOWN AND GENERATE AN ALARM UPON RECEIVING A SUPPLY AIR SMOKE DETECTOR STATUS.

SUPPLY FAN:
THE SUPPLY FAN MUST RUN AT CONSTANT SPEED CORRESPONDING TO DESIGN AIRFLOW SETPOINT (SEE EQUIPMENT SCHEDULES) (SPEED VALUE ACTIVELY COMMUNICATED IN RESPONSE TO MEASURED SUPPLY AIRFLOW) ANYTIME THE UNIT IS COMMANDED TO RUN, UNLESS SHUTDOWN ON SAFETIES. DESIGN AIRFLOW SETPOINT IS DIFFERENT FOR COOLING MODE AND HEATING MODE.

ALARMS MUST BE PROVIDED OVER ALC AS FOLLOWS:
- HIGH SUPPLY AIR FLOWRATE: IF THE SUPPLY AIR FLOWRATE IS 5% (ADJ.) GREATER THAN DESIGN AIRFLOW SETPOINT (SEE ACHPS SCHEDULE).
- LOW SUPPLY AIR FLOWRATE: IF THE SUPPLY AIR FLOWRATE IS 5% (ADJ.) LESS THAN DESIGN AIRFLOW SETPOINT (SEE ACHPS SCHEDULE).

HEATING AND COOLING - 1 COMPRESSOR STAGE:
THE UNIT CONTROLLER MUST MEASURE THE ZONE TEMPERATURE AND CYCLE THE COMPRESSOR TO MAINTAIN ITS SETPOINT. TO PREVENT SHORT CYCLING, THE STAGE MUST HAVE A USER DEFINABLE MINIMUM RUNTIME, INITIALLY 10 MINUTES (ADJ). THE COMPRESSOR MUST RUN SUBJECT TO ITS OWN INTERNAL SAFETIES AND CONTROLS.

HEATING SHALL BE ENABLED WHENEVER:
- OUTSIDE AIR TEMPERATURE IS LESS THAN 63°F (ADJ.).
- AND THE FAN IS ON.
- AND THE REVERSING VALVE IS IN HEAT MODE.

COOLING SHALL BE ENABLED WHENEVER:
- OUTSIDE AIR TEMPERATURE IS GREATER THAN 63°F (ADJ.).
- AND THE FAN IS ON.
- AND THE REVERSING VALVE IS IN COOL MODE.

COOLING AND HEATING MUST BE DISABLED WHEN ECONOMIZER MODE IS ACTIVE.

THE OUTSIDE AIR DAMPER MUST MAINTAIN A MAXIMUM ADJUSTABLE POSITION CORRESPONDING TO DESIGN MINIMUM OUTSIDE AIRFLOW WHEN HEATING OR COOLING IS ENABLED.

ON MODE CHANGE, THE COMPRESSOR MUST BE DISABLED AND REMAIN OFF UNTIL AFTER THE REVERSING VALVE HAS CHANGED POSITION..

ALARMS MUST BE PROVIDED OVER ALC AS FOLLOWS:
- COMPRESSOR RUNTIME EXCEEDED: THE COMPRESSOR RUNTIME EXCEEDS A USER DEFINABLE LIMIT, INITIALLY 8,760 HOURS (ADJ.).

ECONOMIZER:
THE UNIT CONTROLLER MUST MEASURE THE RETURN AIR TEMPERATURE AND MODULATE THE ECONOMIZER DAMPERS IN SEQUENCE TO MAINTAIN THE ZONE COOLING SETPOINT. THE OUTSIDE AIR DAMPER MUST MAINTAIN A MINIMUM ADJUSTABLE POSITION CORRESPONDING TO DESIGN MINIMUM OUTSIDE AIRFLOW (SEE ACHPS SCHEDULE) (ADJ.) WHENEVER OCCUPIED.

THE ECONOMIZER SHALL BE ENABLED WHENEVER:
- OUTSIDE AIR TEMPERATURE IS AT LEAST 3°F (ADJ.) LESS THAN THE RETURN AIR TEMPERATURE FOR 5 MINUTES (ADJ.)
- AND THE OUTSIDE AIR TEMPERATURE IS LESS THAN 75°F (ADJ.)

THE ECONOMIZER SHALL BE DISABLED WHENEVER:
- LOSS OF SUPPLY FAN STATUS
- OUTSIDE AIR TEMPERATURE IS AT LEAST 3°F (ADJ.) MORE THAN THE RETURN AIR TEMPERATURE FOR 5 MINUTES (ADJ.)
- AND THE OUTSIDE AIR TEMPERATURE IS MORE THAN 78°F (ADJ.)

COOLING AND HEATING MUST BE DISABLED WHEN ECONOMIZER MODE IS ACTIVE.

THE ECONOMIZER MUST CLOSE WHENEVER THE FREEZESTAT IS ON.

THE OUTSIDE AIR DAMPER MUST CLOSE AND THE RETURN AIR DAMPER MUST OPEN WHEN THE UNIT IS OFF.

WHEN OPTIMAL START UP MODE IS ACTIVE, THE OUTSIDE AIR DAMPER MUST MODULATE TO FULLY CLOSED AND THE RETURN AIR DAMPER MUST MODULATE TO FULLY OPEN.

BUILDING PRESSURIZATION CONTROL:
THE ALC CONTROLLER MUST MEASURE THE OUTSIDE AIR FLOWRATE AND RELIEF AIR FLOWRATE AND MODULATE THE RELIEF AIR FAN SO THAT RELIEF AIR FLOWRATE ALWAYS EQUALS OUTSIDE AIR FLOWRATE.

RELIEF FAN MUST BE ENABLED WHEN THE SUPPLY FAN STATUS IS PROVEN ON AND RELIEF FAN MUST TURN OFF WHEN THE UNIT IS OFF.

ALARMS MUST BE PROVIDED OVER ALC AS FOLLOWS:
- HIGH RELIEF AIR FLOWRATE: IF THE RELIEF AIR FLOWRATE IS 5% (ADJ.) GREATER THAN OUTSIDE AIR FLOWRATE.
- LOW RELIEF AIR FLOWRATE: IF THE RELIEF AIR FLOWRATE IS 5% (ADJ.) LESS THAN OUTSIDE AIR FLOWRATE.

FILTER DIFFERENTIAL PRESSURE MONITOR:
ALC BAS MUST MONITOR THE DIFFERENTIAL PRESSURE ACROSS INDIVIDUAL FILTER SECTIONS.

ALARMS MUST BE PROVIDED OVER ALC AS FOLLOWS:
- PRE-FILTER CHANGE REQUIRED: FILTER DIFFERENTIAL PRESSURE EXCEEDS 1.0 IN. W.C. (ADJ.)
- FINAL FILTER CHANGE REQUIRED: FILTER DIFFERENTIAL PRESSURE EXCEEDS 1.0 IN. W.C. (ADJ.)

SUPPLY AIR TEMPERATURE MONITORING:
THE UNIT CONTROLLER MUST MONITOR THE SUPPLY AIR TEMPERATURE.

ALARMS MUST BE PROVIDED OVER ALC AS FOLLOWS:
- HIGH SUPPLY AIR TEMP: IF THE SUPPLY AIR TEMPERATURE IS GREATER THAN 120°F (ADJ.).
- LOW SUPPLY AIR TEMP: IF THE SUPPLY AIR TEMPERATURE IS LESS THAN 40°F (ADJ.).

FAN STATUS MONITORING:
THE UNIT CONTROLLER MUST MONITOR THE FAN STATUS, SUPPLY AND RELIEF.

ALARMS MUST BE PROVIDED OVER ALC AS FOLLOWS:
- FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
- FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.

SHELTER IN PLACE (ALC COMMAND):
THE OUTSIDE AIR DAMPER MUST CLOSE, RELIEF FAN MUST DISABLE, AND UNIT MUST ENTER 100% RECIRCULATION MODE WHEN SYSTEM STATUS IS SHELTER IN PLACE, COMMANDED BY ALC BAS.

COMPRESSOR DEFROST MODE:
UNIT CONTROLLER SHALL ENABLE DEFROST MODE ACCORDING TO MANUFACTURER'S STANDARD DEFROST MODE CONTROL SEQUENCE.

WHEN UNIT IS IN DEFROST MODE, FAN SPEED SHALL BE REDUCED TO SPEED CORRESPONDING TO 1,260 CFM FOR DURATION OF DEFROST MODE.

Sheet Title
MECHANICAL CONTROL SEQUENCES

Dwg. No.
PLM2021-0432-0034D

Sht. No.
M-703

	HARDWARE POINTS				SOFTWARE POINTS					
POINT NAME	AI	AO	BI	BO	AV	BV	LOOP	SCHED	TREND	ALARM
432RCHS01-1 (NOTE 1)										
Chiller Start/Stop Command				1				1	1	
Chiller Status			1						1	1
Chilled Water Supply Temp Setpoint Reset					1				1	
Chiller General Alarm			1							1
Chiller CHWS-T > SP + 5deg.F Alarm						1				1
Chiller Run Fault			1							1
Chiller Compressor Status						2			2	2
Chiller Current					1				1	
Chiller Instantaneous Power (kW)					1				1	
Chiller Misc. Monitoring 1					1				1	1
Chiller Misc. Monitoring 2					1				1	1
Condenser Water Head Pressure Control Valve (NOTE 2)										
Condenser Water Head Pressure Control Valve Position					1				1	1
Chilled Water Flow Switch Status (NOTE 2)										
Condenser Water Flow Switch Status (NOTE 2)										
Condenser Water Bypass Control Valve				1				1	1	
Chilled Water Return Temp (NOTE 3)	1								1	1
Condenser Water Supply Temp (NOTE 3)	1								1	1
Chilled Water Flow Meter (NOTE 3)	1								1	1
432PCHW01-1 & 432PCHW02-1 (NOTE 1)										
VFD Pump Start/Stop Command				2				2	2	
VFD Pump Speed Control Command		2						2	2	
VFD Status			2						2	2
VFD Speed/Current	2								2	
VFD Instantaneous Power (kW)					2				2	
VFD General Alarm			2						2	2
Pump Differential Pressure (NOTE 3)	2								2	2
432ACU08-2H / 432RCUA01-2H & 432ACU09-3H / 432RCUA02-3H										
Unit Enable Command						2		2	2	
Room Temp Setpoint					2				2	
Unit General Alarm						2				2
Unit Run Fault						2				2
Unit Current					2				2	
Unit Instantaneous Power (kW)					2				2	
Unit Misc. Monitoring 1					2					2
Unit Misc. Monitoring 2					2					2
Room Temp (NOTE 3)	2								2	2
432HEA01-A1 & 432HEA02-4 & 432HEA03-5										
Heater Enable Command		3							3	
Room Temp Setpoint					3				3	
Room Temp (NOTE 3)	3								3	3
Supply Airflow (NOTE 3)	3								3	3
TOTALS	**15**	**5**	**7**	**4**	**21**	**9**	**0**	**8**	**50**	**34**

ALARM CONDITION	GRAPHIC	POINT SETTING (WITH UNITS)	POINT RANGE (WITH UNITS)	ALARM TYPE
~	Y	~	ON/OFF	~
CHILLER COMMAND IS ON, BUT CHILLER STATUS IS OFF	Y	~	ON/OFF	CRIT
~	Y	43 DEG. F.	<___>	~
STATUS IS "ALARM"	Y	~	NORMAL/ALARM	INFO
STATUS IS "ALARM"	Y	~	NORMAL/ALARM	CRIT
STATUS IS "ALARM"	Y	~	NORMAL/ALARM	INFO
CHILLER COMMAND IS ON, BUT COMPRESSOR STATUS IS OFF	Y	~	ON/OFF	CRIT
~	Y	~	<___>	~
~	Y	~	<___>	~
FOR FUTURE USE AT OWNER'S DISCRETION	Y	~	~	INFO
FOR FUTURE USE AT OWNER'S DISCRETION	Y	~	~	INFO
~	Y	~	0-100%	~
FOR FUTURE USE AT OWNER'S DISCRETION	Y	~	<___>	INFO
~	Y	~	OPEN/CLOSED	~
~	Y	~	OPEN/CLOSED	~
~	Y	~	OPEN/CLOSED	~
CHWR TEMP GREATER THAN 57 DEG F OR LESS THAN 42 DEG F	Y	~	<___>	CRIT
LCWS TEMP GREATER THAN 86 DEG F OR LESS THAN 60 DEG F	Y	~	<___>	INFO
FLOW IS NOT EQUAL TO 220 GPM	Y	~	OPEN/CLOSED	INFO
~	Y	~	ON/OFF	~
~	Y	~	0-100%	~
VFD COMMAND IS ON, BUT VFD STATUS IS OFF	Y	~	ON/OFF	CRIT
~	Y	~	0-100%	~
~	Y	~	<___>	~
FOR FUTURE USE AT OWNER'S DISCRETION	Y	~	~	INFO
VFD COMMAND IS ON, BUT DP IS LESS THAN 5 PSIG	Y	56 PSIG	<___>	CRIT
~	Y	~	ON/OFF	~
~	Y	72 DEG. F.	<___>	~
STATUS IS "ALARM"	Y	~	NORMAL/ALARM	INFO
STATUS IS "ALARM"	Y	~	NORMAL/ALARM	INFO
~	Y	~	<___>	~
~	Y	~	<___>	~
FOR FUTURE USE AT OWNER'S DISCRETION	Y	~	~	INFO
FOR FUTURE USE AT OWNER'S DISCRETION	Y	~	~	INFO
HIGH LIMIT ALARM, LOW LIMIT ALARM - REFER TO SEQUENCE	Y	~	<___>	INFO
~	Y	~	ON/OFF	~
~	Y	72 DEG. F.	<___>	~
~	Y	~	<___>	~
HIGH LIMIT ALARM, LOW LIMIT ALARM - REFER TO SEQUENCE	Y	~	<___>	INFO

Total Hardware (31)
Total Software (122)

NOTES:
1. NEW ALC DDC UNIT CONTROLLERS SERVING 432RCHS01-1, 432PCHW01-1, & 432PCHW02-1 SHALL BE SIZED AND SELECTED TO SERVE AS CENTRAL CONTROL PANEL (432DDCP01) FOR ALL NEW HVAC EQUIPMENT REQUIRED BY PROJECT AND INCLUDE 10% SPARE CAPACITY FOR EACH CATEGORY OF HARD-WIRED POINT.
2. WIRE CONTROL DEVICE DIRECTLY TO FACTORY CHILLER CONTROL PANEL. IF POINT CAN BE MONITORED OVER ALC, MONITOR POINT. FLOW SWITCHES ARE FACTORY-INSTALLED AND FACTORY-WIRED.
3. EQUIPMENT VENDOR WILL NOT PROVIDE CONTROL DEVICE, SUBCONTRACTOR TO PROVIDE FIELD-INSTALLED, HARD-WIRED CONTROL DEVICE.
4. REFER TO SEQUENCES OF OPERATION FOR ALL DEFAULT SYSTEM SETPOINTS. COORDINATE FINAL SYSTEM SETPOINTS WITH LLNL.
5. CONTROLS SUBCONTRACTOR TO PROVIDE ALL PROGRAMMING REQUIRED TO DELIVER NEW ALARM NOTIFICATIONS OVER NEW ALC SYSTEM TO LLNL EMAILS AND PAGERS. COORDINATE WITH LLNL.
6. CELLS WITH "<___>" SHALL BE DETERMINED BY THE CONTROLS SUBCONTRACTOR. SPACES WHERE NO ENTRY IS REQUIRED CONTAIN "~".

HEAT PUMP SPLIT SYSTEMS
432ACU08-2H / 432RCUA01-2H & 432ACU09-3H / 432RCUA02-3H

RUN CONDITIONS - CONTINUOUS:
EACH EVAPORATOR AND INTERLOCKED CONDENSING UNIT (SEE EQUIPMENT SCHEDULES FOR INTERLOCKED CONDENSING UNIT) MUST RUN 24/7 TO SATISFY THE FOLLOWING SETPOINTS:

- 432ACU08: A 72°F (ADJ.) OCCUPIED COOLING SETPOINT
  A 70°F (ADJ.) OCCUPIED HEATING SETPOINT
  A 85°F (ADJ.) UNOCCUPIED COOLING SETPOINT
  A 55°F (ADJ.) UNOCCUPIED HEATING SETPOINT
- 432ACU09: A 72°F (ADJ.) OCCUPIED COOLING SETPOINT
  A 70°F (ADJ.) OCCUPIED HEATING SETPOINT
  A 85°F (ADJ.) UNOCCUPIED COOLING SETPOINT
  A 55°F (ADJ.) UNOCCUPIED HEATING SETPOINT
- 432ACU10: A 72°F (ADJ.) OCCUPIED COOLING SETPOINT
  A 70°F (ADJ.) OCCUPIED HEATING SETPOINT
  A 85°F (ADJ.) UNOCCUPIED COOLING SETPOINT
  A 55°F (ADJ.) UNOCCUPIED HEATING SETPOINT

SPLIT SYSTEMS WILL COMMUNICATE STATUS AND ALARMS TO THE BAS FROM NATIVE UNIT CONTROLLER (REFER TO POINTS LIST). SPLIT SYSTEMS WILL OPERATE ACCORDING TO EXISTING, STAND-ALONE OEM PROGRAMMING.

ADDITIONAL ALARMS MUST BE PROVIDED AS FOLLOWS:
- HIGH ZONE TEMP: IF THE ZONE TEMPERATURE IS GREATER THAN THE COOLING SETPOINT BY A USER DEFINABLE AMOUNT (ADJ.).

WATER FLOW METER (CHILLED WATER)

THE ALC CONTROLLER MUST MONITOR THE CHILLED WATER METER FOR CHILLED WATER FLOW (GPM) VIA ANALOG INPUT. PROVIDE CONNECTION FROM WATER FLOW METER TO ALC PANEL.

ALARM MUST BE GENERATED AS FOLLOWS:
- FLOW IS DIFFERENT THAN DESIGN FLOWRATE (220 GPM) BY MORE THAN 5 GPM (ADJ.)

USAGE HISTORY:
THE ALC CONTROLLER MUST CALCULATE AND RECORD BTU/HR USING FLOW METER GPM VALUE AND TEMPERATURE SENSORS SO AS TO PROVIDE A CHILLED WATER CONSUMPTION HISTORY. USAGE READINGS MUST BE RECORDED ON A DAILY, MONTH-TO-DATE, AND YEAR-TO-DATE BASIS.

432HEA01-A1

WHEN ROOM 1204 TEMPERATURE IS LESS THAN 65 DEG. F. (ADJ.), SCR PROPORTIONAL ELECTRIC DUCT-MOUNTED HEATING COIL SHALL BE ENABLED TO MAINTAIN MINIMUM 65 DEG. F. (ADJ.) ROOM TEMPERATURE.

HEATING COIL SHALL BE DISABLED WHEN ROOM TEMPERATURE IS AT LEAST 65 DEG. F. (ADJ.) FOR 10 MINUTES (ADJ.)

CONTROLLER SHALL MODULATE HEATER LOAD ACCORDING TO THE TEMPERATURE CONTROL SIGNAL. HEATER SHALL PROVIDE MAXIMUM HEATING WHEN WHEN NEEDED WITH NORMAL MINIMUM AIRFLOW (TBD DURING CX), REDUCE HEATING WHEN AIRFLOW IS LOWER THAN NORMAL MINIMUM AIRFLOW (TBD DURING CX), AND STOP HEATING WHEN AIRFLOW IS ZERO.

432HEA02-4 & 432HEA03-5

WHEN ACHPS SUPPLY AIR TEMPERATURE IS LESS THAN 40 DEG. F. (ADJ.), AN ALARM SHALL BE PROVIDED OVER ALC, AND SCR PROPORTIONAL ELECTRIC DUCT MOUNTED HEATING COIL SHALL BE ENABLED TO MAINTAIN MINIMUM 65 DEG. F. (ADJ.) SUPPLY AIR TEMPERATURE.

HEATING COIL SHALL BE DISABLED AFTER 30 MINUTES (ADJ.)

CONTROLLER SHALL MODULATE HEATER LOAD ACCORDING TO THE TEMPERATURE CONTROL SIGNAL. HEATER SHALL PROVIDE MAXIMUM HEATING WHEN WHEN NEEDED WITH NORMAL MINIMUM AIRFLOW (TBD DURING CX), REDUCE HEATING WHEN AIRFLOW IS LOWER THAN NORMAL MINIMUM AIRFLOW (TBD DURING CX), AND STOP HEATING WHEN AIRFLOW IS ZERO.

Sheet Title
MECHANICAL CONTROL POINTS AND SEQUENCES

Dwg. No.
PLM2021-0432-0035D

Sht. No.
M-704

Total Hardware (88)
Total Software (434)

NOTES:

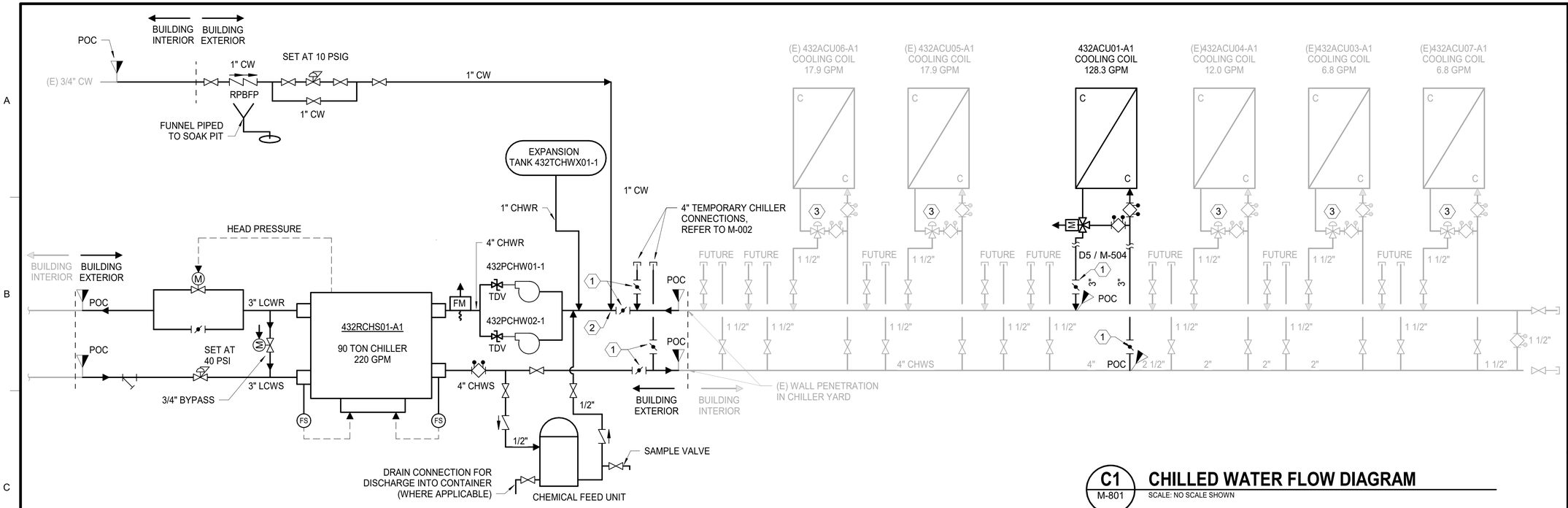
1. SERVED BY NEW 432DDCP02. CONNECT 432DDCP02 TO 432DDCP01 VIA ARCNET OR BACNET/MSTP.
2. 432ACHPS01 AND 432ACHPS02 UTILIZE INTEGRAL ON-BOARD UNIT CONTROLLERS. CONTROLLERS SHALL BE WIRED TO COMMUNICATE WITH NEW ALC DDC SYSTEM OVER BACNET/MSTP OR MODBUS. BACNET/IP IS PROHIBITED. 432ACHPS04 IS AN EXISTING TO REMAIN UNIT THAT IS TO RECEIVE A NEW BACNET/MSTP NETWORK COMMUNICATION CARD - ONLY LISTED SOFTWARE POINTS THAT ARE AVAILABLE OVER BACNET/MSTP ARE REQUIRED OVER ALC FOR EXISTING TO REMAIN 432ACHPS04.
3. EQUIPMENT VENDOR WILL NOT PROVIDE CONTROL DEVICE, MECHANICAL SUBCONTRACTOR TO PROVIDE FIELD-INSTALLED, HARD-WIRED CONTROL DEVICE.
4. REFER TO M-702. SUBCONTRACTOR SHALL RE-USE EXISTING DUCT SMOKE DETECTOR AT EXISTING HVAC EQUIPMENT AND RE-INSTALL AND RE-WIRE DEVICE FOR USE WITH NEW HVAC EQUIPMENT.
5. REFER TO M-702. INSTALL DEVICE NEAR 432ACHPS01.
6. PROVIDE ALL CONTROL RELAYS NECESSARY TO REPORT SMOKE DETECTOR ALARM STATUS TO NEW ALC DDC SYSTEM.
7. REFER TO SEQUENCES OF OPERATION FOR ALL DEFAULT SYSTEM SETPOINTS. COORDINATE FINAL SYSTEM SETPOINTS WITH LLNL.
8. CONTROLS SUBCONTRACTOR TO PROVIDE ALL PROGRAMMING REQUIRED TO DELIVER NEW ALARM NOTIFICATIONS OVER NEW ALC SYSTEM TO LLNL EMAILS AND PAGERS. COORDINATE WITH LLNL.
9. CELLS WITH "<___>" SHALL BE DETERMINED BY THE CONTROLS SUBCONTRACTOR. SPACES WHERE NO ENTRY IS REQUIRED CONTAIN "~".

	HARDWARE POINTS				SOFTWARE POINTS									
POINT NAME	AI	AO	BI	BO	AV	BV	LOOP	SCHED	TREND	ALARM	ALARM CONDITION	GRAPHIC	POINT SETTING (WITH UNITS)	POINT RANGE (WITH UNITS)	ALARM TYPE
642ACU01-A1 (NOTE 1)															
VFD Supply Fan Start/Stop Command				4				4	4		~	Y	~	ON/OFF	~
VFD Relief Fan Start/Stop Command				4				4	4		~	Y	~	ON/OFF	~
Smoke Detector Supply Fan Shutdown (NOTE 4)				4					4		~	Y	~	ON/OFF	~
VFD Supply Fan Speed Control Command		4						4	4		~	Y	~	0-100%	~
VFD Relief Fan Speed Control Command		4						4	4		~	Y	~	0-100%	~
Heating Control Valve Command (NOTE 3)		1							1		~	Y	~	0-100%	~
Cooling Control Valve Command (NOTE 3)		1							1		~	Y	~	0-100%	~
Outside Air Control Damper Command (NOTE 3)		1						1	1		~	Y	~	0-100%	~
Return Air Control Damper Command (NOTE 3)		1						1	1		~	Y	~	0-100%	~
Relief Air Control Damper Command (NOTE 3)		1						1	1		~	Y	~	0-100%	~
Pre-Filter Differential Pressure (NOTE 3)	1									1	DIFFERENTIAL PRESSURE EXCEEDS SETPOINT	Y	1.0" W.C.	<___>	CRIT
Final Filter Differential Pressure (NOTE 3)	1									1	DIFFERENTIAL PRESSURE EXCEEDS SETPOINT	Y	1.0" W.C.	<___>	CRIT
Outside Air Flowrate Measurement	1								1	1	LOW LIMIT ALARM CORRESPONDING TO MINIMUM OA	Y	980 CFM	<___>	CRIT
VFD Suppply Fan Current Transducer (NOTE 3)	4								4	4	HIGH LIMIT ALARM - REFER TO SEQUENCE	Y	~	<___>	CRIT
VFD Relief Fan Current Transducer (NOTE 3)	4								4	4	HIGH LIMIT ALARM - REFER TO SEQUENCE	Y	~	<___>	CRIT
Supply Fan Inlet Air Flowrate Measurement Ring	4								4	4	HIGH LIMIT ALARM, LOW LIMIT ALARM - REFER TO SEQUENCE	Y	16,400 CFM	<___>	INFO
Relief Fan Inlet Air Flowrate Measurement Ring	4								4	4	HIGH LIMIT ALARM, LOW LIMIT ALARM - REFER TO SEQUENCE	Y	VARIES	<___>	INFO
Outside Air Damper Position Feedback (NOTE 3)	1								1	1	DAMPER POSITION DOES NOT MATCH COMMANDED POSITION	Y	~	0-100%	INFO
Return Air Damper Position Feedback (NOTE 3)	1								1	1	DAMPER POSITION DOES NOT MATCH COMMANDED POSITION	Y	~	0-100%	INFO
Relief Air Damper Position Feedback (NOTE 3)	1								1	1	DAMPER POSITION DOES NOT MATCH COMMANDED POSITION	Y	~	0-100%	INFO
Room Temp (NOTE 3)	1								1	1	HIGH LIMIT ALARM, LOW LIMIT ALARM - REFER TO SEQUENCE	Y	~	<___>	INFO
Freezestat Switch Status (NOTE 3)			1						1	1	LOW LIMIT ALARM	Y	35 DEG. F.	OPEN/CLOSED	INFO
Freezestat Switch Auto Reset				1					1		~	Y	~	OPEN/CLOSED	~
Supply Air Temp (NOTE 3)	1								1	1	HIGH LIMIT ALARM, LOW LIMIT ALARM - REFER TO SEQUENCE	Y	~	<___>	INFO
Return Air Temp (NOTE 3)	1								1	1	HIGH LIMIT ALARM, LOW LIMIT ALARM - REFER TO SEQUENCE	Y	~	<___>	INFO
Mixed Air Temp (NOTE 3)	1								1	1	HIGH LIMIT ALARM, LOW LIMIT ALARM - REFER TO SEQUENCE	Y	~	<___>	INFO
Supply Air Temp Setpoint (NOTE 3)					1						~	Y	54 DEG. F.	<___>	~
Mixed Air Temp Setpoint (NOTE 3)					1						~	Y	SEE SEQUENCE	<___>	~
Room Temp Setpoint (NOTE 3)					1				1		~	Y	70 DEG. F.	<___>	~
VFD Supply Fan Status					4				4	4	VFD COMMAND IS ON, BUT VFD STATUS IS OFF	Y	~	ON/OFF	CRIT
VFD Relief Fan Status					4				4	4	VFD COMMAND IS ON, BUT VFD STATUS IS OFF	Y	~	ON/OFF	CRIT
VFD Suppply Fan Speed/Current					4				4		~	Y	~	0-100%	~
VFD Relief Fan Speed/Current					4				4		~	Y	~	0-100%	~
VFD Supply Fan Instantaneous Power (kW)					4				4		~	Y	~	<___>	~
VFD Relief Fan Instantaneous Power (kW)					4				4		~	Y	~	<___>	~
VFD Supply Fan Alarm/Failure			4						4	4	STATUS IS "ALARM"	Y	~	NORMAL/ALARM	INFO
VFD Relief Fan Alarm/Failure			4						4	4	STATUS IS "ALARM"	Y	~	NORMAL/ALARM	INFO
Supply Air Smoke Detector Status (NOTE 6)			1						1	1	STATUS IS "ALARM"	Y	~	NORMAL/ALARM	INFO
432ACHPS01-4 & 432ACHPS02-5 & 432ACHPS04 (NOTE 2)															
Unit Enable Command						3		3	3		~	Y	~	ON/OFF	~
Unit Heat Lockout Command						3			3		~	Y	~	ON/OFF	~
Unit Cool Lockout Command						3			3		~	Y	~	ON/OFF	~
Occupancy Mode Command					3			3	3		~	Y	~	<___>	~
Economizer Enable Command					3				3		~	Y	~	ON/OFF	~
Supply Fan Start/Stop Command						3		3	3		~	Y	~	ON/OFF	~
Relief Fan Start/Stop Command						3		3	3		~	Y	~	ON/OFF	~
Supply Fan Speed Control Command					3			3	3		~	Y	~	0-100%	~
Relief Fan Speed Control Command					3			3	3		~	Y	~	0-100%	~
Smoke Detector Unit Shutdown (NOTE 4)				2							~	Y	~	ON/OFF	~
Pre-Filter Differential Pressure (NOTE 3)	2									3	DIFFERENTIAL PRESSURE EXCEEDS SETPOINT	Y	1.0" W.C.	<___>	CRIT
Final Filter Differential Pressure (NOTE 3)	2									3	DIFFERENTIAL PRESSURE EXCEEDS SETPOINT	Y	1.0" W.C.	<___>	CRIT
Outside Air Flowrate Measurement	1								1	1	LOW LIMIT ALARM CORRESPONDING TO MINIMUM OA	Y	REFER TO SCHED.	<___>	CRIT
VFD Suppply Fan Current Transducer (NOTE 3)	2								3	3	HIGH LIMIT ALARM - REFER TO SEQUENCE	Y	~	<___>	CRIT
VFD Relief Fan Current Transducer (NOTE 3)	2								3	3	HIGH LIMIT ALARM - REFER TO SEQUENCE	Y	~	<___>	CRIT
Supply Fan Inlet Airflow Measurement Ring	1								1	1	HIGH LIMIT ALARM, LOW LIMIT ALARM - REFER TO SEQUENCE	Y	REFER TO SCHED.	<___>	INFO
Relief Fan Inlet Airflow Measurement Ring	1								1	1	HIGH LIMIT ALARM, LOW LIMIT ALARM - REFER TO SEQUENCE	Y	VARIES	<___>	INFO
Room Temp (NOTE 3)	3								3	3	HIGH LIMIT ALARM, LOW LIMIT ALARM - REFER TO SEQUENCE	Y	~	<___>	INFO
Outside Air Temp (NOTE 5)	1								2		~	Y	~	<___>	~
Supply Air Temp					3				3	3	HIGH LIMIT ALARM, LOW LIMIT ALARM - REFER TO SEQUENCE	Y	~	<___>	INFO
Return Air Temp					3				3	3	HIGH LIMIT ALARM, LOW LIMIT ALARM - REFER TO SEQUENCE	Y	~	<___>	INFO
Supply Air Temp Setpoint					3				3		~	Y	54 DEG. F.	<___>	~
Room Temp Setpoint (NOTE 3)					3				3		~	Y	72 DEG. F.	<___>	~
Unit Economizer Minimum Position Command					3			3	3		~	Y	~	<___>	~
Unit Ecomomizer Minimum Position Setpoint					3				3		~	Y	~	<___>	~
Unit Status						3			3		~	Y	~	ON/OFF	~
Unit General Alarm						3			3	3	STATUS IS "ALARM"	Y	~	NORMAL/ALARM	INFO
Unit Run Fault						3			3	3	STATUS IS "ALARM"	Y	~	NORMAL/ALARM	INFO
Unit Current					3				3		~	~	~	<___>	~
Unit Instantaneous Power (kW)					3				3		~	Y	~	<___>	~
Unit Misc. Monitoring 1					3				3	3	FOR FUTURE USE AT OWNER'S DISCRETION	~	~	~	INFO
Unit Misc. Monitoring 2					3				3	3	FOR FUTURE USE AT OWNER'S DISCRETION	~	~	~	INFO
VFD Supply Fan Status					3				3	3	FAN COMMAND IS ON, BUT FAN STATUS IS OFF	Y	~	ON/OFF	CRIT
VFD Relief Fan Status					3				3	3	FAN COMMAND IS ON, BUT FAN STATUS IS OFF	Y	~	ON/OFF	CRIT
VFD Supply Fan Alarm/Failure			2			1			3	3	STATUS IS "ALARM"	Y	~	NORMAL/ALARM	INFO
VFD Relief Fan Alarm/Failure			2			1			3	3	STATUS IS "ALARM"	Y	~	NORMAL/ALARM	INFO
Supply Air Smoke Detector Status (NOTE 6)			1						1	1	STATUS IS "ALARM"	Y	~	NORMAL/ALARM	INFO
Outside Air Damper Failure						3			3	3	STATUS IS "ALARM"	Y	~	NORMAL/ALARM	INFO
Ecomomizer Failure						3			3	3	STATUS IS "ALARM"	Y	~	NORMAL/ALARM	INFO
MISCELLANEOUS															
Supply Air Smoke Detector to Fire Alarm (NOTE 3)	3									3	STATUS IS "ALARM"	Y	~	NORMAL/ALARM	CRIT
Optics Lab Purge Push Button Status			1						1		~	Y	~	ON/OFF	~
TOTALS	**44**	**13**	**16**	**15**	**75**	**32**	**0**	**40**	**185**	**102**					

Sheet Title
MECHANICAL CONTROL POINTS

Dwg. No.
PLM2021-0432-0036D

Sht. No.
M-705



C1 / M-801 **CHILLED WATER FLOW DIAGRAM**

SCALE: NO SCALE SHOWN

WATER COOLED CHILLED WATER SYSTEM WITH PRIMARY ONLY PUMPING SEQUENCE OF OPERATION

GENERAL:
432PCHW01-A1 AND 432PCHW02-A1 ARE 100% REDUNDANT AND MUST OPERATE IN LEAD/STANDBY CONFIGURATION. EQUIPMENT RUN-TIME OR OPERATOR SELECTION MUST DETERMINE ACTIVE LEAD PUMP.

MINIMUM ALLOWABLE CHILLED WATER FLOW THROUGH SYSTEM IS 95 GPM DUE TO MINIMUM FLOW REQUIREMENTS OF 432RCHS01-A1. FOR REFERENCE ONLY, SYSTEM SHALL OPERATE AT CONSTANT VOLUME (220 GPM).

CHILLED WATER PUMPS MUST BE MONITORED AND CONTROLLED BY THE DDC SYSTEM. 432RCHS01-1 CONTROL FUNCTIONS, SAFETY INTERLOCKS, ALARMS, AND MONITORED PARAMETERS MUST BE MADE AVAILABLE TO AND MONITORED BY THE DDC SYSTEM. THE DDC SYSTEM IS AN AUTOMATED LOGIC CONTROLLER.

CHILLER CONTROL:
DDC SYSTEM SHALL MONITOR THE STATUS OF THE CHILLER AND CHILLED WATER PUMPS AND INITIATE ENABLE/DISABLE COMMANDS TO EACH CHILLER AND PUMP. DDC SYSTEM SHALL ENABLE CHILLER AFTER LEAD CHILLED WATER PUMP STATUS PROVES ON.

THE FACTORY CHILLER CONTROL PANEL (CCP) MUST CONTROL CHILLER AND EXTERNAL CHILLER HEAD PRESSURE CONTROL VALVE TO SATISFY CHILLED WATER SUPPLY TEMPERATURE SETPOINT.

DDC SYSTEM MUST DISABLE CHILLER WHEN LEAD CHILLED WATER PUMP STATUS CHANGES TO OFF.

IF CHILLER IS COMMANDED TO RUN AND COMPRESSOR STATUS IS OFF AFTER A 30 SECOND (ADJ.) DELAY OR CHILLED WATER SUPPLY TEMPERATURE IS GREATER THAN CHILLED WATER SUPPLY TEMPERATURE SEPOINT PLUS 5 DEG. F. (ADJ.) FOR 4 MINUTES (ADJ.), AN ALARM MUST BE SENT TO THE DDC SYSTEM. AFTER A 300 SECOND (ADJ.) DELAY, LEAD CHILLER MUST BE COMMANDED OFF.

CHILLER CONTROL FUNCTIONS, MINIMUM RUNTIME, SAFETY INTERLOCKS, AND MAXIMUM STARTS PER HOUR MUST BE AS RECOMMENDED BY THE CHILLER MANUFACTURER DURING EQUIPMENT STARTUP.

CHILLER MUST AUTOMATICALLY DISABLE AFTER OPERATING AT OR BELOW 25% CAPACITY (CONFIRM GREATER THAN EQUIPMENT TURNDOWN) (ADJ.) FOR 15 MINUTES (ADJ.) CORRESPONDING LEAD CHILLED WATER PUMP MUST REMAIN RUNNING DURING LOW DEMAND, STATUS OF PUMP IS ACCORDING TO USER-DEFINED OPERATING SCHEDULE OR OPERATOR MANUAL START/STOP OVER BAS.

CHILLED WATER PUMP CONTROL:
THE LEAD CHILLED WATER PUMP MUST RUN ACCORDING TO A USER-DEFINED OPERATING SCHEDULE OR OPERATOR MANUAL START/STOP OVER BAS.

PUMP VARIABLE SPEED DRIVE MUST MAINTAIN CONSTANT FLOW (220 GPM) THROUGH SYSTEM BY OPERATING AT CONSTANT SPEED. SPEED CORRESPONDING TO CONSTANT FLOW SETPOINT (220 GPM) TO BE DETERMINED DURING TAB.

IF PUMP IS COMMANDED TO RUN AND COMMON DIFFERENTIAL PRESSURE TRANSDUCER DOES NOT INDICATE PROOF OF FLOW AFTER A 30 SECOND (ADJ.) DELAY, AN ALARM MUST BE SENT TO THE DDC SYSTEM. AFTER A 180 SECOND (ADJ.) DELAY, LEAD PUMP MUST BE COMMANDED OFF AND STANDBY PUMP MUST BECOME LEAD PUMP.

CHILLED WATER FREEZE PROTECTION:
WHEN OUTSIDE AIR TEMPERATURE IS LESS THAN 45 DEG. F. (ADJ.), ENABLE BOTH CHILLED WATER PUMPS. RUN BOTH PUMPS AT LOW SPEED (TO BE DETERMINED DURING TAB) UNTIL OUTSIDE AIR TEMPERATURE IS GREATER THAN 45 DEG. F. (ADJ.)

CONDENSER WATER FLOW CONTROL:
THE CONDENSER WATER FLOW CONTROL IS NOT MANAGED BY THE BAS SYSTEM. CHILLER CONTROLLER MUST COMMUNICATE DIRECTLY WITH EXTERNAL CONDENSER WATER CONTROL VALVE THAT IS ACTUATED BASED ON REFRIGERANT PRESSURE IN THE CIRCUIT MEASURED BY THE CHILLER. THIS VALVE MUST AUTOMATICALLY ADJUST CONDENSER WATER FLOW BASED ON REFRIGERANT PRESSURE.

THE CONDENSER SHALL HAVE A FLOW SWITCH WIRED DIRECTLY TO CHILLER. THE CHILLER MUST NOT BE ALLOWED TO START IF FLOW SWITCH DOES NOT INDICATE PROOF OF FLOW THROUGH THE CHILLER.

CONDENSER WATER FREEZE PROTECTION:
WHEN OUTSIDE AIR TEMPERATURE IS LESS THAN 45 DEG. F. (ADJ.), OPEN BYPASS 2-WAY CONTROL VALVE UNTIL OUTSIDE AIR TEMPERATURE IS GREATER THAN 45 DEG. F. (ADJ.)

EVAPORATOR WATER FLOW CONTROL:
THE CHILLED WATER FLOW MUST BE CONSTANT. EXISTING AND NEW 3-WAY ACU COIL CONTROL VALVES MUST MODULATE OPEN AND CLOSED IN RESPONSE TO ACU COMMAND FOR MORE OR LESS CHILLED WATER.

THE EVAPORATOR SHALL HAVE A FLOW SWITCH WIRED DIRECTLY TO CHILLER. THE CHILLER MUST NOT BE ALLOWED TO START IF FLOW SWITCH DOES NOT INDICATE PROOF OF FLOW THROUGH THE CHILLER.

CHILLED WATER PRESSURE/TEMPERATURE CONTROL:
THE CHILLED WATER SUPPLY TEMPERATURE MUST BE CONSTANT AT 43 DEG. F. (ADJ.)

THE MINIMUM SPEED ALLOWED BY THE CHILLED WATER PUMP MUST NOT PROVIDE LESS THAN THE MINIMUM REQUIRED FLOW THROUGH EITHER CHILLER, NOR MUST THE MINIMUM SPEED BE BELOW 30% OF PUMP DESIGN OPERATING SPEED.

MISCELLANEOUS MONITORING:
PUMP STATUS MUST BE MONITORED AT THE VFD AND BY THE DDC SYSTEM. VFD STATUS AND PUMP STATUS VIA DIFFERENTIAL PRESSURE TRANSDUCER IS REQUIRED.

CHILLER MONITORING POINTS SHALL BE PROVIDED FROM THE CCP.

EXISTING AIR HANDLING UNIT CONTROL VALVE:
EXISTING 3-WAY PNEUMATIC CONTROL VALVE FUNCTIONALITY TO REMAIN AS-IS.

NEW AIR HANDLING UNIT CONTROL VALVE: REFER TO M-703.

GENERAL NOTES

1. REFER TO M-001 FOR MECHANICAL ABBREVIATIONS, LEGEND, SYMBOLS, AND GENERAL NOTES.
2. REFER TO M-701 FOR CONTROLS ABBREVIATIONS, SYMBOL LEGEND, AND GENERAL NOTES.
3. COMPONENTS SHOWN HALF-TONE ON THIS DRAWING ARE ITEMS TO REMAIN; BOLD COMPONENTS ARE NEW.
4. REFER TO DETAIL F2 ON M-506 AND D5 ON M-504 FOR COMPLETE VALVE AND PIPELINE ACCESSORY DETAILS FOR NEW CHILLED WATER AND MAKEUP WATER SYSTEM COMPONENTS. CONTENT INCLUDED ON THIS DRAWING IS LIMITED TO ONLY THE PIPELINE ACCESSORIES THAT IMPACT SYSTEM FLOW.

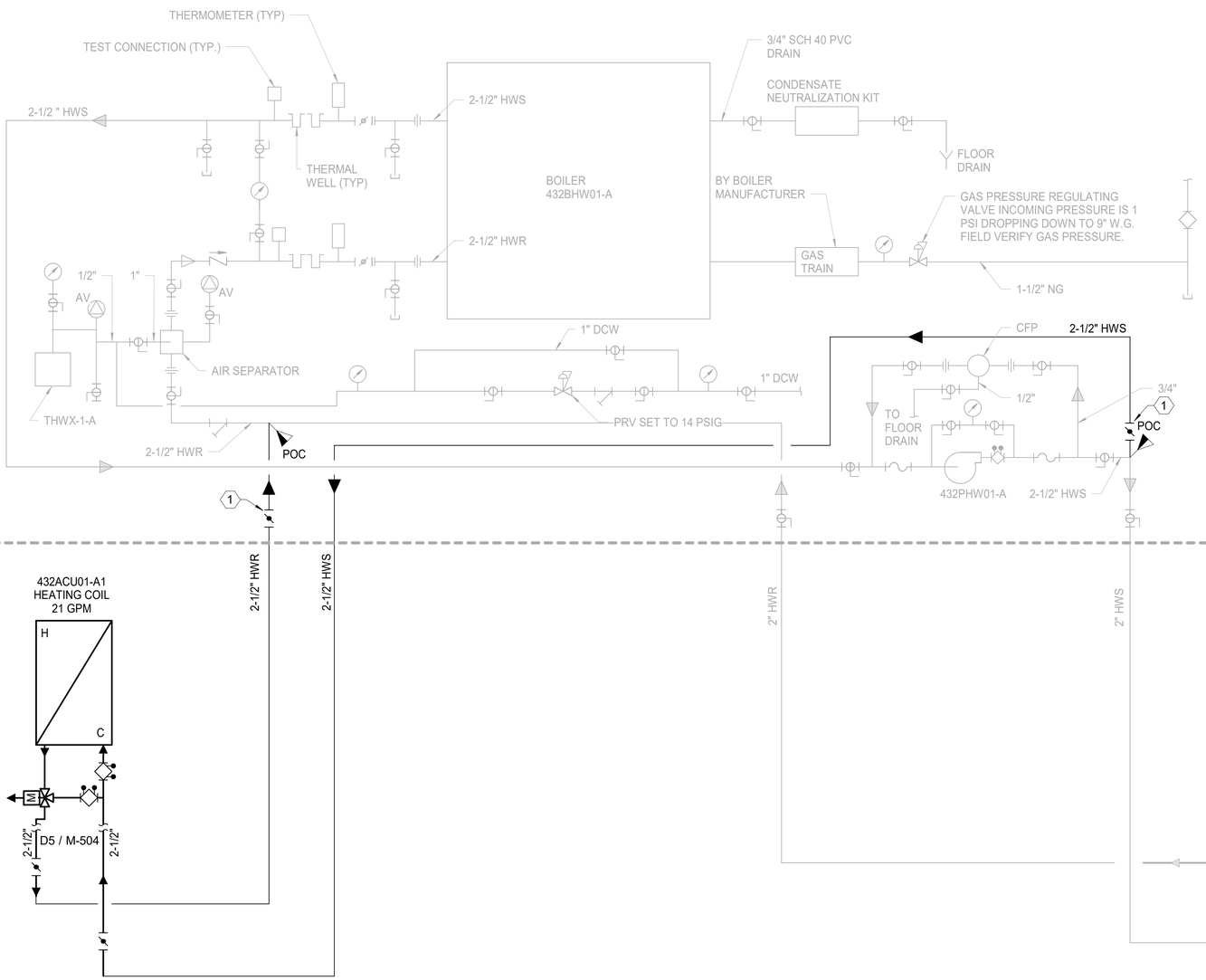
KEYED NOTES

1. INSTALL SELECT PIPING AND LINE-SIZE ISOLATION VALVES WITHIN FIRST SYSTEM SHUTDOWN AT BEGINNING OF CONSTRUCTION PROJECT. REFER TO M-002 AND M-413. WORK SHALL BE ACCOMPLISHED WITHOUT DRAINING FULL SYSTEM. FREEZING PIPE OR USING HOT TAP PIPE PLUG INSERTION SOLUTION IS ACCEPTABLE.
2. CW MAKEUP WATER CONNECTION TO CHILLED SYSTEM IS MADE AT NEW AIR SEPARATOR 432SDE01-1, NOT SHOWN ON THIS DIAGRAM FOR SIMPLICITY.
3. FUNCTIONALITY OF EXISTING PNEUMATIC CONTROL VALVE TO REMAIN AS-IS. EXISTING PNEUMATIC TUBING AND CENTRALIZED CONTROL COMPOMENTS SERVING EXISTING VALVE TO REMAIN AS-IS.

Sheet Title
MECHANICAL CHILLED WATER FLOW DIAGRAM

Dwg. No.
PLM2021-0432-0037D

Sht. No.
M-801



HEATING WATER SYSTEM WITH PRIMARY ONLY PUMPING SEQUENCE OF OPERATION

GENERAL:
BOILER AND HEATING WATER PUMP CONTROLS AND PROGRAMMING TO REMAIN AS IS. CONTROLS DESCRIPTION AND SEQUENCE OF OPERATION IS PROVIDED HERE FOR REFERENCE ONLY.

SYSTEM CONTROLS:
1. START/STOP, LEAVING WATER TEMPERATURE SETPOINTS, STATUS, AND FAULT CONTROL POINTS ARE PROVIDED.
2. ALL INTERNAL SAFETIES MUST BE CONTROLLED BY BOILER MANUFACTURER CONTROLLER.

BOILER:
UPON PROOF OF PUMP FLOW, THE BOILER MUST BE ENABLED. THE BOILER MUST BE COMMANDED TO START. THE BOILER MUST BE CONTROLLED BY THE NATIVE BOILER CONTROLLER TO MAINTAIN HOT WATER SUPPLY TEMPERATURE SETPOINT (ADJ.) THE HOT WATER SUPPLY TEMPLERATURE SETPOINT MUST BE RESET BASED UPON OUTSIDE AIR (OA) TEMPERATURE. WHEN OA TEMPERATURE IS 40 DEGREES OR LOWER THE SETPOINT MUST BE 140 DEGREES. WHEN OA TEMPERATURE IS 70 DEGREES OR HIGHER THE SETPOINT MUST BE 110 DEGREES. THE SETPOINT MUST BE RAMPED LINEARLY BETWEEN 140 DEGREES AND 110 DEGREES AT TEMPERATURES BETWEEN 40 DEGREES AND 70 DEGREES.

PUMP:
PUMP VFD MUST BE INTERLOCKED WITH BOILER. WHEN BOILER IS COMMANDED TO RUN THE PUMP MUST BE COMMANDED ON. PUMP MUST RUN AT CONSTANT FLOW. VFD IS FOR SOFT START AND BALANCING ONLY AS DETERMINED BY INITIAL TEST AND BALANCE. WHEN BOILER IS COMMANDED OFF THE PUMP MUST BE COMMANDED OFF.

EXISTING AIR HANDLING UNIT CONTROL VALVE:
EXISTING 3-WAY PNEUMATIC CONTROL VALVE FUNCTIONALITY TO REMAIN AS-IS.

NEW AIR HANDLING UNIT CONTROL VALVE:
REFER TO M-703.

E1 / M-802 **HEATING WATER FLOW DIAGRAM**
SCALE: NO SCALE SHOWN

GENERAL NOTES

1. REFER TO M-001 FOR MECHANICAL ABBREVIATIONS, LEGEND, SYMBOLS, AND GENERAL NOTES.
2. COMPONENTS SHOWN HALF-TONE ON THIS DRAWING ARE ITEMS TO REMAIN; BOLD COMPONENTS ARE NEW.
3. REFER TO DETAIL D5 ON M-504 FOR COMPLETE VALVE AND PIPELINE ACCESSORY DETAILS FOR NEW HEATING WATER COIL. CONTENT INCLUDED ON THIS DRAWING IS LIMITED TO ONLY THE PIPELINE ACCESSORIES THAT IMPACT SYSTEM FLOW.

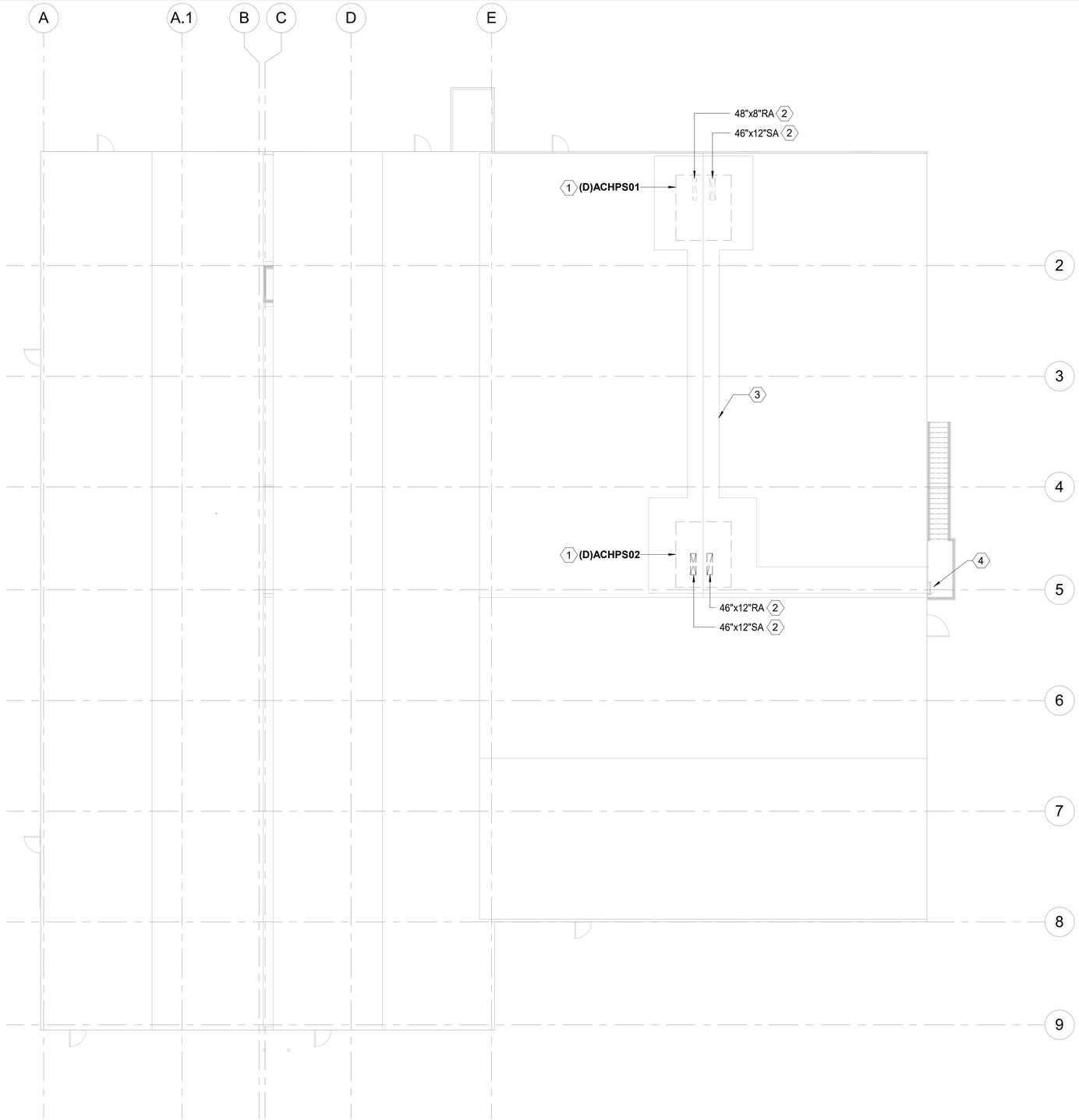
KEYED NOTES

1. INSTALL NEW BRANCH PIPING UP TO NEW BRANCH LINE-SIZE ISOLATION VALVES WITHIN FIRST SYSTEM SHUTDOWN AT BEGINNING OF CONSTRUCTION PROJECT TO FACILITATE INSTALLATION OF REMAINING NEW PIPING WITHOUT AN ADDITIONAL SHUTDOWN. REFER TO M-413. WORK SHALL BE ACCOMPLISHED WITHOUT DRAINING FULL SYSTEM. FREEZING PIPE OR USING HOT TAP PIPE PLUG INSERTION SOLUTION IS ACCEPTABLE.
2. FUNCTIONALITY OF EXISTING PNEUMATIC CONTROL VALVE TO REMAIN AS-IS. EXISTING PNEUMATIC TUBING AND CENTRALIZED CONTROL COMPOMENTS SERVING EXISTING VALVE TO REMAIN AS-IS.

Sheet Title
MECHANICAL HEATING WATER FLOW DIAGRAM

Dwg. No.
PLM2021-0432-0038D

Sht. No.
M-802



F1 MD120 **MECHANICAL DEMO ROOF PLAN**

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

0 8' 16' 24'

3/32" = 1'-0"

GENERAL NOTES

1. REFER TO M-001 FOR MECHANICAL ABBREVIATIONS, LEGEND, SYMBOLS, AND GENERAL NOTES.
2. COMPONENTS SHOWN DASHED ON THIS DRAWING ARE ITEMS TO BE DEMOLISHED; HALF-TONE COMPONENTS ARE EXISTING-TO-REMAIN.
3. PRIOR TO ANY DEMOLITION ACTIVITIES, SUBCONTRACTOR MUST COORDINATE WITH THE STR TO REVIEW FACILITY ES&H DOCUMENTS, EQUIPMENT TO BE REMOVED, MATERIALS TO BE REMOVED OR DISTURBED, AND IDENTIFY A PLAN PRIOR TO COMMENCING THE WORK. ITEMS TO REVIEW INCLUDE BUT ARE NOT LIMITED TO THE FOLLOWING: NEW WORK IN DISTURBING EXISTING WALLS, FLOORS, ROOFS, OR CEILINGS; ALL CUTTING OR DRILLING; ALL DEMOLITION; REMOVAL AND DISPOSAL.
4. CUT, REMOVE, AND LEGALLY DISPOSE OF ALL MECHANICAL ITEMS SELECTED FOR DEMOLITION AND ANY MECHANICAL ITEMS MADE OBSOLETE BY THE NEW WORK, INCLUDING EXISTING EQUIPMENT/PIPE/TUBE SUPPORTS AND HANGERS.

KEYED NOTES

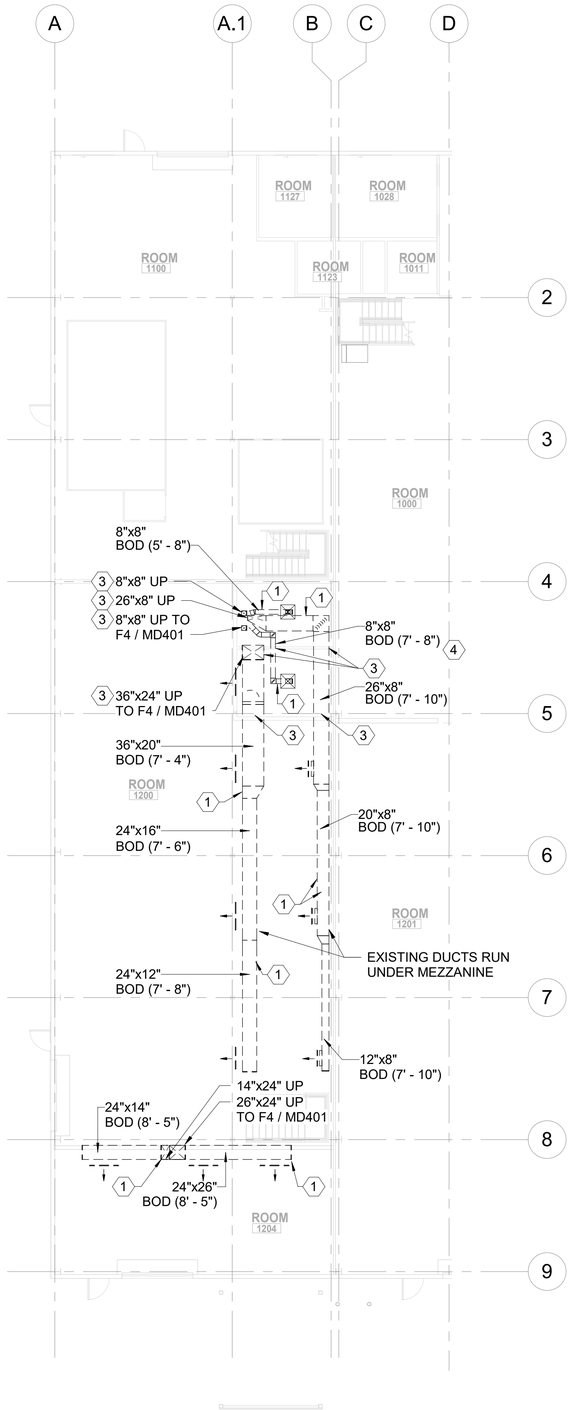
1. REMOVE AND DISPOSE OF EXISTING ROOFTOP AIR CONDITIONING UNIT, PIPING, DUCT AND UTILITY CONNECTIONS, SUPPORTS, ANCHORAGE, AND ALL APPURTENANCES. INFILL EXISTING ROOF OPENINGS EXPOSED BY REMOVAL OF ROOFTOP ACHPS UNIT AND SEAL WATER TIGHT PER ARCHITECTURAL AND STRUCTURAL DRAWINGS AND SPECIFICATIONS. REFER TO F3 / A-501 AND S-512.
2. REMOVE AND DISPOSE OF EXISTING DUCTWORK THROUGH ROOF TO OFFICE SPACE BELOW. REFER TO MD404 FOR CONTINUATION.
3. EXISTING ROOFTOP CATWALK, FLOOR GRATING, AND RAILINGS TO REMAIN.
4. EXISTING LADDER TO ROOF AND LADDER SUPPORTS TO REMAIN AS IS.

KEY PLAN

Sheet Title
MECHANICAL DEMOLITION ROOF PLAN

Dwg. No.
PLM2021-0432-0005D

Sht. No.
MD120

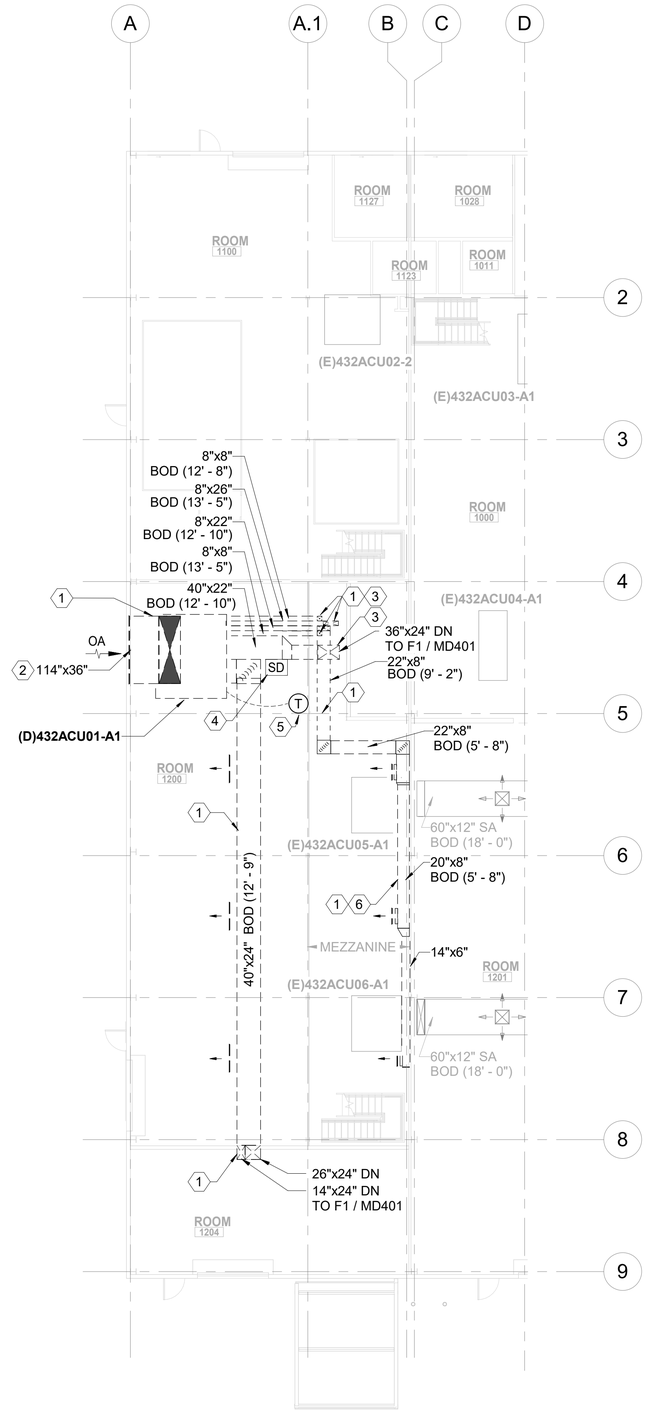


F1 MECHANICAL ENLARGED 1ST FLOOR OPTICS LAB DEMOLITION PLAN

MD401 SCALE: 3/32" = 1'-0"

0 8' 16' 24'

3/32" = 1'-0"



F4 MECHANICAL ENLARGED 2ND FLOOR OPTICS LAB DEMOLITION PLAN

MD401 SCALE: 3/32" = 1'-0"

0 8' 16' 24'

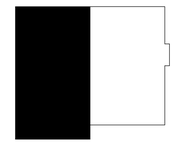
3/32" = 1'-0"

GENERAL NOTES

1. REFER TO M-001 FOR MECHANICAL ABBREVIATIONS, LEGEND, SYMBOLS, AND GENERAL NOTES.
2. COMPONENTS SHOWN DASHED ON THIS DRAWING ARE ITEMS TO BE DEMOLISHED; HALF-TONE COMPONENTS ARE EXISTING-TO-REMAIN.
3. PRIOR TO ANY DEMOLITION ACTIVITIES, SUBCONTRACTOR MUST COORDINATE WITH THE STR TO REVIEW FACILITY ES&H DOCUMENTS, EQUIPMENT TO BE REMOVED, MATERIALS TO BE REMOVED OR DISTURBED, AND IDENTIFY A PLAN PRIOR TO COMMENCING THE WORK. ITEMS TO REVIEW INCLUDE BUT ARE NOT LIMITED TO THE FOLLOWING: NEW WORK IN DISTURBING EXISTING WALLS, FLOORS, ROOFS, OR CEILINGS; ALL CUTTING OR DRILLING; ALL DEMOLITION; REMOVAL AND DISPOSAL.
4. CUT, REMOVE, AND LEGALLY DISPOSE OF ALL MECHANICAL ITEMS SELECTED FOR DEMOLITION AND ANY MECHANICAL ITEMS MADE OBSOLETE BY THE NEW WORK, INCLUDING EXISTING EQUIPMENT/PIPE/TUBE SUPPORTS AND HANGERS.
5. REFER TO STRUCTURAL AND CIVIL DRAWINGS FOR SITE DEMOLITION REQUIRED TO SUPPORT INSTALLATION OF NEW HVAC EQUIPMENT.
6. REMOVAL OF EXISTING SUSPENDED AIR CONDITIONING UNIT FROM ROOM WILL REQUIRE A DETAILED WORK PLAN DEVELOPED WITH INPUT FROM CONSTRUCTION MANAGER, SUBCONTRACTORS, AND FACILITY END-USERS. SUBCONTRACTOR MUST REVIEW EXISTING INSTALLATION AND DISCUSS ACCEPTABLE MEANS AND METHODS FOR REMOVAL WITH CONSTRUCTION MANAGER PRIOR TO BID. USAGE CONTINUITY OF END-USER LAB EQUIPMENT UNDER ACU WILL REQUIRE COMPLETE REMOVAL OF EXISTING ACU AND APPURTENANCES OVER A LONG WEEKEND, INCLUDE COSTS TO ACCOMPLISH THIS IN BID. CONSTRUCTION MANAGER TO COORDINATE TEMPORARY LAB EQUIPMENT REMOVAL

KEYED NOTES

1. REMOVE AND DISPOSE OF EXISTING, SUSPENDED AIR CONDITIONING UNIT, DUCTWORK CONNECTIONS, SUPPORTS, ANCHORAGE, AND ALL APPURTENANCES. REMOVE AND DISPOSE OF ALL SUPPLY, RETURN AND OUTDOOR AIR DUCTWORK INCLUDING: AIR TERMINALS, SUPPORTS, ANCHORAGE, CONROLS, AND APPURTENANCES ASSOCIATED WITH AIR CONDITIONING UNIT REMOVAL.
2. REMOVE AND DISPOSE OF EXISTING 114"x36" WALL-MOUNTED OUTSIDE AIR LOUVER. PREPARE EXISTING WALL OPENING TO RECEIVE NEW SUPPLY AND RETURN DUCTWORK PENETRATIONS PER M-401. SEAL WALL OPENING AROUND NEW DUCTWORK. REFER TO A-501 FOR WALL SEALING REQUIREMENTS.
3. INFILL WALL/CEILING PENETRATION AFTER DUCT REMOVAL. REFER TO A-501.
4. EXISTING DUCT SMOKE DETECTOR. RETAIN AND RE-INSTALL ON REPLACEMENT ACU SYSTEM. REFER TO M-404.
5. REMOVE AND DISPOSE OF EXISTING WALL-MOUNTED THERMOSTAT AND WIRING AND CONDUIT FROM DEVICE TO (D)432ACU01-A1. PATCH AND PAINT WALLS WHERE DEMOLITION RESULTS IN UNFINISHED CONDITION.
6. EXISTING DUCTWORK IS LOCATED BEHIND EXISTING AIR HANDLING UNITS ON MEZZANINE. DETERMINE MEANS AND METHODS FOR REMOVAL PRIOR TO BID.



KEY PLAN

Sheet Title

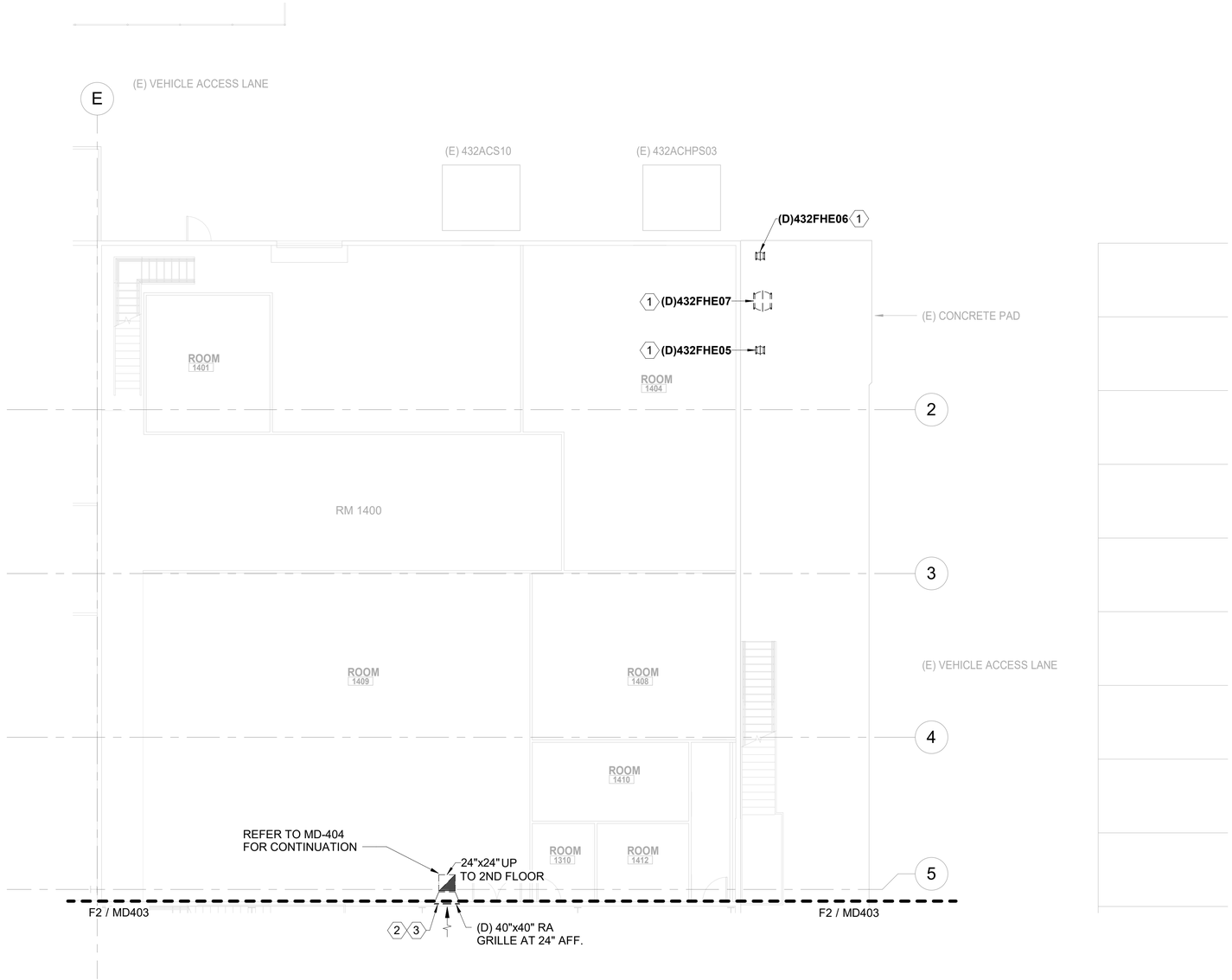
MECHANICAL ENLARGED 1ST AND 2ND FLOOR OPTICS LAB DEMOLITION PLANS - DUCTWORK

Dwg. No.

PLM2021-0432-0006D

Sht. No.

MD401



F2 MECHANICAL ENLARGED 1ST FLOOR NORTHEAST DEMOLITION PLAN - DUCTWORK

MD402

SCALE: 1/8" = 1'-0"

0 4' 8' 16'

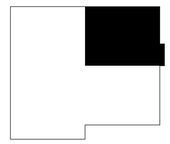
1/8" = 1'-0"

GENERAL NOTES

1. REFER TO M-001 FOR MECHANICAL ABBREVIATIONS, LEGEND, SYMBOLS, AND GENERAL NOTES.
2. COMPONENTS SHOWN DASHED ON THIS DRAWING ARE ITEMS TO BE DEMOLISHED; HALF-TONE COMPONENTS ARE EXISTING-TO-REMAIN.
3. PRIOR TO ANY DEMOLITION ACTIVITIES, SUBCONTRACTOR MUST COORDINATE WITH THE STR TO REVIEW FACILITY ES&H DOCUMENTS, EQUIPMENT TO BE REMOVED, MATERIALS TO BE REMOVED OR DISTURBED, AND IDENTIFY A PLAN PRIOR TO COMMENCING THE WORK. ITEMS TO REVIEW INCLUDE BUT ARE NOT LIMITED TO THE FOLLOWING: NEW WORK IN DISTURBING EXISTING WALLS, FLOORS, ROOFS, OR CEILINGS; ALL CUTTING OR DRILLING; ALL DEMOLITION; REMOVAL AND DISPOSAL.
4. CUT, REMOVE, AND LEGALLY DISPOSE OF ALL MECHANICAL ITEMS SELECTED FOR DEMOLITION AND ANY MECHANICAL ITEMS MADE OBSOLETE BY THE NEW WORK, INCLUDING EXISTING EQUIPMENT/PIPE/TUBE SUPPORTS AND HANGERS.

KEYED NOTES

1. REMOVE AND DISPOSE OF EXHAUST FAN, EXTERIOR INTAKE DUCTWORK TO WALL PENETRATION (MINIMUM OF 25FT, 18" DIAMETER), EXTERIOR VERTICAL DISCHARGE DUCTWORK TO ROOF (MINIMUM OF 40FT, 18" DIAMETER), SUPPORTS, ANCHORAGE, AND ALL APPURTENANCES. RETAIN EXISTING CONCRETE PAD.
2. REMOVE AND DISPOSE OF EXISTING GRILLE PENETRATION THROUGH WALL. INFILL WALL PENETRATION AND SEAL PER ARCHITECTURAL DRAWINGS AND SPECIFICATIONS. REFER TO A-501.
3. REMOVE AND DISPOSE OF EXISTING RETURN AIR DUCTWORK TO SECOND FLOOR INCLUDING: AIR TERMINALS, SUPPORTS, ANCHORAGE, AND APPURTENANCES.



KEY PLAN

Sheet Title

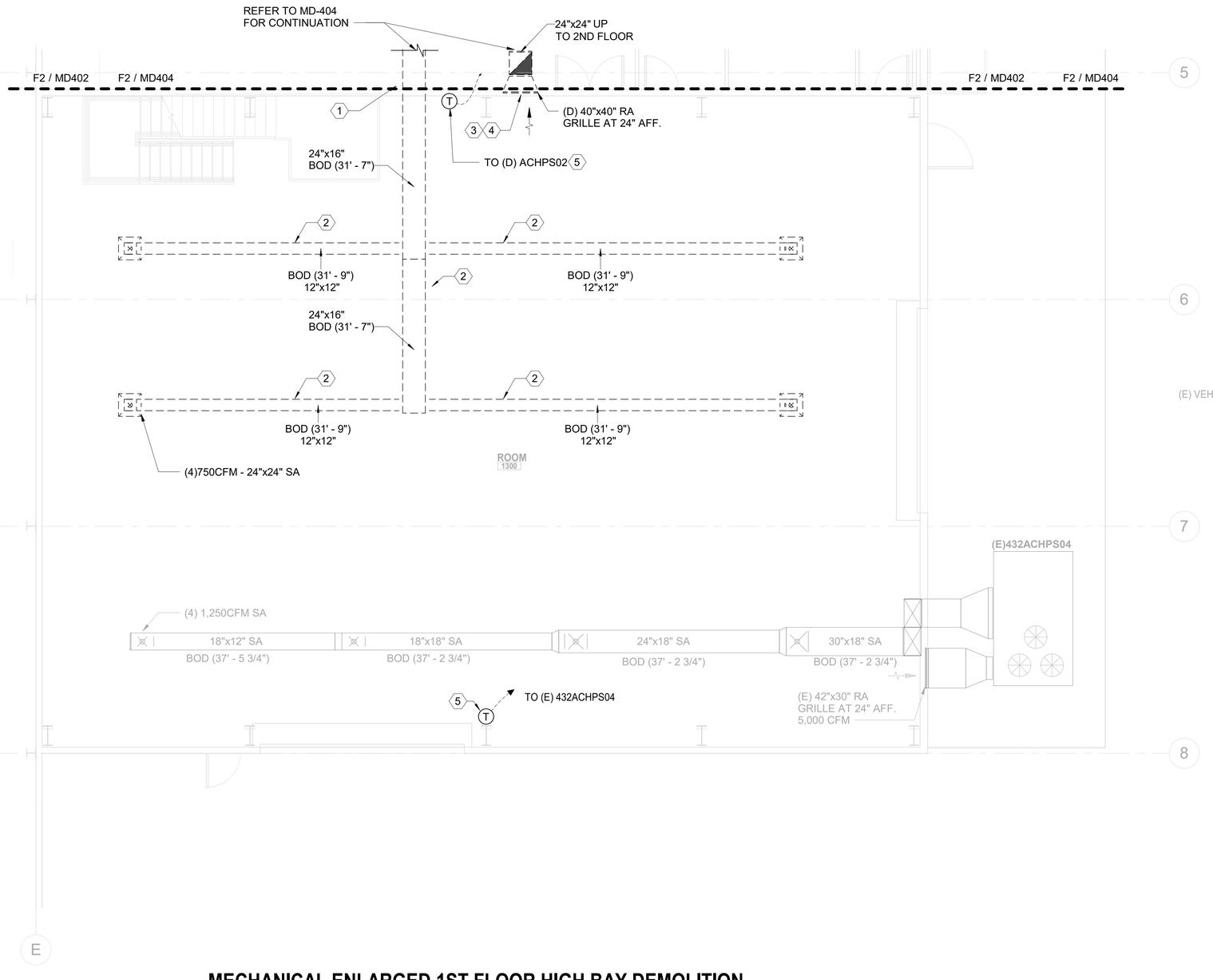
MECHANICAL ENLARGED 1ST FLOOR NORTHEAST DEMOLITION PLAN - DUCTWORK

Dwg. No.

PLM2021-0432-0007D

Sht. No.

MD402



GENERAL NOTES

1. REFER TO M-001 FOR MECHANICAL ABBREVIATIONS, LEGEND, SYMBOLS, AND GENERAL NOTES.
2. COMPONENTS SHOWN DASHED ON THIS DRAWING ARE ITEMS TO BE DEMOLISHED; HALF-TONE COMPONENTS ARE EXISTING-TO-REMAIN.
3. PRIOR TO ANY DEMOLITION ACTIVITIES, SUBCONTRACTOR MUST COORDINATE WITH THE STR TO REVIEW FACILITY ES&H DOCUMENTS, EQUIPMENT TO BE REMOVED, MATERIALS TO BE REMOVED OR DISTURBED, AND IDENTIFY A PLAN PRIOR TO COMMENCING THE WORK. ITEMS TO REVIEW INCLUDE BUT ARE NOT LIMITED TO THE FOLLOWING: NEW WORK IN DISTURBING EXISTING WALLS, FLOORS, ROOFS, OR CEILINGS; ALL CUTTING OR DRILLING; ALL DEMOLITION; REMOVAL AND DISPOSAL.
4. CUT, REMOVE, AND LEGALLY DISPOSE OF ALL MECHANICAL ITEMS SELECTED FOR DEMOLITION AND ANY MECHANICAL ITEMS MADE OBSOLETE BY THE NEW WORK, INCLUDING EXISTING EQUIPMENT/PIPE/TUBE SUPPORTS AND HANGERS.
5. REFER TO STRUCTURAL AND CIVIL DRAWINGS FOR SITE DEMOLITION REQUIRED TO SUPPORT INSTALLATION OF NEW HVAC EQUIPMENT.
6. NEW DUCTWORK MUST BE INSTALLED PRIOR TO DEMOLITION OF EXISTING DUCTWORK TO LIMIT DURATION OF SYSTEM OUTAGE. REFER TO M-403.

KEYED NOTES

1. REMOVE AND DISPOSE OF EXISTING DUCTWORK WALL PENETRATION. INFILL WALL PENETRATION AND SEAL PER ARCHITECTURAL DRAWINGS AND SPECIFICATIONS. REFER TO A-501.
2. REMOVE AND DISPOSE OF EXISTING SUPPLY AIR DISTRIBUTION DUCTWORK BELOW CEILING INCLUDING: AIR TERMINALS, SUPPORTS, ANCHORAGE, AND APPURTENANCES.
3. REMOVE AND DISPOSE OF EXISTING GRILLE PENETRATION THROUGH WALL. INFILL WALL PENETRATION AND SEAL PER ARCHITECTURAL DRAWINGS AND SPECIFICATIONS. REFER TO A-501.
4. REMOVE AND DISPOSE OF EXISTING RETURN AIR DUCTWORK TO SECOND FLOOR INCLUDING: AIR TERMINALS, SUPPORTS, ANCHORAGE, AND APPURTENANCES.
5. REMOVE AND DISPOSE OF EXISTING WALL-MOUNTED THERMOSTAT. REMOVE AND DISPOSE OF EXISTING THERMOSTAT, WIRING, AND CONDUIT FROM DEVICE TO ASSOCIATED ACHPS UNIT.

KEY PLAN

F2 MD403 MECHANICAL ENLARGED 1ST FLOOR HIGH BAY DEMOLITION PLAN - DUCTWORK

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

0 4' 8' 12

3/16" = 1'-0"

Sheet Title
MECHANICAL ENLARGED 1ST FLOOR HIGH BAY DEMOLITION PLAN - DUCTWORK

Dwg. No.
PLM2021-0432-0008D

Sht. No.
MD403

F2 MD404 MECHANICAL ENLARGED 2ND FLOOR OPEN OFFICE DEMOLITION PLAN - DUCTWORK

SCALE: 1/8" = 1'-0"

0 4' 8' 16'

1/8" = 1'-0"

GENERAL NOTES

1. REFER TO M-001 FOR MECHANICAL ABBREVIATIONS, LEGEND, SYMBOLS, AND GENERAL NOTES.
2. COMPONENTS SHOWN DASHED ON THIS DRAWING ARE ITEMS TO BE DEMOLISHED; HALF-TONE COMPONENTS ARE EXISTING-TO-REMAIN.
3. PRIOR TO ANY DEMOLITION ACTIVITIES, SUBCONTRACTOR MUST COORDINATE WITH THE STR TO REVIEW FACILITY ES&H DOCUMENTS, EQUIPMENT TO BE REMOVED, MATERIALS TO BE REMOVED OR DISTURBED, AND IDENTIFY A PLAN PRIOR TO COMMENCING THE WORK. ITEMS TO REVIEW INCLUDE BUT ARE NOT LIMITED TO THE FOLLOWING: NEW WORK IN DISTURBING EXISTING WALLS, FLOORS, ROOFS, OR CEILINGS; ALL CUTTING OR DRILLING; ALL DEMOLITION; REMOVAL AND DISPOSAL.
4. CUT, REMOVE, AND LEGALLY DISPOSE OF ALL MECHANICAL ITEMS SELECTED FOR DEMOLITION AND ANY MECHANICAL ITEMS MADE OBSOLETE BY THE NEW WORK, INCLUDING EXISTING EQUIPMENT/PIPE/TUBE SUPPORTS AND HANGERS.
5. NEW DUCTWORK MUST BE INSTALLED PRIOR TO DEMOLITION OF EXISTING DUCTWORK TO LIMIT DURATION OF SYSTEM OUTAGE. REFER TO M-402, M-405, AND M-407.

KEYED NOTES

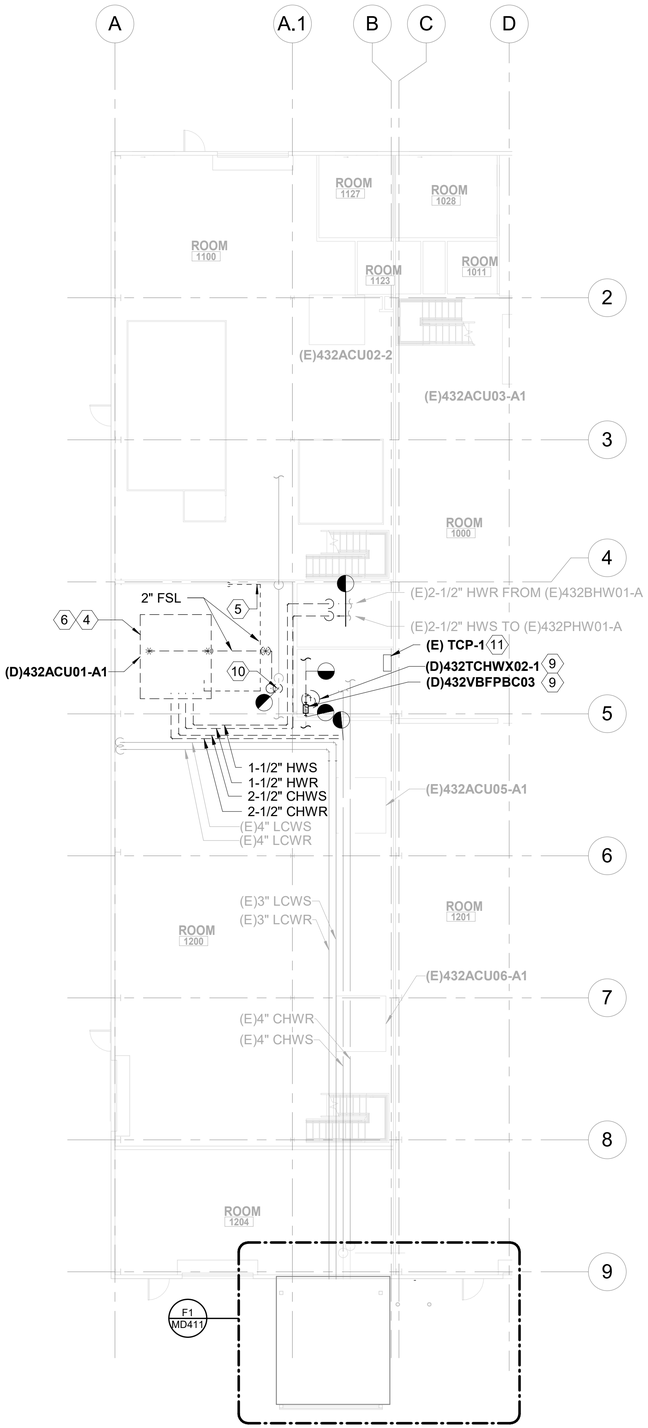
1. REMOVE AND DISPOSE OF EXISTING DUCTWORK THROUGH ROOF. INFILL EXISTING ROOF OPENINGS EXPOSED BY REMOVAL OF ROOFTOP ACHPS UNIT AND SEAL WATER TIGHT PER ARCHITECTURAL AND STRUCTURAL DRAWINGS AND SPECIFICATIONS. REFER TO F3 / A-501 AND S-512.
2. REMOVE AND DISPOSE OF EXISTING DISTRIBUTION DUCTWORK BELOW CEILING INCLUDING: AIR TERMINALS, SUPPORTS, ANCHORAGE, AND APPURTENANCES.
3. REMOVE AND DISPOSE OF EXISTING RETURN AIR PLENUM BELOW CEILING INCLUDING: AIR TERMINALS, SUPPORTS, ANCHORAGE, AND APPURTENANCES.
4. EXISTING DUCT SMOKE DETECTOR. RETAIN AND RE-INSTALL ON REPLACEMENT ACHPS SYSTEM. REFER TO M-403 AND M-405.
5. REMOVE AND DISPOSE OF WALL-MOUNTED THERMOSTAT AND WIRING AND CONDUIT FROM DEVICE TO ROOF-MOUNTED (D)ACHPS01. PATCH AND PAINT WALLS WHERE DEMOLITION RESULTS IN UNFINISHED CONDITION.

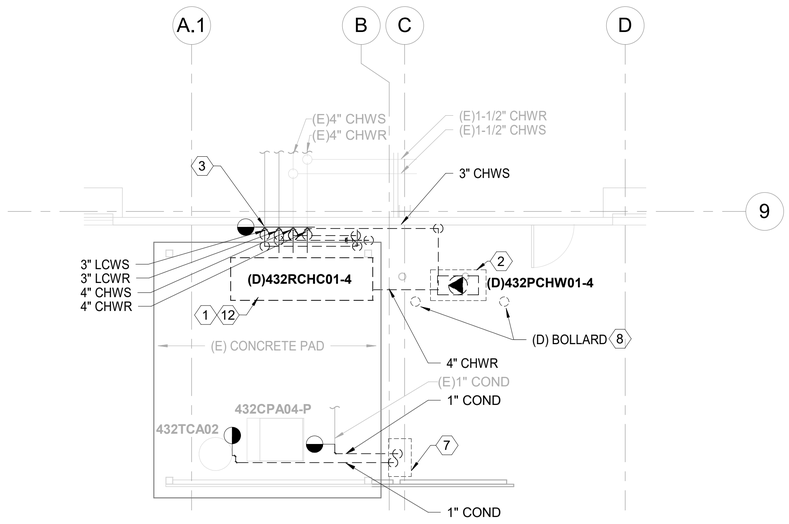
KEY PLAN

Sheet Title
MECHANICAL ENLARGED 2ND FLOOR OPEN OFFICE DEMOLITION PLAN - DUCTWORK

Dwg. No.
PLM2021-0432-0009D

Sht. No.
MD404





F1 MD411 **MECHANICAL ENLARGED 1ST FLOOR OPTICS LAB DEMOLITION PLAN - PIPING**

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

0 4' 8' 12'

3/16" = 1'-0"

F4 MD411 **MECHANICAL ENLARGED 2ND FLOOR OPTICS LAB DEMOLITION PLAN - PIPING**

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

0 8' 16' 24'

3/32" = 1'-0"

KEYED NOTES

7. REMOVE AND DISPOSE OF EXISTING CONDENSATE PUMP, ENCLOSURE, AND PIPING TO EXTENTS INDICATED AND PREPARE EXISTING PIPING TO BE CONNECTED TO REPLACEMENT CONDENSATE PUMP PER M-411.

8. REFER TO CIVIL CD101 FOR BOLLARD REMOVAL AND DISPOSAL.

9. REMOVE AND DISPOSE OF EXISTING CHILLED WATER EXPANSION TANK (432TCHWX02-1) AND BFP (432VBFPBC03) WITH PIPING, VALVING AND APPURTENANCES FROM TANK TO MAIN. EXISTING CHILLED WATER MAKEUP WATER CONNECTION, PRV, BACKFLOW PREVENTER, AND EXPANSION TANK MUST REMAIN CONNECTED TO CHILLED WATER SYSTEM WHILE TEMPORARY CHILLER IS IN OPERATION.

10. REMOVE AND DISPOSE OF APPROXIMATELY 50 FEET OF 2" FIRE SPRINKLER PIPING BELOW EXISTING SUSPENDED AIR HANDLING UNIT, THREE SPRINKLER HEADS, AND ALL APPURTENANCES FROM END OF PIPING BRANCH TO MAIN TEE TIE-IN AS NECESSARY TO ACCOMMODATE REMOVAL OF EXISTING ACU. CAP IMPACTED FSL BRANCHES FOR DURATION OF CONSTRUCTION. REFER TO M-413 FOR NEW FIRE SPRINKLER PIPING AND HEADS TO MATCH EXISTING LAYOUT AFTER NEW DUCTWORK IS INSTALLED IN THIS AREA.

11. REMOVE AND DISPOSE OF ALL EXISTING PNEUMATIC CONTROL DEVICES, WIRING, TUBING, CONDUIT, CONTROLLERS, AND APPURTENANCES SERVING EXISTING 432ACU01-A1 THROUGH TCP-1 IN BOILER ROOM MADE OBSOLETE BY PROJECT. RETAIN ALL PNEUMATICS CONTROLS CONNECTED TO TCP-1 SERVING EQUIPMENT NOT IN SCOPE. FIELD-VERIFY EXTENT OF DEMOLITION REQUIRED TO REMOVE OBSOLETE PNEUMATIC CONTROLS PRIOR TO BID.

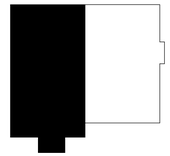
12. REMOVE AND DISPOSE OF ALL EXISTING PNEUMATIC CONTROL DEVICES, WIRING, TUBING, CONDUIT, CONTROLLERS, AND APPURTENANCES SERVING EXISTING 432RCHC01-4 MADE OBSOLETE BY PROJECT. RETAIN ALL PNEUMATICS CONTROLS SERVING EQUIPMENT NOT IN SCOPE, PARTICULARLY ANY PNEUMATIC CONTROLS REQUIRED FOR EXISTING TO REMAIN AIR HANDLING UNIT CONTROLS. FIELD-VERIFY EXTENT OF DEMOLITION REQUIRED TO REMOVE PNEUMATIC CONTROLS AND APPURTENANCES PRIOR TO BID.

GENERAL NOTES

1. REFER TO M-001 FOR MECHANICAL ABBREVIATIONS, LEGEND, SYMBOLS, AND GENERAL NOTES.
2. COMPONENTS SHOWN DASHED ON THIS DRAWING ARE ITEMS TO BE DEMOLISHED; HALF-TONE COMPONENTS ARE EXISTING-TO-REMAIN.
3. PRIOR TO ANY DEMOLITION ACTIVITIES, SUBCONTRACTOR MUST COORDINATE WITH THE STR TO REVIEW FACILITY ES&H DOCUMENTS, EQUIPMENT TO BE REMOVED, MATERIALS TO BE REMOVED OR DISTURBED, AND IDENTIFY A PLAN PRIOR TO COMMENCING THE WORK. ITEMS TO REVIEW INCLUDE BUT ARE NOT LIMITED TO THE FOLLOWING: NEW WORK IN DISTURBING EXISTING WALLS, FLOORS, ROOFS, OR CEILINGS; ALL CUTTING OR DRILLING; ALL DEMOLITION; REMOVAL AND DISPOSAL.
4. CUT, REMOVE, AND LEGALLY DISPOSE OF ALL MECHANICAL ITEMS SELECTED FOR DEMOLITION AND ANY MECHANICAL ITEMS MADE OBSOLETE BY THE NEW WORK, INCLUDING EXISTING EQUIPMENT/PIPE/TUBE SUPPORTS AND HANGERS.
5. REFER TO M-002 FOR INSTALLATION OF SELECT CHWS, CHWR, LCWS, & LCWR PIPING AND LINE-SIZE ISOLATION VALVES WITHIN FIRST SYSTEM SHUTDOWN AT BEGINNING OF CONSTRUCTION PROJECT TO ACCOMMODATE NEW CONSTRUCTION WORK.
6. REFER TO STRUCTURAL AND CIVIL DRAWINGS FOR SITE DEMOLITION REQUIRED TO SUPPORT INSTALLATION OF NEW HVAC EQUIPMENT.
7. PROVIDE LOCKOUT-TAGOUT PLAN FOR APPROVAL PRIOR TO DEMOLITION START.

KEYED NOTES

1. REMOVE AND DISPOSE OF EXISITING WATER COOLED CHILLER, ALL EXTERIOR PIPING (MINIMUM 170 FT), VALVING, SUPPORTS, ANCHORAGE, AND APPURTENANCES. REFER TO MD801 FOR ADDITIONAL REQUIREMENTS.
2. REMOVE AND DISPOSE OF EXISITING BASE-MOUNTED PUMP, ALL EXTERIOR PIPING, VALVES, ACCESSORIES, SUPPORTS, ANCHORAGE, AND APPURTENANCES. REMOVE AND DISPOSE OF EXISTING CONCRETE PUMP PAD.
3. RETAIN EXISTING CHW AND LCW PIPING PENETRATIONS THROUGH WALL FOR CONNECTION TO NEW EXTERIOR CHW AND LCW PIPING. PREPARE EXISTING INSULATION AND JACKETING TO BE COVERED BY NEW INSULATION AND JACKETING.
4. REMOVE AND DISPOSE OF AIR CONDITIONING UNIT CHILLED WATER PIPING, VALVING, UNIT CONNECTIONS, SUPPORTS, ANCHORAGE, AND ALL APPURTENANCES FROM UNIT TO CHW INTERFACE POINT INDICATED. WORK SHALL BE ACCOMPLISHED WITHOUT DRAINING FULL SYSTEM. FREEZING PIPE OR USING HOT TAP PIPE PLUG INSERTION SOLUTION IS ACCEPTABLE.
5. REMOVE AND DISPOSE OF EXISTING 2" CONDENSATE PIPING AND PIPE SUPPORTS BETWEEN ACU AND SURFACE DRAIN AS INDICATED.
6. REMOVE AND DISPOSE OF AIR CONDITIONING UNIT HEATING HOT WATER PIPING, VALVING, UNIT CONNECTIONS, SUPPORTS, ANCHORAGE, AND ALL APPURTENANCES FROM UNIT TO EXTENTS NECESSARY TO ACCOMMODATE NEW WORK SHOWN ON M-802. WORK SHALL BE ACCOMPLISHED WITHOUT DRAINING FULL SYSTEM. FREEZING PIPE OR USING HOT TAP PIPE PLUG INSERTION SOLUTION IS ACCEPTABLE.

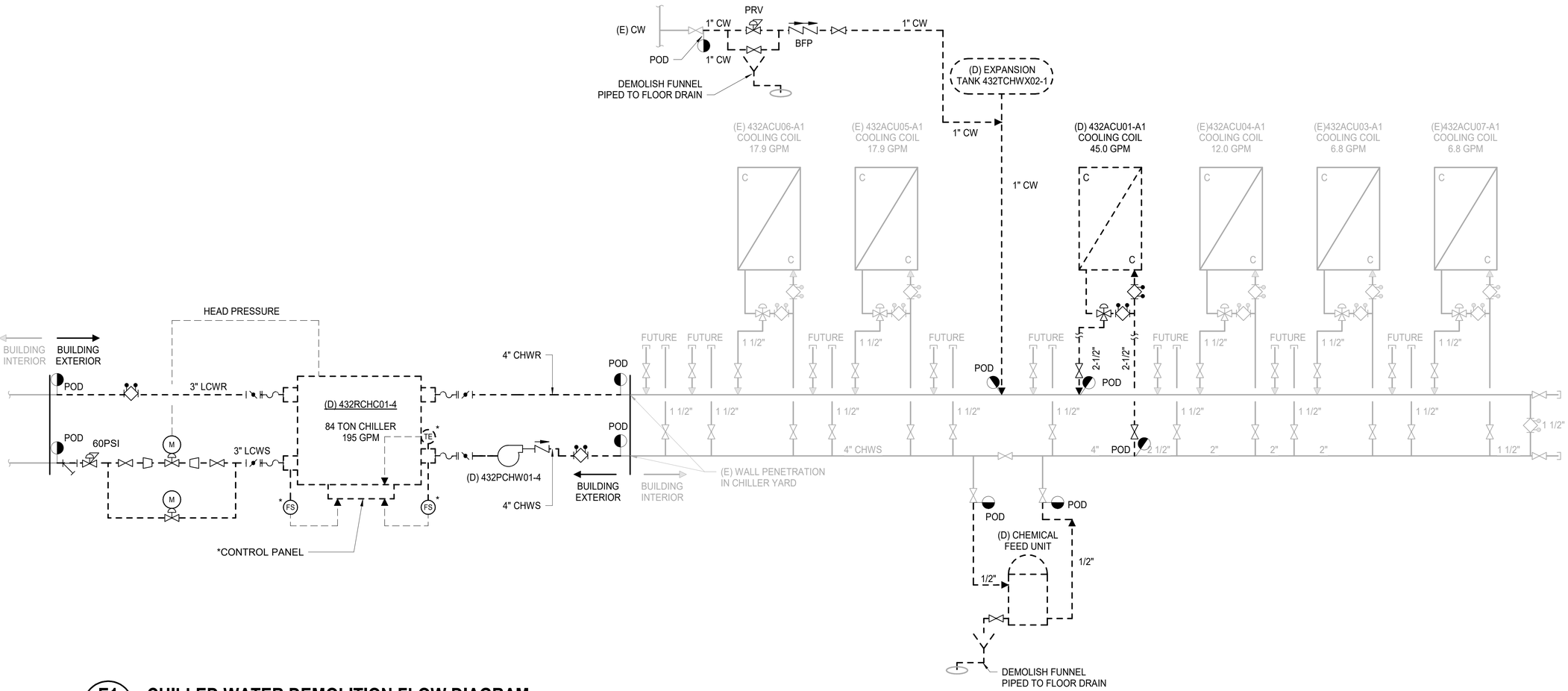


KEY PLAN

Sheet Title
MECHANICAL ENLARGED 1ST AND 2ND FLOOR OPTICS LAB DEMOLITION PLANS - PIPING

Dwg. No.
PLM2021-0432-0010D

Sht. No.
MD411



E1 CHILLED WATER DEMOLITION FLOW DIAGRAM

MD801

SCALE: NO SCALE SHOWN

GENERAL NOTES

1. REFER TO M-001 FOR MECHANICAL ABBREVIATIONS, LEGEND, SYMBOLS, AND GENERAL NOTES.
2. REFER TO M-701 FOR CONTROLS ABBREVIATIONS, SYMBOL LEGEND, AND GENERAL NOTES.
3. COMPONENTS SHOWN HALF-TONE ON THIS DRAWING ARE ITEMS TO REMAIN; DASHED COMPONENTS ARE TO BE DEMOLISHED.
4. DEMOLITION FLOW DIAGRAM IS SCHEMATIC IN NATURE. SUBCONTRACTOR MUST FIELD VERIFY CONDITIONS.
5. CAP EXISTING TO REMAIN OBSOLETE, ABANDONED BRANCH LINES DOWNSTREAM OF EXISTING BRANCH ISOLATION VALVE.
6. DEMOLITION WORK SHALL BE ACCOMPLISHED WITHOUT DRAINING FULL SYSTEM. FREEZING PIPE OR USING HOT TAP PIPE PLUG INSERTION SOLUTION IS ACCEPTABLE.
7. EXISTING CHILLED WATER MAKEUP WATER CONNECTION, PRV, BACKFLOW PREVENTER, AND EXPANSION TANK MUST REMAIN CONNECTED TO CHILLED WATER SYSTEM WHILE TEMPORARY CHILLER IS IN OPERATION.
8. COMMUNICATE VALVE FUNCTION TO CONSTRUCTION MANAGER AND RECEIVE APPROVAL FOR LOCKOUT-TAGOUT PRIOR TO DEMOLITION START.

Sheet Title
MECHANICAL CHILLED WATER DEMOLITION FLOW DIAGRAM

Dwg. No.
PLM2021-0432-0011D

Sht. No.
MD801

STRUCTURAL GENERAL NOTES:

1. GENERAL:
   A. THESE NOTES, AND OTHER DRAWING NOTES CONTAINED WITHIN, ARE PROVIDED TO MEET SPECIFIC REQUIREMENTS AND TO SUPPLEMENT THE CONTRACT SPECIFICATIONS. THESE NOTES NEITHER REPLACE NOR OVERRIDE THE PROVISIONS AND REQUIREMENTS OF THE CONTRACT SPECIFICATIONS.
   B. SUBCONTRACTOR SHALL COORDINATE ALL STRUCTURAL WORK WITH WORK SHOWN ON ALL OTHER DRAWINGS.
   C. VERIFY ALL DIMENSIONS OF EXISTING CONSTRUCTION AND REPORT ANY DISCREPANCIES FROM THE CONTRACT DRAWINGS TO SUBCONTRACTOR PRIOR TO COMMENCING WITH WORK. SCALING OF WORKING DIMENSIONS FROM THE STRUCTURAL DRAWINGS IS PROHIBITED.
   D. CONTRACT DRAWINGS AND SPECIFICATIONS REPRESENT THE FINISHED STRUCTURE. SUBCONTRACTOR IS RESPONSIBLE FOR MEANS AND METHODS OF CONSTRUCTION INCLUDING, BUT NOT LIMITED TO, SHORING AND TEMPORARY BRACING. UNDERTAKE ALL NECESSARY MEASURES TO ENSURE SAFETY OF ALL PERSONS AND STRUCTURES
   E. IF CERTAIN FEATURES ARE NOT FULLY SHOWN OR CALLED FOR ON THE CONTRACT DRAWINGS OR SPECIFICATIONS, THEIR CONSTRUCTION SHALL BE OF THE SAME CHARACTER AS FOR SIMILAR CONDITIONS THAT ARE SHOWN OR CALLED FOR, WITH THE APPROVAL OF THE ENGINEER . WHERE SECTIONS VARY, SUBCONTRACTOR SHALL PROVIDE FOR SMOOTH TRANSITIONS BETWEEN THEM, UNLESS NOTED OTHERWISE.
   F. ALL PRODUCTS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS' WRITTEN INSTRUCTIONS AND RECOMMENDATIONS, UNLESS NOTED OTHERWISE.
   G. ELEVATION +100' - 0" CORRESPONDS TO EXISTING GROUND FLOOR FINISH FLOOR ELEVATION.
   H. UNLESS SPECIFICALLY IDENTIFIED TO BE EXISTING (E) ELEMENTS, ALL ITEMS SHOWN IN THE STRUCTURAL DRAWINGS SHALL BE ASSUMED TO BE NEW CONSTRUCTION.

2. DESIGN STANDARDS
   A. PRINCIPAL CODE OF RECORD: CALIFORNIA BUILDING CODE 2019.
   B. ASCE 7, MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES, 2016.
   C. ACI 318, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE, 2014.
   D. AISC 325, STEEL CONSTRUCTION MANUAL, 15TH EDITION, 2017.
   E. AISC 360, SPECIFICATION FOR STRUCTURAL STEEL BUILDING, 2016.
   F. AISC 341, SEISMIC PROVISIONS FOR STRUCTURAL STEEL BUILDINGS, 2016.
   G. AISI COLD-FORMED STEEL DESIGN MANUAL, 2017 .

3. SPECIAL INSPECTIONS: SEE DRAWINGS S-003 & S-004.

4. DESIGN LOADS
   A. RISK CATEGORY: II
   B. COLLATERAL LOADS: 10 PSF ON ROOF AND ELEVATED FLOOR FRAMING TO ACCOUNT FOR SUSPENDED CEILINGS, DUCTWORK, PIPING INCLUDING FIRE PROTECTION, LIGHTING AND ELECTRICAL.
   C. LIVE LOADS
      1. FLOOR LIVE LOAD: 80 PSF OR A CONCENTRATED LOAD OF 2000 POUNDS UNIFORMLY DISTRIBUTED OVER AN AREA 2.5 FT SQUARE.
      2. ROOF LIVE LOAD: 20 PSF OR A CONCENTRATED LOAD OF 300 LBS UNIFORMLY DISTRIBUTED OVER AN AREA 2.5 FT SQUARE.
      3. FLOOR AND ROOF LIVE LOAD REDUCTION IS PERMITTED IN ACCORDANCE WITH 2019 CBC, SECTION 1607.11.
   D. EQUIPMENT LOADS
      1. AS INDICATED FOR EQUIPMENT WEIGHING IN EXCESS OF 300 LBS. FRAMING AND FOUNDATIONS ARE DESIGNED FOR EQUIPMENT WHICH SATISFIES THE CONTRACT SPECIFICATIONS.
      2. IF EQUIPMENT FURNISHED IS HEAVIER THAN THE WEIGHTS INDICATED, OR REQUIRES STRUCTURAL CHANGES FOR ANY OTHER REASON, SUBCONTRACTOR SHALL PROVIDE ENGINEERING DESIGN CALCULATIONS AND ADDITIONAL STRUCTURAL WORK NECESSARY TO SUPPORT ALL LOADS IN ACCORDANCE WITH THE DESIGN STANDARDS SPECIFIED ABOVE, AT NO ADDITIONAL COST TO BURNS AND MCDONNELL AND WITH NO INCREASE IN CONTRACT TIME.
   A. WIND LOADS
      1. BASIC DESIGN WIND SPEED: 95 MPH 3-SECOND GUST.
      2. NOMINAL DESIGN WIND SPEED: 95 MPH 3-SECOND GUST.
      3. EXPOSURE CATEGORY: C.
      4. BUILDING CONDITION: ENCLOSED, GCpi = 0.18.
      5. TOPOGRAPHIC FACTOR: 1.0.
   F. EARTHQUAKE LOADS
      1. MAPPED SPECTRAL RESPONSE ACCELERATION PARAMETERS Ss = 1.936, S1 = 0.627.
      2. SITE CLASS: D.
      3. DESIGN SPECTRAL RESPONSE ACCELERATION PARAMETERS Sds = 1.549, Sd1 = NA.
      4. SEISMIC DESIGN CATEGORY: D
      5. IMPORTANCE FACTOR: 1.0.

5. EXISTING BUILDING NOTES
   A. SOME WORK OCCURS INSIDE OR ADJACENT TO AN EXISTING FACILITY.
      1. SUBCONTRACTOR SHALL COORDINATE ALL WORK INSIDE OR ADJACENT TO EXISTING FACILITIES WITH SUBCONTRACTOR TO SCHEDULE TIMES THAT WILL NOT AFFECT PRODUCTION INSIDE THE FACILITY.
      2. SUBCONTRACTOR SHALL LIMIT ACTIVITIES THAT MAY CAUSE DISRUPTION TO PRODUCTION INSIDE THE EXISTING FACILITY.
   B. SUBCONTRACTOR SHALL VERIFY THE LOCATIONS, ELEVATIONS, AND DIMENSIONS OF EXISTING STRUCTURE AND REPORT ANY DISCREPANCIES TO THE ENGINEER.
   C. WHEN PERFORMING WORK ACTIVITIES NEAR OWNER'S PROPERTY TO REMAIN, SUBCONTRACTOR SHALL INSTALL PLASTIC SHEETING OR OTHER MATERIALS TO PROTECT THE OWNER'S PROPERTY FROM FLYING DEBRIS OR SPRAYS. REMOVE DRY, WET, OR HARDENED DEBRIS, SPRAY AND STAINS FROM OWNER'S PROPERTY.
   D. CONFIRM THE INSTALLATION AND/OR ERECTION OF NEW CONSTRUCTION WILL NOT BE IMPEDED OR OBSTRUCTED BY EXISTING CONSTRUCTION.
   E. COORDINATE ANY OBSTRUCTION WITH THE SUBCONTRACTOR PRIOR TO STARTING WORK.

6. GENERAL DEMOLITION NOTES
   A. CONTRACT DRAWINGS REPRESENT THE FINISHED STRUCTURE. SUBCONTRACTOR SHALL BE RESPONSIBLE FOR ALL MEANS AND METHODS OF DEMOLITION INCLUDING, BUT NOT LIMITED TO, SHORING AND TEMPORARY BRACING, TEMPORARY BARRIERS AND WALLS, DUST CONTROL, DEBRIS CONTAINMENT, CLEAN UP AND DISPOSAL.
   B. PRIOR TO BEGINNING WORK, SUBCONTRACTOR SHALL VISIT THE SITE TO OBSERVE AND REVIEW SPECIFIC SITE CONDITIONS, REQUIREMENTS FOR EQUIPMENT AND TO REVIEW METHODS OF OWNER.
   C. SUBCONTRACTOR SHALL SUBMIT A DETAILED DEMOLITION PLAN TO THE ENGINEER AND OWNER BEFORE STARTING WORK. THIS PLAN SHOULD INCLUDE, BUT NOT BE LIMITED TO, SEQUENCE OF DEMOLITION METHODS AND EQUIPMENT TO BE USED, DISPOSAL PLAN, SAFETY PLAN AND MEANS TO PROTECT OWNER'S PROPERTY TO REMAIN.
   D. SUBCONTRACTOR SHALL COORDINATE THE DEMOLITION SCHEDULE WITH THE OWNER. THE EXISTING BUILDING IS OCCUPIED AND IN USE. DEMOLITION ACTIVITIES SHALL BE COORDINATED WITH OWNER'S OPERATION OF THE EXISTING BUILDING.
   E. WHEN PERFORMING DEMOLITION ACTIVITIES NEAR OWNER'S PROPERTY TO REMAIN, INSTALL PLASTIC SHEET AND/OR OTHER MATERIALS TO PROTECT OWNER'S PROPERTY FROM FLYING DEBRIS. REMOVE DEBRIS AND STAINS FROM OWNER'S PROPERTY.
   F. SUBCONTRACTOR SHALL PROTECT ADJACENT CONSTRUCTION TO REMAIN DURING DEMOLITION ACTIVITIES. ANY DAMAGE SHALL BE REPAIRED OR REMOVED AND REPLACED IN KIND TO THE OWNER'S SATISFACTION AT NO ADDITIONAL COST TO THE OWNER.
   G. SUBCONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND ELEVATIONS OF EXISTING CONSTRUCTION AND REPORT ANY DISCREPANCIES FROM THE EXISTING CONTRACT OR REFERENCE DRAWINGS PRIOR TO COMMENCING WITH WORK.

7. MATERIALS: SEE THE CONTRACT SPECIFICATIONS FOR COMPLETE REQUIREMENTS AND COMPLY WITH ALL APPLICABLE OSHA REGULATIONS
   A. REINFORCED CONCRETE: (SECTIONS 03 10 00, 03 20 00, 03 30 00)
      1. PREPARE AND PLACE REINFORCED CONCRETE IN ACCORDANCE WITH ACI MANUAL OF CONCRETE PRACTICE AS MODIFIED BY CONTRACT DOCUMENTS.
      2. CONCRETE
         a. UNLESS NOTED OTHERWISE: MINIMUM 28-DAY COMPRESSIVE STRENGTH f'c = 4000 PSI, NORMAL WEIGHT.
         b. SLABS ON GRADE: MINIMUM 28-DAY COMPRESSIVE STRENGTH f'c = 4000 PSI, NORMAL WEIGHT WITH A MINIMUM 28-DAY FLEXURAL STRENGTH OF 650 PSI.
         c. DO NOT AIR-ENTRAIN CONCRETE FOR INTERIOR SLABS WITH TROWEL FINISH.
      3. FORMWORK
         a. SUBCONTRACTOR SHALL BE RESPONSIBLE FOR DESIGN, ENGINEERING, STRUCTURAL ADEQUACY, AND CONSTRUCTION OF ALL CONCRETE FORMWORK IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS.
         b. COORDINATE ALL CONCRETE WORK WITH THE PLACEMENT OF PIPING, INSERTS, FLOOR DRAINS, AND OTHER EMBEDDED ITEMS INDICATED ON THE CONTRACT DRAWINGS OR IN THE CONTRACT SPECIFICATIONS.
         c. SLEEVE NEW OR EXISTING PIPING OR UTILITIES PASSING THROUGH NEW CONCRETE, UNLESS NOTED OTHERWISE. SEE OTHER DISCIPLINE DRAWINGS FOR SLEEVE DETAILS. PROVIDE MEASURES TO ENSURE THAT SLEEVES REMAIN FREE OF DEBRIS AND WATER DURING CONSTRUCTION.
         d. PROVIDE 3/4" CHAMFER STRIPS ON ALL EDGES OF EXPOSED CONCRETE, UNLESS NOTED OTHERWISE.
         e. FOOTINGS MAY BE EARTH-FORMED USING UNDISTURBED NATIVE SOIL PROVIDE MINIMUM EXCAVATION WITH 2" GREATER THAN INDICATED.
      4. REINFORCING STEEL
         a. BARS: ASTM A615 GRADE 60 , (ASTM A706 GRADE 60 FOR WELDING).
         b. WELDED WIRE REINFORCEMENT: ASTM A1064.
         c. REINFORCE ALL CONCRETE UNLESS SPECIFICALLY MARKED "NOT REINFORCED" OR "UNREINFORCED".
         d. DETAIL AND PLACE REINFORCEMENT IN ACCORDANCE WITH ACI SP-66, ACI 301, ACI 318, AND CRSI MANUAL OF STANDARD PRACTICE. DO NOT INSERT REINFORCEMENT INTO FRESH OR PARTIALLY HARDENED CONCRETE.
         e. PROVIDE MINIMUM CONCRETE CLEAR COVER OVER REINFORCEMENT AS FOLLOWS, UNLESS NOTED OTHERWISE.
            (1) CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH: 3".
            (2) CONCRETE EXPOSED TO EARTH OR WEATHER: #6 AND LARGER BARS - 2". OTHER REINFORCEMENT - 1 1/2".
            (3) CONCRETE NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND: SLABS AND WALLS - 3/4"; OTHER MEMBERS - 1 1/2".
         f. CONFORM EMBEDMENT AND LAP SPLICE LENGTHS TO TABLES AND DETAILS ON CONTRACT DRAWINGS, UNLESS NOTED OTHERWISE.
         g. PROVIDE ADDITIONAL REINFORCEMENT AT OPENINGS AND CORNER BARS AT INTERSECTING GRADE BEAMS, WALLS, AND CURBS IN ACCORDANCE WITH TYPICAL DETAILS ON CONTRACT DRAWINGS, UNLESS NOTED OTHERWISE.
         h. EPOXY GROUT: ASTM C881, TYPE IV, GRADE 2 OR 3, WITH EMBEDMENT TO DEVELOP YIELD STRENGTH OF BAR, UNLESS NOTED OTHERWISE.
      5. JOINTS
         a. LOCATE JOINTS AS INDICATED OR SPECIFIED, OR AS OTHERWISE APPROVED BY ENGINEER.
         b. CLEAN SURFACES OF HORIZONTAL AND VERTICAL CONSTRUCTION JOINTS OF LAITANCE TO EXPOSE CLEAN COARSE AGGREGATE SOLIDLY EMBEDDED IN MORTAR MIX. JUST PRIOR TO DEPOSITING CONCRETE, THOROUGHLY CLEAN AND WET SURFACE OF CONSTRUCTION JOINT.
         c. IN ADDITION, WHEN NEW CONCRETE IS PLACED AGAINST EXISTING CONCRETE, ADEQUATELY PREPARE SURFACE BY APPLYING BONDING AGENT.
         d. PROVIDE WATERSTOPS AT CONCRETE JOINTS WHERE INDICATED.
   B. STRUCTURAL STEEL (SECTION 05 12 00)
      1. FABRICATE AND ERECT STRUCTURAL STEEL IN ACCORDANCE WITH AISC STEEL CONSTRUCTION MANUAL, 15th EDITION AND AISC 303-2000 - CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES, AS MODIFIED BY CONTRACT DOCUMENTS.
      2. DESIGN AND PROVIDE TEMPORARY ERECTION BRACING AS REQUIRED, AND DO NOT REMOVE IT UNTIL ALL PERMANENT LATERAL LOAD-RESISTING ELEMENTS AND CONNECTIONS ARE COMPLETELY INSTALLED.
      3. WIDE FLANGE SHAPES AND TEES: ASTM A992, Fy = 50 KSI.
      4. OTHER SHAPES, PLATES, AND THREADED RODS
         a. ASTM A36, Fy = 36 KSI, UNLESS NOTED OTHERWISE.
         b. ASTM A572 GRADE 50, Fy = 50 KSI, WHERE INDICATED AS "(50)".
      5. SQUARE AND RECTANGULAR HOLLOW STRUCTURAL SECTIONS: ASTM A500 GRADE B. Fy = 46 KSI.
      6. ROUND HOLLOW STRUCTURAL SECTIONS: ASTM A500 GRADE B, Fy = 42 KSI.
      7. PIPE: ASTM A53 TYPE E OR S, GRADE B, Fy = 35 KSI.
      8. BOLTS
         a. 3/4" DIAMETER ASTM F3125 GRADE A325, UNLESS NOTED OTHERWISE.
         b. FRAMING CONNECTIONS: PRETENSIONED JOINTS WITH STANDARD HOLES. UNLESS NOTED OTHERWISE.
         c. BRACING CONNECTIONS: PRETENSIONED JOINTS WITH STANDARD HOLES. UNLESS NOTED OTHERWISE.
      9. WELDING: AWS D1.1 USING E70 ELECTRODE, WITH LOW HYDROGEN WHERE REQUIRED.
      10. ANCHOR RODS
         a. ASTM F1554 GRADE 36, UNLESS NOTED OTHERWISE.
         b. LOCATE ANCHOR RODS ACCURATELY, SET WITH TEMPLATES, AND SECURELY HOLD IN POSITION WHILE PLACING CONCRETE. PROTECT IN-PLACE ANCHOR RODS FROM CONSTRUCTION ACTIVITY.
         c. THE FOLLOWING ARE PROHIBITED WITHOUT EXPLICIT PRIOR APPROVAL IN WRITING FROM STRUCTURAL ENGINEER OF RECORD:
            A. INSERTING ANCHOR RODS INTO FRESH OR PARTIALLY HARDENED CONCRETE.
            B. SUBSTITUTING POST-INSTALLED ANCHORS WHERE EMBEDDED ANCHOR RODS ARE INDICATED.
            C. REPAIRING, REPLACING, OR MODIFYING INSTALLED ANCHOR RODS.

7. MATERIALS (CONTINUED):
   C. POST-INSTALLED ANCHORS
      1. POST-INSTALLED MECHANICAL ANCHORS
         a. STAINLESS STEEL MANUALLY EXPANDED WEDGE TYPE, UNLESS NOTED OTHERWISE.
         b. PROVIDE ANCHORS THAT HAVE BEEN TESTED AND ASSESSED IN ACCORDANCE WITH LATEST EDITION OF APPLICABLE ACCEPTANCE CRITERIA AND SUBMIT CORRESPONDING IC EVALUATION SERVICE REPORTS.
            1. MECHANICAL ANCHORS IN CONCRETE: ICC-ES AC193.
            2. EXPANSION ANCHORS IN MASONRY: ICC-ES AC01.
            3. PREDRILLED FASTENERS (SCREW ANCHORS) IN MASONRY: ICC-ES AC106.
      2. POST-INSTALLED ADHESIVE ANCHORS
         a. STAINLESS STEEL THREADED ROD WITH EPOXY OR HYBRID RESIN ADHESIVE AND CYLINDRICAL WIRE MESH SCREEN TUBE FOR INSTALLATION IN HOLLOW MASONRY, UNLESS NOTED OTHERWISE.
         b. DO NOT USE BULK-MIXED ADHESIVES. PROVIDE THREADED ROD COMPATIBLE WITH ADHESIVE AND ACCEPTABLE TO MANUFACTURER.
         c. PROVIDE ANCHORS AS ENTIRE SYSTEM INCLUDING, BUT NOT LIMITED TO MANUFACTURER'S PRINTED INSTRUCTIONS AS FURNISHED WITH ADHESIVE, ADHESIVE CARTRIDGE, MIXING NOZZLE, EXTENSION TUBE, DISPENSER, AND ALL REQUIRED EQUIPMENT FOR PROPERLY CLEANING DRILLED HOLE.
         d. PROVIDE ANCHOR SYSTEMS THAT HAVE BEEN TESTED AND ASSESSED IN ACCORDANCE WITH LATEST EDITION OF APPLICABLE ACCEPTANCE CRITERIA AND SUBMIT CORRESPONDING ICC EVALUATION SERVICE REPORTS.
            1. ADHESIVE ANCHORS IN CONCRETE: ICC-ES AC308.
            2. ADHESIVE ANCHORS IN MASONRY: ICC-ES AC58.
            3. ANCHORS IN UNREINFORCED MASONRY: ICC-ES AC60, REFER TO ARCHITECTURAL DRAWINGS FOR MISCELLANEOUS STEEL NOT INCLUDED IN STRUCTURAL DRAWINGS. INCLUDE MISCELLANEOUS STEEL IN SHOP DRAWINGS SUBMITTED FOR REVIEW AND APPROVAL.
      3. USE NON-PNEUMATIC, ROTARY HAMMER TOOLS WITH ANSI COMPLIANT NON-REBAR CUTTING DRILL BITS TO DRILL HOLES OF PROPER TOLERANCES. LOCATE EXISTING REBAR INCLUDING PRE-STRESSING AND POST-TENSIONING TENDONS USING NON-HAZARDOUS, NON-DESTRUCTIVE METHODS PRIOR TO DRILLING HOLES TO AVOID CUTTING OR DAMAGING EXISTING REBAR OR TENDONS. HOLES SHALL BE THOROUGHLY CLEANED PER MANUFACTURER'S WRITTEN RECOMMENDATIONS PRIOR TO INSTALLATION OF ANCHORAGES.
   D. BOLTED METAL FRAMING (STRUT SYSTEM)
      1. ALL B-LINE METAL FRAMING MATERIAL, FITTINGS, AND RELATED ACCESSORIES SHALL BE MANUFACTURED BY EATON CORPORATION.
      2. ALL MATERIAL IS TO BE DELIVERED TO THE JOB SITE IN ORIGINAL FACTORY PACKAGING.
      3. ALL CHANNEL MEMBERS SHALL BE FABRICATED FROM STRUCTURAL STEEL CONFORMING TO ASTM A-653, GRADE 33.
      4. ALL FITTINGS SHALL BE FABRICATED FROM STEEL CONFORMING TO ASTM A-575, A-576, A-36 OR A-635.
      5. EATON B-LINE COMPONENTS SHALL BE PRE-GALVANIZED STEEL WITH MINIMUM MILL GALVANIZED COATING DESIGNATION G90.
      6. EATON B-LINE NUTS SHALL BE CASE HARDENED STEEL AND SHALL HAVE TWO TOOTHED GROOVES IN THE TOP OF THE NUT TO ENGAGE THE INTURNED EDGES OF THE CHANNEL TO PREVENT ANY MOVEMENT OF THE BOLT AND NUT WITHIN THE FRAMING MEMBER. STANDARD NUTS SHALL CONFORM TO ASTM A1011 SS GR 33 (MATERIAL ONLY). SCREWS SHALL CONFORM TO SAE J429 GR (ALSO MEETS AND EXCEEDS ASTM A-307).
      7. THREADED HARDWARE SHALL BE ZINC PLATED IN ACCORDANCE WITH ASTM B633 SERVICE CLASS 1 (SC1). SERVICE CLASS 1 IS NOT AN ACCEPTABLE COATING FOR FITTINGS OR COMPONENTS OTHER THAN THREADED HARDWARE.
      8. WELDING SHALL BE IN ACCORDANCE WITH STRUCTURAL WELDING CODE - SHEET STEEL, AWS D1.3, BY THE AMERICAN WELDING SOCIETY.
      9. ALL NUTS AND BOLTS SHALL BE TIGHTENED TO THE FOLLOWING VALUES:

BOLT SIZE	TORQUE (FT-LBS)
1/4-20	6
5/16-18	11
3/8-16	19
1/2-13	50

8. DEFERRED SUBMITTALS ITEMS ANCHORED OR SUPPORTED BY STRUCTURE
   A. DESIGN RESPONSIBILITY: SUBCONTRACTOR TO DESIGN AND OBTAIN SEPARATE GOVERNING CODE AUTHORITY APPROVAL FOR THE FOLLOWING DEFERRED SUBMITTAL ITEMS:
      1. SEISMIC BRACING OF MECHANICAL PIPING AND DUCT SUPPORT
      2. SEISMIC BRACING OF ELECTRICAL CONDUIT SUPPORTS
      3. MECHANICAL FIRE PIPING SUPPORTS (GRAVITY AND SEISMIC).
   B. SHOP DRAWINGS AND STRUCTURAL CALCULATIONS: SUBMIT DESIGN PLANS, DETAILS, AND CALCULATIONS OF DEFERRED SUBMITTAL ITEMS SIGNED AND SEALED BY A REGISTERED STRUCTURAL ENGINEER IN THE STATE OF CALIFORNIA FOR ACCEPTANCE TO GOVERNING CODE AUTHORITY FOR APPROVAL PRIOR TO FABRICATION.
   C. DESIGN COMPONENTS FOR IMPOSED FORCES INCLUDING LATERAL RESTRAINT COMPLYING WITH APPLICABLE CODE, CONTRACT DOCUMENTS AND APPLICABLE PORTIONS OF AISI SPECIFICATIONS. IF BUILDING LATERAL RESISTING SYSTEM IS USED FOR LATERAL RESTRAINT, INDICATE LOAD PATHS TO BUILDING LATERAL RESISTING SYSTEM IN CALCULATIONS AND SHOW CONNECTION FORCES ON SHOP DRAWINGS. WHERE BUILDING PROVIDES VERTICAL SUPPORT, INDICATE LOADS AND LOAD PATHS TO BUILDING IN CALCULATIONS AND SHOW CONNECTION FORCES ON SHOP DRAWINGS.
   D. STABILIZING ELEMENTS AT CONNECTIONS TO STRUCTURAL MEMBERS: DESIGN CONNECTION TO DEFERRED SUBMITTAL ITEMS TO SUPPORTING STRUCTURE SUCH THAT TORSION IN SUPPORTING ELEMENTS IS AVOIDED WHEREVER POSSIBLE.
   E. PREFABRICATED STRUCTURAL ELEMENTS SHALL BE FABRICATED BY AN APPROVED FABRICATOR, WHO SHALL SUBMIT A CERTIFICATE OF COMPLIANCE TO THE BUILDING OFFICIAL AT THE COMPLETION OF FABRICATION STATING THAT THE WORK WAS PERFORMED IN ACCORDANCE WITH THE APPROVED CONSTRUCTION DOCMUMENTS.

Sheet Title
GENERAL NOTES

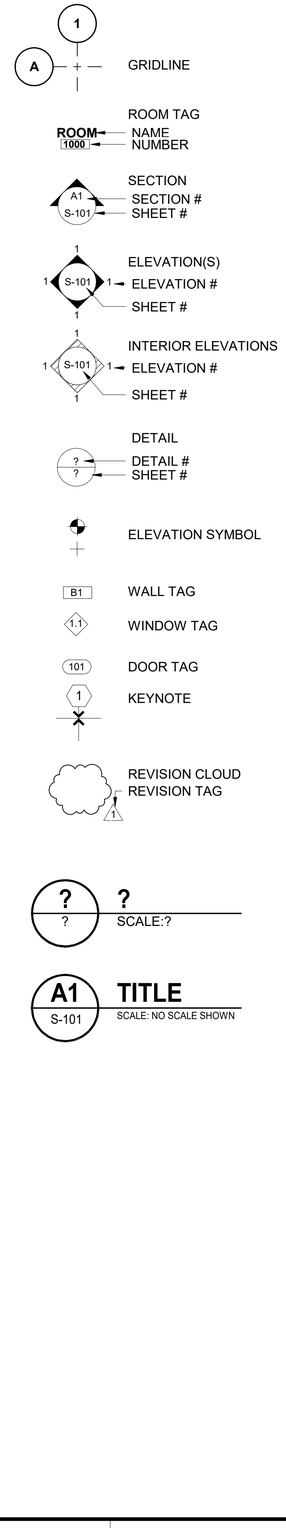
Dwg. No.
PLS2021-0432-0001D

Sht. No.
S-001

STRUCTURAL ABBREVIATIONS

#	NUMBER OR POUND(S)
%	PERCENT
&	AND
@	AT
AA	ALUMINUM ASSOCIATION
AB	ANCHOR BOLT
ACI	AMERICAN CONCRETE INSTITUTE
ADDL	ADDITIONAL
ADH	ADHESIVE
ADJ	ADJACENT
AFF	ABOVE FINISH FLOOR
AGGR	AGGREGATE
AHJ	AUTHORITY HAVING JURISDICTION
AHR	ANCHOR
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION
AISI	AMERICAN IRON AND STEEL INSTITUTE
ALT	ALTERNATE
ALUM	ALUMINUM
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
APPD	APPROVED
APPROX	APPROXIMATE
ARCH	ARCHITECT(URAL)
ASCE	AMERICAN SOCIETY OF CIVIL ENGINEERS
ASTM	ASTM INTERNATIONAL
AWS	AMERICAN WELDING SOCIETY
B/B	BACK TO BACK
BC	BOLT CIRCLE
BFF	BELOW FINISH FLOOR
BLDG	BUILDING
BLW	BELOW
BM	BEAM
BOS	BOTTOM OF STEEL
BOT	BOTTOM
BRCG	BRACING
BRDG	BRIDGING
BRG	BEARING
BTWN	BETWEEN
C	CHANNEL SHAPE
C TO C	CENTER TO CENTER
CAP	CAPACITY
CFS	COLD-FORMED STEEL
CHFR	CHAMFER
CIP	CAST-IN-PLACE
CIR	CIRCLE
CJ	CONSTRUCTION JOINT
CJP	COMPLETE JOINT PENETRATION
CL	CENTER LINE
CLJ	CONTROL JOINT
CLL	COLUMN LINE
CLR	CLEAR
CMPST	COMPOSITE
CMU	CONCRETE MASONRY UNIT
CNR	CORNER
COL	COLUMN
CONC	CONCRETE
CONN	CONNECTION
CONSTR	CONSTRUCTION
CONT	CONTINUOUS
CONTR	CONTRACTOR
COORD	COORDINATE
COTR	CONTRACTING OFFICER'S TECHNICAL REPRESENTATIVE
CPRS	COMPRESSIBLE
CRSI	CONCRETE REINFORCING STEEL INSTITUTE
CTJ	CONTRACTION JOINT
CTR	CENTER(ED)
CY	CUBIC YARD(S)
D	DEEP (DEPTH)
DBL	DOUBLE
DEG	DEGREE(S)
DEMO	DEMOLISH (DEMOLITION)
DET	DETAIL
DIA	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
DIR	DIRECTION
DIV	DIVISION
DK	DECK
DL	DEAD LOAD
DWG	DRAWING
DWL	DOWEL
E	EAST
EA	EACH
ED	EDGE DETAIL
EF	EACH FACE
EJ	EXPANSION JOINT
EL	ELEVATION
EL	EARTHQUAKE LOAD
ELEC	ELECTRICAL
ELEV	ELEVATOR
EMBED	EMBEDMENT
ENGR	ENGINEER
EOD	EDGE OF DECK
EOS	EDGE OF SLAB
EQ	EQUAL
EQUIP	EQUIPMENT
EQUIV	EQUIVALENT
ETC	AND SO FORTH
EW	EACH WAY
EXP	EXPANSION
EXST	EXISTING
EXT	EXTERIOR OR EXTERNAL
EXTN	EXTENSION
FAB	FABRICATE
FD	FLOOR DRAIN
FDTN	FOUNDATION
FF	FAR FACE
FIN	FINISH
FLG	FLANGE
FLR	FLOOR
FR	FRAME
FRMG	FRAMING
FRP	FIBER-REINFORCED POLYMER
FS	FAR SIDE
FT	FOOT (FEET)
FTG	FOOTING
FUT	FUTURE
GA	GAGE
GALV	GALVANIZE(D)
GB	GRADE BEAM
GC	GENERAL CONTRACTOR
GDR	GUARDRAIL
GEN	GENERAL
GOVT	GOVERNMENT
GR	GRADE
GRTG	GRATING
GT	GROUT
H	HIGH (HEIGHT)
HC	HOLLOW CORE
HGR	HANGER
HORIZ	HORIZONTAL
HP	BEARING PILE SHAPE
HPT	HIGH POINT
HS	HIGH STRENGTH
HSS	HOLLOW STRUCTURAL SECTION
I	MOMENT OF INERTIA
IBC	INTERNATIONAL BUILDING CODE
ID	INSIDE DIAMETER
IF	INSIDE FACE
IJ	ISOLATION JOINT
IN	INCH(ES)
INFO	INFORMATION
INT	INTERIOR
INV	INVERT
IR	INSIDE RADIUS
JST	JOIST
JT	JOINT
KB	KNEE BRACE
KIP	THOUSAND POUNDS
KLF	KIP(S) PER LINEAR FOOT
KPL	KICK PLATE
KSF	KIP(S) PER SQUARE FOOT
KSI	KIP(S) PER SQUARE INCH
L	ANGLE SHAPE OR LENGTH
LAD	LADDER
LBS	POUND(S)
LD	DEVELOPMENT LENGTH
LG	LONG
LL	LIVE LOAD
LLH	LONG LEG HORIZONTAL
LLO	LONG LEG OUTSTANDING
LLV	LONG LEG VERTICAL
LONG	LONGITUDINAL
LPT	LOW POINT
LSL	LONG-SLOT HOLE(S)
LTWT	LIGHTWEIGHT
MATL	MATERIAL
MAX	MAXIMUM
MBMA	METAL BUILDING MANUFACTURERS ASSOCIATION
MBS	METAL BUILDING SYSTEM
MC	MISCELLANEOUS CHANNEL SHAPE OR MOMENT CONNECTION
MECH	MECHANICAL
MEZZ	MEZZANINE
MFR	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
MSL	MEAN SEA LEVEL
MTL	METAL
N	NORTH
NA	NOT APPLICABLE
NAAMM	NATIONAL ASSOCIATION OF ARCHITECTURAL METAL MANUFACTURERS
NAVD	NORTH AMERICAN VERTICAL DATUM
NCMA	NATIONAL CONCRETE MASONRY ASSOCIATION
NE	NORTHEAST
NF	NEAR FACE OR NEAR FLANGE
NIC	NOT IN CONTRACT
NO	NUMBER
NOM	NOMINAL
NS	NEAR SIDE
NSFC	NOT SHOWN FOR CLARITY
NTS	NOT TO SCALE
NW	NORTHWEST
OC	ON CENTER
OD	OUTSIDE DIAMETER
OF	OUTSIDE FACE
OPH	OPPOSITE HAND
OPNG	OPENING
OPP	OPPOSITE
OR	OUTSIDE RADIUS
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
OVS	OVERSIZE HOLE(S)
PAR	PARALLEL
PCA	PORTLAND CEMENT ASSOCIATION
PCC	PRECAST CONCRETE
PCF	POUND(S) PER CUBIC FOOT
PCI	POUND(S) PER CUBIC INCH OR PRECAST/PRESTRESSED CONCRETE INSTITUTE
PED	PEDESTAL
PERP	PERPENDICULAR
PH	PHASE
PL	PLATE
PLBG	PLUMBING
PLC	PLACE(S)
PLF	POUND(S) PER LINEAR FOOT
PREFAB	PREFABRICATE(D)
PREP	PREPARATION
PS	PIPE SUPPORT
PSF	POUND(S) PER SQUARE FOOT
PSI	POUND(S) PER SQUARE INCH
PT	PRETENSIONED JOINT
PUR	PURLIN
PVC	POLYVINYL CHLORIDE
QA	QUALITY ASSURANCE
QC	QUALITY CONTROL
R	RADIUS OR RISER(S)
RD	ROOF DRAIN
REBAR	REINFORCING STEEL BAR(S)
REF	REFERENCE
REINF	REINFORCE(D)
REQD	REQUIRED
REV	REVISION
RF	ROOF
RM	ROOM
RST	REINFORCING STEEL
S	SECTION MODULUS OR SOUTH OR AMERICAN STANDARD BEAM SHAPE
SB	SHEAR BAR
SC	SLIP-CRITICAL JOINT
SCHED	SCHEDULE
SDI	STEEL DECK INSTITUTE
SE	SOUTHEAST
SECT	SECTION
SEI	STRUCTURAL ENGINEERING INSTITUTE
SF	SWAY FRAME
SHT	SHEET
SIM	SIMILAR
SJI	STEEL JOIST INSTITUTE
SLNT	SEALANT
SLO	SHORT LEG OUTSTANDING
SLV	SLEEVE
SP	SPACE(S)
SPEC	SPECIFICATION(S)
SQ	SQUARE
SSL	SHORT-SLOT HOLE(S)
SSMR	STANDING SEAM METAL ROOF
SST	STAINLESS STEEL
ST	SNUG-TIGHT JOINT
STD	STANDARD
STIF	STIFFENER
STIR	STIRRUP
STL	STEEL
STR	STRAIGHT
STRUCT	STRUCTURAL
SUB	SUBSTITUTE
SUPT	SUPPORT
SW	SOUTHWEST
SYMM	SYMMETRICAL
T	TON(S) OR TREAD(S)
T&B	TOP AND BOTTOM
TB	THROUGH BOLT
TD	TRENCH DRAIN
TEMP	TEMPORARY
THD	THREAD(ED)
THK	THICK(NESS)
THRU	THROUGH
TMS	THE MASONRY SOCIETY
TOC	TOP OF CONCRETE
TOM	TOP OF MASONRY
TOS	TOP OF STEEL
TOW	TOP OF WALL
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
VAR	VARIES
VB	VAPOR BARRIER
VERT	VERTICAL
VIF	VERIFY IN FIELD
VNR	VENEER
VR	VAPOR RETARDER
W	WEST OR WIDE (WIDTH) OR WIDE FLANGE SHAPE
W/	WITH
W/O	WITHOUT
WH	WEEP HOLE
WL	WIND LOAD
WLD	WELD(ED)
WP	WORKING POINT
WS	WATERSTOP
WT	WEIGHT OR WIDE FLANGE TEE SHAPE
WWR	WELDED WIRE REINFORCEMENT
X	EXTRA STRONG
XX	DOUBLE EXTRA STRONG

SYMBOL LEGEND



Sheet Title
LEGENDS & ABBREVIATIONS

Dwg. No.
PLS2021-0432-0002D

Sht. No.
S-002

GENERAL NOTES:

1. STATEMENT OF SPECIAL INSPECTIONS
   A. THIS "STATEMENT OF SPECIAL INSPECTIONS" HAS BEEN PREPARED IN ACCORDANCE WITH CBC 2019, SECTION 1704.
   B. SUBCONTRACTOR SHALL EMPLOY ONE OR MORE APPROVED AGENCIES TO PROVIDE SPECIAL INSPECTION AND TEST DURING CONSTRUCTION IN ACCORDANCE WITH CBC 2019, CHAPTER 17.
   C. EACH SPECIAL INSPECTOR SHALL BE A QUALIFIED PERSON WHO SHALL DEMONSTRATE COMPETENCE, TO THE SATISFACTION OF BURNS AND MCDONNELL FOR INSPECTION OF THE PARTICULAR TYPE OF CONSTRUCTION OR OPERATION REQUIRING SPECIAL INSPECTION.
   D. SPECIAL INSPECTION AGENCY SHALL SUBMIT INSPECTION REPORTS DURING CONSTRUCTION FOR VERIFICATION, INCLUDING FINAL REPORTS IN ACCORDANCE WITH CBC 2019, SECTION 1704.2.4.
   E. SPECIAL INSPECTOR SHALL USE THE LATEST ISSUE OF THE STRUCTURAL DRAWINGS FOR ALL INSPECTIONS. SHOP FABRICATION DRAWINGS SHALL NOT BE USED FOR SUCH PURPOSES.
   F. THE FOLLOWING TABLES IDENTIFY THE MATERIALS, SYSTEMS, AND COMPONENTS FOR WHICH SPECIAL INSPECTION IS REQUIRED.
2. TESTING REQUIREMENTS
   A. SUBCONTRACTOR SHALL EMPLOY ONE OR MORE APPROVED AGENCIES TO PROVIDE STRUCTURAL TESTING DURING CONSTRUCTION IN ACCORDANCE WITH CBC 2019, CHAPTER 17.
   B. TESTING AGENCY SHALL SUBMIT TEST RESULTS DURING CONSTRUCTION FOR VERIFICATION INCLUDING A FINAL REPORT IN ACCORDANCE WITHCBC 2019, 1704.2.4.
   C. THE TABLES BELOW IDENTIFY THE STRUCTURAL TESTS REQUIRED FOR THIS PROJECT.
3. STRUCTURAL OBSERVATIONS:
   A. SUBCONTRACTOR SHALL EMPLOY ONE OR MORE APPROVED THIRD-PARTY REGISTERED DESIGN PROFESSIONALS TO PROVIDE STRUCTURAL OBSERVATIONS DURING CONSTRUCTION IN ACCORDANCE WITH CBC 2019, CHAPTER 17.
   B. EACH STRUCTURAL OBSERVER SHALL SUBMIT WRITTEN STATEMENTS IDENTIFYING FREQUENCY AND EXTENT OF STRUCTURAL OBSERVATIONS AND ANY REPORTED DEFICIENCIES WHICH, TO THE BEST OF THE STRUCTURAL OBSERVER'S KNOWLEDGE, HAVE NOT BEEN RESOLVED.
3. STRUCTURAL OBSERVATIONS (CONTINUED):
   C. O = OBSERVE THESE ITEMS ON A RANDOM BASIS. OPERATIONS NEED NOT TO BE DELAYED PENDING THESE INSPECTIONS.
   D. P = PERFORM THESE TASKS FOR EACH JOINT OR MEMBER.
   E. QA = INSPECTION THAT THE WORK IS IN COMPLIANCE WITH THE CONSTRUCTION DOCUMENTS
   F. QC = INSPECTION THAT THE WORK IS PERFORMED IN ACCORDANCE WITH THE CONSTRUCTION DOCUMENTS
   G. ALL COSTS DUE TO SPECIAL INSPECTIONS IN ACCORDANCE WITH CBC 2019, TMS 402 AND AISC 360-2016 SHALL BE THE RESPONSIBILITY OF THE SUBCONTRACTOR. THIS INCLUDES ALL QC AND QA REQUIREMENTS INDICATED ON S-003 & S-004.
   H. QUALITY CONTROL: CONTROLS AND INSPECTIONS IMPLEMENTED BY THE FABRICATOR OR ERECTOR, AS APPLICABLE, TO ENSURE THAT THE MATERIAL PROVIDED AND WORK PERFORMED MEET THE REQUIREMENTS OF THE APPROVED CONSTRUCTION DOCUMENTS AND REFERENCED STANDARDS.
   I. QUALITY ASSURANCE: MONITORING AND INSPECTION TASKS PERFORMED BY AN AGENCY OR FIRM OTHER THAN THE FABRICATOR OR ERECTOR TO ENSURE THAT THE MATERIAL PROVIDED AND WORK PERFORMED BY THE FABRICATOR AND ERECTOR MEET THE REQUIREMENTS OF THE APPROVED CONSTRUCTION DOCUMENTS AND REFERENCED STANDARDS. QUALITY ASSURANCE INCLUDES THOSE TASKS DESIGNATED "SPECIAL INSPECTION" BY THE APPLICABLE BUILDING CODE.

CBC 2019 TABLE 1705.3 REQUIRED VERIFICATION AND INSPECTION OF CONCRETE CONSTRUCTION

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD	CBC REFERENCE
1. INSPECT REINFORCEMENT, INCLUDING PRESTRESSING TENDONS, AND VERIFY PLACEMENT.	-	X	ACI 318: 20, 25.2, 25.3, 26.6.1-26.6.3	1908.4
2. REINFORCING BAR WELDING.			AWS D1.4 ACI 318: 26.6.4	
a. VERIFY WELDABILITY OF REINFORCING BARS OTHER THAN ASTM A706.	-	X		
b. INSPECT SINGLE-PASS FILLET WELDS, MAXIMUM 5/16".	-	X		
c. INSPECT ALL OTHER WELDS.	X	-		
3. INSPECTION OF ANCHORS CAST IN CONCRETE.	-	X	ACI 318: 17.8.2	
4. INSPECTION OF ANCHORS POST-INSTALLED IN HARDENED CONCRETE MEMBERS.				
a. ADHESIVE ANCHORS INSTALLED IN HORIZONTALLY OR UPWARDLY INCLINED ORIENTATIONS TO RESIST SUSTAINED TENSION LOADS.	X	-	ACI 318: 17.8.2.4	
b. MECHANICAL ANCHORS AND ADHESIVE ANCHORS NOT DEFINED IN 4.a.	-	X	ACI 318: 17.8.2	
5. VERIFYING USE OF REQUIRED DESIGN MIX.	-	X	ACI 318: 19, 26.4.3, 26.4.4	1904.1, 1904.2, 1908.2, 1908.3
6. PRIOR TO CONCRETE PLACEMENT, FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFORM SLUMP AND AIR CONTENT TESTS, AND DETERMINE THE TEMPERATURE OF THE CONCRETE.	X	-	ASTM C 172, ASTM C 31, ACI 318: 26.5, 26.12	1908.10
7. INSPECT CONCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES.	X	-	ACI 318: 26.5	1908.6, 1908.7, 1908.8
8. VERIFY MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES.	-	X	ACI 318: 26.5.3-26.5.5	1908.9
9. INSPECT PRESTRESSED CONCRETE.			ACI 318: 26.10	
a. APPLICATION OF PRESTRESSING FORCES.	X	-		
b. GROUTING OF BONDED PRESTRESSING TENDONS.	X	-		
10. INSPECT ERECTION OF PRECAST CONCRETE MEMBERS.	-	X	ACI 318: 26.9	
11. VERIFY IN-SITU CONCRETE STRENGTH, PRIOR TO STRESSING OF TENDONS IN POST-TENSIONED CONCRETE AND PRIOR TO REMOVAL OF SHORES AND FORMS BEAMS AND STRUCTURAL SLABS.	-	X	ACI 318: 26.11.2	
12. INSPECT FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED.	-	X	ACI 318: 26.11.1.2(b)	

FOR SI: 1 INCH = 25.4 MM

a. WHERE APPLICABLE, SEE ALSO SECTION 1705.12, SPECIAL INSPECTIONS FOR SEISMIC RESISTANCE.

b. SPECIFIC REQUIREMENTS FOR SPECIAL INSPECTION SHALL BE INCLUDED IN THE RESEARCH REPORT FOR THE ANCHOR ISSUED BY AN APPROVED SOURCE IN ACCORDANCE WITH 17.8.2 IN ACI 318, OR OTHER QUALIFICATION PROCEDURES. WHERE SPECIFIC REQUIREMENTS ARE NOT PROVIDED, SPECIAL INSPECTION REQUIREMENTS SHALL BE SPECIFIED BY THE REGISTERED DESIGN PROFESSIONAL AND SHALL BE APPROVED BY THE BUILDING OFFICIAL PRIOR TO THE COMMENCEMENT OF THE WORK.

Sheet Title
STATEMENT OF SPECIAL INSPECTIONS

Dwg. No.
PLS2021-0432-0003D

Sht. No.
S-003

AISC 360-10 INSPECTIONS FOR WELDING

TABLE N5.4-1 INSPECTION TASKS PRIOR TO WELDING	QC	QA
WELDING PROCEDURE SPECIFICATION (WPSs) AVAILABLE	P	P
MANUFACTURER CERTIFICATIONS FOR WELDING CONSUMABLES AVAILABLE	P	P
MATERIAL IDENTIFICATION (TYPE/GRADE)	O	O
WELDER IDENTIFICATION SYSTEM (1)	O	O
FIT-UP OF GROOVE WELDS (INCLUDING JOINT GEOMETRY) • JOINT PREPARATION • DIMENSIONS (ALIGNMENT, ROOT OPENING, ROOT FACE, BEVEL) • CLEANLINESS (CONDITION OF STEEL SURFACES) • TACKING (TACK WELD QUALITY AND LOCATION) • BACKING TYPE AND FIT (IF APPLICABLE)	O	O
CONFIGURATION AND FINISH OF ACCESS HOLES	O	O
FIT-UP OF FILLET WELDS • DIMENSIONS (ALIGNMENT, GAPS AT ROOT) • CLEANLINESS (CONDITION OF STEEL SURFACES) • TACKING (TACK WELD QUALITY AND LOCATION)	O	O
CHECK WELDING EQUIPMENT	O	—
TABLE N5.4-2 INSPECTION TASKS DURING WELDING		
USE OF QUALIFIED WELDERS	O	O
CONTROL AND HANDLING OF WELDING CONSUMABLES • PACKAGING • EXPOSURE CONTROL	O	O
NO WELDING OVER CRACKED TACK WELDS	O	O
ENVIRONMENTAL CONDITIONS • WIND SPEED WITHIN LIMITS • PRECIPITATION AND TEMPERATURE	O	O
WPS FOLLOWED • SETTINGS ON WELDING EQUIPMENT • TRAVEL SPEED • SELECTED WELDING MATERIALS • SHIELDING GAS TYPE/FLOW RATE • PREHEAT APPLIED • INTERPASS TEMPERATURE MAINTAINED (MIN/MAX) • PROPER POSITION (F, V, H, OH)	O	O
WELDING TECHNIQUES • INTERPASS AND FINAL CLEANING • EACH PASS WITHIN PROFILE LIMITATIONS • EACH PASS MEETS QUALITY REQUIREMENTS	O	O
TABLE N5.4-3 INSPECTION TASKS AFTER WELDING		
WELDS CLEANED	O	O
SIZE, LENGTH AND LOCATION OF WELDS	P	P
WELDS MEET VISUAL ACCEPTANCE CRITERIA • CRACK PROHIBITION • WELD/BASE-METAL FUSION • CRATER CROSS SECTION • WELD PROFILES • WELD SIZE • UNDERCUT • POROSITY	P	P
ARC STRIKES	P	P
K-AREA (2)	P	P
BACKING REMOVED AND WELD TABS REMOVED (IF REQUIRED)	P	P
REPAIR ACTIVITIES	P	P
DOCUMENT ACCEPTANCE OR REJECTION OF WELDED JOINT OR MEMBER	P	P

(1) THE FABRICATOR OR ERECTOR, AS APPLICABLE, SHALL MAINTAIN A SYSTEM BY WHICH A WELDER WHO HAS WELDED A JOINT OR MEMBER CAN BE IDENTIFIED. STAMPS, IF USED, SHALL BE THE LOW-STRESS TYP.

(2) WHEN WELDING OF DOUBLER PLATES, CONTINUITY PLATES OR STIFFENERS HAS BEEN PERFORMED IN THE K-AREA, VISUALLY INSPECT THE WEB K-AREA FOR CRACKS WITHIN 3 IN. (75 MM) OF THE WELD.

AISC 360-10
FABRICATOR AND ERECTOR QUALITY CONTROL PROGRAM

FABRICATOR INSPECTION TASKS	QC	QA
DETAILS IN ACCORDANCE WITH SECTION N5	P	-
SHOP CUT AND FINISHED SURFACES IN ACCORDANCE WITH SECTION M2	P	-
SHOP HEATING FOR STRAIGHTENING, CAMBERING AND CURVING IN ACCORDANCE WITH SECTION M2.1	P	-
TOLERANCES FOR SHOP FABRICATION IN ACCORDANCE WITH SECTION 6 OF THE *CODE OF STANDARD PRACTICE*	P	-
INSPECT THE FABRICATED STEEL TO VERIFY COMPLIANCE WITH DETAILS SHOWN ON SHOP DRAWINGS, SUCH AS PROPER APPLICATION OF JOINT DETAILS AT EACH CONNECTION	P	-
ERECTOR INSPECTION TASKS		
DETAILS IN ACCORDANCE WITH SECTION N5	P	-
STEEL DECK HEADED STEEL STUD ANCHOR PLACEMENT AND ATTACHMENT IN ACCORDANCE WITH SECTION N6	P	-
FIELD CUT SURFACES IN ACCORDANCE WITH SECTION M2.2	P	-
FIELD HEATING FOR STRAIGHTENING IN ACCORDANCE WITH SECTION M2.1	P	-
TOLERANCES FOR FIELD ERECTION IN ACCORDANCE WITH SECTION 7.13 OF THE *CODE OF STANDARD PRACTICE*	P	-
INSPECT THE ERECTED STEEL FRAME TO VERIFY COMPLIANCE WITH THE DETAILS SHOWN ON THE ERECTION DRAWINGS, SUCH AS BRACES, STIFFENERS, MEMBER LOCATIONS AND PROPER APPLICATION OF JOINT DETAILS AT EACH CONNECTION	P	-
INSPECT PLACEMENT OF ANCHOR RODS AND OTHER EMBEDMENTS SUPPORTING STRUCTURAL STEEL FOR COMPLIANCE WITH CONSTRUCTION DOCUMENTS. AS A MINIMUM, THE DIAMETER, GRADE, TYPE AND LENGTH OF THE ANCHOR ROD OR EMBEDDED ITEM, AND THE EXTENT OR DEPTH OF EMBEDMENT INTO CONCRETE, SHALL BE VERIFIED PRIOR TO PLACEMENT OF CONCRETE	-	P
INSPECT THE FABRICATED STEEL OR ERECTED STEEL FRAME, AS APPROPRIATE, TO VERIFY COMPLIANCE WITH THE DETAILS SHOWN ON CONSTRUCTION DOCUMENTS, SUCH AS BRACES, STIFFENERS, MEMBER LOCATIONS AND PROPER APPLICATION OF JOINT DETAILS AT EACH CONNECTION	-	O
REVIEW THE MATERIAL TEST REPORTS AND CERTIFICATIONS FOR COMPLIANCE WITH THE CONSTRUCTION DOCUMENTS	-	P

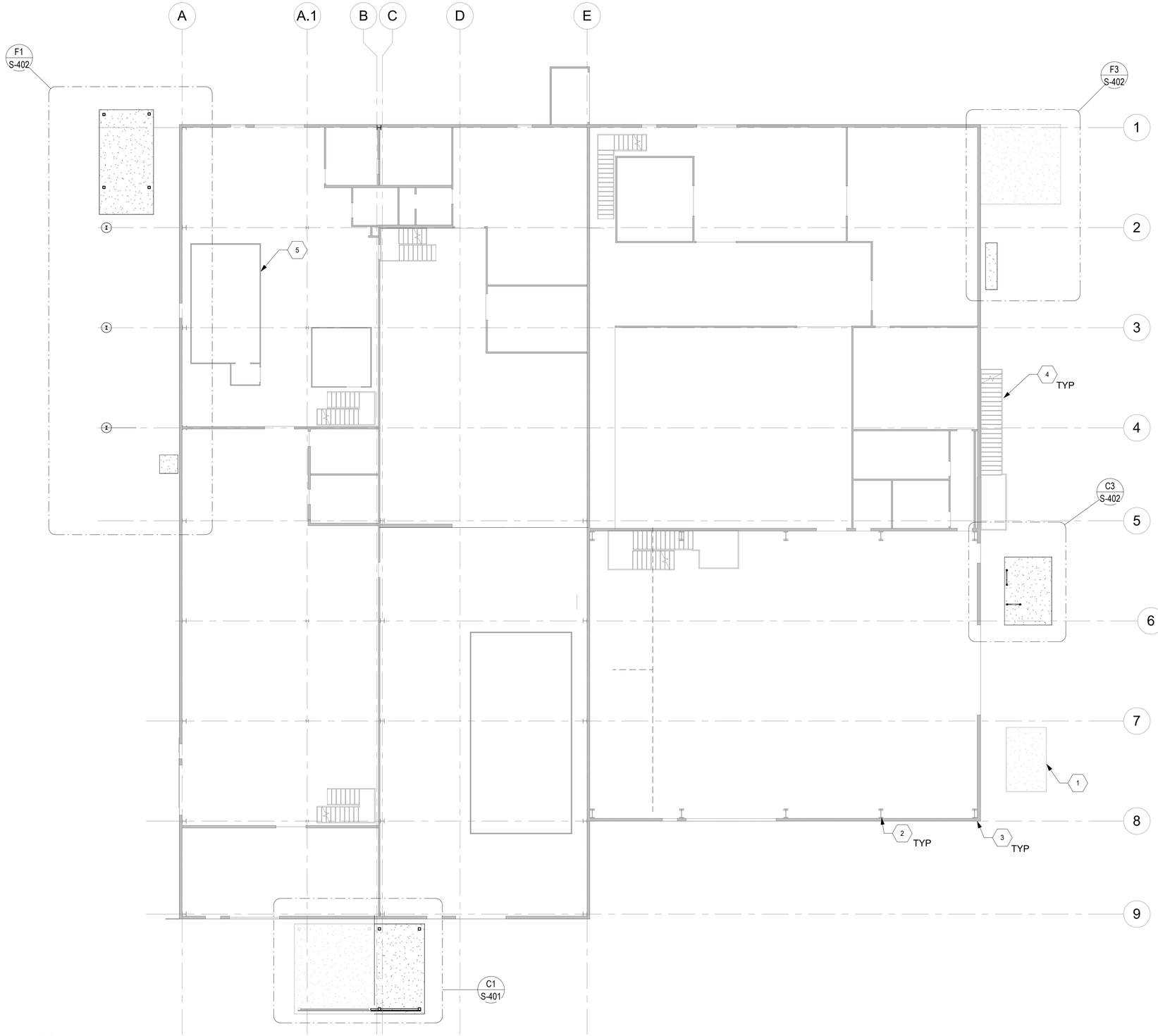
GENERAL NOTES

1) SEE SHEET S-003 FOR SPECIAL INSPECTION PROGRAM NOTES.

Sheet Title
STATEMENT OF SPECIAL INSPECTIONS

Dwg. No.
PLS2021-0432-0004D

Sht. No.
S-004



GENERAL NOTES

1. FOR STRUCTURAL GENERAL NOTES, SEE S-001.
2. FOR STRUCTURAL LEGNEDS AND ABBREVIATIONS, SEE S-002.
3. FOR STRUCTURAL SPECIAL INSPECTIONS, SEE S-003 AND S-004.
4. FOR ALL EQUIPMENT, REFER TO EQUIPMENT ANCHORAGE SCHEDULE (B1/S-513).

KEYED NOTES

1. EXISTING CONC PAD AND HEAT PUMP TO REMAIN
2. TAPERED BUILDING COLUMN
3. EXISTING EXTERIOR METAL PANEL WALL
4. EXISTING STAIRS
5. EXISTING CLEAN ROOM

F1
S-101

OVERALL STRUCTURAL FOUNDATION PLAN

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

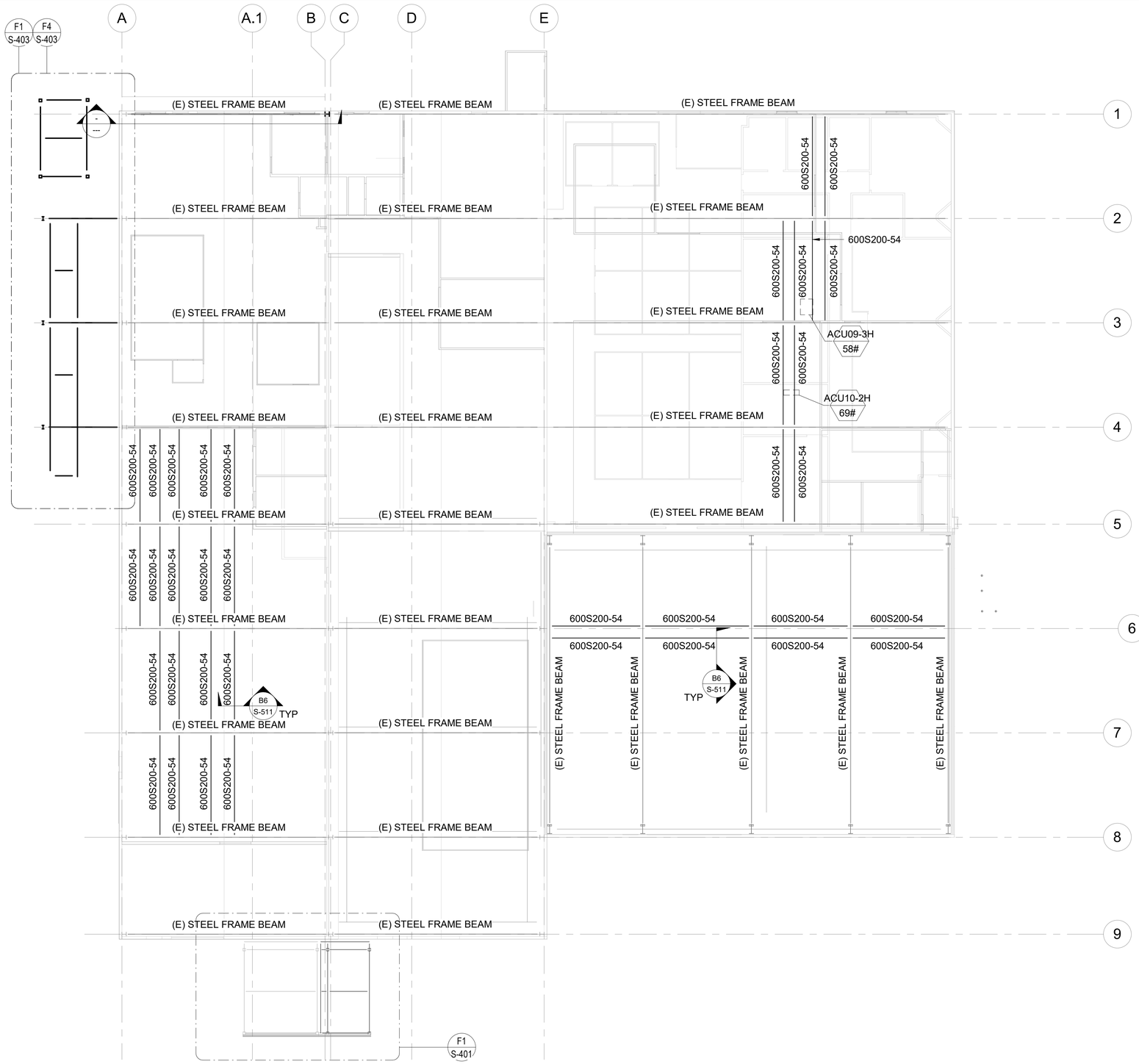
0 8' 16' 24'

3/32" = 1'-0"

Sheet Title
OVERALL FOUNDATION PLAN

Dwg. No.
PLS2021-0432-0005D

Sht. No.
S-101



F1 OVERALL ROOF FRAMING PLAN

S-102

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

0 8' 16' 24'

3/32" = 1'-0"

GENERAL NOTES

1. FOR STRUCTURAL GENERAL NOTES, SEE S-001.
2. FOR STRUCTURAL LEGNEDS AND ABBREVIATIONS, SEE S-002.
3. FOR STRUCTURAL SPECIAL INSPECTIONS, SEE S-003 AND S-004.

Sheet Title

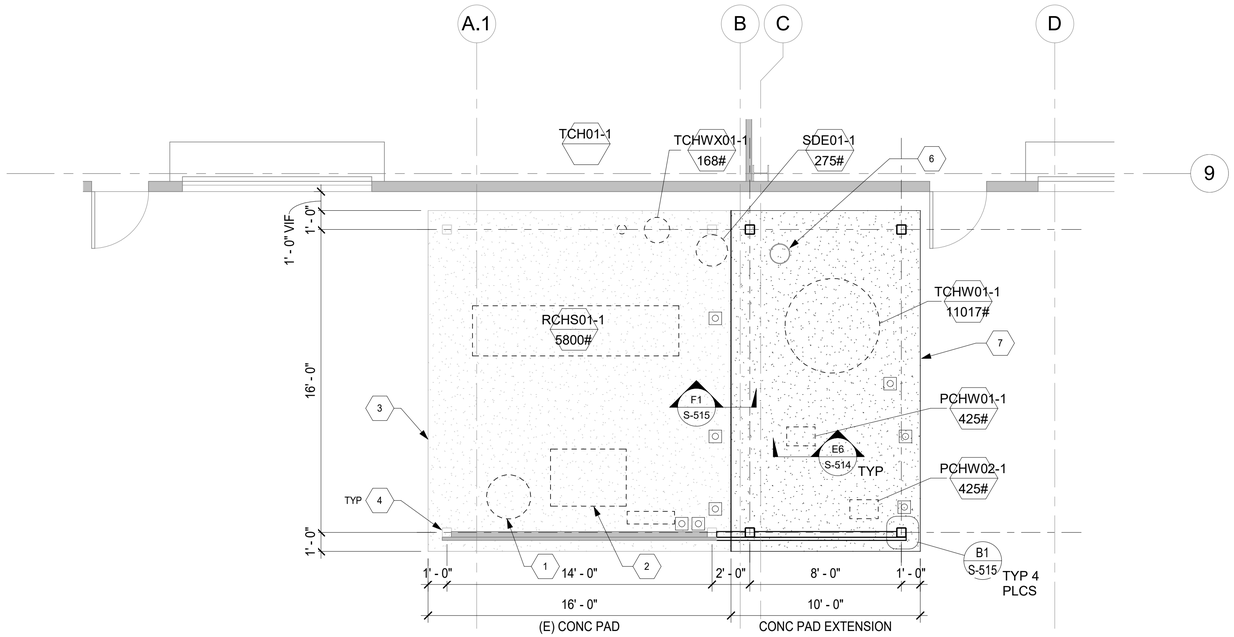
OVERAL STRUCTURAL ROOF PLAN

Dwg. No.

PLS2021-0432-0006D

Sht. No.

S-102

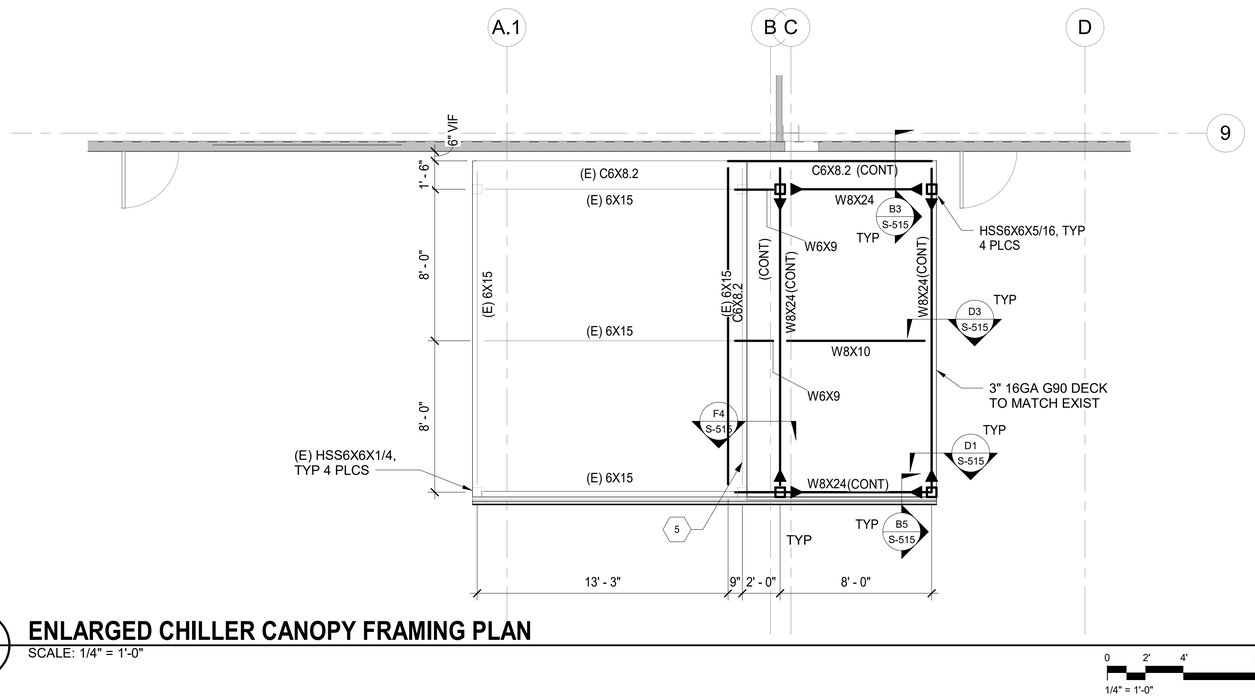


C1 / S-401

ENLARGED CHILLER CANOPY FOUNDATION PLAN

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

0 2' 4' 8'
1/4" = 1'-0"



F1 / S-401

ENLARGED CHILLER CANOPY FRAMING PLAN

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

0 2' 4' 8'
1/4" = 1'-0"

GENERAL NOTES

1. FOR STRUCTURAL GENERAL NOTES, SEE S-001.
2. FOR STRUCTURAL LEGNEDS AND ABBREVIATIONS, SEE S-002.
3. FOR STRUCTURAL SPECIAL INSPECTIONS, SEE S-003 AND S-004.

KEYED NOTES

1. EXISTING COMPRESSED AIR TANK TO REMAIN.
2. EXISTING AIR COMPRESSOR TO REMAIN.
3. EXISTING CONCRETE MAT SLAB FOUNDATION TO REMAIN.
4. EXIST TS6X6X1/4 STEEL CANOPY COLUMN TO REMAIN.
5. EDGE OF EXIST CANOPY ROOF DECK TO REMAIN.
6. EXIST GROUNDING ROD TEST WELL TO BE EXTENDED. REFER TO ELEC FOR ADDITIONAL INFORMATION
7. EF-1 CONCRETE FOUNDATION PER D5/S-501

LEGEND

PCHW01-1 / 425# — PCHW01-1: EQUIPMENT TAG PER MECH DWGS. REFER TO S-514 FOR EQUIPMENT ANCHORAGE.

425# : MAX OPERATING WEIGHT OF EQUIPMENT

ELBOW STANCHION PIPE SUPPORT PER F1/S-513. COORDINATE LOCATIONS WITH MECH DRAWINGS

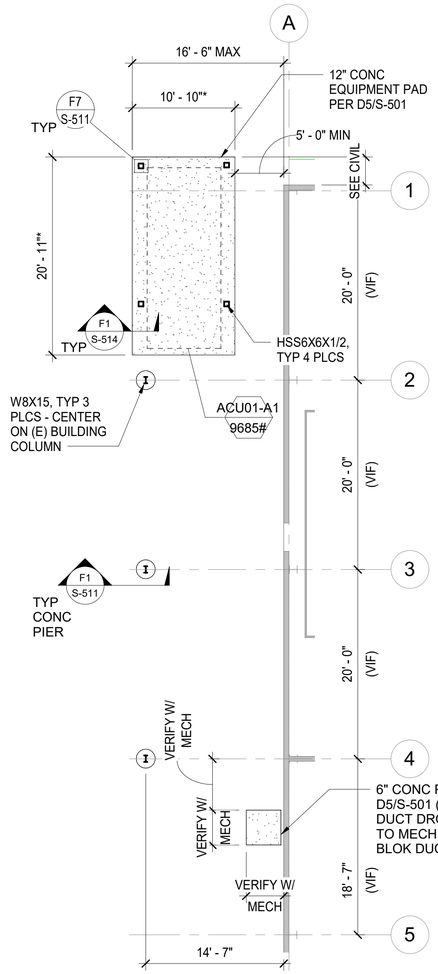
MOMENT CONNECTION

INDICATES THE FOOTPRINT OF EQUIPMENT. REFER TO MECH FOR ADDITIONAL INFORMATION

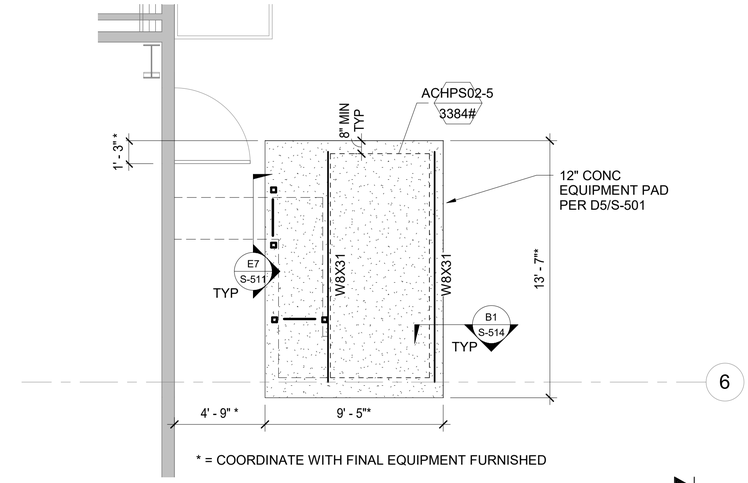
Sheet Title
ENLARGED CHILLER PLANT FOUNDATION & CANOPY FRAMING PLAN

Dwg. No.
PLS2021-0432-0007D

Sht. No.
S-401



F1 S-402 **EXTERIOR DUCTWORK FOUNDATION PLAN**
SCALE: 1/8" = 1'-0"
0 4' 8' 16'
1/8" = 1'-0"



C3 S-402 **ENLARGED ACHPS02-5 FOUNDATION PLAN**
SCALE: 1/4" = 1'-0"
0 2' 4' 8'
1/4" = 1'-0"

F3 S-402 **ENLARGED ACHPS01-4 FOUNDATION PLAN**
SCALE: 1/4" = 1'-0"
0 2' 4' 8'
1/4" = 1'-0"

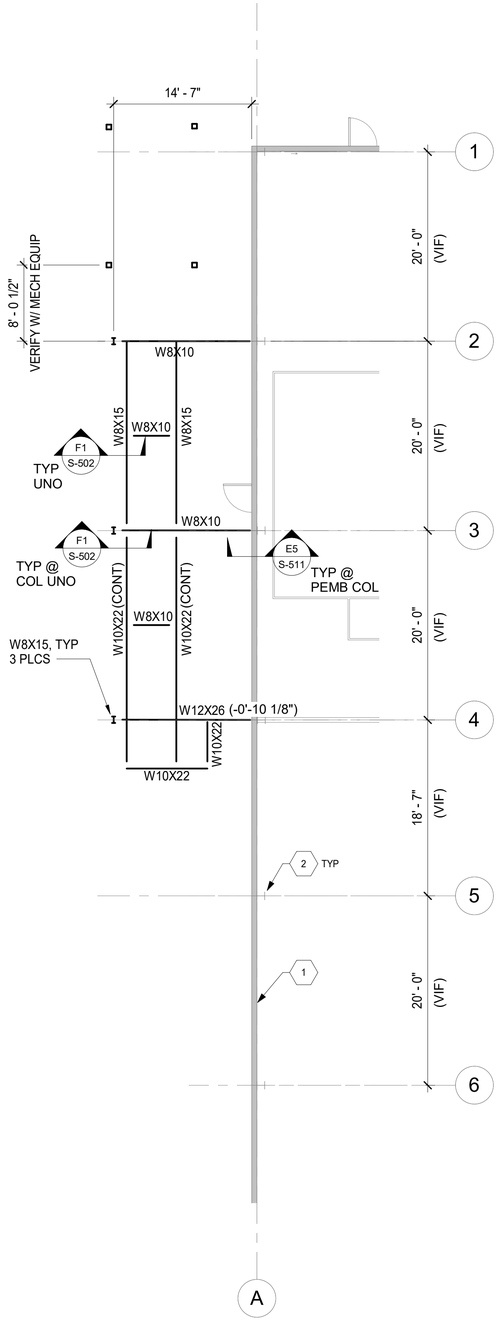
GENERAL NOTES

1. FOR STRUCTURAL GENERAL NOTES, SEE S-001.
2. FOR STRUCTURAL LEGNEDS AND ABBREVIATIONS, SEE S-002.
3. FOR STRUCTURAL SPECIAL INSPECTIONS, SEE S-003 AND S-004.
4. REFER TO MECHANICAL FOR ANY DIMENSIONS NOT SHOWN.
5. ALL TOP OF STEEL ELEVATIONS SHALL BE COORDINATED AND CONFIRMED WITH MECHANICAL.

Sheet Title
ENLARGED FOUNDATION PLANS

Dwg. No.
PLS2021-0432-0008D

Sht. No.
S-402



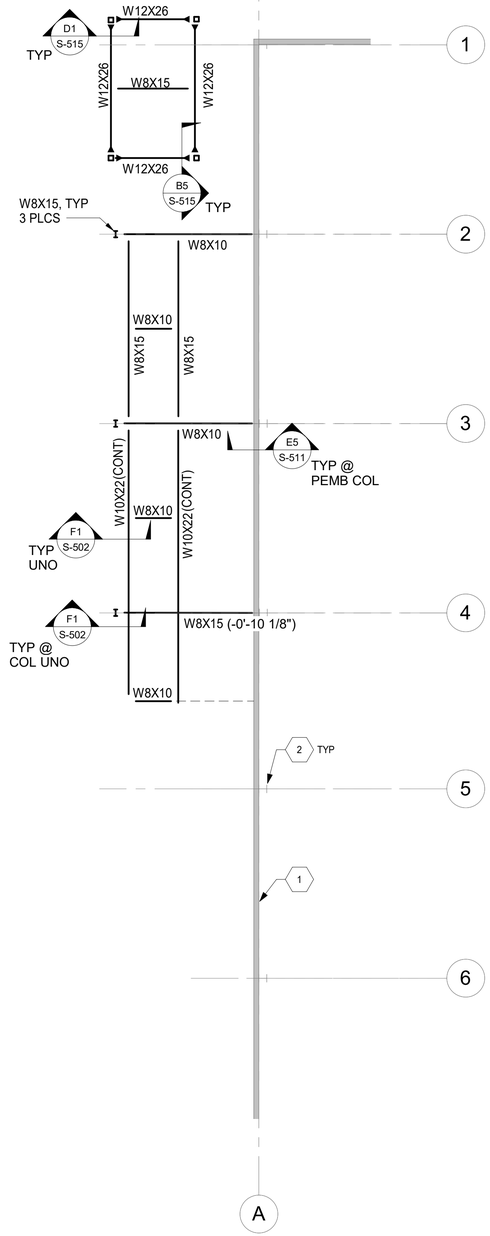
F1 S-403 **LOWER DUCT SUPPORT FRAMING PLAN**

SCALE: 1/8" = 1'-0"

TOS = 109'-0", UNO

0 4' 8' 16'

1/8" = 1'-0"



F4 S-403 **UPPER DUCT SUPPORT FRAMING PLAN**

SCALE: 1/8" = 1'-0"

TOS = 115'-0", UNO

0 2' 4' 8'

1/4" = 1'-0"

GENERAL NOTES

1. FOR STRUCTURAL GENERAL NOTES, SEE S-001.
2. FOR STRUCTURAL LEGNEDS AND ABBREVIATIONS, SEE S-002.
3. FOR STRUCTURAL SPECIAL INSPECTIONS, SEE S-003 AND S-004.
4. REFER TO MECHANICAL FOR ANY DIMENSIONS NOT SHOWN.
5. ALL TOP OF STEEL ELEVATIONS SHALL BE COORDINATED AND CONFIRMED WITH MECHANICAL.

KEYED NOTES

1. EXISTING EXTERIOR BUILDING WALL.
2. EXISTING BUILDING STEEL COLUMN.

LEGEND

▶	MOMENT CONNECTION
(-0' - 10 1/8")	DESIGNATES TOP OF STEEL BEAM ELEVATION RELATIVE TO TYPICAL TOP OF STEEL ELEVATION NOTED ON PLAN

Sheet Title
ENLARGED DUCT SUPPORT FRAMING PLANS

Dwg. No.
PLS2021-0432-0009D

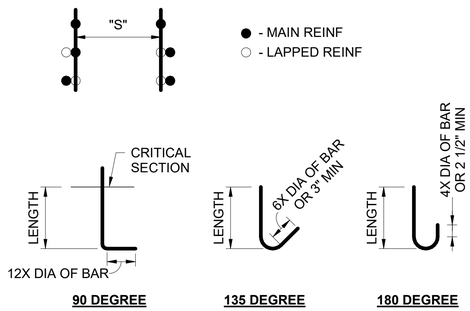
Sht. No.
S-403

REINFORCING DEVELOPMENT LENGTHS TYPE A (NORMAL WEIGHT) = 4500psi

BAR SIZE	DEVELOPMENT LENGTH		SPLICE LENGTH		HOOK LENGTH
	OTHER	TOP	OTHER	TOP	
#3	1' - 1"	1' - 5"	1' - 5"	1' - 11"	7"
#4	1' - 6"	1' - 11"	1' - 11"	2' - 6"	9"
#5	1' - 10"	2' - 5"	2' - 5"	3' - 2"	11"
#6	2' - 3"	2' - 11"	2' - 11"	3' - 9"	1' - 1"
#7	3' - 3"	4' - 3"	4' - 3"	5' - 6"	1' - 4"
#8	3' - 9"	4' - 10"	4' - 10"	6' - 4"	1' - 6"
#9	4' - 2"	5' - 6"	5' - 6"	7' - 1"	1' - 8"
#10	4' - 9"	6' - 2"	6' - 2"	8' - 0"	1' - 11"
#11	5' - 3"	6' - 10"	6' - 10"	8' - 11"	2' - 1"
#14	6' - 4"	8' - 2"	8' - 2"	10' - 8"	2' - 6"
#18	8' - 5"	10' - 11"	10' - 11"	14' - 3"	3' - 4"

TYPICAL REINFORCING NOTES:

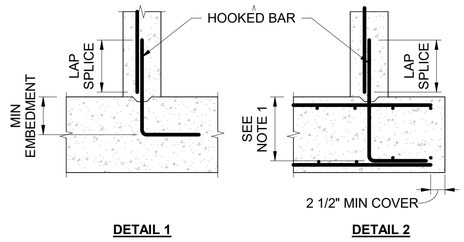
1. REINFORCING BAR DEVELOPMENT AND LAP SPLICE LENGTHS SHALL BE AS SHOWN IN THESE TABLES UNLESS NOTED OTHERWISE ON THE DRAWINGS.
2. THE LENGTHS SHOWN IN THE TABLES ARE BASED ON THE FOLLOWING CONCRETE COVERAGE AND REINFORCING C TO C SPACING:
   - BEAMS OR COLUMNS: COVER ≥ 1.0bd (BAR DIAMETER)
     C TO C SPACING ≥ 2.0bd
   - ALL OTHERS: COVER ≥ 1.0bd
     C TO C SPACING ≥ 3.0 bd
3. TOP BARS ARE DEFINED AS HORIZONTAL REINFORCEMENT PLACED SUCH THAT MORE THAN 12" OF FRESH CONCRETE IS CAST IN THE MEMBER BELOW THE DEVELOPMENT LENGTH OR SPLICE. VERTICAL BARS MAY BE CLASSIFIED AS OTHER.
4. THE DEVELOPMENT AND SPLICE LENGTHS SHOWN SHALL NOT APPLY IF ANY OF THE FOLLOWING CONDITIONS OCCUR:
   - A. f'c < 4000 psi
   - B. fy > 60,000 psi
   - C. THE COVER OR C TO C BAR SPACING IS NOT AS LISTED ABOVE.
   - D. THE REINFORCING STEEL IS EPOXY COATED.
5. WHERE BAR SPLICES ARE STAGGERED SUCH THAT ONE-HALF OR LESS OF TOTAL REINFORCEMENT IS SPLICED WITHIN REQD LAP LENGTH. SPLICE LENGTH MAY EQUAL DEVELOPMENT LENGTH.
6. C TO C SPACING(S) IS DEFINED AS BELOW:



90 DEGREE **135 DEGREE** **180 DEGREE**

INSIDE BEND DIAMETER (DEVELOPMENT, UNO):
6X DIA OF BAR - #3 TO #8 BARS
8X DIA OF BAR - #9 TO #11 BARS
10X DIA OF BAR - #14 & #18 BARS

INSIDE BEND DIAMETER (STIRRUPS/TIES/HOOPS):
4X DIA OF BAR - #3 TO #5 BARS
6X DIA OF BAR - #6 TO #8 BARS



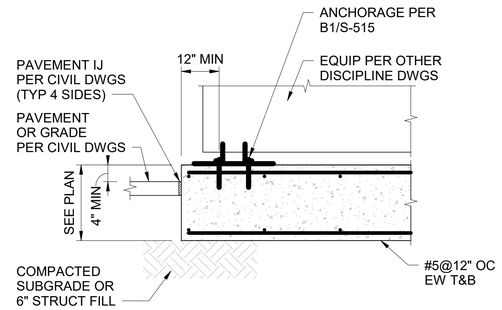
DETAIL 1 **DETAIL 2**

DEVELOPMENT LENGTH NOTES:

1. WHERE DRAWINGS ARE DETAILED SIMILIAR TO DETAIL 2, EXTEND THE EMBEDMENT LENGTH SUCH THAT THE HOOKED BAR CONTACTS THE LAYER OF MAIN REINFORCING SHOWN.
2. EMBEDMENT LENGTHS IN CHART ARE TYPICAL EXCEPT AS NOTED IN DETAIL 2, OR AS INDICATED ON DRAWINGS.

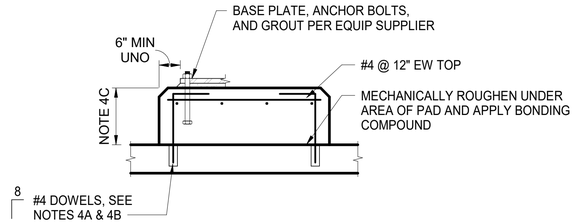
F3 S-501 TYPICAL REINFORCING DEVELOPMENT AND SPLICES

SCALE: 1" = 1'-0"



D5 S-501 EQUIPMENT FOUNDATION (EF-1)

SCALE: 1" = 1'-0"



EQUIPMENT PAD (EP-1)
NOT TO SCALE

NOTES:

1. PROVIDE EP-1 FOR ALL INT EQUIP. SEE OTHER DISCIPLINE DRAWINGS FOR EQUIP LOCATIONS.
2. EQUIP ANCHOR BOLTS SHALL BE STANDARD TYPE VII BOLTS, UNLESS OTHERWISE RECOMMENDED BY EQUIP MFR.
3. EQUIP SHALL BE GROUTED IN PLACE W/ NON-SHRINK GROUT UNLESS OTHERWISE RECOMMENDED BY EQUIP MFR.
4. FOR EP-1 ONLY:
   - A. PROVIDE NUMBER OF DOWELS TO MATCH TOTAL CROSS-SECTIONAL AREA OF ANCHOR BOLTS, EQUALLY SPACED AROUND PAD, EXCEPT THAT SPACING OF DOWELS SHALL NOT EXCEED 12".
   - B. IF FLOOR SLAB OR PAVEMENT IS EXISTING OR CONSTRUCTED BEFORE DOWELS ARE PLACED, DOWELS SHALL BE EPOXY GROUTED INTO FLOOR SLAB OR PAVEMENT W/ 4 1/2" EMBED.
   - C. HEIGHT OF PAD ABOVE SURROUNDING FLOOR SLAB OR PAVEMENT PER PLAN.

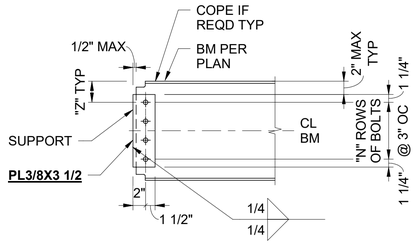
F5 S-501 EQUIPMENT PAD

SCALE: 3/4" = 1'-0"

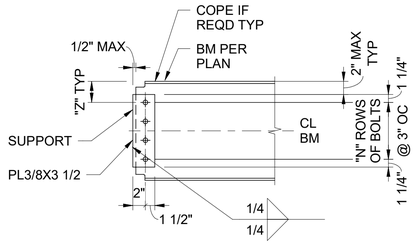
Sheet Title
STANDARD CONCRETE DETAILS

Dwg. No.
PLS2021-0432-0010D

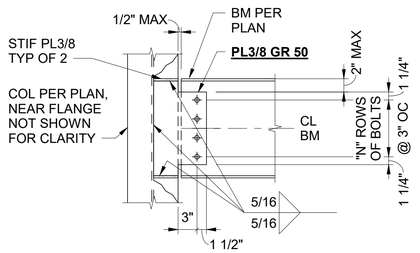
Sht. No.
S-501



TYPICAL CONNECTION



TYPICAL CONNECTION

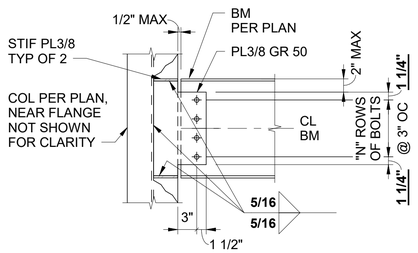


EXTENDED PLATE CONNECTION/STANDARD CONNECTION AT COLUMN WEB

MEMBER SIZE	"N" UNO
W30, W33	7
W27,W24	6
W21	5
W16, W18	4
W12, W14	3
W8, W10	2

NOTES:
1. STANDARD CONNECTIONS ABOVE SHALL USE 3/4"DIA A325-PT-STD BOLTS.
2. USE WHERE CONNECTION IS NOT OTHERWISE INDICATED ON PLANS, NOTES, ELEVATIONS, SECTIONS, OR DETAILS.
3. "Z": 2" MIN FOR STANDARD HOLES (1 1/4" MIN FOR BEAMS LESS THAN A W12).
   2 1/4" MIN FOR OVS AND SSLT HOLES (1 3/8" MIN FOR BEAMS LESS THAN A W12).

STANDARD SINGLE PLATE BEAM CONNECTION



EXTENDED PLATE CONNECTION CONNECTION AT COLUMN WEB

NOTES:
1. SPECIAL CONNECTION SYMBOL AS NOTED ON PLANS.

   X — THE LETTER INDICATES THE CONNECTION DESIGNATION PER THE SPECIAL CONNECTION SCHEDULE

2. "Z": 2" MIN FOR STANDARD HOLES (1 1/4" MIN FOR BEAMS LESS THAN A W12).
   2 1/4" MIN FOR OVS AND SSLT HOLES (1 3/8" MIN FOR BEAMS LESS THAN A W12).

SPECIAL SINGLE PLATE BEAM CONNECTION

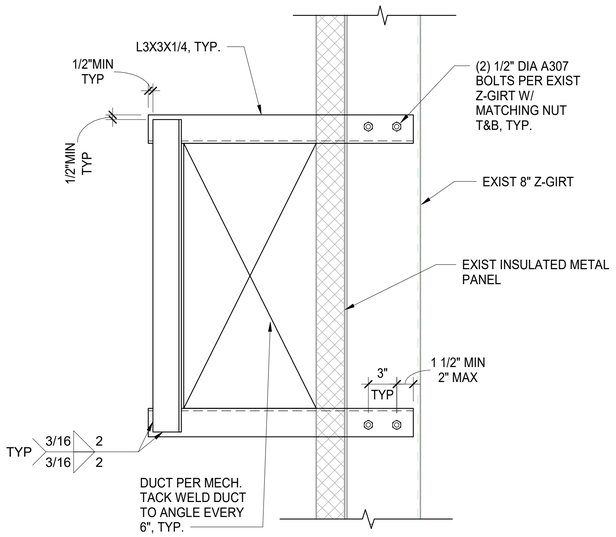
F1 / S-502 — TYPICAL BEAM CONNECTION-SINGLE PLATE
SCALE: 1" = 1'-0"

F3 / S-502 — SPECIAL BEAM CONNECTION-SINGLE PLATE
SCALE: 1" = 1'-0"

Sheet Title
STANDARD STEEL DETAILS

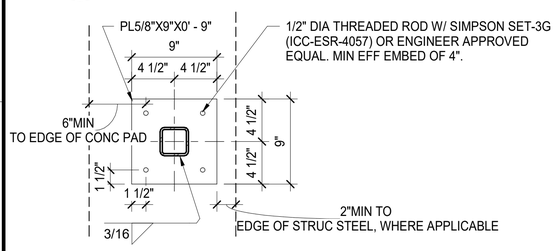
Dwg. No.
PLS2021-0432-0011D

Sht. No.
S-502



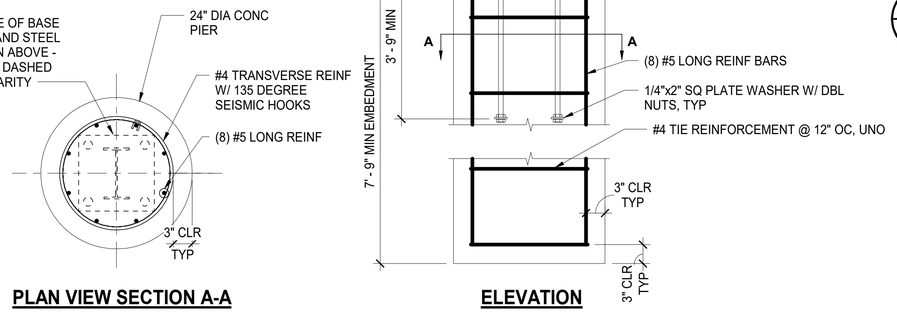
C1 / S-511 DUCT SUPPORT - PLAN VIEW

SCALE: 1 1/2" = 1'-0"



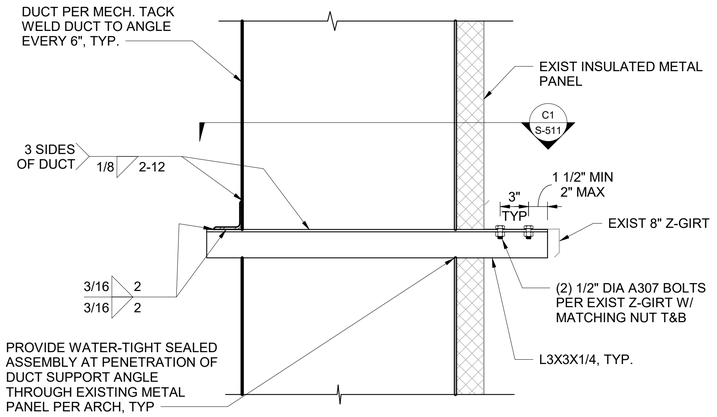
D1 / S-511 TYP HEAT PUMP BASE PLATE

SCALE: 1 1/2" = 1'-0"



F1 / S-511 TYP DUCT SUPPORT PIER

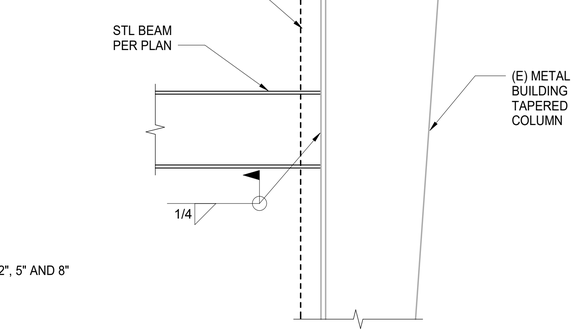
SCALE: 1" = 1'-0"



NOTE: PROVIDE ANGLE SUPPORT AT EVERY EXISTING GIRT. MAX SPACING OF 7'-0".

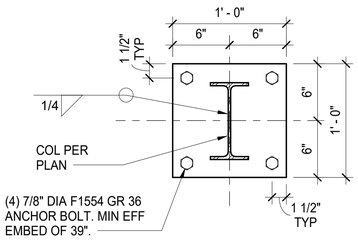
C3 / S-511 DUCT SUPPORT - SECTION VIEW

SCALE: 1 1/2" = 1'-0"



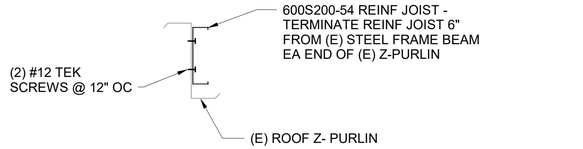
E5 / S-511 TYP CONNECTION TO (E) PEMB COLUMN

SCALE: 1 1/2" = 1'-0"



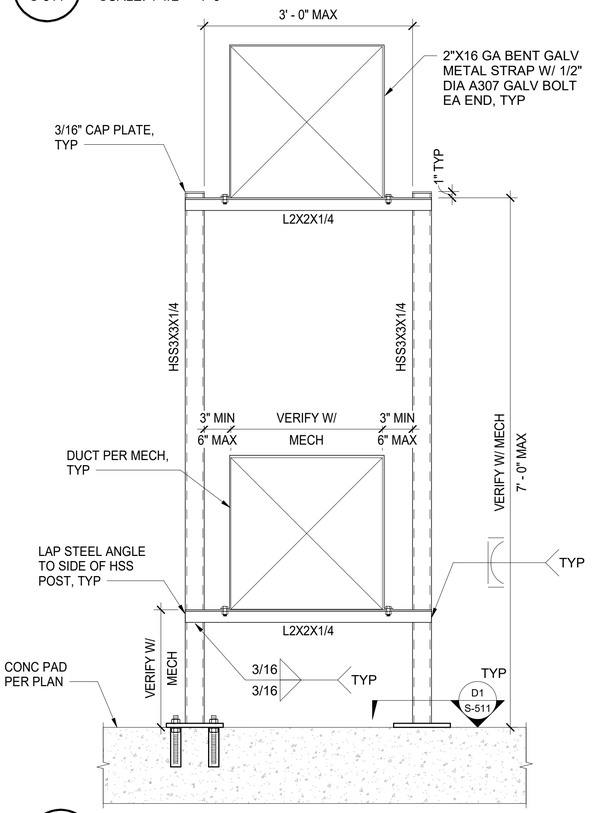
F5 / S-511 TYP DUCT SUPPORT BASE PLATE

SCALE: 1 1/2" = 1'-0"



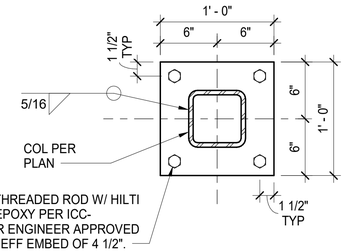
B6 / S-511 TYP ROOF Z-GIRT REINFORCEMENT

SCALE: 1 1/2" = 1'-0"



E7 / S-511 HEAT PUMP DUCT SUPPORT FRAME

SCALE: 1" = 1'-0"



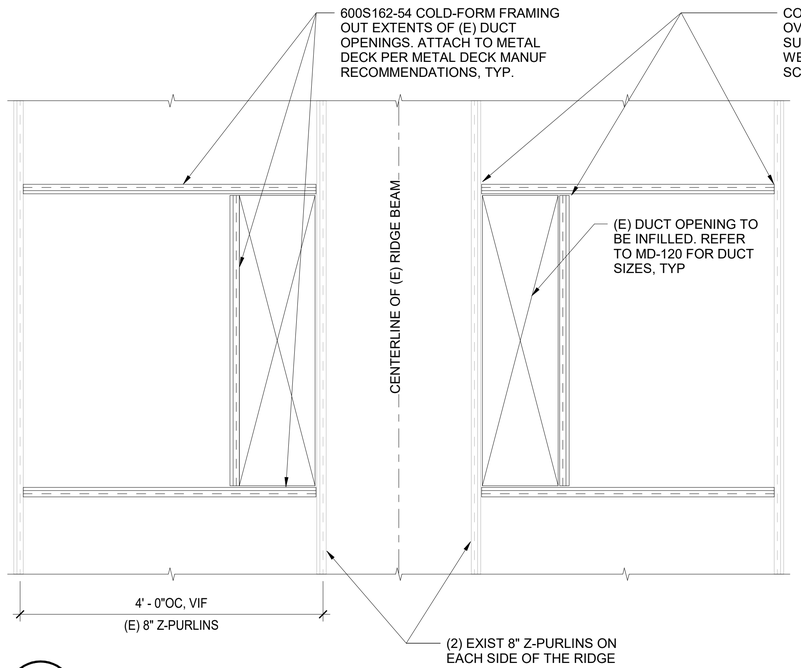
F7 / S-511 TYP DUCT SUPPORT BASE (OVER ACU)

SCALE: 1 1/2" = 1'-0"

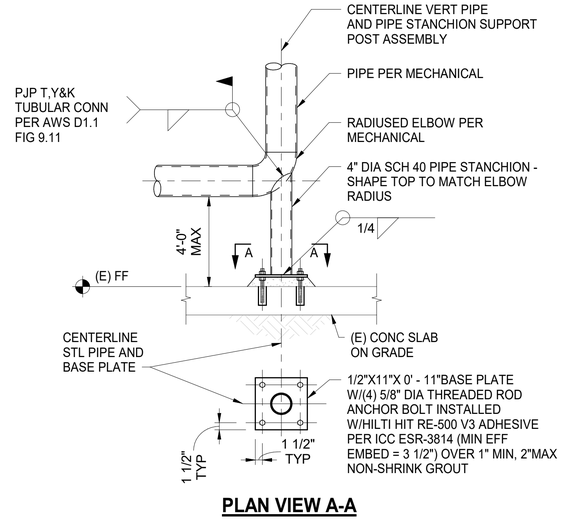
Sheet Title
DUCT SUPPORT DETAILS

Dwg. No.
PLS2021-0432-0012D

Sht. No.
S-511

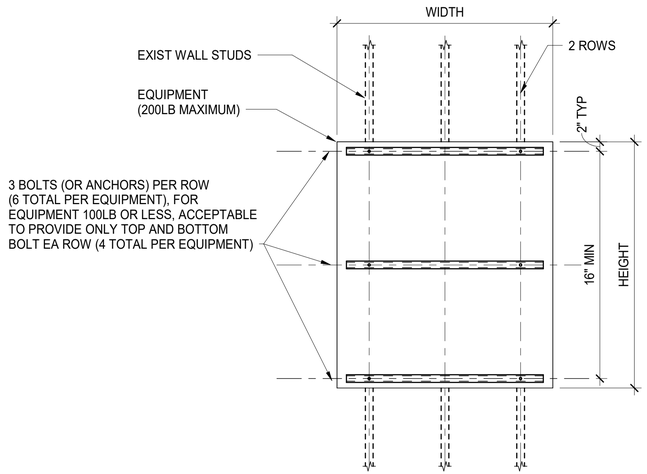


C1 S-512 **TYP ROOF INFILL**
SCALE: 1" = 1'-0"

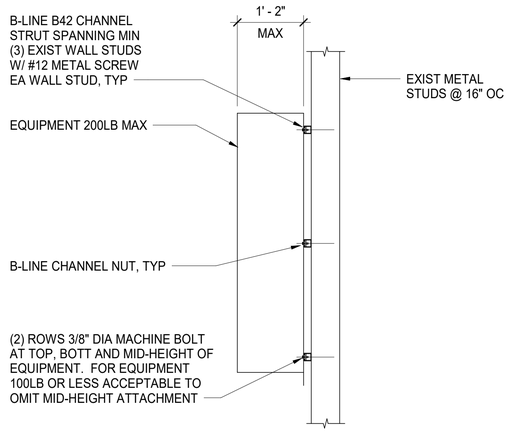


PLAN VIEW A-A

C4 S-512 **TYPICAL PIPE STANCHION SUPPORT AT RADIUS ELBOW**
SCALE: 3/4" = 1'-0"

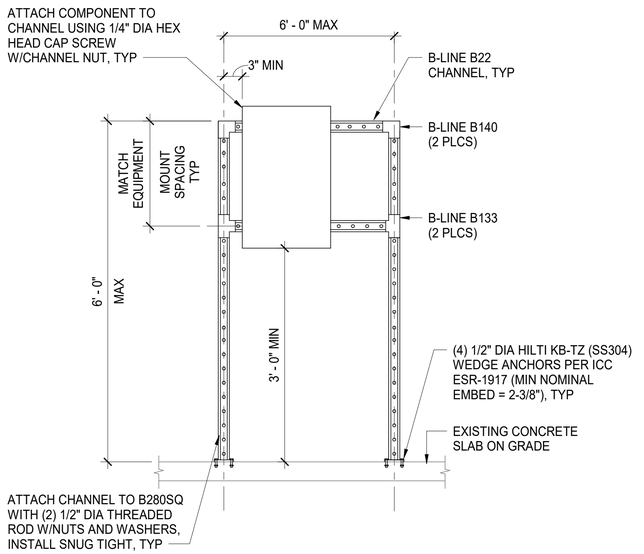


FRONT ELEVATION



SECTION

F1 S-512 **TYP WALL MOUNTED EQUIPMENT ANCHORAGE**
SCALE: 3/4" = 1'-0"



NOTE: MAXIMUM DEPTH OF UNIT IS 14" AND MAXIMUM WEIGHT OF UNIT IS 100 LB.

F6 S-512 **TYPICAL ELECTRICAL EQUIP STAND AT CONC SLAB**
SCALE: 3/4" = 1'-0"

Sheet Title
MISCELLANEOUS SUPPORT DETAILS

Dwg. No.
PLS2021-0432-0013D

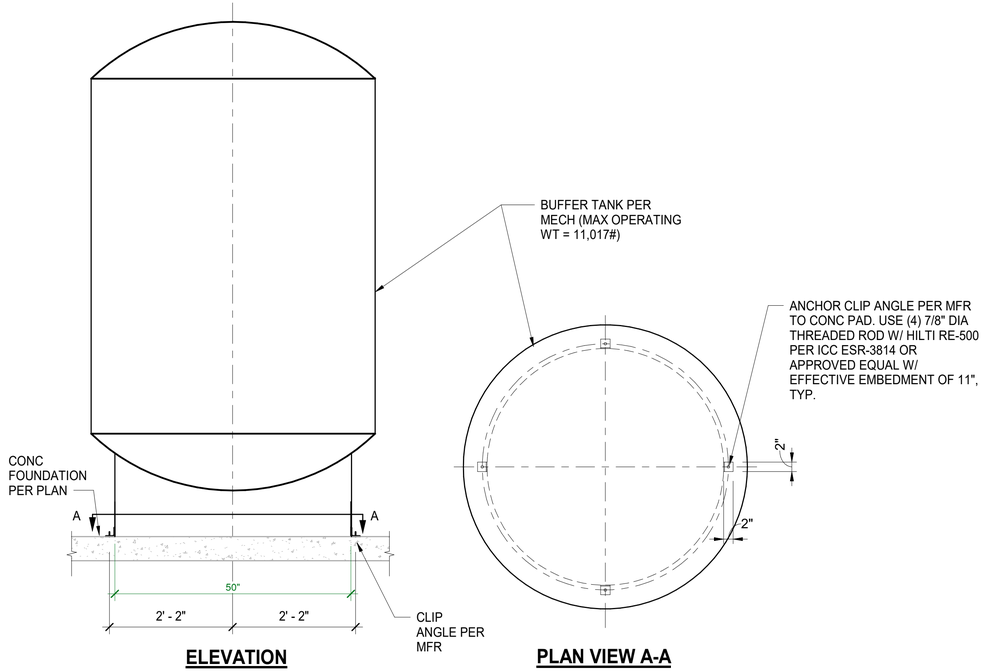
Sht. No.
S-512

EQUIP. ID	EQUIP NAME/DESCRIPTION	WT (LB)	"W" OR DIA (IN)	"L" LENGTH (IN)	"H" HEIGHT (IN)	ANCHORS	REF DETAIL	REMARKS/LOCATIONS
TCHW01-1	BUFFER TANK	11,107	60	-	108	SEE DETAIL	F1/S-513	
PCHW01-1	CHILLED WATER PUMP	425	12	17	38	SEE DETAIL	E6/S-514	
PCHW02-1	CHILLED WATER PUMP	425	12	17	38	SEE DETAIL	E6/S-514	
SDE01-1	AIR SEPERATOR	237	13	-	34	SEE DETAIL	F4/S-513	
TCHWX01-1	BLADDER EXPANSION TANK	270	16	-	48	PER MANUF RECOMMENDATION	N/A	
TCH01-1	CHEMICAL POT FEEDER	40	8	-	20	PER MANUF RECOMMENDATION	N/A	
RCHS01-1	CHILLER	5,800	75	51	71	SEE DETAIL	E1/S-514	
DDCP01	DDC CONTROL PANEL	100	8	30	30	SEE DETAIL	F6/S-512	
ACHPS01-4	AIR CONDITIONING HEAT PUMP	3,331	95	146	68	(4) 5/8" DIA A307 BOLT	B1/S-514	TO STEEL BASE RAIL BEAM
ACHPS02-5	AIR CONDITIONING HEAT PUMP	3,384	95	146	68	(4) 5/8" DIA A307 BOLT	B1/S-514	TO STEEL BASE RAIL BEAM
ACU01-A1	AIR CONDITIONING UNIT	9,685#	100	221	141	5/8" DIA THREADED ROD W/ HILTI HIT-RE 500 V3 W/ 6" EMBED	F1/S-514	
ACU08-2H	AIR CONDITIONING UNIT	70	46	60	43	SEE DETAIL	B4/S-514	
ACU09-3H	AIR CONDITIONING UNIT	60	80	175	59	SEE DETAIL	B4/S-514	
RCUA01-2H	EXTERIOR CONDENSING UNIT	150	37	13	37	(4) 1/2" DIA HILTI KB-TZ2 (ICC-ESR-4266) W/ 3 1/4" EMBED	N/A	
RCUA02-3H	EXTERIOR CONDENSING UNIT	140	37	13	37	(4) 1/2" DIA HILTI KB-TZ2 (ICC-ESR-4266) W/ 3 1/4" EMBED	N/A	

NOTES:
1. ANCHORS SPECIFIED ARE MINIMUM QUANTITIES. ADDITIONAL ANCHORS SHALL BE INSTALLED AS REQUIRED BY MANUFACTURER.
2. SUBCONTRACTOR SHALL SUBMIT ALL EQUIPMENT CUTSHEETS (INDICATING DIMENSIONS & OPERATING WEIGHTS) TO SEOR FOR FINAL REVIEW PRIOR TO INSTALLATION.
3. "DA" INDICATES A DEFERRED APPROVAL.
4. STAINLESS STEEL HARDWARE SHALL HAVE ISOLATION MATERIAL AS REQUIRED AT CARBON STEEL INTERFACES.

B1 S-513 EQUIPMENT ANCHORAGE SCHEDULE

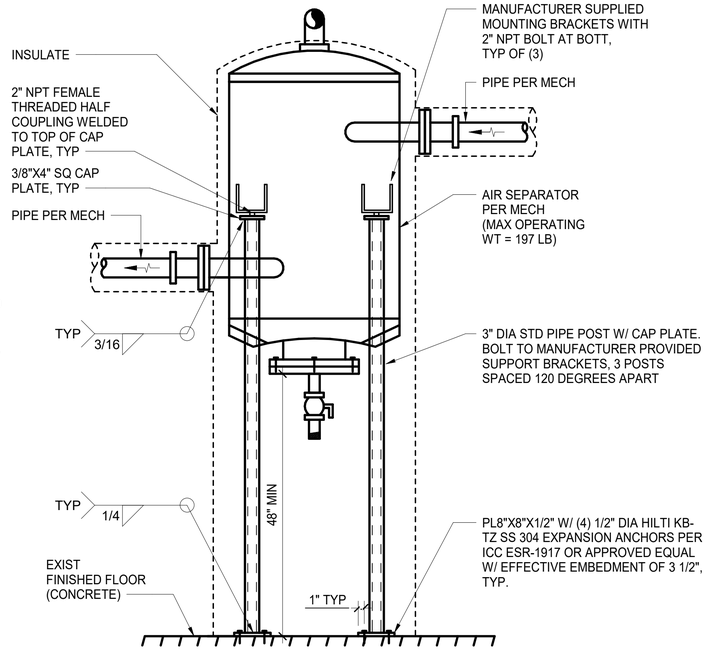
SCALE: 1" = 1'-0"



ELEVATION PLAN VIEW A-A

F1 S-513 BUFFER TANK ANCHORAGE

SCALE: 3/4" = 1'-0"



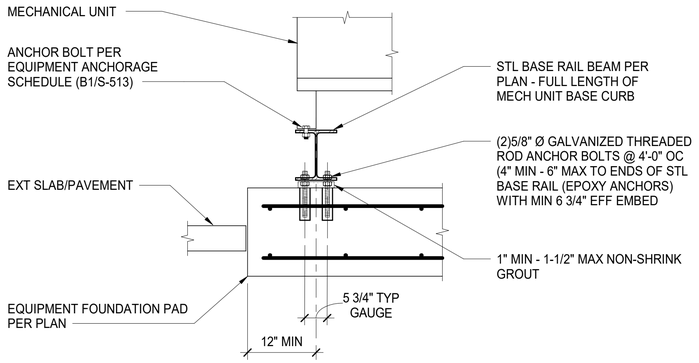
F4 S-513 AIR SEPARATOR FLOOR MOUNT SUPPORT

SCALE: 12" = 1'-0"

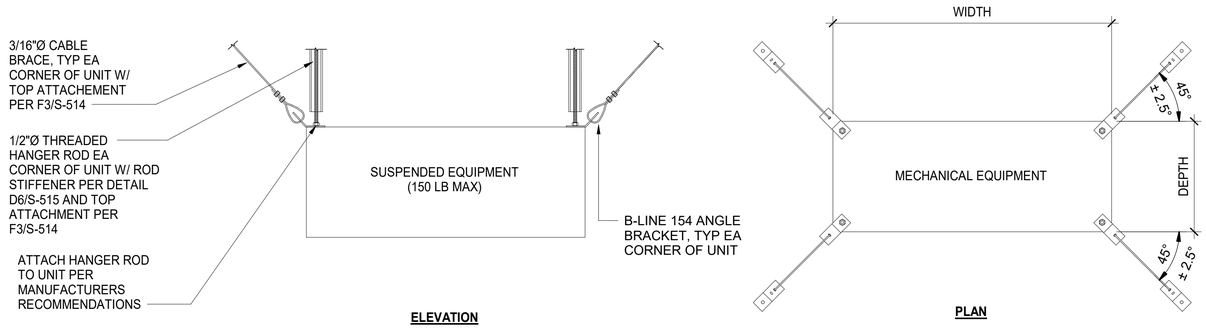
Sheet Title
EQUIPMENT SUPPORT DETAILS

Dwg. No.
PLS2021-0432-0014D

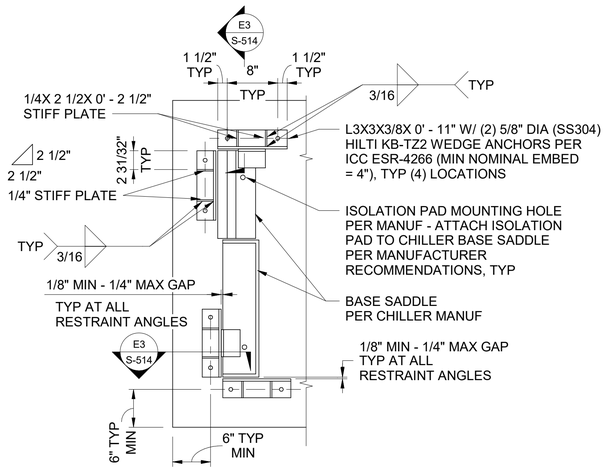
Sht. No.
S-513



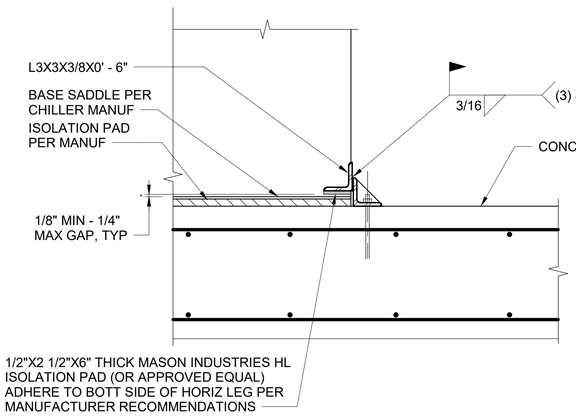
B1 MECH UNIT STEEL BASE FRAME
S-514 — SCALE: 1" = 1'-0"



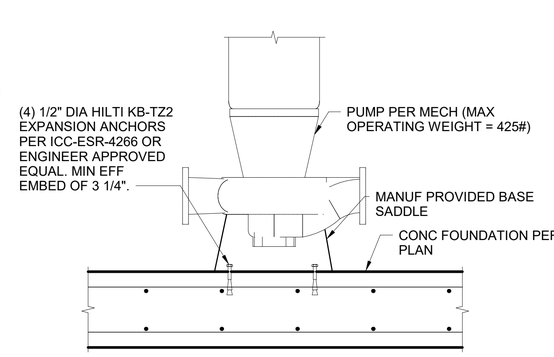
B4 TYPICAL SUSPENDED EQUIPMENT BRACING DETAIL
S-514 — SCALE: 1" = 1'-0"



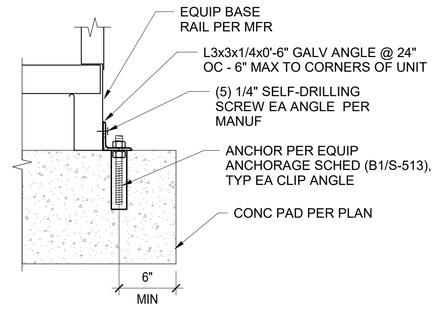
E1 CHILLER UNIT ANCHORAGE DETAIL
S-514 — SCALE: 1" = 1'-0"



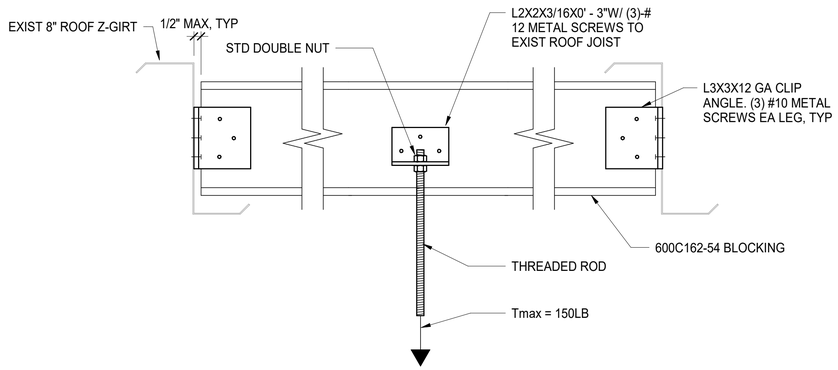
E3 ANCHORAGE SECTION
S-514 — SCALE: 1 1/2" = 1'-0"



E6 TYP VERTICAL PUMP ANCHORAGE
S-514 — SCALE: 1" = 1'-0"



F1 TYP ACU01-A1 ANCHORAGE
S-514 — SCALE: 1 1/2" = 1'-0"

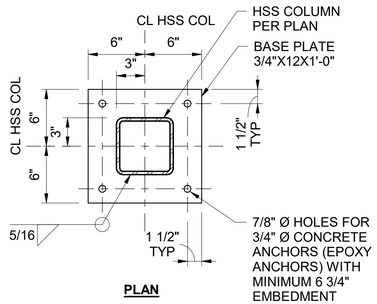


F3 TYPICAL ROOF JOIST HANGER ATTACHMENT ROD DETAIL
S-514 — SCALE: 3" = 1'-0"

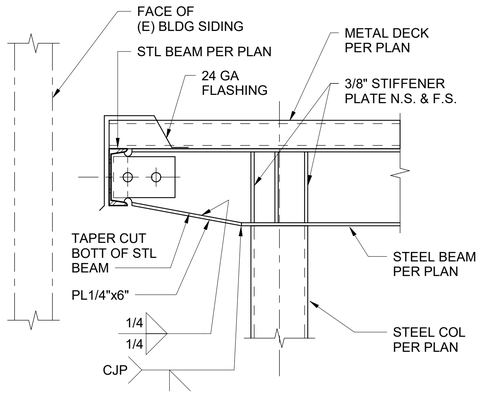
Sheet Title
EQUIPMENT SUPPORT DETAILS

Dwg. No.
PLS2021-0432-0015D

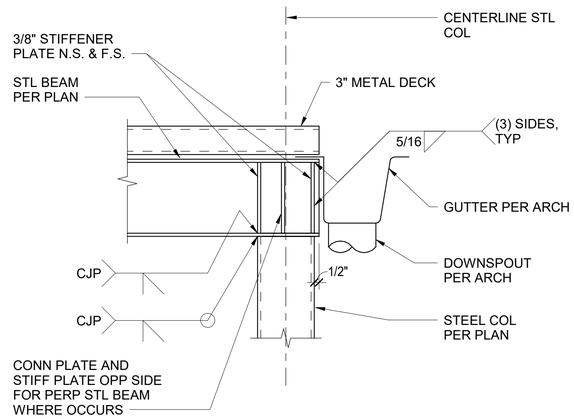
Sht. No.
S-514



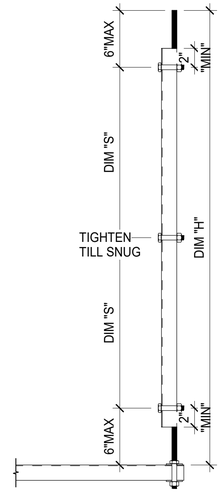
B1 S-515 **SECTION**
SCALE: 1 1/2" = 1'-0"



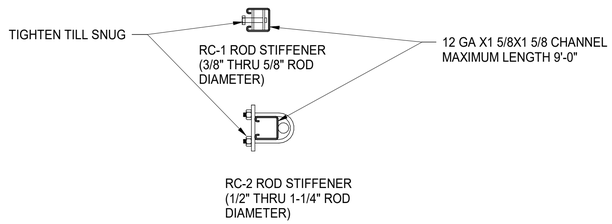
B3 S-515 **SECTION**
SCALE: 1 1/2" = 1'-0"



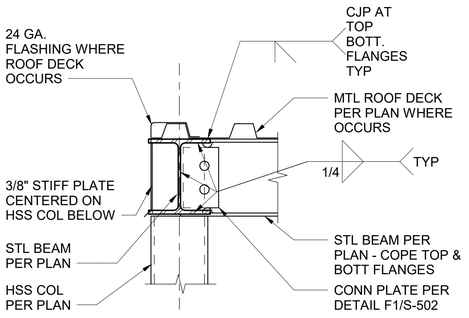
B5 S-515 **SECTION**
SCALE: 1 1/2" = 1'-0"



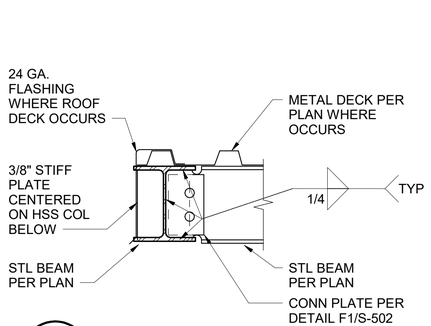
ROD STIFFENER CHART						
THREADED ROD DIAMETER		DIM "H" MAXIMUM ROD LENGTH WITHOUT STIFFENER		DIM "S" MAXIMUM SPACING BETWEEN ROD STIFFENERS		MAX REACTION
IN	(mm)	IN	(mm)	IN	(mm)	LBS
3/8"	(10)	16"	(406)	13"	(330)	790
1/2"	(13)	22"	(559)	18"	(457)	1460



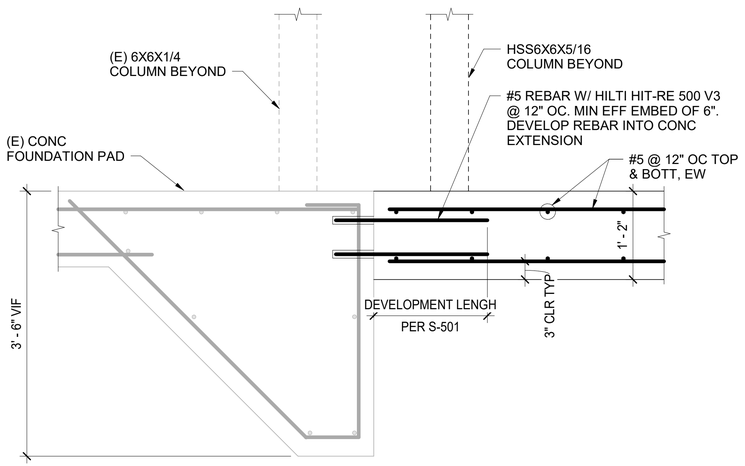
D6 S-515 **TYPICAL HANGER ROD STIFFENER DETAIL**
SCALE: 1 1/2" = 1'-0"



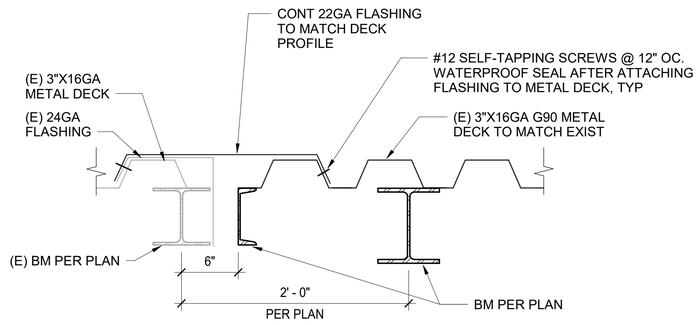
D1 S-515 **SECTION**
SCALE: 1 1/2" = 1'-0"



D3 S-515 **SECTION**
SCALE: 1 1/2" = 1'-0"



F1 S-515 **CONC PAD EXTENSION**
SCALE: 1" = 1'-0"



F4 S-515 **SECTION**
SCALE: 1 1/2" = 1'-0"

Sheet Title
CANOPY SUPPORT DETAILS

Dwg. No.
PLS2021-0432-0016D

Sht. No.
S-515

FINISH NOTES

GENERAL

1. NOTES PERTAIN TO AREA WITHIN THE SCOPE OF WORK ONLY.
2. IF A COLOR OR FINISH IS NOT SPECIFIED, CONTACT THE CONSTRUCTION MANAGER FOR CLARIFICATION.
3. SUBMIT LABELED SAMPLES FOR EACH MATERIAL SPECIFIED. INCLUDE PRODUCT DATA, SEAMING DIAGRAMS, AND SHOP DRAWINGS PRIOR TO PROCUREMENT OF FABRICATION.
4. PROVIDE REPRESENTATIVE SAMPLES FOR ALL DYE LOTS REQUIRED TO COMPLETE INSTALLATION.
5. PROTECT EXISTING FLOOR, WALL, DOOR AND CEILING FINISHES TO REMAIN AND REPAIR ANY DAMAGE AS A RESULT OF DEMOLITION ON CONSTRUCTION.
6. PROVIDE A SUBMITTAL SCHEDULE FOR ALL LONG LEAD ITEMS TO PREVENT SUBSTITUTIONS.

PATCHING

1. SMALL HOLES < 1" MAY BE PATCHED TO MATCH EXISTING FINISH. PREPARE SURFACES PER MANUFACTURE'S RECOMMENDATIONS.
2. LARGE VOIDS >12" IN ANY DIMENSION SHALL BE PATCHED USING REINFORCING STEEL WELDED TO STEEL FRAMED OPENING OR DOWELED INTO EXISTING CONCRETE OPENING AND A 4000# CONCRETE MIX.

FLOOR FINISHES

1. FINISH FLOOR PER MANUFACTURER'S BASE LEVEL SPECIFICATIONS UNLESS OTHERWISE NOTED IN DRAWINGS
2. USE LOW-VOC ADHESIVES.

CEILING FINISHES

1. PAINT EXPOSED COMPONENTS ON OPEN STRUCTURE CEILING - SEE DRAWINGS

WALL / DOOR FINISHES

1. PATCH AND PREP EXISTING WALLS THAT HAVE NEW PENETRATIONS OR PENETRATIONS TO BE PATCHED FOLLOWING DEMO.
2. CONFIRM EQUIPMENT MOUNTING HEIGHTS PRIOR TO INSTALLATION OR RE-INSTALLATION.
3. PROVIDE SAMPLES OF PAINT IN SPECIFIED COLOR AND GLOSS.
4. PROVIDE 1 COAT OF PRIMER AND 2 COATS OF FINISH COATS WHERE PAINTING IS CALLED OUT.
5. REMOVE UNUSED UNISTRUT, TAPE, BOLTS, COVER PLATES, AND ANY LEGACY UTILITY LINES WHERE THEY OCCUR. PATCH HOLES TO MATCH EXISTING CONSTRUCTION PRIOR TO FINISHING.
6. REMOVE EXISTING SIGNS, TAGS, ETC PRIOR TO APPLYING FINISHES. RE-INSTALL ONCE FINISHES ARE COMPLETE. PROVIDE NEW IF ORIGINAL LABEL, SIGN, TAG, ETC. IS DAMAGED OR LOST.

PAINTING OF MECHANICAL AND ELECTRICAL EQUIPMENT

1. DO NOT PAINT

GENERAL NOTES

1. **SPECIFICATIONS**
   THE SPECIFICATIONS ARE A PART OF THESE CONTRACT DOCUMENTS. THE SUBCONTRACTOR AND THEIR PERSONNEL MUST BECOME FAMILIAR WITH THE SPECIFICATIONS PRIOR TO BIDDING THE PROJECT AND STARTING ANY CONSTRUCTION.
2. **DIMENSIONS**
   DIMENSIONS MUST GOVERN ON DRAWINGS. DO NOT SCALE DRAWINGS.
4. **CONFLICT BETWEEN DRAWINGS AND SPECIFICATIONS**
   SHOULD CONFLICTS OCCUR BETWEEN THE DRAWINGS AND SPECIFICATIONS, DRAWINGS MUST GOVERN IN MATTERS OF DIMENSION OR QUANTITY, SPECIFICATIONS SHALL GOVERN IN MATTERS OF MATERIALS OR FINISHES.
5. **REVIEW PLANS AND EXISTING CONDITIONS**
   THE SUBCONTRACTOR MUST THOROUGHLY REVIEW PLANS AND EXISTING SITE CONDITIONS AND NOTIFY THE CONSTRUCTION MANAGER OF ANY DISCREPANCIES, ERRORS, OR OMISSIONS PRIOR TO CONSTRUCTION.
6. **SUBCONTRACTOR'S RESPONSIBILITIES**
   NEITHER ARCHITECT OF RECORD NOR THE ENGINEER OF RECORD ARE RESPONSIBLE FOR CONSTRUCTION MEANS,METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES OF THE SUBCONTRACTOR, SAFETY PRECAUTIONS AND PROGRAMS OF THE SUBCONTRACTOR, THE ACTS OR OMISSIONS OF THE SUBCONTRACTOR, OR THE FAILURE OF THE SUBCONTRACTOR TO CARRY OUT THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
7. **FIELD CONFIRMATION OF DISCREPANCIES**
   FIELD CONFIRMATION OF DISCREPANCIES MUST BE RECORDED AND IMMEDIATELY TRANSMITTED TO THE CONSTRUCTION MANAGER FOR PROJECT RECORD, COORDINATION, AND NECESSARY RESOLUTION PRIOR TO CONTINUING WORK.
8. **MATERIAL AND PRODUCT INSTALLATION**
   INSTALL MATERIAL AND PRODUCTS IN STRICT ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND APPLICABLE ICC REPORTS.
11. **CLEANLINESS**
    UPON COMPLETION OF WORK, JOBSITE MUST BE THOROUGHLY CLEANED PRIOR TO TURN-OVER TO CLIENT.
12. **EXISTING CONSTRUCTION AND CONDITIONS:**
    SUBCONTRACTOR MUST FIELD VERIFY THE DIMENSIONS, ELEVATION, MATERIALS, ETC. NECESSARY FOR THE PROPER CONSTRUCTION AND ALIGNMENT OF THE WORK. THE SUBCONTRACTOR MUST MAKE MEASUREMENTS NECESSARY FOR FABRICATION AND ERECTION OF STRUCTURAL MEMBERS.

SYMBOL LEGEND

GRIDLINE

ROOM TAG — NAME / NUMBER (ROOM 1000)

SECTION — SECTION # / SHEET # (1 / A101)

ELEVATION(S) — ELEVATION # / SHEET # (1 / A101)

INTERIOR ELEVATIONS — ELEVATION # / SHEET # (1 / A101)

DETAIL

WORK POINT, CONTROL POINT, DATUM POINT (1 / A101)

B1 — WALL TAG

1.1 — WINDOW TAG

FLOOR TRANSITION

101 — DOOR TAG

KEYNOTE

1

1 / A101 — TITLE
SCALE:1/8" = 1'-0"

1 / A101 — TITLE
SCALE: NTS.

ABBREVIATIONS

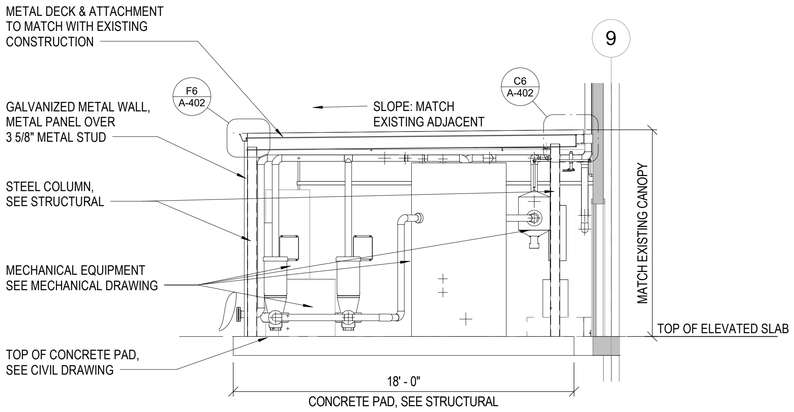
@	AT
A.D.	AREA DRAIN
ACCESS.	ACCESSIBLE
ACOUS.	ACOUSTICAL
ADA	AMERICANS WITH DISABILITIIES ACT
ADJ.	ADJUSTABLE
AFF.	ABOVE FINISH FLOOR
APPROX.	APPROXIMATE
ARCH	ARCHITECTURAL
BLDG.	BUILDING
BLKG.	BLOCKING
BOT.	BOTTOM
C.B.	CATCH BASIN
CL	CENTERLINE
CLG.	CLEAR
CMU	CONCRETE MASONRY UNITS
COL.	COLUMN
CONC.	CONCRETE
COORD.	COORDINATE
D/F	DRINKING FOUNTAIN
DEMO.	DEMOLITION
DET.	DETAIL
DIA	DIAMETER
DN.	DOWN
DN.	DOWN SPOUT
DWG.	DRAWING
(E)	EXISTING
EA.	EACH
EJ.	EXPANSION BOLT
ELEC.	ELECTRICAL
EQ.	EQUAL
EQUIP.	EQUIPMENT
EXT.	EXTERIOR
F.A.	FIRE ALARM
F.D.	FLOOR DRAIN
F.E.	FIRE EXTINGUISHER
F.F.	FACE OF
FIX.	FIXED
FLR.	FLOOR
FLUOR.	FLUORESCENT
FRP	FIBERGLASS REINFORCED PLASTIC
FTG.	FOOTING
GA.	GALVANIZED
GFCI	GROUND FAULT CIRCUIT INTERRUPTED
GL.	GLASS
GYP. BD.	GYPSUM BOARD
H.B.	HOSE BIB
HE	HEAVY EQUIPMENT
HORIZ.	HORIZONTAL
INSUL.	INSULATION
INT.	INTERIOR
MAX	MAXIMUM
MFR.	MANUFACTURER
MIN.	MINIMUM
MIR.	MIRRORED
MTD.	MOUNTED
(N)	NEW
NIC.	NOT IN SCOPE
NTS.	NOT TO SCALE
O.C.	ON CENTER
O.F.C.I.	OWNER FURNISHED/SUBCONTRACTOR INSTALLED
O/	OVER
PLYWD	PLYWOOD
PTD.	PAPER TOWEL DISPENSER
RCP	REFLECTED CEILING PLAN
REF.	REFERENCE
REFRG.	REFRIGERATOR
REQ.	REQUIRED
RM.	ROOM
RWL.	RAIN WATER LEADER
S.C.D.	SEAT COVER DISPENSER
S.D.	STORM DRAIN
S.N.R.	SANITARY NAPKIN RECEPTACLE
SAFM	SELF ADHERING FLASHING
SCHED.	SCHEDULED
SF	SQUARE FOOT
SIM.	SIMILAR
SQ.	SQUARE
SST.	STAINLESS STEEL
SUSP.	SUSPENDED
SYM.	SYMMETRICAL
T&G	TONGUE& GROOVE
T.P.D.	TOILET PAPER DISPENSER
THK.	THICKNESS
TYP.	TYPICAL
U.L.	UNDERWRITERS LABORATORY
UON.	UNLESS OTHERWISE NOTED
VIF.	VERIFY IN FIELD
W.O.	WHERE OCCURS
W.S.	WOOD SCREW
W/	WITH
W/O	WITHOUT
DOWN	DOWN SPOUT WITH SPLASH BLOCK

LICENSED ARCHITECT — CHRISTOPHER DANIELS — No. C29178 Exp. 11/20/2023 — STATE OF CALIFORNIA

Sheet Title
SYMBOLS, ABBREVIATIONS, GENERAL NOTES

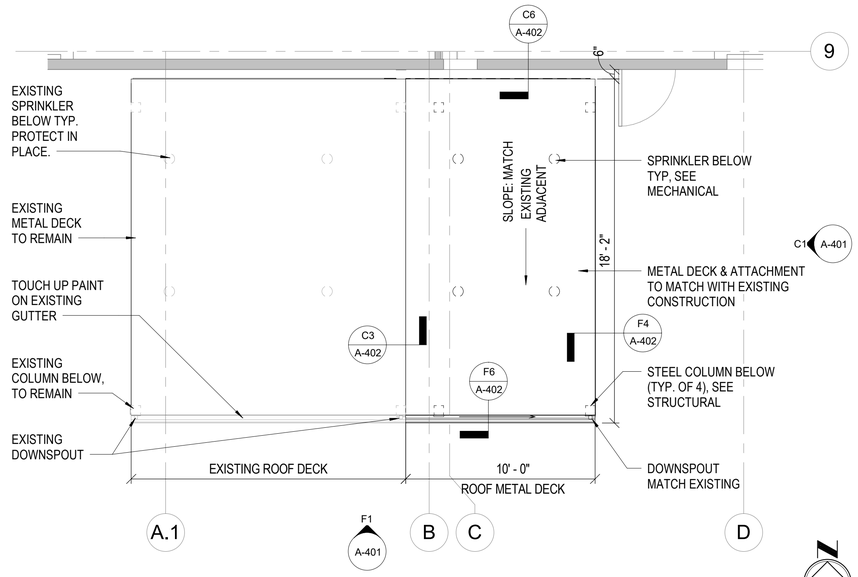
Dwg. No.
PLA2021-0432-0001D

Sht. No.
A-001



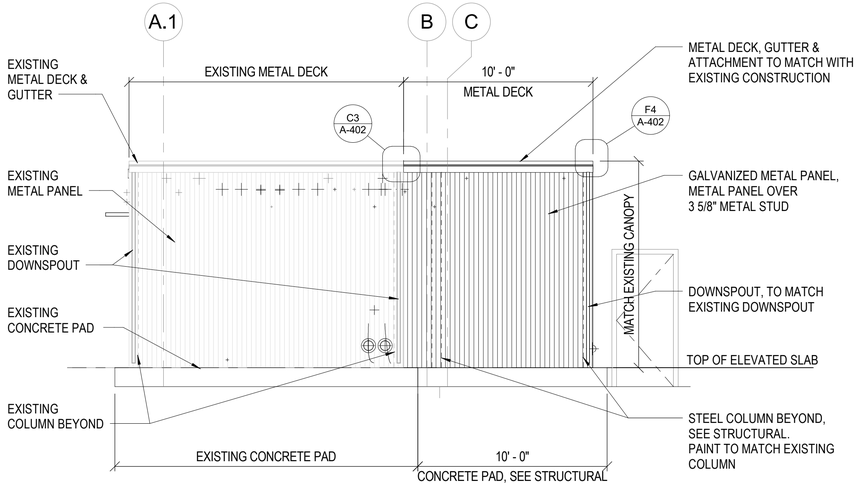
C1 EAST ELEVATION
A-401
SCALE: 1/4" = 1'-0"

0 2' 4' 8'
1/4" = 1'-0"



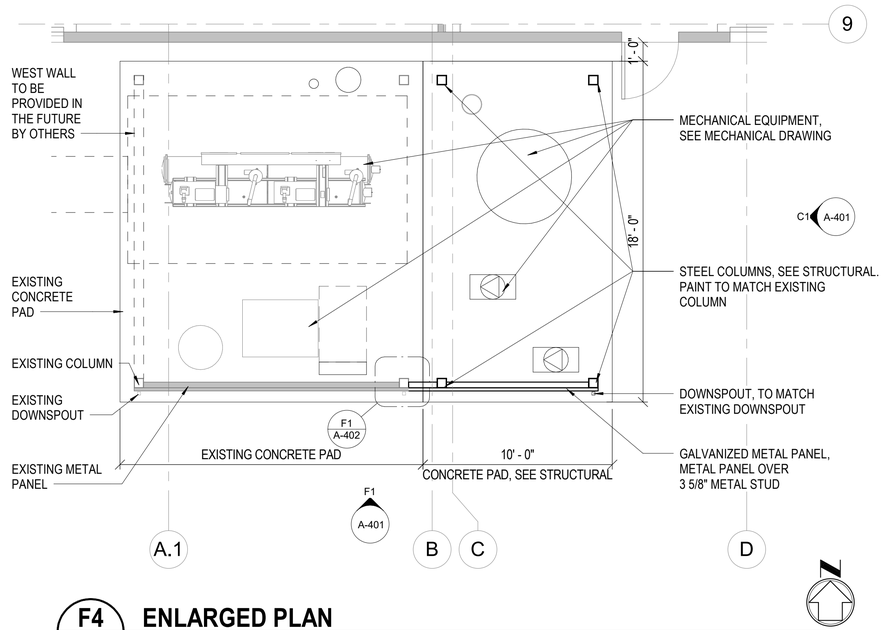
C4 ENLARGED CANOPY PLAN
A-401
SCALE: 1/4" = 1'-0"

0 2' 4' 8'
1/4" = 1'-0"



F1 SOUTH ELEVATION
A-401
SCALE: 1/4" = 1'-0"

0 2' 4' 8'
1/4" = 1'-0"



F4 ENLARGED PLAN
A-401
SCALE: 1/4" = 1'-0"

0 2' 4' 8'
1/4" = 1'-0"

GENERAL NOTES

1. GENERAL

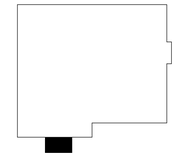
FOR ARCHITECTURAL GENERAL NOTES, MATERIAL LEGEND, AND ABBREVIATIONS REFER TO SHEET A-001.

2. DIMENSIONS

DIMENSIONS MUST GOVERN ON WORKING DRAWINGS. DO NOT SCALE DRAWINGS. THE CONTRACTOR MUST VERIFY ALL DIMENSIONS, ELEVATIONS AND SITE CONDITIONS BEFORE BEGINNING WORK AND FABRICATION. THE OWNER MUST BE NOTIFIED IN WRITING IMMEDIATELY OF ANY DISCREPANCIES OR INCONSISTENCIES. IN NO CASE MUST DIMENSIONS BE SCALED OFF PLANS, SECTIONS, OR DETAILS FROM THESE DRAWINGS.

3. REVIEW PLANS AND EXISTING CONDITIONS

THE SUBCONTRACTOR MUST THOROUGHLY REVIEW PLANS AND EXISTING SITE CONDITIONS AND NOTIFY THE CONSTRUCTION MANAGER OF ANY DISCREPANCIES, ERRORS, OR OMISSIONS PRIOR TO CONSTRUCTION.



KEY PLAN

KEYNOTES - NEW WORK

NO.	DESCRIPTION

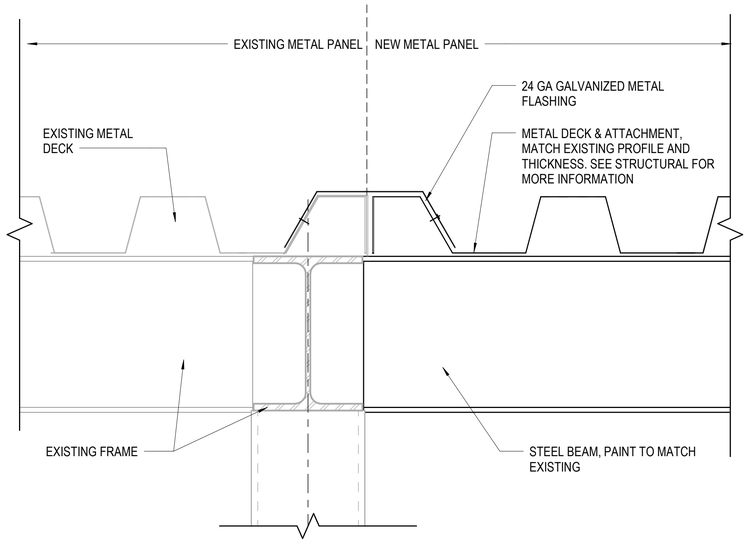
LEGEND

- EXISTING WALL
- DEMOLISH WALL
- NEW WALL
- 1i — WALL TAG
- 101 — DOOR TAG

Sheet Title
CHILLER YARD - PLANS & ELEVATIONS

Dwg. No.
PLA2021-0432-0003D

Sht. No.
A-401

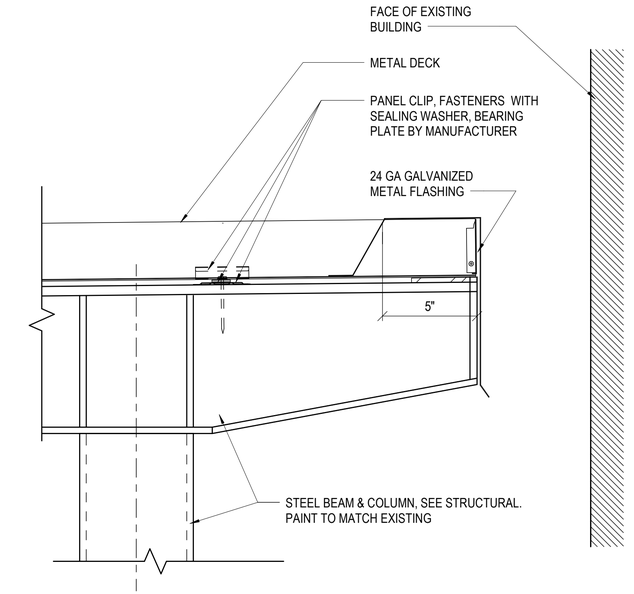


C3 / A-402 — **CANOPY DETAIL - NEW & EXISTING**

SCALE: 3" = 1'-0"

0 3" 6" 9"

3" = 1'-0"

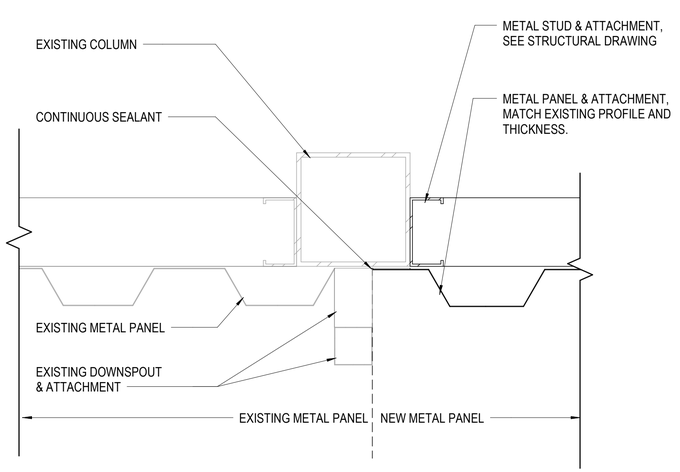


C6 / A-402 — **CANOPY DETAIL AT HIGH POINT**

SCALE: 3" = 1'-0"

0 3" 6" 9"

3" = 1'-0"

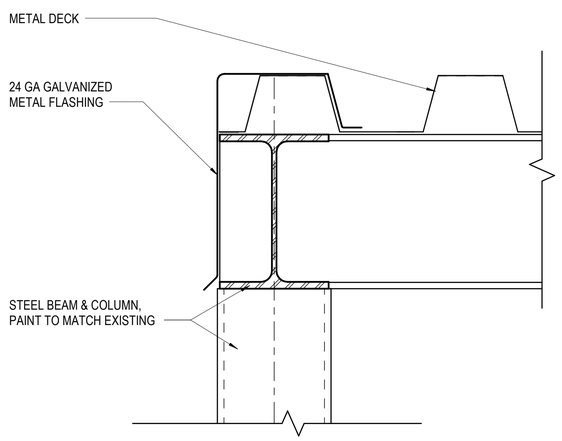


F1 / A-402 — **METAL PANEL DETAIL - PLAN**

SCALE: 3" = 1'-0"

0 3" 6" 9"

3" = 1'-0"

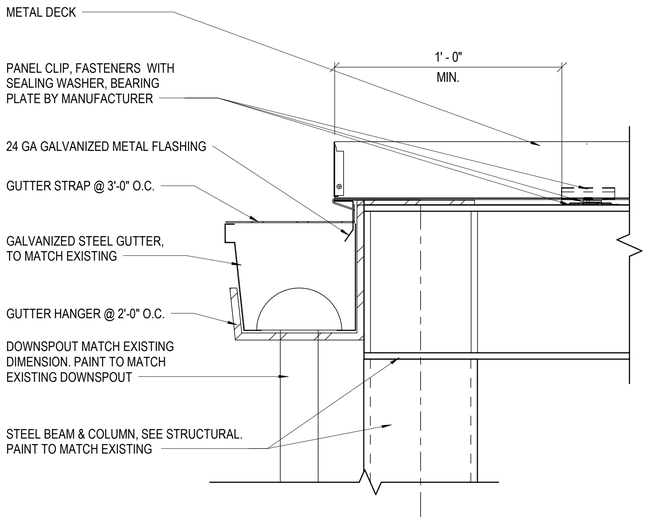


F4 / A-402 — **CANOPY DETAIL AT EDGE**

SCALE: 3" = 1'-0"

0 3" 6" 9"

3" = 1'-0"



F6 / A-402 — **CANOPY DETAIL AT GUTTER**

SCALE: 3" = 1'-0"

0 3" 6" 9"

3" = 1'-0"

KEY PLAN

LICENSED ARCHITECT — CHRISTOPHER RAMEY HILL — No. C29178 Exp. 11/30/2023 — STATE OF CALIFORNIA

Sheet Title

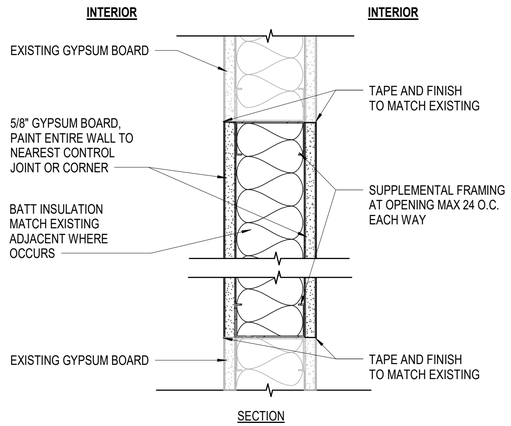
CANOPY AND METAL PANEL DETAILS - CHILLER YARD

Dwg. No.

PLA2021-0432-0004D

Sht. No.

A-402

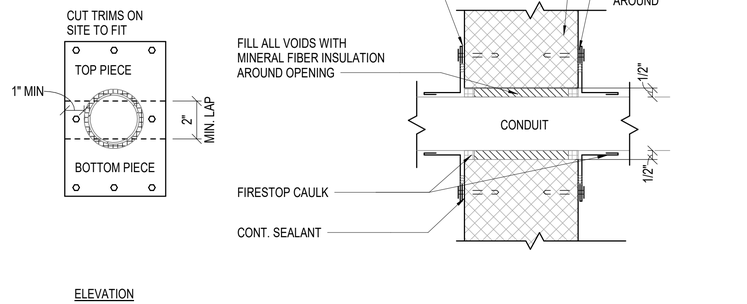


D1 INFILL DETAIL@ INTERIOR GYPSUM BOARD WALL

A-501 SCALE: 3" = 1'-0"

0 3" 6" 9"

3" = 1'-0"

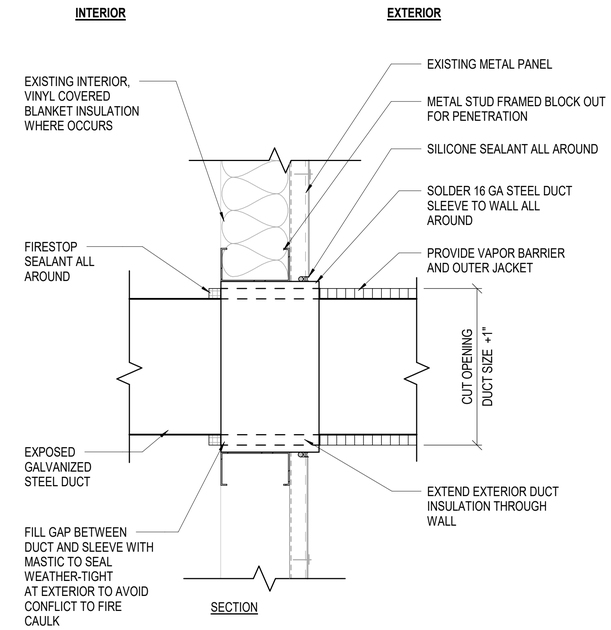


C3 PIPE PENETRATION @ EXTERIOR METAL WALL

A-501 SCALE: 3" = 1'-0"

0 3" 6" 9"

3" = 1'-0"

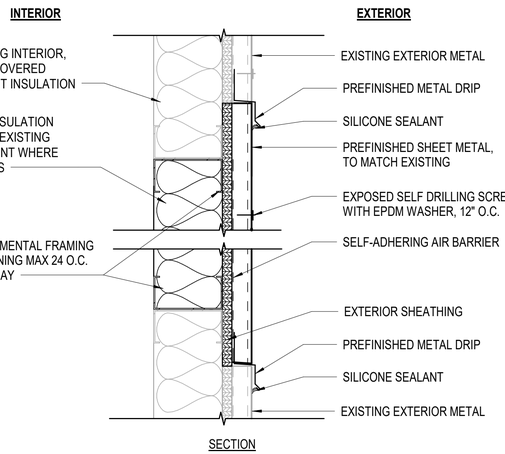


C6 DUCT PENETRATION @ EXTERIOR METAL WALL

A-501 SCALE: 3" = 1'-0"

0 3" 6" 9"

3" = 1'-0"

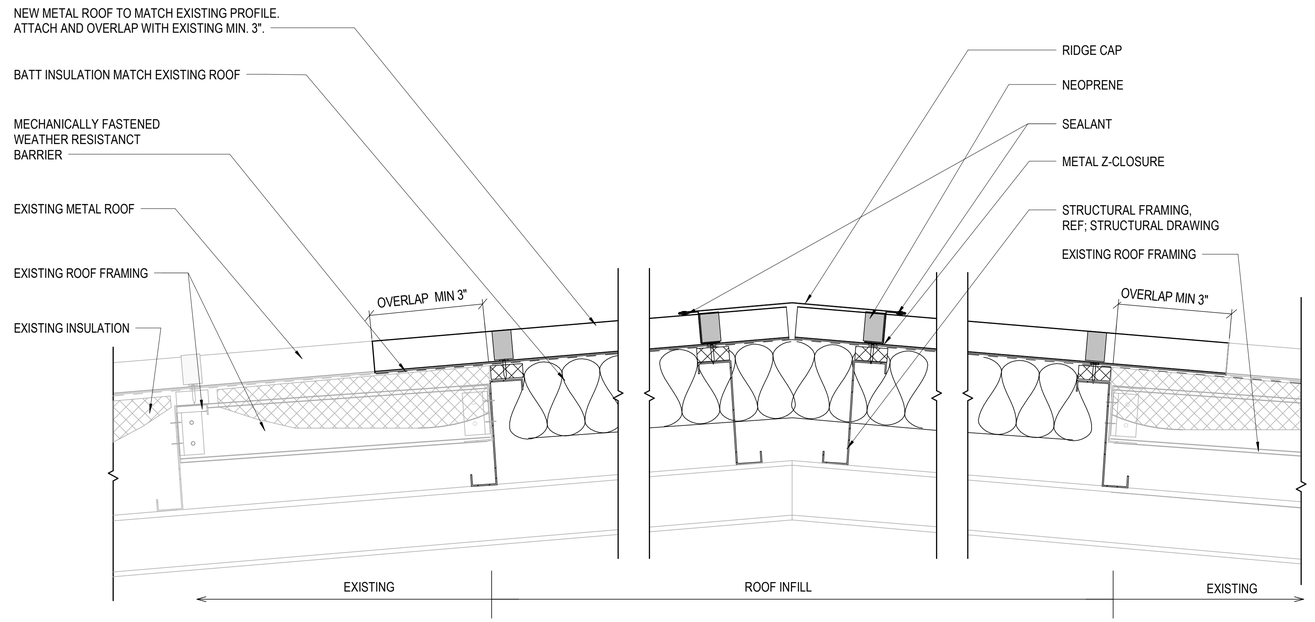


F1 INFILL DETAIL @ EXTERIOR METAL WALL

A-501 SCALE: 3" = 1'-0"

0 3" 6" 9"

3" = 1'-0"



F3 ROOF INFILL DETAIL

A-501 SCALE: 3" = 1'-0"

0 3" 6" 9"

3" = 1'-0"

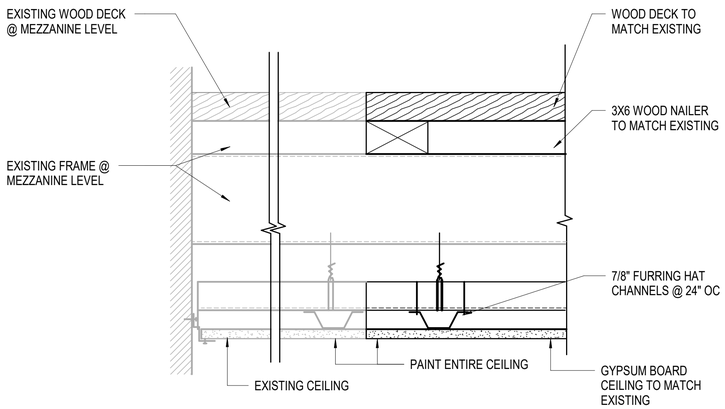
KEY PLAN

LICENSED ARCHITECT CHRISTOPHER DANIEL HILL No. C29178 Exp. 11/30/2023 STATE OF CALIFORNIA

Sheet Title
PENETRATION AND INFILL DETAILS

Dwg. No.
PLA2021-0432-0005D

Sht. No.
A-501



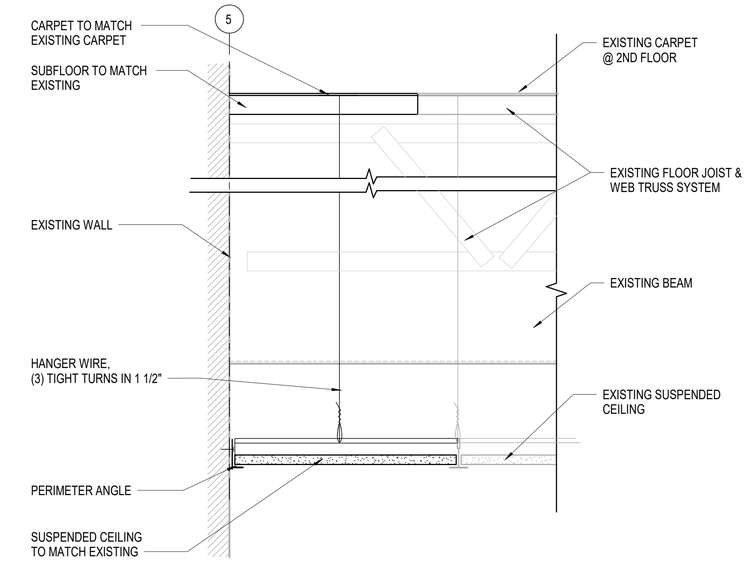
C3 CEILING & WOOD DECK INFILL DETAIL

A-502

SCALE: 3" = 1'-0"

0 3" 6" 9"

3" = 1'-0"



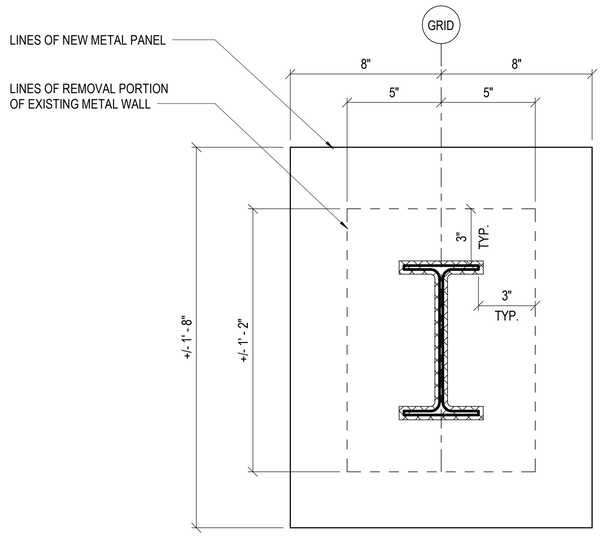
C6 CEILING & FLOOR INFILL DETAIL

A-502

SCALE: 3" = 1'-0"

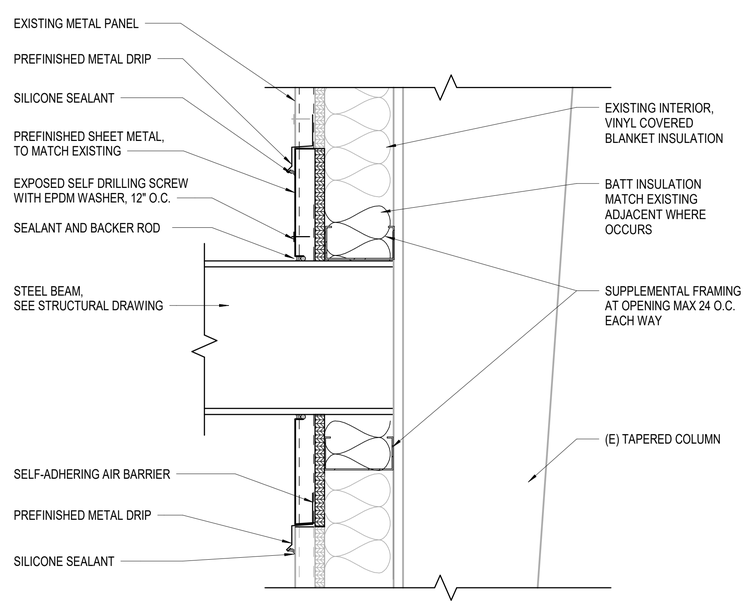
0 3" 6" 9"

3" = 1'-0"



ELEVATION

EXTERIOR **INTERIOR**



SECTION

F4 INFILL EXTERIOR WALL DETAIL @ STEEL BEAM

A-502

SCALE: 3" = 1'-0"

0 3" 6" 9"

3" = 1'-0"

KEY PLAN

LICENSED ARCHITECT
CHRISTOPHER RANEY
No. C29178
Exp. 11/30/2023
STATE OF CALIFORNIA

Sheet Title

PENETRATION AND INFILL DETAILS

Dwg. No.

PLA2021-0432-0006D

Sht. No.

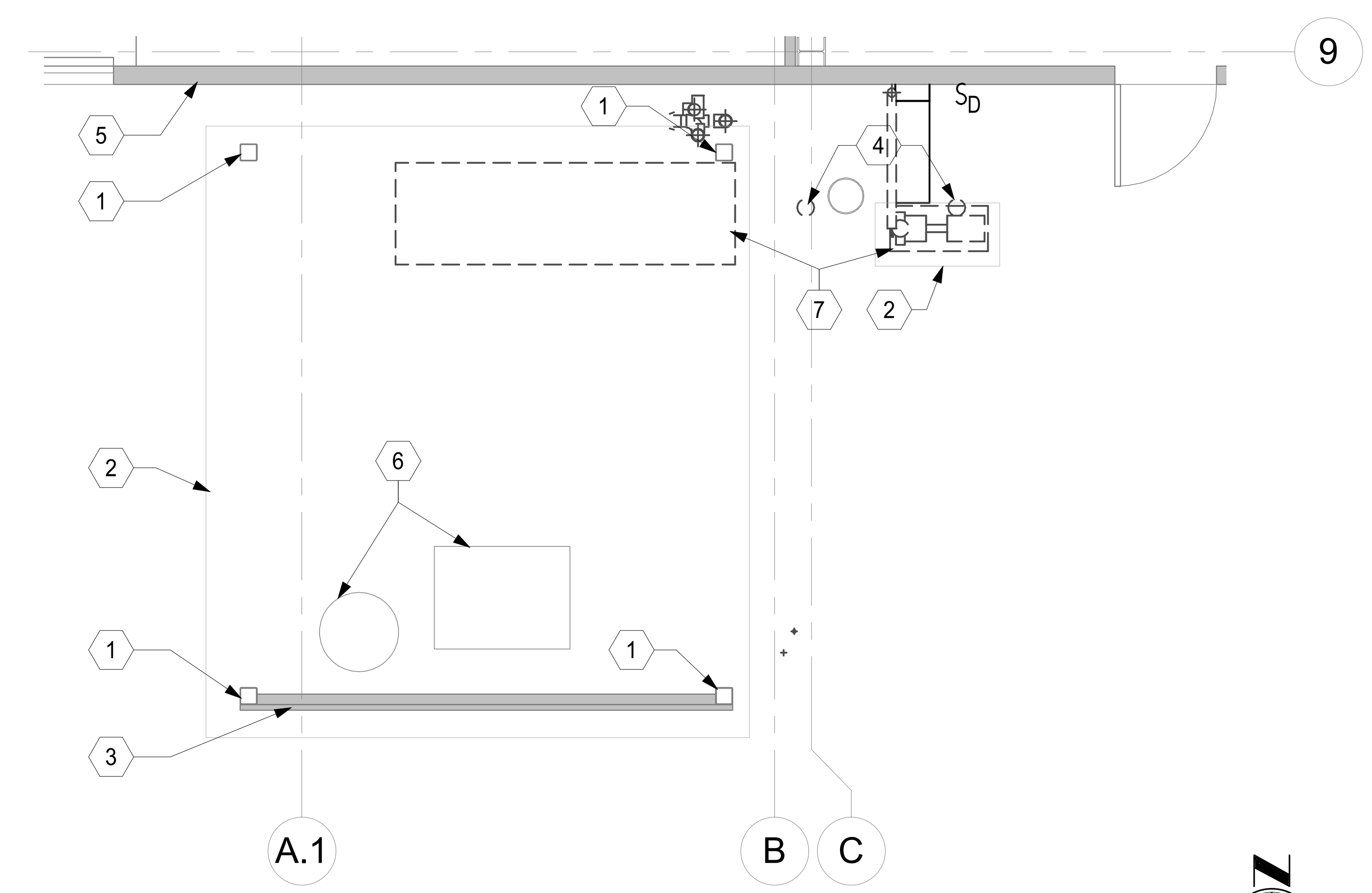
A-502

C5 AD101 DEMOLITION DETAIL - BOLLARDS

SCALE: NTS.

F1 AD101 DEMOLITION DETAIL

SCALE: NTS.



F5 AD101 ENLARGED FLOOR PLAN - DEMOLITION

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

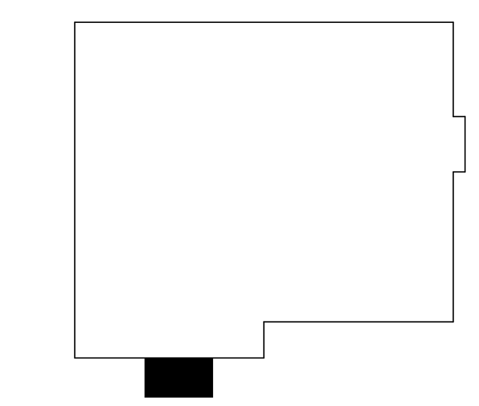
0 2' 4' 8'
1/4" = 1'-0"

GENERAL NOTES

1. EXISTING CONDITIONS SHOWN ON DRAWINGS ARE FOR INFORMATIONAL PURPOSES ONLY AND DO NOT SHOW ALL CONDITIONS THAT MAY AFFECT THE WORK OF THIS CONTRACT. CONTRACTOR MUST FIELD VERIFY ALL EXISTING CONDITIONS. REFER TO ALL ARCHITECTURAL, CIVIL, MECHANICAL, ELECTRICAL, AND STRUCTURAL DRAWINGS FOR ADDITIONAL DEMOLITION INFORMATION AND COORDINATION.
2. FIELD VERIFY EXISTING CONDITIONS BEFORE COMMENCING ANY WORK. ARCHITECT MUST BE NOTIFIED IMMEDIATELY OF ANY DISCREPANCIES DETRIMENTAL TO THE PROPER EXECUTION OF NEW CONSTRUCTION.
3. ALL DEMOLITION WORK MUST COMPLY WITH APPLICABLE BUILDING CODE AND ALL APPLICABLE LOCAL, STATE, AND FEDERAL LAWS, ORDINANCES, AND REGULATIONS. SEE CODE SUMMARY SHEET FOR APPLICABLE BUILDING CODE.
4. REMOVE EXISTING CONSTRUCTION TO THE EXTENT INDICATED ON THE DRAWINGS. PROTECT ALL OTHER EXISTING STRUCTURES ON ADJACENT PROPERTIES FROM DAMAGE THROUGHOUT CONSTRUCTION. SHOULD ANY DAMAGE OCCUR TO ANY EXISTING CONSTRUCTION ON ADJACENT PROPERTIES OR EXISTING CONSTRUCTION TO REMAIN ON SITE, THE CONTRACTOR MUST REPAIR THE DAMAGE TO THE SATISFACTION OF THE PROPERTY OWNER.
5. CONTRACTOR MUST PROTECT ALL EXISTING CONSTRUCTION NOTED TO REMAIN FROM DAMAGE AND SOILING DURING DEMOLITION. REMOVE DEBRIS REGULARLY AS NECESSARY TO ELIMINATE INTERFERENCE.
6. ALL DEMOLISHED MATERIALS MUST BE LEGALLY DISPOSED OF PROMPTLY. DO NOT ALLOW DEMOLISHED MATERIALS TO ACCUMULATE ON SITE. NO BURNING IS ALLOWED.
7. PROTECT ALL ADJACENT AREAS FROM THE DEMOLITION. REPAIR OR REPLACE, AT NO COST TO THE OWNER, ALL AREAS OR ITEMS DAMAGED DURING THE DEMOLITION.
8. PRIOR TO COMMENCEMENT WITH ANY DEMOLITION WORK, CONTRACTOR MUST IDENTIFY ALL ELECTRICAL CIRCUITS SERVICING THE AREA INVOLVED WITH THIS DEMOLITION. THOSE CIRCUITS MUST THEN BE LOCKED OUT AND TAGGED OUT IF THEY DO NOT SERVICE ANY OF THE REMAINING BUILDING. THOSE CIRCUITS WHICH ARE IDENTIFIED TO SERVICE BOTH THE AREA TO BE DEMOLISHED AND THE REMAINING BUILDING MUST BE SPLIT SO AS TO KILL ALL ELECTRICAL POWER TO THE AREA TO BE DEMOLISHED WHILE MAINTAINING POWER TO THE REMAINDER OF THE BUILDING.

KEYNOTES - DEMO

NO.	DESCRIPTION
1	EXISTING COLUMN TO REMAIN
2	EXISTING CONCRETE PAD TO REMAIN.
3	EXISTING WALL TO REMAIN
4	DEMOLISH EXISTING BOLLAR
5	EXISTING BUILDING TO REMAIN
6	EXISTING MECHANICAL EQUIPMENT TO REMAIN.
7	DEMOLISH MECHANICAL EQUIPMENT.



KEY PLAN

Sheet Title

DEMOLITION DETAILS - CHILLER YARD

Dwg. No.
PLA2021-0432-0002D

Sht. No.
AD101

GENERAL NOTES:

1. SUBCONTRACTOR MUST VERIFY DIMENSIONS AND CONDITIONS PRIOR TO STARTING WORK.

2. SUBCONTRACTOR MUST SUBMIT MATERIAL DATA PER THE SPECIFICATIONS TO CONSTRUCTION MANAGER FOR REVIEW PRIOR TO INSTALLATION

3. THE "REGULATIONS FOR IN-USE OFF-ROAD DIESEL VEHICLES" LIMITS IDLING OF DIESEL-FUELED OFF-ROAD VEHICLES WITH ENGINES GREATER THAN OR EQUAL TO 25 HORSEPOWER THAT ARE NOT DESIGNED FOR USE ON ROADS OR HIGHWAYS (E.G., BACK HOES, ASPHALT COMPACTOR ROLLERS, CRANES, DOZERS, EXCAVATORS, FORKLIFTS, GRADERS, TRACTORS, ETC.). SUBCONTRACTOR MUST RESTRICT IDLING OF ANY DIESEL-FUELED EQUIPMENT WITH AN ENGINE GREATER THAN OR EQUAL TO 25 HORSEPOWER TO NO LONGER THAN FIVE MINUTES. IDLING IS WHEN THE ENGINE IS OPERATING AND THE VEHICLE IS NOT MOVING OR IS NOT PERFORMING WORK. THE ENGINES MUST HAVE A CALIFORNIA AIR CONTROL RESOURCES BOARD (CARB) REGISTRATION AND ASSOCIATED STICKERS.

4. SUBCONTRACTOR MUST BE RESPONSIBLE FOR IMPLEMENTATION OF BEST MANAGEMENT PRACTICES (BMPS) PER THE SWPPP TO LIMIT DISCHARGE OF POLLUTANTS FROM CONSTRUCTION RELATED ACTIVITIES. SEE FACILITY SPECIFICATION 01 35 43 ENVIRONMENTAL PROTECTION.

5. THE PROJECT LAND DISTURBANCE IS OVER ONE ACRE AND IS SUBJECT TO EISA 438 OR CALIFORNIA GENERAL CONSTRUCTION PERMIT REQUIREMENTS.

6. SUBCONTRACTOR MAY REQUEST HORIZONTAL AND VERTICAL CONTROL POINTS, SUBCONTRACTOR MUST COORDINATE WITH CONSTRUCTION MANAGER.

7. CALTRANS SPECIFICATIONS REFERENCES THE 2018 STANDARD SPECIFICATIONS.

8. SUBCONTRACTOR IS REQUIRED TO POTHOLE AND VERIFY TIE-IN UTILITY DEPTH AND MATERIAL TYPE PRIOR TO COMMENCING TRENCHING.

9. THE SUBCONTRACTOR MUST BE SOLELY RESPONSIBLE FOR THE COST OF REPLACING ALL SURVEY WHICH ARE DAMAGED, DESTROYED OR DISTURBED DUE TO THEIR CONSTRUCTION ACTIVITIES. PRIOR TO CONSTRUCTION, SURVEY MONUMENTS THAT ARE LOCATED WITHIN THE CONSTRUCTION WORK AREA MUST BE TIED-OUT AND REFERENCED BY A LAND SURVEYOR LICENSED IN THE STATE OF CALIFORNIA. UPON COMPLETION OF CONSTRUCTION, ALL DAMAGED DESTROYED OR DISTURBED SURVEY MONUMENTS MUST BE REPLACED, AND A CORNER RECORD OF SURVEY MUST BE PREPARED AND FILED WITH THE COUNTY SURVEYOR AS REQUIRED BY THE PROFESSIONAL LAND SURVEYOR'S ACTS, SECTION 8771 OF THE BUSINESS AND PROFESSIONS CODE OF THE STATE OF CALIFORNIA.

10. IF ANY VERTICAL CONTROL IS TO BE DISTURBED OR DESTROYED, MUST BE NOTIFIED IN WRITING, AT LEAST 3 DAYS PRIOR TO THE CONSTRUCTION. THE SUBCONTRACTOR IS SOLELY RESPONSIBLE FOR THE COST ASSOCIATED WITH REPLACING ANY VERTICAL CONTROL BENCHMARKS DESTROYED OR DISTURBED DUE TO THE CONTRACTOR'S CONSTRUCTION ACTIVITIES.

11. SUBCONTRACTOR MUST COORDINATE WITH CM FOR FINAL INSPECTION OF NEW UTILITIES PRIOR TO BACKFILLING OR PRIOR TO PLACING CONCRETE FOR ELECTRICAL AND TELECOM DUCTBANK.

12. PERFORM WORK SAFELY AND PROVIDE A PLACE OF EMPLOYMENT FREE FROM RECOGNIZED HAZARDS THAT MAY CAUSE, OR ARE LIKELY TO CAUSE, DEATH OR SERIOUS PHYSICAL HARM TO EMPLOYEES. THIS INCLUDES PROVIDING PROTECTION FOR THE PUBLIC AND THE ENVIRONMENT. THE SUBCONTRACTOR IS RESPONSIBLE FOR THE SAFE PERFORMANCE OF THE WORK IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE, AND SPECIFIC ES&H REQUIREMENTS. EXERCISE A DEGREE OF CARE COMMENSURATE WITH THE WORK AND THE ASSOCIATED HAZARDS. ENSURE THAT ES&H IS AN INTEGRAL AND TRANSPARENT PART OF THE PLANNING AND EXECUTION OF WORK.

13. STANDARD WORK HOURS ARE MONDAY THROUGH FRIDAY FROM 7:00 AM TO 6:00 PM, EXCEPT HOLIDAYS
    a. OPEN TO EARLIER START TIMES DURING SUMMER MONTHS DUE TO SUMMER TEMPERATURES
    b. SUBMIT REQUESTS FOR NONSTANDARD WORK HOURS TO THE STR AT LEAST 48 HOURS IN ADVANCE

14. COMPLY WITH, AND ASSIST IN COMPLYING WITH, ES&H REQUIREMENTS OF APPLICABLE LAWS AND REGULATIONS, AND APPLICABLE DIRECTIVES IDENTIFIED IN THIS SUBCONTRACT. COOPERATE WITH FEDERAL, STATE, AND LOCAL AGENCIES HAVING JURISDICTION OVER ES&H MATTERS UNDER THIS SUBCONTRACT.

15. SUBCONTRACTORS ARE REQUIRED TO SUBMIT DOCUMENTATION OF THE WORK TASKS, HAZARDS, CONTROLS, GENERAL SAFETY PRACTICES, AND READINESS TO WORK . THIS INFORMATION IS TERMED "ES&H SUBMITTALS."

16. THE SUBCONTRACTOR IS RESPONSIBLE TO TRAIN ITS EMPLOYEES IN ACCORDANCE WITH LAWS AND STANDARDS, AND INCLUDE ADDITIONAL TRAINING FOR SITE SUPERVISION. CONTINUE TRAINING THROUGH THE TERM OF THE SUBCONTRACT. SUBMIT COPIES OF TRAINING CERTIFICATES FOR EACH EMPLOYEE FOR OPERATIONS THAT REQUIRE SUCH TRAINING PRIOR TO PERFORMING THE WORK

17. CONFINED SPACES. CONDUCT ENTRIES OF PERMIT-REQUIRED CONFINED SPACES IN ACCORDANCE WITH 29 CFR 1910.146, 29 CFR1926 SUBPART AA, AND ANSI Z88.2. IF THE SUBCONTRACTOR IS THE SOLE ENTRANT, THE ENTRY WILL BE PERFORMED UNDER THE SUBCONTRACTOR'S CONFINED SPACE PROGRAM USING THE SUBCONTRACTOR'S ENTRY PERMIT.

    IN ALL CASES, CONDUCT A JOINT PRE-ACTIVITY WALKTHROUGH TO REVIEW CONFINED SPACE HAZARDS AND CONTROLS.

18. WELDING AND BURNING ACTIVITIES. PERFORM WELDING IN ACCORDANCE WITH ANSI Z49.1: SAFETY IN WELDING, CUTTING, AND ALLIED PROCESSES, SECTIONS 4.3 AND E4.3. DO NOT USE THORIATED WELDING RODS WITHOUT THE STR'S APPROVAL IN WRITING. SUBMIT WELDING PROGRAM AS PART OF THE CORPORATE SAFETY PLAN.

19. SILICA DUST. WHEN PERFORMING WORK GENERATING SILICA DUST (E.G., JACKHAMMERING, CORE-DRILLING, OR SAW-CUTTING CONCRETE, REMOVING OR SAWING TILE OR STONE, SAND-BLASTING, REPAVING), PROTECT WORKERS IN ACCORDANCE WITH THE OSHA SILICA STANDARD (29 CFR 1926.1153) USING A COMBINATION OF ADMINISTRATIVE CONTROLS, ENGINEERING CONTROLS, AND PPE TO PREVENT WORKER EXPOSURE TO RESPIRABLE AIRBORNE SILICA FROM EXCEEDING THE ACGIH TLV EXPOSURE LIMITS. AFTER JANUARY 17, 2019, CONSTRUCTION CONTRACTORS MUST OBTAIN EITHER EXPOSURE MONITORING DATA OR USE A COMBINATION OF EXPOSURE MONITORING DATA AND OBJECTIVE DATA TO ACCURATELY CHARACTERIZE WORKER EXPOSURES TO RESPIRABLE SILICA INSTEAD OF RELYING SOLELY ON THE CONTROLS IDENTIFIED 29 CFR 1926.1153(C)(1) TABLE 1. IN THE ABSENCE OF EXPOSURE MONITORING DATA, RESPIRATORY PROTECTION GREATER THAN THAT SPECIFIED IN TABLE 1 MAY BE REQUIRED. ALL MONITORING RESULTS CONDUCTED BY SUBCONTRACTORS ON THEIR EMPLOYEES PERFORMING WORK MUST BE SUBMITTED TO THE STR AND ES&H TEAMS

20. ASBESTOS HAZARD RELATED TO THE CUTTING/REMOVAL OF UNDERGROUND ASBESTOS CEMENT PIPE (TRANSIT PIPE) IS EXPECTED DURING UTILITIES DEMOLITION AND UTILITY TIE-IN WORK. SUCH ACTIVITIES REQUIRE 16 HOURS ASBESTOS TRAINING AND RESPIRATOR PROTECTION PER OSHA ASBESTOS SAFETY CLASS III.

21.

22. TRAFFIC CONTROL PLAN. SUBMIT A TRAFFIC CONTROL PLAN TO PMEC CIVIL ENGINEER AND THE FACILITIES & INFRASTRUCTURE POINT OF CONTACT (FPOC) FOR 02 LAND FOR REVIEW AND APPROVAL PRIOR TO THE START OF CONSTRUCTION. SHOW HOW PEDESTRIAN AND VEHICULAR TRAFFIC WILL BE MAINTAINED DURING CONSTRUCTION ON THE TRAFFIC CONTROL PLAN.

23. DO NOT COMMENCE EARTH-MOVING OPERATIONS UNTIL TEMPORARY SITE FENCING AND EROSION- AND SEDIMENTATION-CONTROL MEASURES SPECIFIED IN SECTION 01 35 43 "ENVIRONMENTAL PROTECTION," 01 50 00 "TEMPORARY FACILITIES AND CONTROLS", AND 31 10 00 "SITE CLEARING" ARE IN PLACE.

PERMITTING GENERAL NOTES:

1. ADVANCE NOTIFICATION REQUIREMENTS:
   a. 24 HOURS FOR BURN ACTIVITIES
   b. 14 DAYS FOR THE FOLLOWING; SOIL AND EXCAVATION, CONCRETE PENETRATIONS, UTILITY OUTAGE.
   c. KEEP THE PERMIT CARD ON THE JOB SITE AT ALL TIMES FOR BUILDING INSPECTOR SIGN-OFF.

EXCAVATION AND TRENCHING GENERAL NOTES:

1. BEFORE BEGINNING EXCAVATIONS 5 FEET OR MORE IN DEPTH, SUBMIT IN THE CORPORATE SAFETY PLAN THE TRENCHING AND EXCAVATION PROGRAM, AND IN THE JHA OR A SEPARATE DOCUMENT SUBMIT A DETAILED PLAN SHOWING THE DESIGN OF SHORING, BRACING, SLOPING, OR OTHER PROVISIONS TO PROTECT WORKERS FROM THE HAZARD OF CAVING GROUND DURING THE EXCAVATION.
2. SUBCONTRACTOR MUST COORDINATE WITH CONSTRUCTION MANAGER TO OBTAIN SOIL AND EXCAVATION PERMIT AND CONCRETE PENETRATION PERMIT PRIOR TO COMMENCING TRENCHING. TRENCHING MUST CONFORM TO REQUIREMENTS PER SPECIFICATION 31 20 00 EARTH MOVING.
3. PERFORM EXCAVATION UNDER THE SUPERVISION OF A COMPETENT PERSON AS DEFINED BY 29 CFR 1926, SECTIONS 650 AND 651. IF EXCAVATION UNCOVERS AN UNIDENTIFIED UTILITY, STOP EXCAVATION IN THIS AREA AND IMMEDIATELY NOTIFY

EMERGENCIES:

1. IN AN EMERGENCY AFFECTING THE SAFETY OF PERSONS OR PROPERTY, IMMEDIATELY CALL 911 FROM SYSTEM PHONE OR CELLULAR PHONE, AND TAKE APPROPRIATE ACTION TO PREVENT OR MINIMIZE DAMAGE, INJURY, OR LOSS, AND TO PRESERVE THE INTEGRITY OF THE SCENE FOR FUTURE INVESTIGATION. PROMPTLY NOTIFY THE STR OF THE OCCURRENCE OF SUCH AN EMERGENCY AND ACTIONS TAKEN BY THE SUBCONTRACTOR. THIS NOTICE MAY BE ORAL FOLLOWED BY WRITTEN CONFIRMATION.

CIVIL SHEET INDEX

LEGEND

Existing Condition	Description	Plan
	LIMITS OF CONSTRUCTION	
	GRADING LIMIT LINE	
	EASEMENT LINE	
X X X X	CHAIN LINK FENCE	
HPG HPG	HIGH PRESSURE NATURAL GAS	HPG HPG
E	ELECTRIC UTILITY/CONDUIT	E
COM	COMMUNICATION LINE	COM
SD	STORM DRAINAGE LINE	SD
SS SS	SANITARY SEWER LINE	SS
CW CW	DOMESTIC WATER LINE	CW CW
IRR IRR	IRRIGATION LINE	IRR IRR
(XXX)	MAJOR CONTOURS	XXX
	MINOR CONTOURS	
W	MONITORING WELL	
S	SEWER STRUCTURE/MANHOLE	S
	FIRE DEPARTMENT CONNECTION	
	FIRE HYDRANT	
	POST INDICATOR VALVE	
	TREE OR SHRUB AS INDICATED	
	LIGHT POLE	
	STORM DRAIN STRUCTURE/MANHOLE	D
	STORM DRAIN INLET	
	IRRIGATION BOX	
	UTILITY VAULT PER PLAN	
	INLET/OUTLET STRUCTURE	
	WATER VALVE	
	THRUST BLOCK	
	TEE	
	ELBOW	
	CAP OR PLUG	
000.00	SIGN	
	ELEVATION	00.00 XX 00.00 XX 00.00 XX
	FLOW LINE	

GRID LETTER, GRID NUMBER

D5 **VIEW/SHEET TITLE**

SHEET NO SCALE: 1"= SCALE IN FEET OR NONE

KEYED ITEM/NOTE #

GRID LETTER, GRID NUMBER

D7 **DETAIL TITLE**

SHEET NO SCALE: 1"=SCALE IN FEET OR NONE

ABBREVIATIONS

ADA	AMERICAN DISABILITIES ACT		
BC	BEGIN CURVE	LP	LOW POINT
BVC	BEGIN VERTICAL CURVE	MH	MANHOLE
CL	CENTERLINE	MOC	MIDDLE OF CURVE
CO	CLEANOUT	O.C.	ON CENTER
DIA	DIAMETER	PB	PULL BOX
DI	DROP INLET	PCC	PORTLAND CEMENT CONCRETE
EC	END CURVE	PIV	POST INDICATOR VALVE
ECCAB/TRANS	ELECTRICAL CABINET / TRANSFORMER	SW	SIDEWALK
EP	EDGE OF PAVEMENT	SDMH	STORM DRAIN MANHOLE
EV	ELECTRIC VEHICLE	TG	TOP OF GRATE
EVC	END VERTICAL CURVE	TYP	TYPICAL
EX	EXISTING	UTILS	UTILITIES
FF	FINISH FLOOR	WM	WATER METER
FDC	FIRE DEPARTMENT CONNECTION	@	AT
FH	FIRE HYDRANT	Ø	DIAMETER/PHASE
FG	FINISH GROUND	#	NUMBER
FL	FLOW LINE	%	PERCENT
FS	FINISH SURFACE	±	PLUS/MINUS (APPROXIMATE)
GB	GRADE BREAK		
HH	HAND HOLE		
HP	HIGH POINT		
INV	INVERT		

NOTE:
SOME ABBREVIATIONS MAY NOT BE USED ON THIS PLAN

811 CONTACT US BEFORE YOU DIG SAFE DIGGING PARTNER

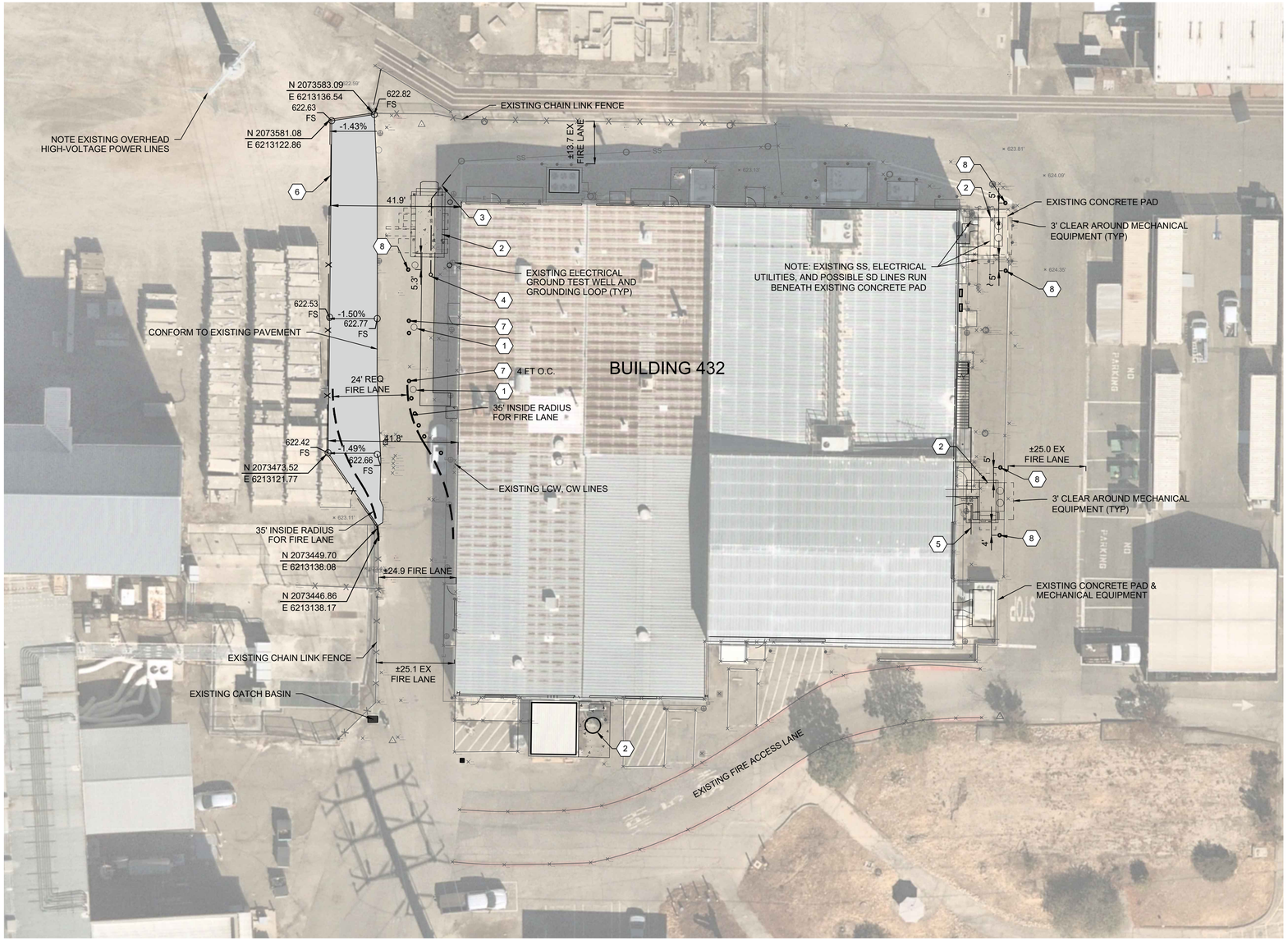
THIS IS PRIVATE PROPERTY AND THE 811 PROCESS DOES NOT PROTECT YOU FROM HITTING PRIVATE UTILITIES. PLEASE USE NON-INVASIVE TECHNIQUES SUCH AS GPR AND ELECTROMAGNETIC TRACING TO LOOK FOR UTILITIES PRIOR TO ANY EXCAVATION.

KEY PLAN

Sheet Title
GENERAL NOTES AND ABBREVIATIONS

Dwg. No.
PLC2021-0432-0001D

Sht. No.
C-001



F2 C-100 **CIVIL SITE PLAN**
SCALE: 1" = 20'

0 10' 20' 40'
1" = 20'

LEGEND

- CONSTRUCT NEW ASPHALT CONCRETE PAVEMENT, MATCH EXISTING SLOPES & ELEVATIONS. SEE A2/C-502 FOR PAVEMENT SECTION
- CONSTRUCT FENCE, SEE DETAILS SHEET C-501
- CONSTRUCT CONCRETE PAD, SEE STRUCTURAL SHEETS
- FIRE LANE LIMITS

THIS IS PRIVATE PROPERTY AND THE 811 PROCESS DOES NOT PROTECT YOU FROM HITTING PRIVATE UTILITIES. PLEASE USE NON-INVASIVE TECHNIQUES SUCH AS GPR AND ELECTROMAGNETIC TRACING TO LOOK FOR UTILITIES PRIOR TO ANY EXCAVATION.

GENERAL NOTES

1. GPR SCAN TO BE PERFORMED PRIOR TO SITE WORK WHERE EXISTING ASPHALT IS TO BE DISTURBED FOR NEW WORK.
2. HAND EXCAVATE WHERE DIGGING WITHIN 5' OF EXISTING UTILITY IDENTIFIED USING GPR SCAN.
3. FOR UTILITIES NOT SPECIFICALLY REFERENCED IN KEYED NOTES 3 - 5, DO NOT DIG WITHIN 30" HORIZONTALLY OF EXISTING UTILITY.
4. DASHED REGIONS AROUND EQUIPMENT INDICATE CLEARANCE REQUIRED FOR EQUIPMENT ACCESS AND MAINTENANCE.
5. CONFIRM MINIMUM PROPOSED EQUIPMENT PAD SIZES ON MECHANICAL DRAWINGS. REFER TO MECHANICAL DRAWINGS FOR CLEARANCE BETWEEN THE EXISTING BUILDING AND EQUIPMENT.

KEYED NOTES

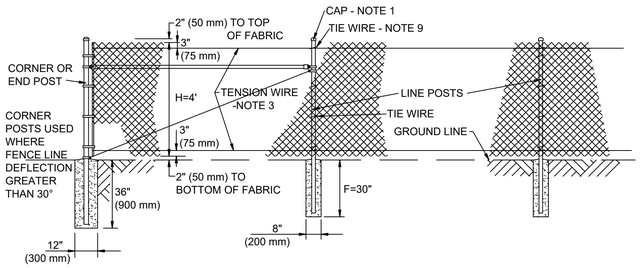
1. CONSTRUCT SUPPORT COLUMN FOR OVERHEAD DUCT BANKS, SEE STRUCTURAL SHEETS
2. NEW MECHANICAL EQUIPMENT, SEE MECHANICAL SHEETS FOR MINIMUM EQUIPMENT PAD SIZE.
3. REPLACE EXISTING SANITARY SEWER WITH 6" CERAMIC-LINED DIP, MATCH EXISTING SLOPE AND ELEVATIONS
4. CONSTRUCT SANTIARY SEWER CLEAN OUT, SEE E2/C-502
5. REPLACE EXISTING STORM SEWER WITH 12" DIP, MATCH EXISTING SLOPE AND ELEVATIONS
6. CONSTRUCT 19'9" DOUBLE LEAF SWING CHAIN LINK FENCE GATE, SEE DETAILS ON SHEET C-501
7. CONSTRUCT FIXED BOLLARD, SEE DETAIL D1/C-503 (TYP)
8. CONSTRUCT REMOVABLE BOLLARD, SEE DETAIL D4/C-503 (TYP)

KEY PLAN

Sheet Title
CIVIL SITE PLAN

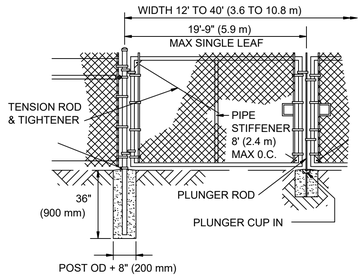
Dwg. No.
PLC2021-0432-0003D

Sht. No.
C-101



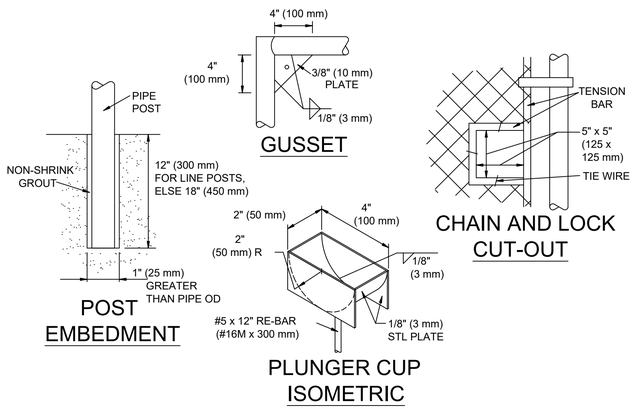
B1 CHAIN-LINK FENCE W/CORNER POST

C-501 C-101 SCALE: NONE



B4 SWING GATE

C-501 C-101 SCALE: NONE



E1 SWING GATE DETAILS

C-501 C-101 SCALE: NONE

NOTES:

1. SECURE DRIVE-FIT GALVANIZED CAP TO POST WITH 1/4" (6 mm) ROUND-HEAD RIVET.
2. H DENOTES FABRIC WIDTH AND NOMINAL FENCE HEIGHT. H = 4' UNLESS OTHERWISE NOTED.
3. IF FENCE WITH TOP RAIL IS SPECIFIED, DELETE STEEL TENSION WIRE AT TOP, AND PIPE RAILS AT INTERMEDIATE, SLOPE, END AND CORNER POSTS. EXTEND TENSION ROD TO TOP RAIL.
4. POST SPACING IS MAXIMUM 10' (3.0 m).
5. FILL CLEAR OPENINGS GREATER THAN 3" (75 mm) WITH FABRIC. FOR OPENINGS LESS THAN 18" (450 mm), TIE FABRIC TO POSTS.
6. USE ONE POST FOR COMBINED SLOPE AND CORNER POST IF TOP OF CHANNEL WALL IS CONSTRUCTED AS SHOWN FOR "ALTERNATE".
7. STEEL BANDS AT TENSION BARS MUST BE 1/8" x 1" (3 x 25 mm), MINIMUM, SPACED AT MAXIMUM 16" (400 mm).
8. SECURE TENSION WIRES TO EACH LINE POST WITH TIE WIRES.

E4 FENCING NOTES

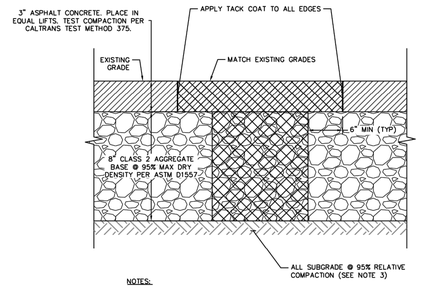
C-501 C-101 SCALE: NONE

Lawrence Livermore National Laboratory
Operations & Business - Detail

Des: BLAKE BROWN	03/20/19	Sheet: 1 of 1
Dwn: NIKKI TANG	03/20/19	
Chk: BLAKE BROWN	03/20/19	

REV	DATE	REVISIONS	DRAWN	CHECK

Detail Title: PAVEMENT SECTION REPAIR



NOTES:

1. CUT THE PAVEMENT TO A NEAT, STRAIGHT EDGE.
2. IF EXISTING AC/AB SECTION IS GREATER THAN 3"/8", MATCH EXISTING.
3. SCARIFY AND RECOMPACT EXISTING SUBGRADE TO 95% OF RELATIVE COMPACTION PER ASTM D1557.
4. VALUES ASSUME AN R-VALUE OF 5.

Reference Scale: NTS

File Name: I:\Civil\Standard Details\CAD\Pavement Section Repair.dwg Date Plotted: 4/25/2019 - 9:56:06 AM

E6 PAVEMENT SECTION REPAIR

C-501 C-101 SCALE: NONE

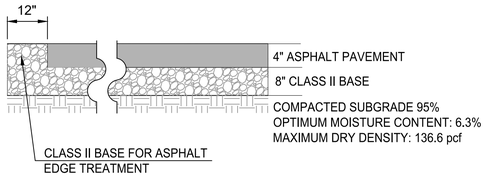
KEY PLAN

Sheet Title

CIVIL DETAILS

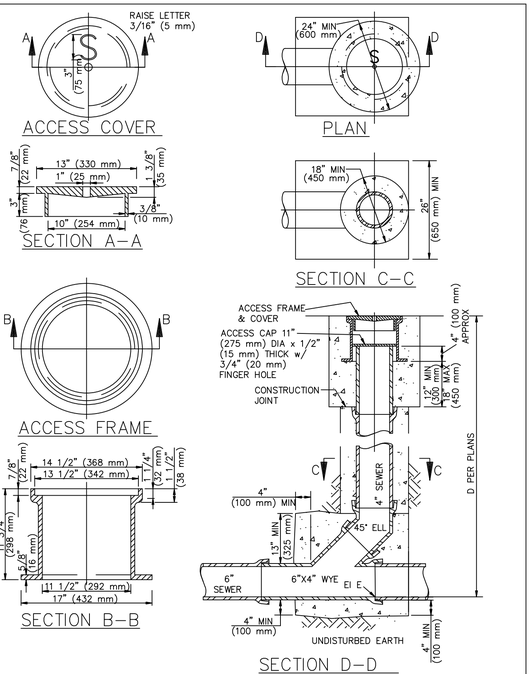
Dwg. No.
PLC2021-0432-0004D

Sht. No.
C-501



A2 ASPHALT PAVING

C-502 C-101 SCALE: NONE



STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION		
PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1983 REV. 2005, 2009, 2021	TERMINAL CLEANOUT STRUCTURE	STANDARD PLAN 204–3
	USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION	SHEET 1 OF 2

NOTES:

1. VALUES OF DIMENSION D AND ELEVATION E MUST BE AS SHOWN ON THE PLANS.
2. PIPE AND FITTINGS, UNLESS OTHERWISE NOTED, MUST BE OF THE SAME MATERIALS AS THE SEWER, UNLESS APPROVED ADAPTORS ARE USED
3. PIPE AND FITTINGS MUST BE BEDDED AND ENCASED IN CONCRETE AS SHOWN. CONCRETE MUST BE CLASS 450–C–2000 (265–C–14). JOIN AND ALIGN PIPE AND FITTINGS BEFORE PLACING CONCRETE. MAINTAIN ALIGNMENT WHILE PLACING AND ALLOWING CONCRETE TO SET.
4. THE ACCESS FRAME, COVER AND CAP MUST BE CAST IRON. FINGER HOLES MAY BE DRILLED OR BLOCKED OUT PRIOR TO CASTING. FINGER HOLES MUST NOT BE PUNCHED OUT.
5. THE CONTRACTOR MAY PLACE EITHER CIRCULAR OR SQUARE CONCRETE PIPE WALL SUPPORTS.

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION	STANDARD PLAN
TERMINAL CLEANOUT STRUCTURE	204–3
	SHEET 2 OF 2

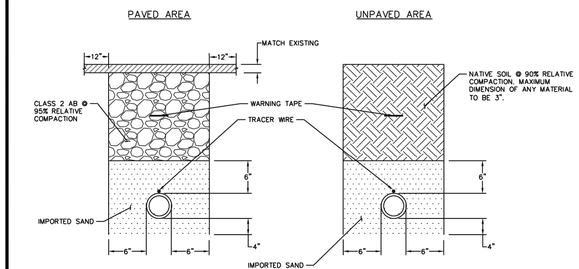
E2 SEWER CLEAN OUT

C-502 C-101 SCALE: NONE

Lawrence Livermore National Laboratory Operations & Business - Detail	Des:		
	Dwn: MEL VILLEGAS	05/19/08	Sheet: 1 of 1
	Chk: RAY LEFFNER	05/19/08	

REV	DATE	REVISIONS	DRAWN	CHECK
A	05/19/08			
B	03/18/15	REVISION	NB	

Detail Title: TRENCH BACKFILL DETAIL



NOTES:

1. IMPORTED SANDS SHALL BE A CLEAN, UNIFORMLY GRADED SAND MEETING THE FOLLOWING GRADATION REQUIREMENTS:

SIEVE SIZE	PERCENT PASSING
NO. 8	100%
200	0 – 3%

MATERIAL SHALL HAVE A MINIMUM SAND EQUIVALENT OF 50.

2. TRENCH SHALL CONFORM TO CAL OSHA. PROVIDE TRENCHING DETAILS FOR TRENCHES OVER 5' IN DEPTH.
3. ASPHALT CONCRETE PAVING SHALL BE SAW CUT IN NEAT PARALLEL LINES AND A "TACK COAT" APPLIED BEFORE PAVING.
4. NO PEA GRAVEL SHALL BE USED.
5. NATIVE BACKFILL MATERIAL SHALL HAVE NO SOLID MATERIALS LARGER THAN 3"
6. TRACER WIRE IS REQUIRED FOR ALL NONMETALLIC PIPE.
7. WARNING TAPE SHALL BE INSTALLED APPROX 2" ABOVE ALL BURIED PIPE.

Reference Scale: NTS

File Name: T:\Civil\Standard Details\CAD\Trench Backfill Detail.dwg Date Plotted: 4/25/2019 – 9:51:56 AM

E7 TRENCH DETAIL

C-502 C-101 SCALE: NONE

KEY PLAN

Sheet Title

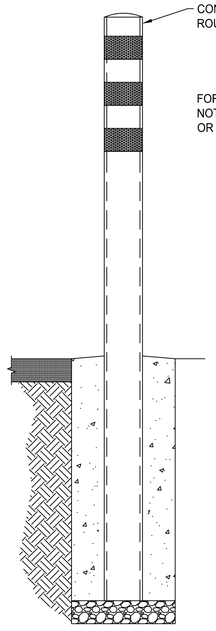
CIVIL DETAILS

Dwg. No.

PLC2021-0432-0005D

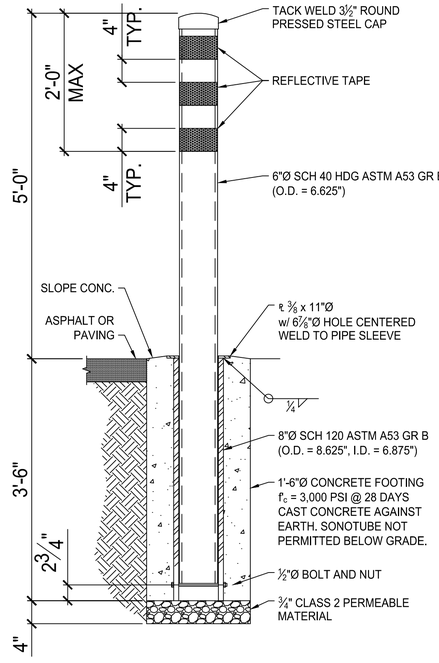
Sht. No.

C-502



D1 FIXED BOLLARD

C-502 C-101 SCALE: NONE



D4 REMOVABLE BOLLARD

C-502 C-101 SCALE: NONE

BOLLARD NOTES

1. ASCE 7 VEHICLE BARRIER DESIGN CRITERIA:
   6,000 LBS APPLIED HORIZONTALLY IN ANY DIRECTION AT 2'-3" ABOVE GRADE.
2. VEHICLE IMPACT PROTECTION SHALL COMPLY WITH THE FOLLOWING:
   - SECTION 312 OF THE INTERNATIONAL FIRE CODE (IFC), AND
   - NFPA 55: COMPRESSED GASSES AND CRYOGENIC FLUIDS CODE
3. PROVIDE BOLLARDS WHERE EQUIPMENT IS SUBJECT TO ACCIDENTAL LOW-SPEED VEHICLE CONTACT SUCH AS IN PARKING LOTS, ALLEYS, OR EQUIPMENT SERVICE PATHS. WHERE EQUIPMENT IS NEAR ROADWAYS, PROVIDE SUITABLE ROADSIDE BARRIER TO MEET SITE CONDITIONS IN ACCORDANCE WITH THE AASHTO "ROADSIDE DESIGN GUIDE."
4. PROVIDE TYPE 1 GUARD POSTS TO PROTECT THE FOLLOWING PER SECTION 4.11.1.1 OF NFPA 55-20:

   A. STORAGE TANKS AND CONNECTED PIPING, VALVES, AND FITTINGS
   B. STORAGE AREAS CONTAINING TANKS OR PORTABLE CONTAINERS EXCEPT WHERE THE EXPOSING VEHICLES ARE LIMITED TO POWERED INDUSTRIAL TRUCKS USED FOR TRANSPORTING THE HAZARDOUS MATERIALS
   C. COMPRESSED GAS USE AREAS
5. LOCATE ALL UNDERGROUND UTILITIES PRIOR TO EXCAVATING BOLLARD FOOTING. CONSULT CIVIL OR STRUCTURAL ENGINEER IF UNDERGROUND UTILITIES ARE WITHIN 18 INCHES OF BOLLARD FOOTING.
6. PROVIDE 4 FT CLEARANCE AND REMOVABLE BOLLARDS WHERE ACCESS IS REQUIRED FOR SERVICE OR HOT STICK OPERATIONS. SECTIONALIZING SWITCHGEAR TYPICALLY REQUIRES HOT STICK OPERATION SPACES ON TWO SIDES.
7. HOT DIP GALVANIZE ALL STEEL PARTS AFTER FABRICATION IN ACCORDANCE WITH ASTM A123.
8. PAINT BOLLARDS WITH TWO COATS OF "SAFETY YELLOW PAINT OVER A SUITABLE PRIMER. SHERMAN WILLIAMS "POLANE" H.S. POLYURETHANE ENAMEL OR BETTER.
9. YELLOW POLYETHYLENE SLEEVES, SUCH AS THE ARMORCAST "GUARDIAN SLEEVE" MAY BE USED INSTEAD OF PAINTING.
10. REFLECTIVE TAPE SHALL BE 4" WHITE HIGH INTENSITY PRISMATIC REFLECTIVE TAPE (ORALITE 5900, ASTM D4956-13 TYPE IV) OR APPROVED EQUAL.
11. SUBCONTRACTOR SHALL SUBMIT DIMENSIONED LAYOUT DRAWING FOR APPROVAL PRIOR TO INSTALLATION.

D6 BOLLARD NOTES

C-502 C-101 SCALE: NONE

KEY PLAN

Sheet Title

CIVIL DETAILS

Dwg. No.
PLC2021-0432-0006D

Sht. No.
C-503

F2
C-100

DEMOLITION PLAN

SCALE: 1" = 20'

0 10' 20' 40'

1" = 20'

LEGEND

- CLEAR AND GRUB, REMOVE EX GRAVEL TO CONSTRUCT PAVEMENT SECTION
- REMOVE EXISTING ASHPALT TO DEPTH NEEDED TO CONSTRUCT EQUIPMENT PAD. SEE STRUCTURAL PLANS FOR PAD THICKNESS
- REMOVE EXISTING CONCRETE
- REMOVE EXISTING FENCE
- REMOVE EXISTING UTILITY

GENERAL NOTES

1. GPR SCAN TO BE PERFORMED PRIOR TO SITE WORK WHERE EXISTING ASPHALT IS TO BE DISTURBED FOR NEW WORK.
2. HAND EXCAVATE WHERE DIGGING WITHIN 5' OF EXISTING UTILITY IDENTIFIED USING GPR SCAN.
3. FOR UTILITIES NOT SPECIFICALLY REFERENCED IN KEYED NOTES, DO NOT DIG WITHIN 30" HORIZONTALLY OF EXISTING UTILITY.
4. DASHED REGIONS AROUND EQUIPMENT INDICATE CLEARANCE REQUIRED FOR EQUIPMENT ACCESS AND MAINTENANCE.

KEYED NOTES

1. REMOVE EXISTING FENCE, FENCE POST AND FOUNDATION. SAWCUT PAVEMENT AND REMOVE 6" FROM EXISTING EDGE OF PAVEMENT
2. TRENCH AND REMOVE EXISTING SANITARY SEWER
3. REMOVE EXISTING BOLLARD. SAWCUT AND GRIND FLUSH TO GRADE
4. TRENCH AND REMOVE EXISTING STORM SEWER
5. CONCRETE BARRIERS IN WORK ZONE TO BE RELOCATED

99 PROTECT IN PLACE

KEY PLAN

Sheet Title
DEMOLITION PLAN

Dwg. No.
PLC2021-0432-0002D

Sht. No.
CD-101

ELECTRICAL SYMBOL LIST

LAYOUT PLANS

SYMBOL	DESCRIPTION
	CONDUIT RUN EXPOSED, CONCEALED IN WALL OR ABOVE CEILING.
	CONDUIT, CABLE, OR BARE GROUND OCNDUCTORS, RUN UNDERGROUND, CONCEALED IN OR UNDER FLOOR SLAB OR GRADE.
	CIRCUIT EXTENDED IN LIQUIDTIGHT FLEXIBLE CONDUIT, AT THE END OF A CONDUIT RUN
	CONDUIT RUN TURNED DOWN
	CONDUIT RUN TURNED UP
	CONDUIT CAPPED
POWER PANEL NUMBER POWER CIRCUIT NUMBERS 855B2-14/9,10	
	CIRCUIT HOMERUN IN MIN. 3/4"C (FIELD TO ROUTE TO POWER PANEL)
	208/120V PANELBOARD
	480/277V PANELBOARD
	480V PANELBOARD OR MCC
	208/120V LOAD CENTER
	240/120V PANELBOARD
	EQUIPMENT CONTROL PANEL
T	TRANSFORMER, SIZE AND RATING AS INDICATED ON DRAWINGS
MO	MULTI-OUTLET BOX, TYPE AND RATINGS AS INDICATED ON THE DRAWINGS AND/OR SPECIFICATIONS
CB	ENCLOSED CIRCUIT BREAKER, TYPE AND RATINGS AS INDICATED ON THE DRAWINGS
PB	PULL BOX
(J) or J or (J)	JUNCTION BOX, SIZE AS REQUIRED, UNO
VFD	VARIABLE FREQUENCY DRIVE WITH INTEGRAL BYPASS SWITCH, TYPE AND RATINGS AS INDICATED ON THE DRAWINGS
(M)	ELECTRIC MOTOR, HORSEPOWER AND VOLTAGE, AS INDICATED ON DRAWINGS
SWITCH RATING SIZE OF FUSES (WHEN INDICATED FUSIBLE) 60AS,45AF F WP	3-POLE, 240VAC-600VAC, HEAVY DUTY, SINGLE THROW NON-FUSIBLE (UNLESS INDICATED OTHERWISE) SAFETY SWITCH, HP RATED IN A NEMA 250, TYPE 1, ENCLOSURE (UNLESS INDICATED OTHERWISE) INDICATES IN A NEMA 250, TYPE 3R, ENCLOSURE (TYP. FOR ALL DEVICES) INDICATES FUSIBLE (THREE CLASS RK5 FUSES)
S_M	MANUAL MOTOR STARTER WITH THERMAL OVERLOAD PROTECTION, TYPE AND RATINGS AS INDICATED ON THE DRAWINGS
S_D	TOGGLE TYPE MOTOR RATED SWITCHED DISCONNECT AND ENCLOSURE WITH LOCKOUT/TAGOUT
	MOTOR STARTER, TYPE AND RATINGS AS INDICATED ON THE DRAWINGS. COORDINATE CONTROL WIRING VOLTAGE WITH MECHANICAL EQUIPMENT.
	COMBINATION MOTOR STARTER, WITH INTEGRAL DISCONNECT SWITCH/MOLDED CASE CIRCUIT BREAKER, HP RATED, TYPE AND RATINGS AS INDICATED ON THE DRAWINGS. COORDINATE CONTROL WIRING VOLTAGE WITH MECHANICAL EQUIPMENT.
	DRIVEN GROUND ROD, 3/4"Ø x10' LONG
	DRIVEN GROUND ROD, 3/4"Ø x10' LONG IN GROUND WELL

SYMBOL	DESCRIPTION
GFCI	20A, 125V, 2-POLE 3-WIRE, HEAVY DUTY, SPECIFICATION GRADE, DUPLEX RECEPTACLE, NEMA 5-20R, WHITE. FLUSH MOUNT IN WALL. HUBBELL 5362W UNO
A/C S R	ABOVE CEILING SURFACE MOUNTED RECESSED
GFCI	INDICATES GROUND FAULT CIRCUIT INTERRUPTING TYPE. HUBBELL GFRST20W UNO.
WL,WP	WET LOCATIONS. INDICATES WEATHER-RESISTANT GFCI TYPE RECEPTACLE WITH WEATHERPROOF EXTRA DUTY IN-USE COVER.
RECEPTACLE: COVER:	HUBBELL GFWRST20W UNO. HUBBELL TAYMAC MX3200 UNO.
DL	DAMP LOCATIONS. INDICATES WEATHER-RESISTANT GFCI TYPE RECEPTACLE WITH FLIP COVER.
RECEPTACLE: COVER:	HUBBELL GFWRST20W UNO. HUBBELL HBL5206WO UNO.
	TWO 20A, 125V, 2-POLE 3-WIRE, HEAVY DUTY, SPECIFICATION GRADE DUPLEX RECEPTACLES, NEMA TYPE 5-20R, WHITE. FLUSH MOUNT IN WALL. HUBBELL 5362W UNO.
	DUPLEX FLOOR RECEPTACLE
	DUPLEX CEILING RECEPTACLE
	DOUBLE DUPLEX FLOOR RECEPTACLE
	DOUBLE DUPLEX CEILING RECEPTACLE
H	20A, 125V, 2P, 3W, SINGLE RECEPTACLE (NEMA 5-20R) INDICATES HAZARDOUS CLASS II, DIV. 2 RECEPTACLE
	15A, 125V DUPLEX RECEPTACLE (NEMA 5-15R)
	15A, 125V RECEPTACLE (NEMA L5-15R)
	20A, 125V, 2P, 3W RECEPTACLE (NEMA L5-20R)
	30A, 125V, 2P, 3W RECEPTACLE (NEMA L5-30R)
	15A, 250V RECEPTACLE (NEMA 6-15R)
	20A, 250V RECEPTACLE (NEMA 6-20R)
	30A, 250V RECEPTACLE (NEMA 6-30R)
	50A, 250V RECEPTACLE (NEMA 6-50R)
	15A, 250V RECEPTACLE (NEMA L6-15R)
	20A, 250V RECEPTACLE (NEMA L6-20R)
	30A, 250V RECEPTACLE (NEMA L6-30R)
	20A, 125/250V, 3P, 4W RECEPTACLE (NEMA L14-20R)
	30A, 125/250V, 3P, 4W RECEPTACLE (NEMA L14-30R)
	20A, 250V, 3P, 4W RECEPTACLEACLE (NEMA L15-20R)
	30A, 250V, 3P, 4W RECEPTACLE (NEMA L15-30R)
	30A, 480V, 3P 4W RECEPTACLE (NEMA L16-30R)
	20A, 120/208V, 4P, 5W RECEPTACLE (NEMA L21-20R)
	30A, 120/208V, 4P, 5W RECEPTACLE (NEMA L21-30R)
	30A, 250/125V, 4P, 5W IEC PIN & SLEEVE
	30A, 480V, 3P 4W I.E.C. PIN & SLEEVE
	60A, 250/125V, 4P, 5W IEC PIN & SLEEVE
	60A, 480V, 3P 4W IEC PIN & SLEEVE
	100A, 250/125V, 4P, 5W IEC PIN & SLEEVE
	100A, 480V, 3P 4W IEC PIN & SLEEVE
PS	120/24V POWER SUPPLY FUNCTIONAL DEVICES #PSH500AB10-LVC

SYMBOL	DESCRIPTION
	MECHANICAL INTERLOCKED RECEPTACLE
G	GROUNDING OUTLET
R	RADIO RECEPTACLE
	SURFACE METAL RACEWAY. LEGRAND WIREMOLD 4000 SERIES UNO.
	OVER/IN-FLOOR METAL RACEWAY. CONNECTRACK UNO.
S	SPEAKER
	2"W X 4"L X 2-1/8"D WALL TELEPHONE OUTLET WITH 3/4" EMPTY CONDUIT WITH PULL ROPE
P	PRIMARY TELEPHONE/DATA OUTLET: 4-11/16"W X 4-11/16"L X 2-1/8"D TELEPHONE/DATA OUTLET BOX WITH SINGLE DEVICE GALVANIZED ZINC PLASTER RING WITH 1/2" RAISED HEIGHT AND 1" EMPTY CONDUIT WITH PULL ROPE TO 6" ABOVE ACCESSIBLE CEILING.
S	SECONDARY TELEPHONE/DATA OUTLET: 4-11/16"W X 4-11/16"L X 2-1/8"D TELEPHONE/DATA OUTLET BOX WITH SINGLE DEVICE GALVANIZED ZINC PLASTER RING WITH 1/2" RAISED HEIGHT AND 3/4" EMPTY CONDUIT WITH PULL ROPE TO NEAREST CABLE TRAY OR TELECOMMUNICATIONS ROOM.
a b	20A, 120-277V, INDUSTRIAL, HEAVY DUTY SPECIFICATION GRADE, SINGLE POLE TOGGLE SWITCH, IVORY NYLON. FLUSH MOUNT IN WALL, UNO, AT 48" AFF TO TOP. A LOWERCASE LETTER INDICATES CONTROLLED LOAD.
2 3 4 A D K M DOS PC P T	TWO POLE THREE WAY FOUR WAY AUTOMATIC DIMMER KEY OPERATED MOTOR RATED DIMMER AND OCCUPANCY SENSOR PHOTOELECTRIC CONTROL - TORK 2100 SERIES WITH PILOT LIGHT TIME SWITCH, SPRING WOUND, NO-HOLD, 30 MIN. BYPASS
C	CONTROL
OS a	PASSIVE INFRARED WALL SWITCH SENSOR WITH DIMMING CONTROLS (120/277VAC, 180°, 1000 SQ. FT. COVERAGE)
OS a	DUAL CIRCUIT PASSIVE INFRARED WALL SWITCH (120/277VAC, 180°, 1000 SQ. FT. COVERAGE)
OS a	CEILING MOUNTED OCCUPANCY SENSOR. CEILING MOUNTED SENSORS ARE DUAL TECHNOLOGY UNO. A LOWERCASE LETTER INDICATES CONTROLLED LOAD.
PO U PI HB	PARTIAL-OFF OPERATION ULTRASONIC TECHNOLOGY PASSIVE INFRARED TECHNOLOGY HIGH BAY SENSOR
OS a	WALL MOUNTED OCCUPANCY SENSOR. WALL MOUNTED SENSORS ARE DUAL TECHNOLOGY UNO. A LOWERCASE LETTER INDICATES CONTROLLED LOAD.
DS a	CEILING MOUNTED INDOOR DAYLIGHT SENSOR. A LOWERCASE LETTER INDICATES CONTROLLED ZONE.
OL CL SL	OPEN LOOP SENSOR CLOSED LOOP SENSOR MOUNTED TO SKYLIGHT
a L	LOW VOLTAGE WALL STATION WITH INTEGRAL LED STATUS INDICATORS. A LOWERCASE LETTER INDICATES A CONTROLLED LOAD.
LC01	MODULAR RELAY CONTROL UNIT. SELF-CONTAINED CLASS 2 TRANSFORMER WITH ONE OR MORE RELAYS. 120/277V DUAL VOLTAGE INPUT FROM UNSWITCHED BRANCH CIRCUIT.
D a,ZTV	LOW VOLTAGE MODULAR DIMMING RELAY. 0-10V DIMMING UNO. A LOWERCASE LETTER INDICATES CONTROLLED ZONE.
S a	LOW VOLTAGE MODULAR ON/OFF SWITCHING RELAY. A LOWER CASE LETTER INDICATES A CONTROLLED ZONE.
CS #	ELECTRICAL VEHICLE CHARGING STATION - CHARGEPOINT CT4000 LEVEL 2 COMMERCIAL CHARGING STATION. # NUMBER INDICATES 1 - SINGLE PORT CT4011 BOLLARD STATION 2 - DUAL PORT CT 4021 BOLLARD STATION

SYMBOL	DESCRIPTION
	DOWN LIGHT LUMINAIRE
	DOWN LIGHT LUMINAIRE WITH EMERGENCY BATTERY PACK.
	DOWN LIGHT WALL WASH LUMINAIRE
	WALL MOUNTED LUMINAIRE
	WALL MOUNTED LUMINAIRE WITH EMERGENCY BATTERY PACK.
	STRIP LUMINAIRE
	STRIP LUMINAIRE WITH A EMERGENCY BATTERY PACK.
	1'x4' LUMINAIRE
	1'x4' LUMINAIRE WITH AN EMERGENCY BATTERY PACK.
	2' X 2' LUMINAIRE
	2' X 2' LUMINAIRE WITH AN EMERGENCY BATTERY PACK.
	2' X 4' LUMINAIRE
	2' X 4' LUMINAIRE WITH AN EMERGENCY BATTERY PACK.
	WALL MOUNTED EXIT SIGN: DARKENED SEGMENT INDICATES FACE OF SIGN AND ARROW INDICATES DIRECTION OF TRAVEL TO EXIT.
	CEILING MOUNTED EXIT SIGN
	WALL MOUNTED COMBINATION EMERGENCY BATTERY OPERATED LIGHTING UNIT AND EXIT SIGN
	EMERGENCY BATTERY OPERATED LIGHTING UNIT
	POLE MOUNTED LIGHT FIXTURE
	EXTERIOR PHOTO CELL
	PHOTOHELIC SIGNAL LIGHT/ALARM
	PUSHBUTTON
M	UTILITY METER
DM	DIGITAL METER INSTALLED IN PANEL
MTS	MANUAL TRANSFER SWITCH
	MAIN GROUND BAR

ANNOTATIONS

SYMBOL	DESCRIPTION
1	KEYED NOTE TAG, NOTE NO. 1 SHOWN.
AC 1	EQUIPMENT TAG, AIR CONDITIONING UNIT NO. 1 SHOWN. MECHANICAL EQUIPMENT AND ABBREVIATIONS TO MATCH MECHANICAL PLANS.
100	ROOM IDENTIFICATION TAG, ROOM NO. 100 SHOWN.
0	REVISION DELTA TAG, REVISION NO. 0 SHOWN.

ONE-LINE DIAGRAMS

SYMBOL	DESCRIPTION
	HIGH VOLTAGE TERMINATION
	HIGH VOLTAGE SWITCH AND FUSE
	PRIMARY CONNECTION (DELTA)
	LIQUID FILLED SUBSTATION TRANSFORMER, TYPE AND RATINGS AS INDICATED ON THE DRAWINGS
	SECONDARY CONNECTION (GROUNDED WYE)
1200AF 1000AT LSIGA	DRAWOUT TYPE POWER BREAKER 1200 AMP FRAME, 1000 AMP TRIP, 3-POLE L = LONG TIME TRIP S = SHORT TIME TRIP I = INSTANTANEOUS TRIP G = GROUND FAULT TRIP A = ALARM
600AF 400AT LSIGA	MOLDED CASE CIRCUIT BREAKER 600 AMP FRAME, 400 AMP TRIP, 3-POLE SEE DRAWOUT TYPE BREAKER ABBREVIATIONS ABOVE.
MCP 7	CONTINUOUS AMPERE RATING MOLDED CASE MOTOR CIRCUIT PROTECTOR TYPE BREAKER
1	STARTER SIZE MAGNETIC STARTER
	PRIMARY CONNECTION (DELTA)
	TRANSFORMER, DRY-TYPE DISTRIBUTION, RATINGS AS INDICATED ON DRAWINGS
	INDICATES WITH ELECTROSTATIC SHIELD (FARADAY)
	SECONDARY CONNECTION (GROUNDED WYE)
	BUSWAY, CURRENT AND VOLTAGE RATINGS AS INDICATED ON DRAWINGS
	SURGE ARRESTOR
	GROUND
	SEPARABLE CONTACTS
OR	FUSE, SIZE AND RATINGS AS INDICATED ON THE DRAWINGS
	FUSED DISCONNECT SWITCH, RATINGS AS INDICATED ON DRAWINGS
	DISCONNECT SWITCH, RATINGS AS INDICATED ON DRAWINGS
75	INDUCTION MOTOR, 3Ø, NUMERAL INDICATES HORSEPOWER
1/2	INDUCTION MOTOR, 1Ø, NUMERAL INDICATES HORSEPOWER
	PRIMARY FUSES
H1 480V H4 X1 120V X2	CONTROL TRANSFORMER, DESCRIPTION AND RATING AS INDICATED ON DRAWINGS
	GROUND SECONDARY TERMINAL "X2"
	SECONDARY FUSE
	NORMALLY OPEN CONTACT
	NORMALLY CLOSED CONTACT
	THERMAL OVERLOAD ELEMENT

NOTES:

1. THIS IS A STANDARD LEGEND SHEET. SOME SYMBOLS OR ABBREVIATIONS MAY APPEAR ON THIS SHEET AND NOT ON THE PROJECT DRAWINGS.

ABBREVIATIONS

A, AMP.	AMPERE
AC	ALTERNATING CURRENT
AIC	AMPERE INTERRUPTING CAPACITY
AF	AMPERE FRAME
AE	ARC-ENERGY REDUCTION
AFC	ABOVE FINISHED CONCRETE
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE (EARTH)
AFS	ABOVE FINISHED SURFACE
AT	AMPERE TRIP
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BAHJ	BUILDING AUTHORITY HAVING JURISDICTION
BC	BARE COPPER
BLDG	BUILDING
C	CONDUIT
CO	CONDUIT ONLY
CB	CIRCUIT BREAKER
CIR., CKT	CIRCUIT
CTRL	CONTROL
DEMO.	DEMOLISH
DC	DIRECT CURRENT
DWG	DRAWING
E	EMERGENCY CIRCUIT
EGC	EQUIPMENT GROUNDING CONDUCTOR
(E)	EXISTING
EMT	ELECTRICAL METALLIC TUBING
EOL	END OF LINE DEVICE
EQPM	EQUIPMENT
EV	ELECTRIC VEHICLE
EV/A	EVACUATION VOICE/ALARM
EYS	EXPLOSION PROOF Y SEAL
(F)	FUTURE
FA	FIRE ALARM
FACU	FIRE ALARM CONTROL UNIT
FFCP	FIREMANS FAN CONTROL PANEL
FLEX	FLEXIBLE METAL CONDUIT
G, GND	GROUND
GEC	GROUNDING ELECTRODE CONDUCTOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFPE	GROUND FAULT PROTECTION EQUIPMENT
H-O-A	HAND-OFF-AUTO
HP	HORSEPOWER
HV	HIGH VOLTAGE
JB, J-BOX	JUNCTION BOX
KW	KILOWATT
KV	KILOVOLT
KVA	KILOVOLT-AMPERE
MAX.	MAXIMUM
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MCP	MOTOR CIRCUIT PROTECTOR
MFR	MANUFACTURER
MIN.	MINIMUM
MISC.	MISCELLANEOUS
MOB	MULTI-OUTLET BOX
MTG HT	MOUNTING HEIGHT
N/A	NOT APPLICABLE
NEC	NATIONAL ELECTRIC CODE
NEMA	NATIONAL ELEC. MFR. ASSOCIATION
NF	NON FUSED
NO	NORMALLY OPEN
NC	NORMALLY CLOSED
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
NTS	NOT TO SCALE
OL	THERMAL OVERLOAD DEVICE
PH, Ø	PHASE
PNL	PANEL
PVC	POLYVINYL CHLORIDE RIGID CONDUIT
RGS,RMC	GALVANIZED RIGID METAL CONDUIT
SCCR	SHORT CIRCUIT CURRENT RATING
SSBJ	SUPPLY-SIDE BONDING JUMPER
STR	SUBCONTRACT TECHNICAL REP.
SW.	SWITCH
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
SYS.	SYSTEM
TDC	TIME DELAY CLOSE
TDO	TIME DELAY OPEN
TEL.	TELEPHONE
TP	TWISTED PAIR
TSP	TWISTED SHIELDED PAIR
TYP.	TYPICAL
UNO	UNLESS NOTED OTHERWISE
V	VOLT
VA	VOLT-AMPERE
VFD	VARIABLE FREQUENCY DRIVE
WP	WEATHERPROOF
XFMR	TRANSFORMER
ZTV	0-10V WIRING

Sheet Title
ELECTRICAL LEGENDS, NOTES AND ABBREVIATIONS

Dwg. No.
PLE2021-0432-0001D

Sht. No.
E-001

GENERAL

A. PROVIDE NEW ELECTRICAL WORK INDICATED. PERFORM WORK IN ACCORDANCE WITH THE DRAWINGS, SPECIFICATIONS, PROJECT REQUIREMENTS DOCUMENT (PRD), AND OTHER CONSTRUCTION DOCUMENT. IF DISCREPANCIES OR CONFLICTS BETWEEN ANY DOCUMENTS ARE IDENTIFIED, PROMPTLY NOTIFY THE SUBCONTRACT TECHNICAL REPRESENTATIVE (STR) AND DO NOT PROCEED WITH THAT PORTION OF THE WORK UNTIL THE STR PROVIDES DIRECTION FOR CORRECTIVE ACTION.

B. COMPLY WITH THE CURRENT VERSION OF THE NATIONAL ELECTRICAL CODE FOR ELECTRICAL CONNECTIONS AND INSTALLATIONS.

C. THE DRAWINGS AND SPECIFICATIONS DO NOT SPECIFICALLY SHOW OR MENTION EVERY ITEM NECESSARILY REQUIRED. PROVIDE COMPLETE AND OPERABLE SYSTEMS AND EQUIPMENT UNLESS EXPLICITLY STATED OTHERWISE.

D. ELECTRICAL DRAWINGS ARE ESSENTIALLY DIAGRAMMATIC, ALTHOUGH THE LOCATIONS OF EQUIPMENT ARE SHOWN TO SCALE WHEREVER POSSIBLE. VERIFY EQUIPMENT SIZE WITH SHOP DRAWINGS. LAYOUT AND INSTALL WORK TO AVOID INTERFERENCE WITH OTHER TRADES.

E. NOTES ON THIS SHEET ARE GENERAL AND MAY NOT APPLY TO THE PROJECT.

F. ENSURE MATERIALS AND EQUIPMENT ARE INSTALLED CORRECTLY AND MAKE ADJUSTMENTS AS NECESSARY OR REQUIRED TO RESOLVE SPACE PROBLEMS AND PRESERVE SERVICE CLEARANCE. IN THE EVENT OF MAJOR REROUTING OF A SYSTEM APPEARS NECESSARY, PREPARE SHOP DRAWINGS OF THE PROPOSED REARRANGEMENT AND SUBMIT DRAWINGS FOR APPROVAL TO THE STR.

G. SUBMIT FOR APPROVAL EXACT LOCATION OF NEW EQUIPMENT WITH STR.

H. ELECTRICAL MATERIALS MUST BE NEW AND LISTED BY A NATIONALLY RECOGNIZED TESTING LABORATORY (NRTL). ELECTRICAL MATERIALS AND EQUIPMENT MUST MEET THE NRTL REQUIREMENTS AND BEAR THE NRTL LABEL.

I. ENCLOSURE CONSTRUCTION AND METHODS OF ASSEMBLY MUST BE IN ACCORDANCE WITH UL 50 AND NEMA PB 1.

J. NEUTRAL CONDUCTOR FOR ALL NON-LINEAR LOADS (EX. COMPUTER, ELECTRONIC RACKS, ETC.) MUST BE COUNTED AS CURRENT-CARRYING CONDUCTORS. MAXIMUM NUMBER OF CURRENT-CARRYING CONDUCTORS MUST NOT EXCEED 9 IN ANY HOME RUN CONDUIT.

K. CIRCUIT BREAKERS RATED 250 AMPS AND HIGHER MUST BE 100% RATED WITH ADJUSTABLE LONG TIME PICKUP AND DELAY, BANDS, ADJUSTABLE SHORT TIME PICKUP WITH MULTIPLE DELAY BANDS AND ADJUSTABLE INSTANTANEOUS PICKUP FOR OPTIMAL SYSTEM COORDINATION. INCLUDE A 3-PHASE AMMETER IN CIRCUIT BREAKER AND PROVIDE INTERCHANGEABLE/UNIVERSAL RATING PLUGS.

L. PROVIDE FIELD-ADJUSTABLE MAGNETIC INSTANTANEOUS TRIP SETTING FOR THERMAL MAGNETIC CIRCUIT BREAKERS RATED HIGHER THAN 150 AMPS.

M. CIRCUIT BREAKERS RATED, OR CAN BE ADJUSTED TO, 1200 AMPS OR HIGHER MUST HAVE ARC ENERGY REDUCTION MAINTENANCE SWITCH THAT CAN REDUCE CLEARING TIME FOR ARC-ENERGY REDUCTION AND DOCUMENTATION MADE AVAILABLE.

N. SERIES-RATED COMBINATION DEVICES ARE NOT PERMITTED. OVERCURRENT PROTECTION DEVICES MUST HAVE AN INTERRUPTING DUTY THAT EXCEEDS MAXIMUM AVAILABLE FAULT CURRENT.

O. DO NOT MOUNT MAIN CIRCUIT BREAKER IN A BRANCH BREAKER POSITION.

P. INDOOR PANELBOARD MUST BE PROVIDED WITH TWO DOORS. DOOR-IN-DOOR STYLE (INNER AND OUTER) DOORS THAT OPEN TO THE RIGHT. INNER DOOR EXPOSE THE CIRCUIT BREAKERS INSULATED BODY AND HANDLE ONLY WHEN OPEN. OUTER DOOR FULLY EXPOSE GUTTER SPACE, THE WIRING RACEWAY, AND CIRCUIT BREAKER LOAD SIDE TERMINALS WHEN OPEN. EACH DOOR MUST BE HINGED AND HAVE A FLUSH LOCKABLE HANDLE.

Q. OUTDOOR PANELBOARD MUST BE PROVIDED WITH THREE DOORS. NEMA 3R EXTERIOR DOOR WITH HINGED DOOR-IN-DOOR (INNER AND OUTER) STYLE DOORS THAT OPEN TO THE RIGHT. INNER DOOR EXPOSE THE CIRCUIT BREAKERS INSULATED BODY AND HANDLE ONLY WHEN OPEN. OUTER DOOR FULLY EXPOSE GUTTER SPACE, THE WIRING RACEWAY, AND CIRCUIT BREAKER LOAD SIDE TERMINALS WHEN OPEN. EACH DOOR MUST BE HINGED AND HAVE A FLUSH LOCKABLE HANDLE.

R. PANELBOARD DOOR HINGES MUST BE CONCEALED BUTT OR FULL LENGTH PIANO HINGES.

S. PANELBOARDS MUST BE SOURCED FROM INDUSTRIAL ELECTRIC MANUFACTURING (IEM).

T. ELECTRICAL PANELS MUST BE COPPER BUS, FULLY BUSSED WITH MINIMUM 30 TO MAXIMUM 42 CIRCUIT. DEAD-FRONTED SAFETY TYPE NEUTRAL BUS MUST BE FULL-SIZED AND FULLY RATED AND EQUAL TO THE PHASE BUS RATING. CIRCUIT BREAKERS MUST BE MOLDED CASE BOLT-ON TYPE. CIRCUIT BREAKERS MUST BE PROVIDED WITH LOCKING DEVICES SO THAT EACH CIRCUIT BREAKER MAY BE LOCKED IN THE OPEN POSITION. ENSURE THAT DEVICES CANNOT BE MOVED FROM THE FRONT OF PANEL WITH TRIM IN PLACE, AND THAT THE DEVICE IS FIRMLY INSTALLED.

U. SHORT CIRCUIT RATING OF EACH CIRCUIT BREAKER FOR NEW PANELBOARDS MUST BE MINIMUM 14 kAIC RMS SYMMETRICAL FOR 480/277V AND 22 kAIC RMS SYMMETRICAL FOR 240V OR LESS.

W. DRY-TYPE TRANSFORMER WINDINGS MUST BE COPPER, FULLY RATED WITH NO MOVING PARTS, INTERNAL SWITCH OR CIRCUIT BREAKER.

X. ALL CIRCUIT BREAKERS MUST BE MOLDED CASE BOLT-ON TYPE. PLUG-IN CIRCUIT BREAKERS ARE NOT ALLOWED. MULTI-POLE CIRCUIT BREAKERS MUST HAVE A COMMON TRIP MECHANISM. HANDLE TIES ARE NOT ALLOWED.

Y. MOTOR STARTERS MUST BE PROVIDED WITH THE FOLLOWING INDICATING LIGHT COLORS:
- WHITE: INDICATES CONTROL POWER IS ON (LABELED AS "POWER ON")
- GREEN: INDICATES MOTOR IS RUNNING (LABELED AS "RUNNING")
- AMBER: INDICATES OVERLOAD RELAY IS TRIPPED (LABELED AS "OL TRIPPED")
- RED: INDICATES MOTOR STOPPED (LABELED AS "STOPPED")

Z. PROVIDE 600 VOLT CONDUCTORS WITH TYPE THHN/THWN-2 INSULATED RATED FOR 90°C IN BOTH DRY AND WET LOCATIONS. MC CABLE IS PERMITTED TO BE THHN/THWN. ALL CONDUCTORS MUST BE STRANDED FOR ALL SIZES.

AA. PROVIDE COLOR-CODED, INSULATED CONDUCTORS FOR ALL SIZES. WHERE NEUTRAL CONDUCTORS OF DIFFERENT VOLTAGE SYSTEMS ARE MIXED IN THE SAME BOX, RACEWAY, OR ENCLOSURE, THE NEUTRALS MUST BE IDENTIFIED TO DIFFERENTIATE THEM. TRAVELER WIRING MUST BE UNIQUELY IDENTIFIED.

	208Y/120V 3Ø 4W	480Y/277V 3Ø 4W	240/120V 2Ø 3W
A PHASE	BLACK	BROWN	BLACK
B PHASE	RED	YELLOW	BLUE
C PHASE	BLUE	PURPLE	
NEUTRAL	WHITE/GRAY	WHITE/GRAY	WHITE

EXECUTION

A. ELECTRICAL INSTALLATIONS MUST BE INSPECTED BY BUILDING AUTHORITY HAVING JURISDICTION (BAHJ) OR BUILDING AUTHORITY HAVING JURISDICTION FIELD REPRESENTATIVE (BAHJFR). COORDINATE INSPECTION EFFORTS WITH THE STR.

B. FIELD VERIFY EXISTING CONDITIONS, INCLUDING LOCATION OF ELECTRICAL EQUIPMENT.

C. MAINTAIN AT LEAST 6 INCHES CLEARANCE BETWEEN ELECTRICAL CONDUITS AND OTHER SYSTEM PIPING AND TUBING. MAINTAIN 12 INCHES CLEARANCE BETWEEN ELECTRICAL CONDUIT AND STEAM PIPING. MAINTAIN 1 INCH CLEARANCE BETWEEN ELECTRICAL CONDUIT AND DUCTWORK. MAINTAIN 8 INCHES CLEARANCE BETWEEN ELECTRICAL CONDUIT AND ROOF. INSTALL HORIZONTAL RACEWAY RUNS ABOVE WATER AND STEAM PIPING.

D. PROTECT AND REPAIR ADJACENT EXISTING SURFACES AND UTILITIES AND AREAS DAMAGED AS A RESULT OF DEMOLITION OR NEW WORK. PATCH, REPAIR, AND FINISH SURFACES TO MATCH EXISTING ADJACENT SURFACES.

E. PERFORM CUTTING AND DEMOLITION BY METHODS THAT WILL NOT JEOPARDIZE THE STRUCTURAL INTEGRITY OF THE BUILDING AND THAT WILL NOT DAMAGE PORTIONS TO REMAIN.

F. IN ADDITION TO THOSE THAT MAY BE SHOWN ON THE DRAWINGS, PROVIDE PULL BOXES AND JUNCTION BOXES AS NEEDED TO FACILITATE THE INSTALLATION OF WIRING. EXTENSION BOXES ARE NOT ALLOWED ON NEW CONSTRUCTION.

G. PROVIDE DEDICATED NEUTRAL CONDUCTOR FOR EACH BRANCH CIRCUIT. ALL NEUTRALS FOR BRANCH CIRCUITS MUST BE CONSIDERED CURRENT-CARRYING CONDUCTORS.

H. PROVIDE GALVANIZED RIGID METAL CONDUIT AND FITTINGS IF EXPOSED AND WHEN INSTALLED IN AREAS SUBJECT TO PHYSICAL DAMAGE.

I. PROVIDE ELECTRICAL POWER WIRING FOR THE HVAC SYSTEM AND OTHER MECHANICAL, PLUMBING, AND FIRE PROTECTION EQUIPMENT, INCLUDING WIRING THROUGH LINE VOLTAGE CONTROL DEVICES. COORDINATE WITH DRAWINGS AND PROVIDE NECESSARY CONTROL WIRING.

J. COORDINATE EXACT LOCATIONS OF HVAC UNITS, DISCONNECTS, AND DEVICES IN FIELD. VERIFY AND CONFIRM THE ACTUAL MOUNTING LOCATION OF THE HVAC UNIT FOR PLACEMENT OF THE DISCONNECT.

K. DISCONNECT SWITCH MUST BE MOUNTED ON WALL OR STRUT, INDEPENDENT OF THE EQUIPMENT AND ANY OTHER STRUCTURES (FREE STANDING). LOCATION MUST COMPLY WITH NEC DEPTH AND HEIGHT OF WORKING SPACE.

L. EXISTING PANEL SCHEDULES FOR PANELS AFFECTED BY THIS PROJECT ARE SHOWN ON THE DRAWINGS. UPDATE EXISTING PANEL SCHEDULES FOR PANELS AFFECTED BY THIS PROJECT. PROVIDE NEW PANEL SCHEDULES FOR PANELS INCLUDED IN THIS PROJECT.

M. CIRCUIT NUMBERS TO EXISTING PANELS AS SHOWN ARE FOR REFERENCE. FIELD TRACE DOWN AND VERIFY CIRCUITS BEFORE WORK STARTS. FIELD RED LINE FINDINGS ON DRAWING FOR RECORD.
PANEL SCHEDULE CHANGES ARE RED FOR DELETE AND GREEN FOR ADDITION.

N. MOUNT OUTLET BOXES FOR NOTED DEVICES AS FOLLOWS UNO.
MEASUREMENTS ARE TO TOP OF BOX UNO.:
- 120V POWER RECEPTACLES AT 15" AFF TO BOTTOM OF BOX
- DATA OUTLETS AT 36" AFF
- TELEPHONE OUTLETS AT 48" AFF
- LIGHT SWITCHES AT 48" AFF
- COUNTERTOP POWER RECEPTACLES AND TELE/DATA OUTLETS AT 8" ABOVE COUNTER OR BACKSPLASH IF SPECIFIED.

O. DO NOT MOUNT OUTLETS OR BOXES BACK-TO-BACK. MOUNT OUTLETS AND BOXES MINIMUM HORIZONTAL DISTANCE OF ONE STUD BAY OR 16" APART, OR 24" APART IN FIRE-RATED WALLS.

P. ELECTRICAL COMPONENTS INSTALLED BEHIND LADDERS: DO NOT CREATE OBSTRUCTIONS THAT VIOLATE 29 CFR 1910.23(D)(2). PROVIDE AT LEAST 7 INCHES OF PERPENDICULAR CLEAR SPACE FROM THE FACE OF NEW WORK TO A PLANE RUNNING THROUGH THE LONGITUDINAL CENTERLINES OF THE LADDER RUNGS.\

Q. UNLESS NOTED OTHERWISE PERFORM THE FOLLOWING WORK FOR ANY DEVICE OR EQUIPMENT IDENTIFIED TO BE DEMOLISHED AS A PART OF THIS PROJECT SCOPE:
- REMOVE ALL EXPOSED CONDUIT AND ALL WIRING BACK TO SOURCE PANELBOARD OR NEXT ACTIVE DEVICE TO REMAIN IN SERVICE.
- CONCEALED OR UNDERGROUND CONDUIT MUST BE ABANDONED IN PLACE. CUT CONCEALED CONDUIT FLUSH WITH SURFACE. CUT AND CAP UNDERGROUND CONDUIT 6" ABOVE FLOOR.

R. EXISTING LIGHTNING CIRCUITS MAY HAVE SHARED NEUTRALS. FIELD VERIFY ALL EXISTING LIGHTING CIRCUITS WITHIN PANELBOARD BEFORE DEMOLITION AND SAFE END SHARED NEUTRALS.

S. NO UNTERMINATED WIRING IS ALLOWED, AND WIRING ASSOCIATED WITH THE DEMOLITION SCOPE OF THIS PROJECT MUST NOT BE ABANDONED.

T. METAL-CLAD CABLE (MC) IS PERMITTED ONLY FOR CONCEALED APPLICATIONS IN DRY LOCATIONS SERVING BRANCH WIRING DEVICES AND LIGHTING WITH THE FOLLOWING RESTRICTIONS:
- DO NOT USE FOR CIRCUITS OVER 250V TO GROUND.
- DO NOT USE FOR HOMERUNS.
- BRANCH CIRCUIT RUNS MUST BE LIMITED TO 75 FEET.
- DO NOT USE AROUND HORIZONTAL CORNERS WHEN CONCEALED IN WALLS.
- DO NOT USE WHERE EXPOSED TO PHYSICAL DAMAGE.
- DO NOT USE IN CORROSIVE LOCATIONS.
- PROVIDE WITH ADDITIONAL ISOLATED INSULATED GROUNDING CONDUCTOR FOR ISOLATED GROUND CIRCUITS.

W. MAINTAIN CONTINUITY AND WIRING FOR EXISTING CIRCUITS AND SYSTEMS REMAINING IN SERVICE. IF CIRCUITS ARE INTERRUPTED, PROVIDE NEW WIRING TO MAINTAIN SYSTEM OPERATION.

X. PROVIDE GFCI PROTECTION FOR RECEPTACLES PER NEC.

Y. ALL NONHAZARDOUS ELECTRICAL EQUIPMENT INSTALLED INDOORS WITHIN 6 FEET FROM ANY WATER SOURCE (SINK, EYEWASH, SHOWER, ETC.) MUST BE RATED FOR INGRESS OF WATER (DRIPPING AND LIGHT SPLASHING).

Z. DO NOT ATTACH ELECTRICAL EQUIPMENT, CONDUIT OR DEVICES TO SEISMIC BRACING.

AA. DO NOT USE EQUIPMENT TO SUPPORT CONDUIT AND VICE VERSA.

AB. FOR UNDERGROUND GROUNDING ELECTRODE SYSTEM CONNECTIONS, USE IRREVERSIBLE CONNECTIONS. MECHANICAL CONNECTORS ENCASED IN CONCRETE ARE CONSIDERED IRREVERSIBLE. USE REMOVABLE COMPRESSION-TYPE CONNECTIONS AT THE GROUND RODS UNLESS BURIED.

AC. IN UNDERGROUND INSTALLATIONS, INSTALL AN ELECTRICALLY DETECTABLE WARNING TAPE ABOVE THE ENTIRE LENGTH OF THE DUCT BANK OR DIRECT BURIED CONDUIT.

AD. PROVIDE SCHEDULE 40 RIGID PVC CONDUIT, CONCRETE ENCASED, FOR UNDERGROUND INSTALLATIONS THAT ARE SUBJECT TO TRAFFIC BOTH DURING AND AFTER CONSTRUCTION.

AE. PROVIDE SCHEDULE 80 RIGID PVC CONDUIT FOR UNDERGROUND INSTALLATIONS THAT ARE PERMANENTLY IN NON-TRAFFIC AREAS.

AF. MAINTAIN AT LEAST 6 INCHES BETWEEN ELECTRICAL AND TELECOMMUNICATION UNDERGROUND CONDUITS, AND AT LEAST 12 INCHES BETWEEN ELECTRICAL OR TELECOMMUNICATION UNDERGROUND CONDUITS AND OTHER SYSTEM PIPING.

AG. VERTICAL STUB-UPS, HORIZONTAL BENDS AND OFF-SETS GREATER THAN 22 DEGREES IN THE DUCT BANK RUN MUST USE RIGID STEEL ELBOWS AND RISERS, WRAPPED WITH TWO LAYERS OF HALF-LAPPED, 10MIL THICK, BLACK VIRGIN POLYETHYLENE TAPE, OR FACTORY APPLIED EPOXY PVC COATING.

AH. JOINT UTILITY TRENCHES MUST ONLY CONTAIN ELECTRICAL AND TELECOMMUNICATION CONDUITS. NO OTHER SYSTEMS SHOULD BE LOCATED IN THE SAME TRENCH AS ELECTRICAL OR TELECOM.

AJ. OCCUPANCY SENSORS MUST NOT BE INSTALLED WITHIN 4 FEET OF ANY MECHANICAL DIFFUSERS.

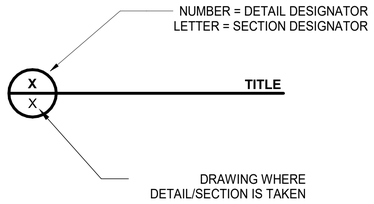
AK. PHOTOCELLS MUST NOT BE INSTALLED FACING INTO ELECTRICAL LIGHT THAT IS BEING CONTROLLED.

AL. DO NOT SPLICE FEEDER CONDUCTORS.

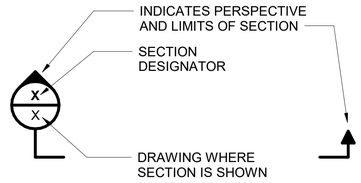
AM. DO NOT SPLICE CONDUCTORS IN PANELBOARDS, MOTOR CONTROL CENTERS, DISTRIBUTION PANELS, SWITCHBOARD, OR SWITCHGEAR.

AN. DO NOT USE GUTTERS FOR BRANCH CIRCUIT COLLECTION AT PANELBOARDS.

ELECTRICAL LEGENDS



SECTION CUT SYMBOL



Sheet Title
ELECTRICAL NOTES

Dwg. No.
PLE2021-0432-0002D

Sht. No.
E-002

GENERAL

A. BASIS OF ACCEPTANCE
1. BASIS FOR ACCEPTANCE IS COMPLIANCE WITH REQUIREMENTS SET FORTH IN SUBCONTRACT, AND OTHER TERMS AND CONDITIONS OF SUBCONTRACT. CORRECT REJECTED DELIVERABLE ITEMS IN ACCORDANCE WITH APPLICABLE CLAUSES.

C. QUALITY ASSURANCE
1. SPECIFY MATERIALS THAT ARE TESTED AND LISTED, OR LABELED BY A NATIONALLY RECOGNIZED TESTING LABORATORY (NRTL), RECOGNIZED BY THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) UNDER 29 CFR 1910.7. IN CASES WHERE NO MATERIAL OF TYPE SPECIFIED IS LISTED/APPROVED BY A NRTL, REFERENCE CODES AND STANDARDS PERTINENT TO FABRICATION, MANUFACTURE, AND USE OF MATERIAL. DEMONSTRATE THAT MATERIAL DESIGN AND FABRICATION CONFORMS TO BEST CURRENT ENGINEERING PRACTICE AND IS SUITABLE FOR ITS INTENDED USE.

INSPECTIONS

A. SCOPE OF INSPECTIONS
1. STR WILL INSPECT DELIVERABLES FOR CONTENT, COMPLETENESS, ACCURACY, AND CONFORMANCE TO SUBCONTRACT REQUIREMENTS. INSPECTION MUST INCLUDE VALIDATION AND/OR TESTING OF THE DELIVERABLES, AS SPECIFIED IN THE SUBCONTRACT.

TESTING

A. SCOPE OF TESTING
1. PROVIDE THIRD PARTY ENGINEERING TECHNICIAN, CERTIFIED BY A NATIONAL ORGANIZATION AND WITH RELEVANT EXPERIENCE, FOR ELECTRICAL ACCEPTANCE AND FUNCTION TESTS TO ENSURE TOTAL SYSTEM OPERATION OF PROVIDED ELECTRICAL EQUIPMENT IS OPERATIONAL WITHIN INDUSTRY AND MANUFACTURERS' TOLERANCES, AND AS SPECIFIED.

B. ELECTRICAL TESTS
1. ONLY THE FOLLOWING TESTS ARE REQUIRED . SECTIONS NOTED ARE FROM NETA ATS:
a. LOW-VOLTAGE CIRCUIT BREAKERS: VISUAL AND MECHANICAL INSPECTIONS AND TESTS PER SECTION 7.6.1.1(A) & (C) ONLY.

b. LOW-VOLTAGE, 250 AMP FRAME AND HIGHER CIRCUIT BREAKERS: REMOVE AND DELIVER TO SITE 200 CIRCUIT BREAKER TESTING FACILITY.

c. GROUNDING SYSTEM PER SECTION 7.13.

d. LOW-VOLTAGE CABLES, 600 VOLTS MAXIMUM: VISUAL AND MECHANICAL INSPECTIONS AND TESTS PER SECTION 7.3.2 FOR ALL CONDUCTORS. ELECTRICAL INSPECTIONS AND TESTS PER SECTION 7.3.2 FOR CONDUCTORS #1 AWG AND LARGER. FIELD MEGGER AND TORQUE TESTS WITH REPORTS. USE BOTH LOW-RESISTANCE OHMMETER AND TORQUE-WRENCH METHOD WHEN INSPECTING BOLTED ELECTRICAL CONNECTIONS FOR HIGH RESISTANCE PER SECTION 7.3.2.A.3. DO NOT USE THERMOGRAPHIC SURVEY.

e. BOLT-TORQUE VALUES FOR ELECTRICAL CONNECTIONS MUST BE IN ACCORDANCE WITH MANUFACTURERS PUBLISHED DATA. IN ABSENCE OF MANUFACTURERS PUBLISHED DATA, USE TABLE 100.12.1 IN NETA ATS.

f. LICENSED ELECTRICIAN MUST TORQUE ALL ELECTRICAL CONNECTIONS AND BEAHJ OR DELEGATED AUTHORITY MUST WITNESS. TORQUE TEST VERIFICATION MUST BE PERFORMED BY BEAHJ OR DELEGATED AUTHORITY.

g. SWITCHGEAR AND SWITCHBOARD ASSEMBLIES PER SECTION 7.1.

h. TRANSFORMERS PER SECTION 7.2.

i. MOTOR CONTROL CENTERS AND MOTOR STARTERS PER SECTION 7.16.

j. ADJUSTABLE SPEED DRIVE SYSTEMS PER SECTION 7.17.

k. SURGE ARRESTERS PER SECTION 7.19.

l. OUTDOOR BUS STRUCTURES PER SECTION 7.21.

m. EMERGENCY SYSTEMS: ENGINE GENERATOR, UNINTERRUPTIBLE POWER SYSTEMS, AND AUTOMATIC TRANSFER SWITCHES PER SECTION 7.22.

COMMISSIONING

A. SCOPE OF COMMISSIONING
1. ENSURE THAT SYSTEMS ARE COMPLETE, FUNCTIONING IN ACCORDANCE WITH THE DESIGN INTENT.

2. PROVIDE DOCUMENTED CONFIRMATION THAT THE FACILITY FULFILLS THE FUNCTIONAL AND PERFORMANCE REQUIREMENTS. ESTABLISH DESIGN INTENT/CRITERIA; VERIFY AND DOCUMENT COMPLIANCE WITH THESE CRITERIA THROUGHOUT CONSTRUCTION, START-UP, AND THE INITIAL PERIOD OF OPERATION. COMPLETE OPERATION AND MAINTENANCE MANUALS.

3. DEVELOP FUNCTIONAL TEST PROCEDURES FOR COMMISSIONED EQUIPMENT AND ASSEMBLIES, AND DEVELOP FUNCTIONAL TEST REPORT FOR REVIEW AND APPROVAL.

4. ENSURE THAT COMMISSIONING ACTIVITIES ARE INCLUDED IN THE PROJECT SCHEDULES, KEPT UP TO DATE, AND COMMUNICATED TO THE STR.

5. DEVELOP A START-UP AND INITIAL SYSTEMS CHECK PLAN FOR SELECTED EQUIPMENT.

6. DOCUMENT SYSTEMS START-UP; REVIEW START-UP REPORTS.

7. COORDINATE FUNCTIONAL TESTING FOR COMMISSIONED SYSTEMS AND ASSEMBLIES.

8. AFTER MANUAL TESTING AND INITIAL TROUBLE-SHOOTING IS COMPLETE, MONITOR SYSTEM OPERATION AND PERFORMANCE FOR SELECTED DATA POINTS FOR UP TO ONE WEEK BY REQUESTING TREND LOGS. ANALYZE MONITORED DATA TO VERIFY OPERATION AND PERFORMANCE AND ISSUE A REPORT (INCLUDE IN FINAL COMMISSIONING REPORT).

9. REVISE CONSTRUCTION PHASE COMMISSIONING PLANS AS NECESSARY.

10. COMPILE A COMMISSIONING RECORD.

11. EQUIPMENT MANUFACTURER, IF APPLICABLE, MUST BE ENGAGED DURING COMMISSIONING AND START-UP.

B. COMMISSIONING REQUIREMENTS
1. IMPLEMENT FINAL ADJUSTMENTS ON PROTECTIVE DEVICE SETTINGS PER COORDINATION STUDY AND REPORT.

2. LIGHTING SYSTEM: PERFORM THE FOLLOWING FUNCTION TESTS FOR APPLICABLE LIGHTING CONTROL DEVICES:
a. OCCUPANCY SENSORS: SIMULATE OCCUPIED AND UNOCCUPIED STATES. VERIFY OPERATION MATCHES DESIGN DRAWING INTENT. LIGHTS MUST TURN ON, OFF, OR DIM WITHOUT FLICKER.

b. DIMMABLE WALL SWITCHES: TEST DIMMABLE STATES FOR FULL RANGE OF DIMMING SWITCH CAPABILITIES. LIGHTS MUST NOT FLICKER AT ANY POINT.

c. INDOOR PHOTO SENSORS: PERFORM FULL, PARTIAL, AND NO DAYLIGHT TESTS TO ENSURE PROPER OPERATION. DAYLIGHT SENSORS MUST BE COORDINATED WITH SHADE OPERATION IF APPLICABLE.

d. OUTDOOR PHOTO SENSORS: VERIFY LIGHTS TURN ON WHEN NO DAYLIGHT IS AVAILABLE.

3. MEASURE AND VERIFY LIGHTING LEVEL PER DESIGN DRAWINGS, AND SET ALL ADJUSTMENTS ON LIGHTING DEVICES AND LIGHTING CONTROL PANELS PER DESIGN DRAWINGS OR MANUFACTURER REQUIREMENTS. PROVIDE THE FOLLOWING DATA: AVERAGE LIGHT LEVEL FOR EACH SPACE TYPE FROM A MINIMUM OF NINE POINTS SPREAD OUT UNIFORMLY IN THE SPACE.

4. AFTER INSTALLATION AND INSPECTION APPROVAL, BUT BEFORE APPLYING CIRCUIT LABELS, VERIFY BRANCH CIRCUIT RECEPTACLES ARE CONNECTED TO APPROPRIATE CIRCUIT BY OPENING CORRESPONDING BRANCH CIRCUIT BREAKER AND TESTING FOR VOLTAGE. RECORD CONNECTED BRANCH CIRCUIT IF DIFFERENT TO WHAT IS ON PLAN. BRANCH CIRCUITING MUST FOLLOW DESIGN INTENT, LATEST BULLETIN, AND UPDATED PANEL SCHEDULES.

CLOSEOUT DOCUMENTATION

A. AT COMPLETION OF PROJECT, THE FOLLOWING DOCUMENTS MUST BE PROVIDED:
1. ALL CONSTRUCTION DOCUMENT MARKUPS MUST BE PROVIDED TO THE DESIGNER OF RECORD, EVALUATED, AND INCORPORATED INTO THE FINAL RECORD DOCUMENTS.

2. ALL FINAL SHOP DRAWINGS

3. ALL WARRANTY DOCUMENTATION FOR EQUIPMENT

4. ALL UPDATED PANEL SCHEDULES

B. PROVIDE TRAINING FOR NEW SYSTEMS TO RELEVANT PERSONNEL

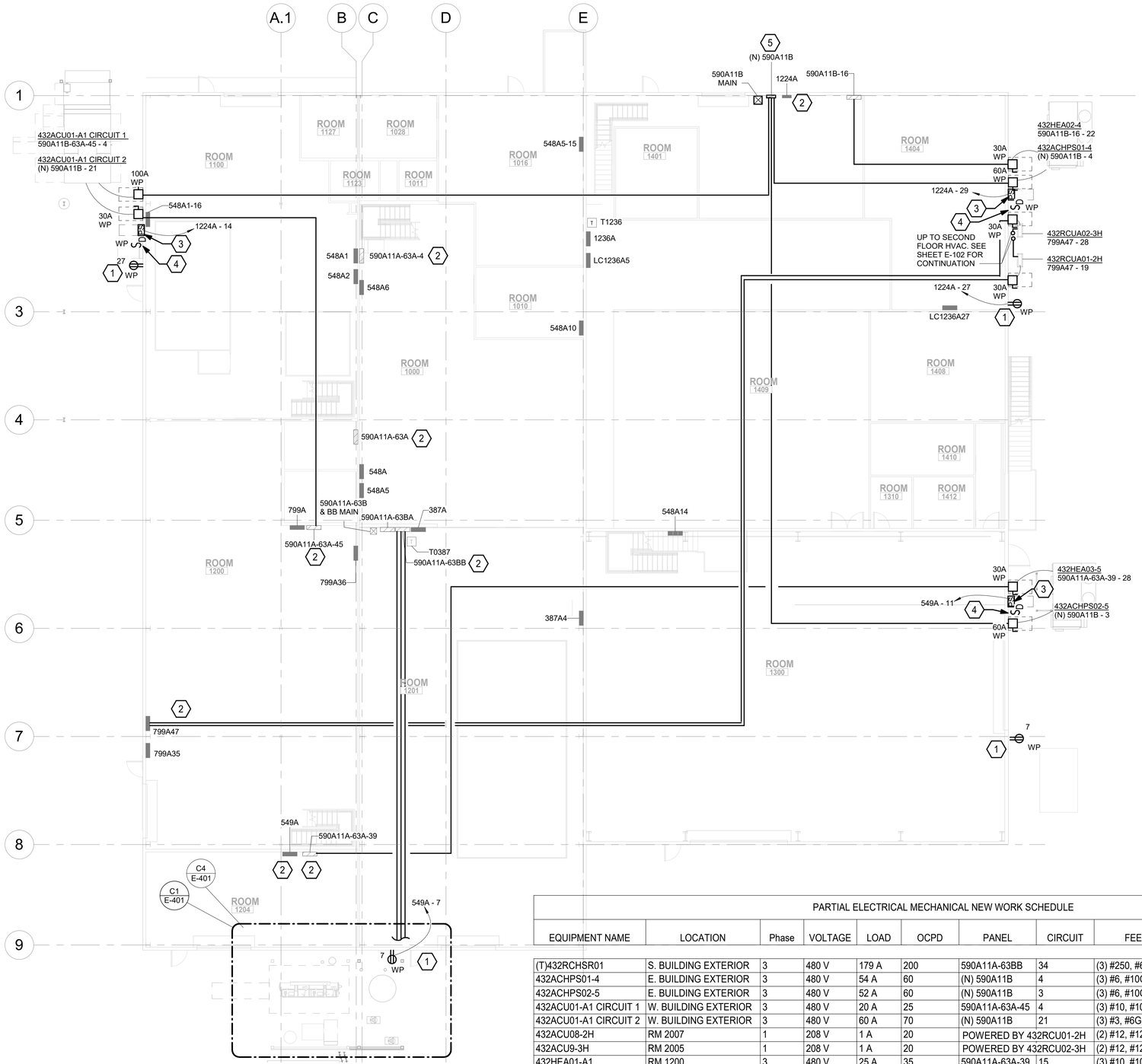
Sheet Title
ELECTRICAL NOTES

Dwg. No.
PLE2021-0432-0003D

Sht. No.
E-003

A B C D E F

1 2 3 4 5 6 7 8



F1 ELECTRICAL OVERALL PLAN - FIRST FLOOR

E-101

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

0 8' 16' 24'

SCALE IN FEET

PARTIAL ELECTRICAL MECHANICAL NEW WORK SCHEDULE

EQUIPMENT NAME	LOCATION	Phase	VOLTAGE	LOAD	OCPD	PANEL	CIRCUIT	FEEDER	DISCONNECT SIZE	DISCONNECT RATING
(T)432RCHSR01	S. BUILDING EXTERIOR	3	480 V	179 A	200	590A11A-63BB	34	(3) #250, #6G, 2 1/2"C	200A NONFUSIBLE	NEMA 3R
432ACHPS01-4	E. BUILDING EXTERIOR	3	480 V	54 A	60	(N) 590A11B	4	(3) #6, #10G, 1"C	60A NONFUSIBLE	NEMA 3R
432ACHPS02-5	E. BUILDING EXTERIOR	3	480 V	52 A	60	(N) 590A11B	3	(3) #6, #10G, 1"C	60A NONFUSIBLE	NEMA 3R
432ACU01-A1 CIRCUIT 1	W. BUILDING EXTERIOR	3	480 V	20 A	25	590A11A-63A-45	4	(3) #10, #10G, 3/4"C	30A NONFUSIBLE	NEMA 3R
432ACU01-A1 CIRCUIT 2	W. BUILDING EXTERIOR	3	480 V	60 A	70	(N) 590A11B	21	(3) #3, #6G, 1"	100A NONFUSIBLE	NEMA 3R
432ACU08-2H	RM 2007	1	208 V	1 A	20	POWERED BY 432RCU01-2H		(2) #12, #12G, 3/4"C	30A NONFUSIBLE	NEMA 1
432ACU9-3H	RM 2005	1	208 V	1 A	20	POWERED BY 432RCU02-3H		(2) #12, #12G, 3/4"C	30A NONFUSIBLE	NEMA 1
432HEA01-A1	RM 1200	3	480 V	25 A	35	590A11A-63A-39	15	(3) #10, #10G, 3/4"	60A NONFUSIBLE	NEMA 1
432HEA02-4	E. BUILDING EXTERIOR	3	480 V	13 A	30	590A11B-16	28	(3) #12, #12G, 3/4"	30A NONFUSIBLE	NEMA 3R
432HEA03-5	E. BUILDING EXTERIOR	3	480 V	13 A	30	590A11A-63A-39	28	(3) #12, #12G, 3/4"	30A NONFUSIBLE	NEMA 3R
432PCHW01-1	S. BUILDING EXTERIOR	3	480 V	21 A	30	590A11A-63BB	28	(3) #10, #10G, 1"C	30A NONFUSIBLE	NEMA 3R
432PCHW02-1	S. BUILDING EXTERIOR	3	480 V	21 A	30	590A11A-63BB	22	(3) #10, #10G, 1"C	30A NONFUSIBLE	NEMA 3R
432RCHS01-1	S. BUILDING EXTERIOR	3	480 V	108 A	150	590A11A-63BB	34	(3) #2/0, #6G, 2"C	200A NONFUSIBLE	NEMA 3R
432RCUA01-2H	E. BUILDING EXTERIOR	1	208 V	19 A	20	799A47	19	(2) #10, #10G, 3/4"C	30A NONFUSIBLE	NEMA 3R
432RCUA02-3H	E. BUILDING EXTERIOR	1	208 V	11 A	20	799A47	28	(2) #10, #10G, 3/4"C	30A NONFUSIBLE	NEMA 3R

LOAD AND MOCP PER MECHANICAL EQUIPMENT MANUFACTURER'S SPECIFICATIONS

GENERAL NOTES

1. FOR GENERAL NOTES, SYMBOLS, AND ABBREVIATIONS, REFER TO SHEET E-001.
2. UNLESS OTHERWISE NOTED, LIGHT LINEWEIGHT INDICATES EXISTING EQUIPMENT TO REMAIN AND HEAVY LINEWEIGHT INDICATES NEW WORK.
3. SUBCONTRACTORS MUST FIELD VERIFY LOCATION OF EXISTING EQUIPMENT AND EQUIPMENT TO BE DISCONNECTED AND REMOVED.
4. SUBCONTRACTOR MUST FIELD VERIFY CIRCUITS INDICATED AND LOADS SERVED BY THEM.
5. SUBCONTRACTORS MUST WORK CLOSELY WITH MECHANICAL SUBCONTRACTOR TO VERIFY PHASING OF DEMOLITION. THIS IS TO AVOID ANY UNNECESSARY OR UNPLANNED OUTAGES FOR EQUIPMENT OR THE FACILITY.
6. SUBCONTRACTOR MUST REFER TO DIVISION 1 SPECIFICATIONS FOR CONSTRUCTION SEQUENCING AND PHASING.
7. REFER TO SHEETS E-801 AND E-802 FOR ADDITIONAL WORK AT ELECTRICAL PANELS.
8. SUBCONTRACTOR MUST VERIFY THAT NEW ELECTRICAL EQUIPMENT HAVE PROPER WORKING CLEARANCE PRIOR TO INSTALLATION.
9. ALL NEW CONDUITS MUST BE PAINTED TO MATCH EXISTING IN AREA.
10. DISCONNECT SWITCHES MUST BE HEAVY-DUTY WITH PADLOCKABLE HANDLE. REFER TO ELECTRICAL MECHANICAL EQUIPMENT SCHEDULE ON SHEET E-401 FOR ADDITIONAL INFORMATION.
11. LFMC CONNECTIONS CAN ONLY BE 6' MAX IN LENGTH AND MUST BE SECURED AND SUPPORTED WITHIN 12" OF TERMINATIONS AND NO MORE THAN 4'-6" OTHERWISE.
12. REFER TO STRUCTURAL DRAWING S-512 FOR ELECTRICAL SUPPORT FRAME DETAILS.

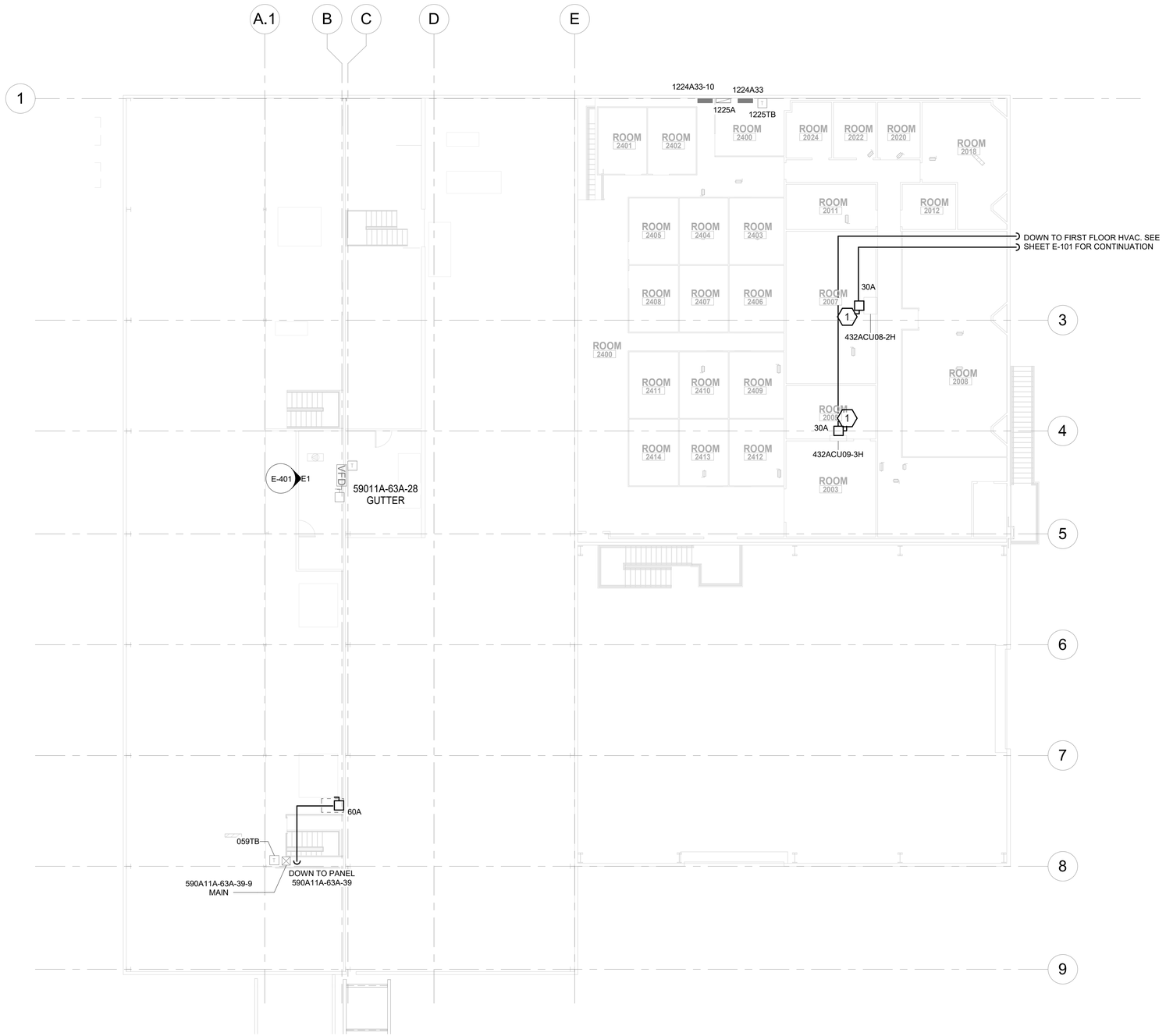
KEYED NOTES

1. PROVIDE OUTDOOR GFCI, WEATHER RESISTANT RECEPTACLE WITH EXTRA DUTY IN-USE COVERS.
2. EXISTING PANEL TO BE AFFECTED BY THIS PROJECT. COORDINATE SHUTDOWN WITH SUBCONTRACT TECHNICAL REPRESENTATIVE DURING CONSTRUCTION. SEE SHEET E-801, E-802 AND E-803 FOR ADDITIONAL WORK.
3. 120V/24V TRANSFORMER FOR MECHANICAL CONTROLS. PROVIDE FUNCTIONAL DEVICES #PSH500AB10-LVC OR APPROVED EQUAL. SMALLER PSH UNITS ARE PERMITTED WHERE THE CONTROL POWER DEMAND IS MET WITH A SMALLER POWER SUPPLY. PROVIDE ADDITIONAL WEATHER PROOF NEMA 3R/4X ENCLOSURE TO SURROUND THE NEMA 1 ENCLOSURE. ALL 120V WIRING WITHIN THE NEMA 3R/4X ENCLOSURE MUST BE WITHIN A FIXED RACEWAY, EMT, MC OR LIQUIDTIGHT CONDUIT. WIRE DUCT IS NOT PERMITTED.
4. PROVIDE A LOCKABLE TOGGLE SWITCH IN WEATHER PROOF ENCLOSURE FOR 120V/24V TRANSFORMER.
5. INSTALL NEW 480V-3PH-3W PANELBOARD. EXISTING CONDUITS MUST BE REUSED. EXTEND CONDUITS TO NEW LOCATION OF LOCAL DISCONNECT AND VFD AS REQUIRED. FIELD VERIFY THAT ALL EXISTING CONDUITS BEING RE-USED ARE SECURED AND SUPPORTED PROPERLY PER NEC STANDARDS. REFER TO ELECTRICAL NEW WORK SCHEDULE ON SHEET E-401 FOR ADDITIONAL INFORMATION.

Sheet Title
ELECTRICAL OVERALL PLAN - FIRST FLOOR

Dwg. No.
PLE2021-0432-0009D

Sht. No.
E-101



GENERAL NOTES

1. FOR GENERAL NOTES, SYMBOLS, AND ABBREVIATIONS, REFER TO SHEET E-001.
2. UNLESS OTHERWISE NOTED, LIGHT LINEWEIGHT INDICATES EXISTING EQUIPMENT TO REMAIN AND HEAVY LINEWEIGHT INDICATES NEW WORK.
3. SUBCONTRACTORS MUST FIELD VERIFY LOCATION OF EXISTING EQUIPMENT AND EQUIPMENT TO BE DISCONNECTED AND REMOVED.
4. SUBCONTRACTOR MUST FIELD VERIFY CIRCUITS INDICATED AND LOADS SERVED BY THEM.
5. SUBCONTRACTORS MUST WORK CLOSELY WITH MECHANICAL SUBCONTRACTOR TO VERIFY PHASING OF DEMOLITION. THIS IS TO AVOID ANY UNNECESSARY OR UNPLANNED OUTAGES FOR EQUIPMENT OR THE FACILITY.
6. SUBCONTRACTOR MUST REFER TO DIVISION 1 SPECIFICATIONS FOR CONSTRUCTION SEQUENCING AND PHASING.
7. REFER TO SHEETS E-801 AND E-802 FOR ADDITIONAL WORK AT ELECTRICAL PANELS.
8. IT HAS BEEN FIELD VERIFIED THAT THERE ARE EXISTING MAINTENANCE RECEPTACLES WITHIN 25' OF MECHANICAL EQUIPMENT.
9. SUBCONTRACTOR MUST VERIFY THAT NEW ELECTRICAL EQUIPMENT HAVE PROPER WORKING CLEARANCE PRIOR TO INSTALLATION.
10. ALL NEW CONDUITS MUST BE PAINTED TO MATCH EXISTING IN AREA.

KEYED NOTES

1. PROVIDE 2#12, #12G - 3/4"C FROM AIR CONDITIONING UNIT TO OUTDOOR CONDENSING UNIT.

F1 / E-102 **ELECTRICAL OVERALL PLAN - SECOND FLOOR**

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

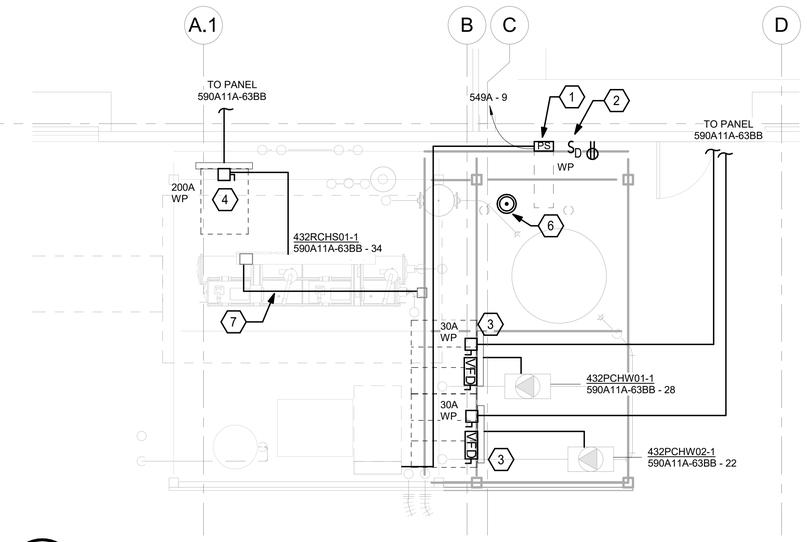
0 8' 16' 24'

SCALE IN FEET

Sheet Title
ELECTRICAL OVERALL PLAN - SECOND FLOOR

Dwg. No.
PLE2021-0432-0010D

Sht. No.
E-102



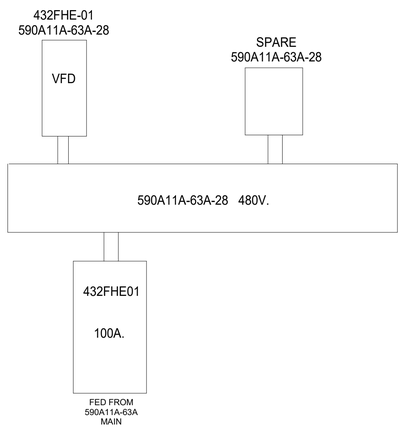
C1 ENLARGED NEW WORK PLAN - SOUTH BUILDING EXTERIOR

E-401

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

0 2' 4' 8'

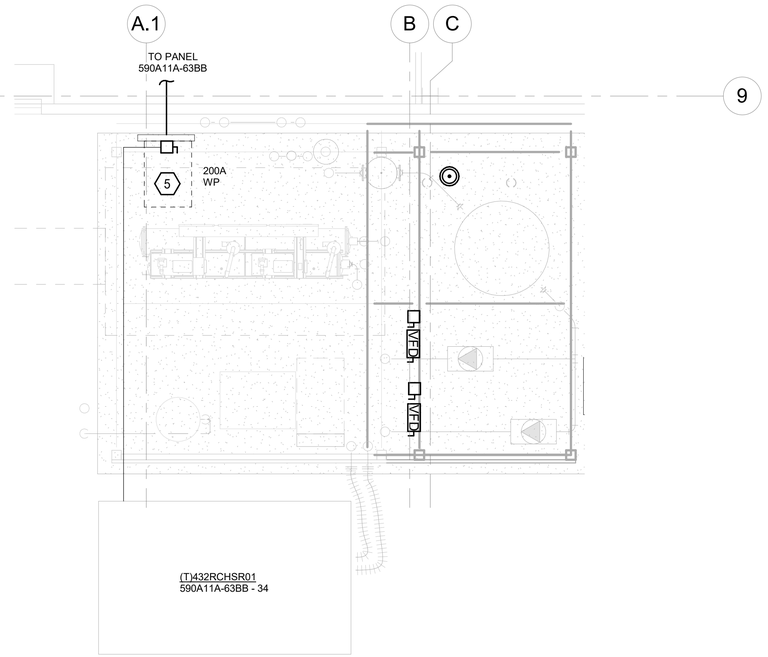
SCALE IN FEET



E1 590A11A-63A-28 NEW WORK ELEVATION

E-401

SCALE: NO SCALE SHOWN



C4 ENLARGED NEW WORK PLAN - TEMPORARY CHILLER

E-401

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

0 2' 4' 8'

SCALE IN FEET

ELECTRICAL MECHANICAL NEW WORK SCHEDULE

EQUIPMENT NAME	LOCATION	Phase	VOLTAGE	MCA / LOAD	OCPD	PANEL	CIRCUIT	FEEDER	DISCONNECT SIZE	DISCONNECT RATING	REMARKS
(T)432RCHSR01	S. BUILDING EXTERIOR	3	480 V	179 A	200	590A11A-63BB	34	(3) #250, #6G, 2 1/2"C	200A NONFUSIBLE	NEMA 3R	PROVIDE PADLOCKABLE, HEAVY DUTY DISCONNECT SWITCH.
432ACHPS01-4	E. BUILDING EXTERIOR	3	480 V	54 A	60	(N) 590A11B	4	(3) #6, #10G, 1"C	60A NONFUSIBLE	NEMA 3R	PROVIDE PADLOCKABLE, HEAVY DUTY DISCONNECT SWITCH.
432ACHPS02-5	E. BUILDING EXTERIOR	3	480 V	52 A	60	(N) 590A11B	3	(3) #6, #10G, 1"C	60A NONFUSIBLE	NEMA 3R	PROVIDE PADLOCKABLE, HEAVY DUTY DISCONNECT SWITCH.
432ACU01-A1 CIRCUIT 1	W. BUILDING EXTERIOR	3	480 V	20 A	25	590A11A-63A-45	4	(3) #10, #10G, 3/4"C	30A NONFUSIBLE	NEMA 3R	PROVIDE PADLOCKABLE, HEAVY DUTY DISCONNECT SWITCH.
432ACU01-A1 CIRCUIT 2	W. BUILDING EXTERIOR	3	480 V	60 A	70	(N) 590A11B	21	(3) #3, #6G, 1"	100A NONFUSIBLE	NEMA 3R	PROVIDE PADLOCKABLE, HEAVY DUTY DISCONNECT SWITCH.
432ACU08-2H	RM 2007	1	208 V	1 A	20	POWERED BY 432RCU01-2H		(2) #12, #12G, 3/4"C	30A NONFUSIBLE	NEMA 1	SINGLE POINT POWER CONNECTION WITH 432RCUA02-3H. PROVIDE PADLOCKABLE, HEAVY DUTY DISCONNECT SWITCH.
432ACU9-3H	RM 2005	1	208 V	1 A	20	POWERED BY 432RCU02-3H		(2) #12, #12G, 3/4"C	30A NONFUSIBLE	NEMA 1	SINGLE POINT POWER CONNECTION WITH 432RCUA02-3H. PROVIDE PADLOCKABLE, HEAVY DUTY DISCONNECT SWITCH.
432HEA01-A1	RM 1200	3	480 V	25 A	35	590A11A-63A-39	15	(3) #10, #10G, 3/4"	60A NONFUSIBLE	NEMA 1	PROVIDE PADLOCKABLE, HEAVY DUTY DISCONNECT SWITCH.
432HEA02-4	E. BUILDING EXTERIOR	3	480 V	13 A	30	590A11B-16	28	(3) #12, #12G, 3/4"	30A NONFUSIBLE	NEMA 3R	PROVIDE PADLOCKABLE, HEAVY DUTY DISCONNECT SWITCH.
432HEA03-5	E. BUILDING EXTERIOR	3	480 V	13 A	30	590A11A-63A-39	28	(3) #12, #12G, 3/4"	30A NONFUSIBLE	NEMA 3R	PROVIDE PADLOCKABLE, HEAVY DUTY DISCONNECT SWITCH.
432PCHW01-1	S. BUILDING EXTERIOR	3	480 V	21 A	30	590A11A-63BB	28	(3) #10, #10G, 1"C	30A NONFUSIBLE	NEMA 3R	VFD SHALL BE ABB ACH550 WITH ELECTRONIC BYPASS. PROVIDE PADLOCKABLE, HEAVY DUTY DISCONNECT SWITCH.
432PCHW02-1	S. BUILDING EXTERIOR	3	480 V	21 A	30	590A11A-63BB	22	(3) #10, #10G, 1"C	30A NONFUSIBLE	NEMA 3R	VFD SHALL BE ABB ACH550 WITH ELECTRONIC BYPASS. PROVIDE PADLOCKABLE, HEAVY DUTY DISCONNECT SWITCH.
432RCHS01-1	S. BUILDING EXTERIOR	3	480 V	108 A	150	590A11A-63BB	34	(3) #2/0, #6G, 2"C	200A NONFUSIBLE	NEMA 3R	PROVIDE PADLOCKABLE, HEAVY DUTY DISCONNECT SWITCH.
432RCUA01-2H	E. BUILDING EXTERIOR	1	208 V	19 A	20	799A47	19	(2) #10, #10G, 3/4"C	30A NONFUSIBLE	NEMA 3R	PROVIDE 2-POLE PADLOCKABLE, NEMA 3R, MOTOR_RATED TOGGLE SWITCH. HUBBELL CIRCUIT-LOCK OR APPROVED EQUAL.
432RCUA02-3H	E. BUILDING EXTERIOR	1	208 V	11 A	20	799A47	28	(2) #10, #10G, 3/4"C	30A NONFUSIBLE	NEMA 3R	PROVIDE 2-POLE PADLOCKABLE, NEMA 3R, MOTOR_RATED TOGGLE SWITCH. HUBBELL CIRCUIT-LOCK OR APPROVED EQUAL.

LOAD AND MOCP PER MECHANICAL EQUIPMENT MANUFACTURER'S SPECIFICATIONS

GENERAL NOTES

1. FOR GENERAL NOTES, SYMBOLS, AND ABBREVIATIONS, REFER TO SHEET E-001.
2. UNLESS OTHERWISE NOTED, LIGHT LINEWEIGHT INDICATES EXISTING EQUIPMENT TO REMAIN AND HEAVY LINEWEIGHT INDICATES NEW WORK.
3. SUBCONTRACTORS MUST FIELD VERIFY LOCATION OF EXISTING EQUIPMENT AND EQUIPMENT TO BE DISCONNECTED AND REMOVED.
4. SUBCONTRACTOR MUST FIELD VERIFY CIRCUITS INDICATED AND LOADS SERVED BY THEM.
5. SUBCONTRACTORS MUST WORK CLOSELY WITH MECHANICAL SUBCONTRACTOR TO VERIFY PHASING OF DEMOLITION. THIS IS TO AVOID ANY UNNECESSARY OR UNPLANNED OUTAGES FOR EQUIPMENT OR THE FACILITY.
6. SUBCONTRACTOR MUST REFER TO DIVISION 1 SPECIFICATIONS FOR CONSTRUCTION SEQUENCING AND PHASING.
7. REFER TO SHEETS E-801 AND E-802 FOR ADDITIONAL WORK AT ELECTRICAL PANELS.
8. IT HAS BEEN FIELD VERIFIED THAT THERE ARE EXISTING MAINTENANCE RECEPTACLES WITHIN 25' OF MECHANICAL EQUIPMENT.
9. SUBCONTRACTOR MUST VERIFY THAT NEW ELECTRICAL EQUIPMENT HAVE PROPER WORKING CLEARANCE PRIOR TO INSTALLATION.
10. ALL NEW CONDUITS MUST BE PAINTED TO MATCH EXISTING IN AREA.
11. ALL CONDUCTORS FROM VFD TO MOTOR MUST BE SYMMETRICAL SHIELDED VFD CABLE TYPE INSTALLED IN CONDUIT.
12. LFMC CONNECTIONS CAN ONLY BE 6' MAX IN LENGTH AND MUST BE SECURED AND SUPPORTED WITHIN 12" OF TERMINATIONS AND NO MORE THAN 4'-6" OTHERWISE.
13. VERIFY EXISTING CONDITIONS MEET NEC STANDARDS.

ⓗ KEYED NOTES

1. 120V/24V TRANSFORMER FOR MECHANICAL CONTROLS. PROVIDE FUNCTIONAL DEVICES #PSH500AB10-LVC OR APPROVED EQUAL. PROVIDE ADDITIONAL NEMA 3R ENCLOSURE TO SURROUND THE NEMA 1 ENCLOSURE.
2. PROVIDE A LOCKABLE TOGGLE SWITCH FOR 120V/24V TRANSFORMER.
3. INSTALL DISCONNECT AND VFD ON UNISTRUT STAND. PROVIDE AUXILIARY CONTACTS IN VFD DISCONNECTS. REFER TO STRUCTURAL DETAIL SHEETS FOR ADDITIONAL INFORMATION.
4. INSTALL DISCONNECT ON NEW UNISTRUT STAND. REFER TO STRUCTURAL SHEETS FOR ADDITIONAL INFORMATION.
5. DISCONNECT MUST FEED TEMPORARY CHILLER DURING CONSTRUCTION. REUSE DISCONNECT TO FEED PERMANENT CHILLER UPON REMOVAL OF TEMPERARY CHILLER. EXTEND CONDUCTORS TO NEW CHILLER LOCAITON.
6. EXISTING GROUND WELL TO BE RAISED TO BE ACCESSABLE FROM NEW PAD. VERIFY REMOVABLE CLAMPS WILL REMAIN ACCESSIBLE AND REMOVABLE.
7. PROVIDE CONDUIT AND CABLING FOR 120V CONNECTION FROM CHILLER CONTROL POWER TRANSFORMER TO FIELD INSTALLED CONDENSER CONTROL VALVE.

Sheet Title

ELECTRICAL ENLARGED PLANS - NEW WORK

Dwg. No.

PLE2021-0432-0011D

Sht. No.

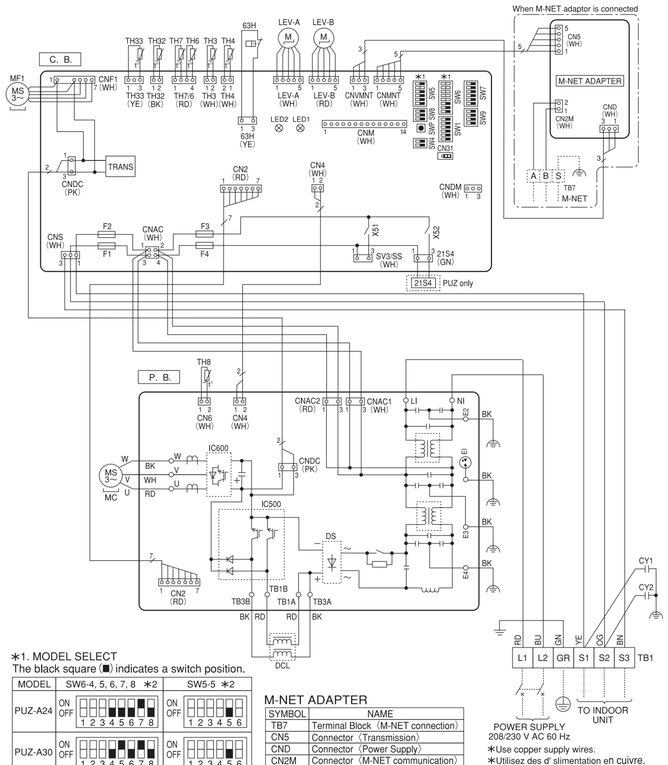
E-401

PUZ-A24NHA7 **PUZ-A30NHA7** **PUY-A24NHA7** **PUY-A30NHA7**
PUZ-A24NHA7-BS **PUZ-A30NHA7-BS** **PUY-A24NHA7-BS** **PUY-A30NHA7-BS**

SYMBOL	NAME
TB1	Terminal Block〈Power Supply, Indoor/Outdoor〉
MC	Motor for Compressor
MF1	Fan Motor
21S4	Solenoid Valve〈4-Way Valve〉
63H	High Pressure Switch
TH3	Thermistor〈Liquid〉
TH4	Thermistor〈Discharge〉
TH6	Thermistor〈2-Phase Pipe〉
TH7	Thermistor〈Ambient〉
TH8	Thermistor〈Heat Sink〉
TH32	Thermistor〈Suction〉

SYMBOL	NAME
TH33	Thermistor〈Comp. Surface〉
LEV-A, LEV-B	Linear Expansion Valve
DCL	Reactor
CY1, CY2	Capacitor
P. B.	Power Circuit Board
C. B.	Controller Circuit Board
F1, F2	Fuse〈T10AL250V〉
F3, F4	Fuse〈T6.3AL250V〉
SW1	Switch〈Manual Defrost, Defect History Record Reset, Refrigerant Address〉
SW4	Switch〈Function Switch〉

SYMBOL	NAME
SW5	Switch〈Function Switch, Model Select〉
SW6	Switch〈Model Select〉
SW7	Switch〈Function Switch〉
SW8	Switch〈Function Switch〉
SW9	Switch〈Function Switch〉
SWP	Switch〈Pump Down〉
CNM	Connector〈Connection for Option〉
CN31	Connector〈Emergency Operation〉
CNDM	Connector〈Connection for Option〉
SV3/SS	Connector〈Connection for Option〉



∗1. MODEL SELECT
The black square (■) indicates a switch position.

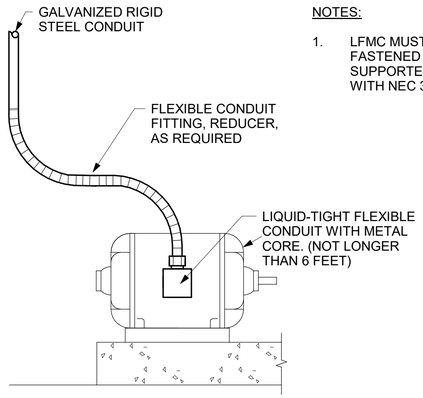
MODEL	SW6-4, 5, 6, 7, 8 ∗2	SW5-5 ∗2
PUZ-A24	ON OFF 1 2 3 4 5 6 7 8	ON OFF 1 2 3 4 5 6
PUZ-A30	ON OFF 1 2 3 4 5 6 7 8	ON OFF 1 2 3 4 5 6
PUY-A24	ON OFF 1 2 3 4 5 6 7 8	ON OFF 1 2 3 4 5 6
PUY-A30	ON OFF 1 2 3 4 5 6 7 8	ON OFF 1 2 3 4 5 6

∗2. SW6-1 to 3, SW5-1 to 4, 6 : Function Switch

M-NET ADAPTER

SYMBOL	NAME
TB7	Terminal Block〈M-NET connection〉
CN5	Connector〈Transmission〉
CND	Connector〈Power Supply〉
CN2M	Connector〈M-NET communication〉

∗Use copper supply wires.
∗Utilisez des d' slimentation en cuivre.



NOTES:

1. LFMC MUST BE SECURELY FASTENED IN PLACE AND SUPPORTED IN ACCORDANCE WITH NEC 350.30(A) AND (B).

C5 / E-501 **TYP. OVERHEAD CONDUIT SERVICE FOR SMALL AND MEDIUM SIZE MOTORS**
SCALE: NO SCALE SHOWN

F1 / E-501 **432RCU01-2H & 432RCU02-3H SPLIT SYSTEM WIRING DIAGRAM**
SCALE:NOT TO SCALE

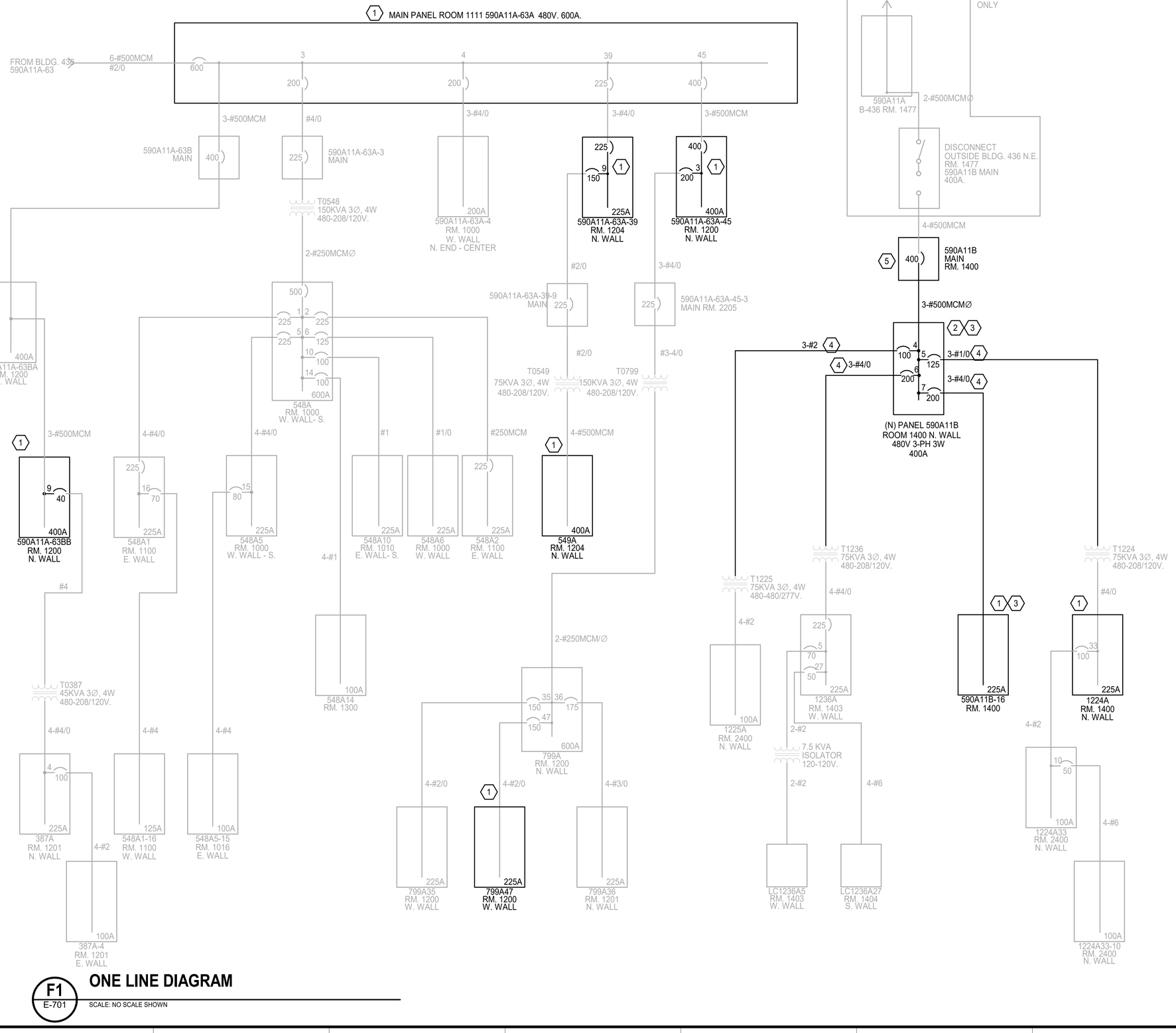
GENERAL NOTES

1. FOR GENERAL NOTES, SYMBOLS, AND ABBREVIATIONS, REFER TO SHEET E-001.
2. REFER TO STRUCTURAL SHEET S-501 FOR ADDITIONAL REQUIREMENTS.

Sheet Title
ELECTRICAL DETAILS

Dwg. No.
PLE2021-0432-0012D

Sht. No.
E-501



F1
E-701

ONE LINE DIAGRAM

SCALE: NO SCALE SHOWN

GENERAL NOTES

1. FOR GENERAL NOTES, SYMBOLS, AND ABBREVIATIONS, REFER TO SHEET E-001.
2. UNLESS OTHERWISE NOTED, LIGHT LINEWEIGHT INDICATES EXISTING EQUIPMENT TO REMAIN AND HEAVY LINEWEIGHT INDICATES NEW WORK.
3. REFER TO SHEETS E-801 AND E-802 FOR ADDITIONAL WORK AT ELECTRICAL PANELS.
4. VERIFY EXISTING CONDITIONS MEET NEC STANDARDS.

KEYED NOTES

1. EXISTING PANEL TO BE AFFECTED BY THIS PROJECT. COORDINATE SHUTDOWN WITH SUBCONTRACT TECHNICAL REPRESENTATIVE DURING CONSTRUCTION. SEE SHEET E-801 AND E-802 FOR ADDITIONAL WORK.
2. PROVIDE NEW 480V-3PH-3W PANELBOARD IN ROOM 1400. REUSE EXISTING CONDUIT TO RECONNECT EQUIPMENT.
3. ALL CONNECTED LOADS WHETHER NEW OR EXISTING MUST BE RELABELED.
4. PROVIDE NEW CONDUCTORS FROM NEW PANEL 590A11B TO RE-FEED EXISTING EQUIPMENT. EXISTING CONDUIT MUST REMAIN AND TO BE REUSED FOR NEW WORK.
5. PROVIDE 400A ENCLOSED CIRCUIT BREAKER. ENCLOSED BREAKER MUST HAVE PADLOCKABLE HANDLE. THE ENCLOSURE MUST BE LOCKED WHEN THE BREAKER IS CLOSED.

Sheet Title
ELECTRICAL ONE LINE DIAGRAM

Dwg. No.
PLE2021-0432-0013D

Sht. No.
E-701

432 PANELBOARD SCHEDULE — PANEL 590A11A-63A (EXISTING) — PAGE 1 OF 2

PANEL 590A11A-63A (EXISTING) BLDG. 432 LOCATION RM. 1111 E. WALL
MFR. G.E. PANEL TYPE CCB BREAKER TYPE THEF, TFK VOLTS 480 AMPS 600
SUPPLY DISCONNECT CKT. 590A11A-63 LOCATION BLDG. 436 N.E. WALL SUBSTATION 590
BREAKER KAIC (MIN.) 25K
(OLD 590A11-25A)

DESCRIPTION	WIRE SIZE	BREAKER	CKT. NO.	CKT. NO.	BREAKER	WIRE SIZE	DESCRIPTION
	4/0					4/0	
T0548 150KVA RM. 2022 W. WALL	4/0	200 TFK	3	4	200 TFK	4/0	PNL. 590A11A-63A-4 RM. 1000 W. WALL
	4/0					4/0	
	12					4	
432ACU02-2 RM. 2100 MEZZ	12	15 THED	9	10	70 THED	4	DISCONNECT SW. RM. 1100
	12					4	
	12					12	
432PCHW01-2 OUTSIDE NORTH	12	15	15	16	15	12	WIRES SAFE END IN J-BOX RM. 1300 S. WALL
	12					12	
						4	
SPARE		50	21	22	70 THED	4	480V. 3-PH. RECEPT. RM. 1113 S.E. WALL
						4	
	1					2	
480V. 3-PH. RECEPT. RM. 1000 W. WALL	1	70 THED	27	28	100 THED	2	432FHE01 ROOF OVER RM. 1200; RM. 1200
	1					2	432ACU01-A1 CEILING MTD. N. END (1)
	12					12	
L-650 MOORE LATHE RM. 1000	12	20	33	34	20 THED	12	L-658 MOORE LATHE RM. 1000
	12					12	
	4/0					1/0	
PNL. 590A11A-63A-39 RM. 1204 N. WALL	4/0	225	39	40	125	1/0	432RCHSR01-2 OUTSIDE NORTH
	4/0					1/0	

BUS ENTRY B; FDR. BREAKER 600; DATE INST. 1970; LAST PM DATE 2015
CONNECTED LOAD: PHASE "A" kW; PHASE "B" kW; PHASE "C" kW
ARC FLASH CATEGORY 2
FEEDER SIZE: WIRE 2 - #500MCM/PH THW; NEUT NONE; GND. 1 - #4/0 B.C.; CONDUIT 4" C.
REVISION SUBMITTED BY: NFPA70E; J.O./W.T.; CAD REV. BY ML; CAD REV. DATE 6/10/15

432 PANELBOARD SCHEDULE — PANEL 590A11A-63A (EXISTING) — PAGE 2 OF 2

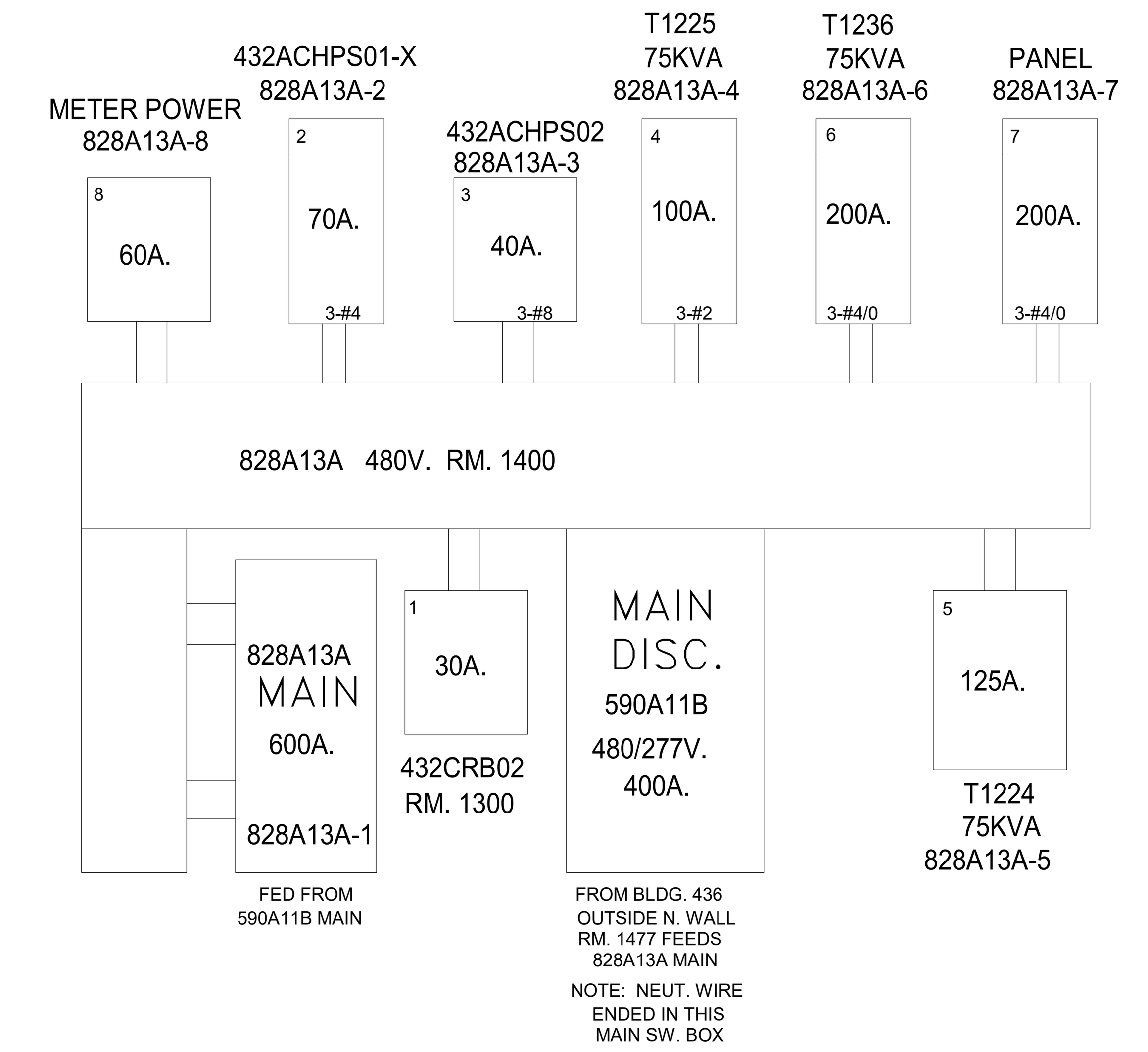
PANEL 590A11A-63A (EXISTING) BLDG. 432 LOCATION RM. 1111 E. WALL
MFR. G.E. PANEL TYPE CCB BREAKER TYPE THEF, TFK, TJK VOLTS 480 AMPS 600
SUPPLY DISCONNECT CKT. 590A11A-63 LOCATION BLDG. 436 N.E. WALL SUBSTATION 590
BREAKER KAIC (MIN.) 25K
(OLD 590A11-25A)

DESCRIPTION	WIRE SIZE	BREAKER	CKT. NO.	CKT. NO.	BREAKER	WIRE SIZE	DESCRIPTION
PNL. 590A11A-63A-45 RM. 1200	500	400 TJK G.E.	45	46	TJK		SPACE
	500						
	500						
	12						
ESPC METER POWER RM. 1111 E. WALL	12	15 THED	57	58			SPACE
	12						
MAIN (ALSO FEEDS 400A. 590A11A-63B MAIN)	2-500	600 TJK G.E.	63	64	TJK		SPACE
	2-500						
	2-500						

BUS ENTRY B; FDR. BREAKER 600; DATE INST. 1970; LAST PM DATE 2015
CONNECTED LOAD: PHASE "A" kW; PHASE "B" kW; PHASE "C" kW
ARC FLASH CATEGORY 2
FEEDER SIZE: WIRE 2 - #500MCM/PH THW; NEUT. NONE; GND. 1 - #4/0 B.C.; CONDUIT 4" C.
REVISION SUBMITTED BY: NFPA70E; J.O./W.T.; CAD REV. BY ML; CAD REV. DATE 6/10/15

432 (2) SCHEDULE — PANEL 828A13A GUTTER (EXISTING)

PANEL 828A13A GUTTER (EXISTING) BLDG. 432 LOCATION RM. 1400 N. WALL
MFR. PANEL TYPE BREAKER TYPE VOLTS 480 AMPS
SUPPLY DISCONNECT CKT. 590A11B MAIN LOCATION BLDG. 436 O/S N.E. SUBSTATION 590
BREAKER KAIC (MIN.) 35K



BUS ENTRY; FDR. BREAKER 400; DATE INST.; LAST PM DATE 6/1/15
CONNECTED LOAD: PHASE "A" kW; PHASE "B" kW; PHASE "C" kW
ARC FLASH CATEGORY 4
FEEDER SIZE: WIRE 2 - #500MCM/PH.; NEUT.; GND.; CONDUIT
REVISION SUBMITTED BY: NFPA70E; J.O./W.T.; CAD REV. BY ML; CAD REV. DATE 6/10/15

432 PANELBOARD SCHEDULE — PANEL 590A11A-63A (MODIFIED) — PAGE 1 OF 2

PANEL 590A11A-63A (MODIFIED) BLDG. 432 LOCATION RM. 1111 E. WALL
MFR. G.E. PANEL TYPE CCB BREAKER TYPE THEF, TFK VOLTS 480 AMPS 600
SUPPLY DISCONNECT CKT. 590A11A-63 LOCATION BLDG. 436 N.E. WALL SUBSTATION 590
BREAKER KAIC (MIN.) 25K
(OLD 590A11-25A)

DESCRIPTION	WIRE SIZE	BREAKER	CKT. NO.	CKT. NO.	BREAKER	WIRE SIZE	DESCRIPTION
	4/0					4/0	
T0548 150KVA RM. 2022 W. WALL	4/0	200 TFK	3	4	200 TFK	4/0	PNL. 590A11A-63A-4 RM. 1000 W. WALL
	4/0					4/0	
	12					4	
432ACU02-2 RM. 2100 MEZZ	12	15 THED	9	10	70 THED	4	DISCONNECT SW. RM. 1100
	12					4	
	12					12	
432PCHW01-2 OUTSIDE NORTH	12	15	15	16	15	12	WIRES SAFE END IN J-BOX RM. 1300 S. WALL
	12					12	
						4	
SPARE		50	21	22	70 THED	4	480V. 3-PH. RECEPT. RM. 1113 S.E. WALL
						4	
	1					2	
480V. 3-PH. RECEPT. RM. 1000 W. WALL	1	70 THED	27	28	100 THED	2	432FHE01 ROOF OVER RM. 1200;
	1					2	
	12					12	
L-650 MOORE LATHE RM. 1000	12	20	33	34	20 THED	12	L-658 MOORE LATHE RM. 1000
	12					12	
	4/0					1/0	
PNL. 590A11A-63A-39 RM. 1204 N. WALL	4/0	225	39	40	125	1/0	432RCHSR01-2 OUTSIDE NORTH
	4/0					1/0	

BUS ENTRY B; FDR. BREAKER 600; DATE INST. 1970; LAST PM DATE 2015
CONNECTED LOAD: PHASE "A" kW; PHASE "B" kW; PHASE "C" kW
ARC FLASH CATEGORY 2
FEEDER SIZE: WIRE 2 - #500MCM/PH THW; NEUT NONE; GND. 1 - #4/0 B.C.; CONDUIT 4" C.
REVISION SUBMITTED BY: NFPA70E; J.O./W.T.; CAD REV. BY ML; CAD REV. DATE 6/10/15

432 PANELBOARD SCHEDULE — PANEL 590A11A-63A (MODIFIED) — PAGE 2 OF 2

PANEL 590A11A-63A (MODIFIED) BLDG. 432 LOCATION RM. 1111 E. WALL
MFR. G.E. PANEL TYPE CCB BREAKER TYPE THEF, TFK, TJK VOLTS 480 AMPS 600
SUPPLY DISCONNECT CKT. 590A11A-63 LOCATION BLDG. 436 N.E. WALL SUBSTATION 590
BREAKER KAIC (MIN.) 25K
(OLD 590A11-25A)

DESCRIPTION	WIRE SIZE	BREAKER	CKT. NO.	CKT. NO.	BREAKER	WIRE SIZE	DESCRIPTION
PNL. 590A11A-63A-45 RM. 1200	500	400 TJK G.E.	45	46	TJK		SPACE
	500			52			
	500						
	12						
ESPC METER POWER RM. 1111 E. WALL	12	15 THED	57	58			SPACE
	12						
MAIN (ALSO FEEDS 400A. 590A11A-63B MAIN)	2-500	600 TJK G.E.	63	64	TJK		SPACE
	2-500						
	2-500						

BUS ENTRY B; FDR. BREAKER 600; DATE INST. 1970; LAST PM DATE 2015
CONNECTED LOAD: PHASE "A" kW; PHASE "B" kW; PHASE "C" kW
ARC FLASH CATEGORY 2
FEEDER SIZE: WIRE 2 - #500MCM/PH THW; NEUT. NONE; GND. 1 - #4/0 B.C.; CONDUIT 4" C.
REVISION SUBMITTED BY: NFPA70E; J.O./W.T.; CAD REV. BY ML; CAD REV. DATE 6/10/15

432 PANELBOARD SCHEDULE — PANEL 590A11B (MODIFIED)

PANEL 590A11B (MODIFIED) BLDG. 432 LOCATION RM. 1400 N. WALL
MFR. G.E. PANEL TYPE CCB BREAKER TYPE THEF, TFK, TJK VOLTS 480 AMPS 400
SUPPLY DISCONNECT CKT. 590A11B MAIN LOCATION BLDG. 436 O/S N.E. SUBSTATION 590
BREAKER KAIC (MIN.) 35K

DESCRIPTION	WIRE SIZE	BREAKER	CKT. NO.	CKT. NO.	BREAKER	WIRE SIZE	DESCRIPTION
	6					6	
432ACHPS02-5 OUTSIDE EAST	6	60	3	4	60	6	432ACHPS01-4 OUTSIDE EAST
	6					6	
	2					4/0	
T1225 75KVA	2	100	9	10	200	4/0	T1236 75KVA
	2					4/0	
	6					4/0	
METER POWER	6	60	15	16	200	4/0	PNL 590A11B-16 RM. 1400
	6					4/0	
	4					1	
432ACU01-A1 CIRCUIT 2 W. BUILDING EXTERIOR	4	70	21	22	125	1	T1236 75KVA
	4					1	
	10						
432CRB02 RM. 1300	10	30	27	28	20		SPARE
	10						
SPACE			33	34			SPACE
	500						
MAIN DISC (ENCLOSED CIRCUIT BREAKER ADJACENT TO PANEL)	500	400	39	40			SPACE
	500						

BUS ENTRY; FDR. BREAKER; DATE INST.; LAST PM DATE
CONNECTED LOAD: PHASE "A" kW; PHASE "B" kW; PHASE "C" kW
ARC FLASH CATEGORY
FEEDER SIZE: WIRE; NEUT.; GND.; CONDUIT
REVISION SUBMITTED BY:; J.O./W.T.; CAD REV. BY; CAD REV. DATE

GENERAL NOTES

1. FOR GENERAL NOTES, SYMBOLS, AND ABBREVIATIONS, REFER TO SHEET E-001.
2. UNLESS OTHERWISE NOTED, LIGHT LINEWEIGHT INDICATES EXISTING EQUIPMENT TO REMAIN AND HEAVY LINEWEIGHT INDICATES EQUIPMENT TO BE MODIFIED.
3. SUBCONTRACTORS MUST FIELD VERIFY LOCATION OF EXISTING EQUIPMENT AND EQUIPMENT TO BE INSTALLED.
4. SUBCONTRACTOR MUST FIELD VERIFY CIRCUITS INDICATED AND LOADS SERVED BY THEM.
5. SUBCONTRACTOR MUST UPDATE ALL MODIFIED PANELBOARD SCHEDULES.
6. PANEL SCHEDULES FOR AFFECTED PANELS ARE SHOWN. COORDINATE EQUIPMENT SHUTDOWN WITH CONSTRUCTION MANAGER / SUBCONTRACT TECHNICAL REPRESENTATIVE DURING CONSTRUCTION.
7. CONDUCTOR SPLICES ARE NOT ALLOWED WITHOUT LEAD ELECTRICAL ENGINEER APPROVAL

KEYED NOTES

1. DISCONNECT AND REMOVE EXISTING LOAD IN EXISTING PANEL. SPLICE CONDUCTORS AND REFEED TO SERVE EXISTING 432FHE01 LOAD. PROVIDE NEW CONDUCTORS TO FEED NEW 432ACU01 LOAD FROM NEW PANEL 590A11B. SPLICES MUST BE APPROVED
2. DEMOLISH EXISTING GUTTER AND REPLACE WITH 480V-3PH-3W PANELBOARD. PROVIDE NEW CONDUCTORS TO RE-FEED EXISTING EQUIPMENT. EXISTING CONDUIT MUST REMAIN AND TO BE REUSED FOR NEW WORK. SPLICE EXISTING 432CRB02 LOAD AND RECONNECT TO NEW PANELBOARD. SPLICE MUST OCCUR IN SPLICE BOX. SPLICES MUST BE APPROVED

Sheet Title
ELECTRICAL PANEL SCHEDULES

Dwg. No.
PLE2021-0432-0014D

Sht. No.
E-801

PANELBOARD SCHEDULE

PANEL 590A11A-63BB (EXISTING) BLDG. 432 LOCATION RM. 1201 N. WALL
MFR. IEM PANEL TYPE PIE BREAKER TYPE THED VOLTS 480 AMPS 400
SUPPLY DISCONNECT CKT. 590A11A-63B MAIN LOCATION RM. 1201 N. WALL SUBSTATION 590
BREAKER KAIC (MIN.) 25K

WIRE SIZE	BREAKER	CKT. NO. A	CKT. NO. B	CKT. NO. C	BREAKER	WIRE SIZE	DESCRIPTION
							(OLD 590A11-25BB)
12						12	FEEDS 590A11A-63BA & 590A11A-63BB
12	20 THED	3	4		20 THED	12	432ACU06-A1 RM. 2200
12						12	
4						12	
4	90 THED	9	10		20 THED	12	432ACU05-A1 RM. 2200
4						12	
12						12	
12	20 THED	15	16		20 THED	12	432PHW02-A RM. 2205
12						12	
4						12	
4	60 THED	21	22		20 THED	12	432PCHW02-1 OUTSIDE S. RM. 1204 (1)
4						12	
		27	28		20 THED		SPARE (3)
						2/0	(VERT.)
	175	34				2/0	432RCHS01-1 OUTSIDE S. RM. 1204 (7)
						2/0	

SPACE — 432CRB01 2-TON RM. 1201 — T0387 45KVA RM. 1201 N. WALL — 432FHE04 ROOF RM. 1200 — 432ACHPS04-X O/S E. RM. 1300

MARKED-UP BY: ACC. NO: DATE: PNL-01

BUS ENTRY T | FDR. BREAKER 400 | DATE INST. 1995 | LAST PM DATE: 2015
CONNECTED LOAD: PHASE "A" kW | PHASE "B" kW | PHASE "C" kW
ARC FLASH CATEGORY: 2
FEEDER SIZE: WIRE 3 - #500MCM THW | NEUT. NONE | GND. 1 - #1 B.C. | CONDUIT 3" C.
REVISION SUBMITTED BY: NFPA70E | J.O.W.T. 35983;PW;ES;5200.53 | CAD REV. BY ML | CAD REV. DATE 6/4/15

PANELBOARD SCHEDULE

PANEL 1224A (EXISTING) BLDG. 432 LOCATION RM. 1400 N. WALL
MFR. G.E. PANEL TYPE NAB BREAKER TYPE TED VOLTS 208/120 AMPS 225
SUPPLY DISCONNECT CKT. 828A13A-5 MAIN LOCATION RM. 1400 N. WALL SUBSTATION 590
BREAKER KAIC (MIN.) 18K

WIRE SIZE	BREAKER	CKT. NO. A	CKT. NO. B	CKT. NO. C	BREAKER	WIRE SIZE	DESCRIPTION
12	20	1	2		20	12	RECEPTS. RMS. 1400, 1403, 1408
12	20	3	4		20	12	RECEPT. RM. 1310
12	20	5	6		20	12	FLOOR RECEPT. RM. 2007 RECEPT. RMS. 1400, 1403, 1408
12	20	7	8		20	12	RECEPT. - 1403, 1408; 432FDC02; RMS. 1300, RM. 1310 432HDHW02
12	20	9	10		20	12	RECEPT. RM. 1300 N. WALL
12	20	11	12		20	12	RECEPT. RM. 1400 W. WALL
12	20	13	14		20	12	432DRU02 RM. 1300 E. WALL
12	20	15	16		20	12	432DRU03 RM. 1300 S. WALL
12	20	17	18		40	8	RECEPT. RM. 1300 HIGH BAY S.W. WALL
12	20	19			6		RECEPT. RM. 1400 W. WALL
12	20	21	22		50 TED	6	RECEPT. RM. 1400 E. WALL
12	20	23			6		TIME CLOCK RM. 1400 N. WALL
12	20	25			6		CONTROLS FOR OUTSIDE AIR COMPRESSOR
	20	27	28		50 TED	6	(4) SPARE
	20	29			6		(4) SPARE
2						8	
2	100 TED	33	34		50 TED	8	PNL. 1224A33 RM. 2400 N. WALL
2						8	

RECEPT. RM. 1412 (WOMENS RM.) — 432FHE05 OUTSIDE E. RM. 1404 (6) SPARE SAFE ENDED 4-SQ. BOX RM. 1404 N.E. CRNR. — POLYMETRICS DISC. — M.O. BOX RM. 1401 — M.O. BOX RM. 1400 S. PILLAR — M.O. BOX RM. 1300 S.W. WALL

MARKED-UP BY: ACC. NO: DATE: PNL-01

BUS ENTRY B | FDR. BREAKER 125 | DATE INST. 1986 | LAST PM DATE: 2015
CONNECTED LOAD: PHASE "A" kW | PHASE "B" kW | PHASE "C" kW
ARC FLASH CATEGORY: 4
FEEDER SIZE: WIRE 3 - #4/0 THHN | NEUT. 1 - #4/0 THHN | GND. 1 - #6 THHN | CONDUIT 2.5" C.
REVISION SUBMITTED BY: OUTAGE-E. EPPERLEY | J.O.W.T. PW00801720 | CAD REV. BY LSF | CAD REV. DATE 3/22/18

PANELBOARD SCHEDULE

PANEL 590A11A-63BB (TEMPORARY) BLDG. 432 LOCATION RM. 1201 N. WALL
MFR. IEM PANEL TYPE PIE BREAKER TYPE THED VOLTS 480 AMPS 400
SUPPLY DISCONNECT CKT. 590A11A-63B MAIN LOCATION RM. 1201 N. WALL SUBSTATION 590
BREAKER KAIC (MIN.) 25K

WIRE SIZE	BREAKER	CKT. NO. A	CKT. NO. B	CKT. NO. C	BREAKER	WIRE SIZE	DESCRIPTION
							(OLD 590A11-25BB)
12						12	FEEDS 590A11A-63BA & 590A11A-63BB
12	20 THED	3	4		20 THED	12	432ACU06-A1 RM. 2200
12						12	
4						12	
4	90 THED	9	10		20 THED	12	432ACU05-A1 RM. 2200
4						12	
12						12	
12	20 THED	15	16		20 THED	12	432PHW02-A RM. 2205
12						12	
4						12	
4	60 THED	21	22		30 THED	10	432PCHW02-1 OUTSIDE S. RM. 1204
4						10	
		27	28		30 THED	10	432PCHW01-1 OUTSIDE S. RM. 1204
						10	
						250	(VERT.)
	200	34				250	(T)432RCHSR01 OUTSIDE S. RM. 1204 (8)
						250	

SPACE — 432CRB01 2-TON RM. 1201 — T0387 45KVA RM. 1201 N. WALL — 432FHE04 ROOF RM. 1200 — 432ACHPS04-X O/S E. RM. 1300

MARKED-UP BY: ACC. NO: DATE: PNL-01

BUS ENTRY T | FDR. BREAKER 400 | DATE INST. 1995 | LAST PM DATE: 2015
CONNECTED LOAD: PHASE "A" kW | PHASE "B" kW | PHASE "C" kW
ARC FLASH CATEGORY: 2
FEEDER SIZE: WIRE 3 - #500MCM THW | NEUT. NONE | GND. 1 - #1 B.C. | CONDUIT 3" C.
REVISION SUBMITTED BY: NFPA70E | J.O.W.T. 35983;PW;ES;5200.53 | CAD REV. BY ML | CAD REV. DATE 6/4/15

PANELBOARD SCHEDULE

PANEL 590A11A-63BB (MODIFIED) BLDG. 432 LOCATION RM. 1201 N. WALL
MFR. IEM PANEL TYPE PIE BREAKER TYPE THED VOLTS 480 AMPS 400
SUPPLY DISCONNECT CKT. 590A11A-63B MAIN LOCATION RM. 1201 N. WALL SUBSTATION 590
BREAKER KAIC (MIN.) 25K

WIRE SIZE	BREAKER	CKT. NO. A	CKT. NO. B	CKT. NO. C	BREAKER	WIRE SIZE	DESCRIPTION
							(OLD 590A11-25BB)
12						12	FEEDS 590A11A-63BA & 590A11A-63BB
12	20 THED	3	4		20 THED	12	432ACU06-A1 RM. 2200
12						12	
4						12	
4	90 THED	9	10		20 THED	12	432ACU05-A1 RM. 2200
4						12	
12						12	
12	20 THED	15	16		20 THED	12	432PHW02-A RM. 2205
12						12	
4						10	
4	60 THED	21	22		30 THED	10	432PCHW02-1 OUTSIDE S. RM. 1204 (2)
4						10	
		27	28		30 THED	10	432PCHW01-1 OUTSIDE S. RM. 1204
						10	
						2/0	(VERT.)
	150	34				2/0	432RCHS01-1 OUTSIDE S. RM. 1204 (9)
						2/0	

SPACE — 432CRB01 2-TON RM. 1201 — T0387 45KVA RM. 1201 N. WALL — 432FHE04 ROOF RM. 1200 — 432ACHPS04-X O/S E. RM. 1300

MARKED-UP BY: ACC. NO: DATE: PNL-01

BUS ENTRY T | FDR. BREAKER 400 | DATE INST. 1995 | LAST PM DATE: 2015
CONNECTED LOAD: PHASE "A" kW | PHASE "B" kW | PHASE "C" kW
ARC FLASH CATEGORY: 2
FEEDER SIZE: WIRE 3 - #500MCM THW | NEUT. NONE | GND. 1 - #1 B.C. | CONDUIT 3" C.
REVISION SUBMITTED BY: NFPA70E | J.O.W.T. 35983;PW;ES;5200.53 | CAD REV. BY ML | CAD REV. DATE 6/4/15

PANELBOARD SCHEDULE

PANEL 1224A (MODIFIED) BLDG. 432 LOCATION RM. 1400 N. WALL
MFR. G.E. PANEL TYPE NAB BREAKER TYPE TED VOLTS 208/120 AMPS 225
SUPPLY DISCONNECT CKT. 828A13A-5 MAIN LOCATION RM. 1400 N. WALL SUBSTATION 590
BREAKER KAIC (MIN.) 18K

WIRE SIZE	BREAKER	CKT. NO. A	CKT. NO. B	CKT. NO. C	BREAKER	WIRE SIZE	DESCRIPTION
12	20	1	2		20	12	RECEPTS. RMS. 1400, 1403, 1408
12	20	3	4		20	12	RECEPT. RM. 1310
12	20	5	6		20	12	FLOOR RECEPT. RM. 2007 RECEPT. RMS. 1400, 1403, 1408
12	20	7	8		20	12	RECEPT. - 1403, 1408; 432FDC02; RMS. 1300, RM. 1310 432HDHW02
12	20	9	10		20	12	RECEPT. RM. 1300 N. WALL
12	20	11	12		20	12	RECEPT. RM. 1400 W. WALL
12	20	13	14		20	12	432DRU02 RM. 1300 E. WALL
12	20	15	16		20	12	432DRU03 RM. 1300 S. WALL
12	20	17	18		40	8	RECEPT. RM. 1300 HIGH BAY S.W. WALL
12	20	19			6		RECEPT. RM. 1400 W. WALL
12	20	21	22		50 TED	6	RECEPT. RM. 1400 E. WALL
12	20	23			6		TIME CLOCK RM. 1400 N. WALL
12	20	25			6		CONTROLS FOR OUTSIDE AIR COMPRESSOR
10	20	27	28		50 TED	6	RECEPT. BUILDING EXTERIOR
12	20	29			6		120/24V CONTROLS TRANSFORMER
2						8	
2	100 TED	33	34		50 TED	8	PNL. 1224A33 RM. 2400 N. WALL
2						8	

120/24V CONTROLS TRANSFORMER (5) SPARE SAFE ENDED 4-SQ. BOX RM. 1404 N.E. CRNR. — POLYMETRICS DISC. — M.O. BOX RM. 1401 — M.O. BOX RM. 1400 S. PILLAR — M.O. BOX RM. 1300 S.W. WALL

MARKED-UP BY: ACC. NO: DATE: PNL-01

BUS ENTRY B | FDR. BREAKER 125 | DATE INST. 1986 | LAST PM DATE: 2015
CONNECTED LOAD: PHASE "A" kW | PHASE "B" kW | PHASE "C" kW
ARC FLASH CATEGORY: 4
FEEDER SIZE: WIRE 3 - #4/0 THHN | NEUT. 1 - #4/0 THHN | GND. 1 - #6 THHN | CONDUIT 2.5" C.
REVISION SUBMITTED BY: OUTAGE-E. EPPERLEY | J.O.W.T. PW00801720 | CAD REV. BY LSF | CAD REV. DATE 3/22/18

GENERAL NOTES

1. FOR GENERAL NOTES, SYMBOLS, AND ABBREVIATIONS, REFER TO SHEET E-001.
2. UNLESS OTHERWISE NOTED, LIGHT LINEWEIGHT INDICATES EXISTING EQUIPMENT TO REMAIN AND HEAVY LINEWEIGHT INDICATES EQUIPMENT TO BE MODIFIED.
3. SUBCONTRACTORS MUST FIELD VERIFY LOCATION OF EXISTING EQUIPMENT AND EQUIPMENT TO BE INSTALLED.
4. SUBCONTRACTOR MUST FIELD VERIFY CIRCUITS INDICATED AND LOADS SERVED BY THEM.
5. SUBCONTRACTOR MUST UPDATE MODIFIED PANELBOARD SCHEDULES.
6. PANEL SCHEDULES FOR AFFECTED PANELS ARE SHOWN. COORDINATE EQUIPMENT SHUTDOWN WITH CONSTRUCTION MANAGER / SUBCONTRACT TECHNICAL REPRESENTATIVE DURING CONSTRUCTION.
7. CONDUCTOR SPLICES ARE NOT ALLOWED WITHOUT LEAD ELECTRICAL ENGINEER APPROVAL

KEYED NOTES

1. EXISTING LOAD TO BE DISCONNECTED AND REPURPOSED FOR NEW LOAD. EXISTING CONDUCTORS MUST BE EXTENDED TO NEW EQUIPMENT LOCATION.
2. DISCONNECT AND REMOVE EXISTING CIRCUIT BREAKER IN EXISTING PANEL. REPLACE WITH NEW 3P-480V-30A CIRCUIT BREAKER IN EXISTING PANEL TO SERVE NEW LOAD.
3. UTILIZE EXISTING SPARE 3P-480V-20A CIRCUIT BREAKER IN EXISTING PANEL TO SERVE NEW LOAD.
4. UTILIZE EXISTING SPARE 1P-120V-20A CIRCUIT BREAKER IN EXISTING PANEL TO SERVE NEW LOAD.
5. UTILIZE EXISTING BREAKER TO SERVE NEW LOAD.
6. EXISTING LOAD TO BE DISCONNECTED AND REMOVED BACK TO SOURCE.
7. DISCONNECT AND REMOVE EXISTING CIRCUIT BREAKER IN EXISTING PANEL.
8. CIRCUIT MUST FEED TEMPORARY CHILLER DURING CONSTRUCTION. INSTALL NEW 3P-480V-200A CIRCUIT BREAKER TO POWER TEMPORARY LOAD. TEMPORARY CIRCUIT BREAKER CHARACTERISTICS MUST MATCH EXISTING.
9. UPON REMOVAL OF THE TEMPORARY CHILLER DISCONNECT AND REMOVE TEMPORARY 3P-480V-200A CIRCUIT BREAKER. REPLACE WITH NEW 3P-480V-150A CIRCUIT BREAKER TO POWER NEW PERMANENT CHILLER LOAD. NEW CIRCUIT BREAKER CHARACTERISTICS MUST MATCH EXISTING.

Sheet Title
ELECTRICAL PANEL SCHEDULES

Dwg. No.
PLE2021-0432-0015D

Sht. No.
E-802

432 PANELBOARD SCHEDULE

PANEL 590A11A-63A-4 (EXISTING) BLDG. 432 LOCATION RM. 1000 W. WALL N. END - CTR.
MFR. COLUMBIA PANEL TYPE CDP BREAKER TYPE ATB, F VOLTS 480 AMPS 200
SUPPLY DISCONNECT CKT. 590A11A-63A-4 LOCATION RM. 1111 E. WALL SUBSTATION 590
BREAKER KAIC (MIN.) 14K

(OLD 590A11-25A-2)

DESCRIPTION	WIRE SIZE	BREAKER	CKT. NO. A	CKT. NO. B	CKT. NO. C	BREAKER	WIRE SIZE	DESCRIPTION
SPARE	12	30 F ATB	3	4		30 F	10	SPARE DISC. SW. RM. 1016 E. WALL
432ACU07-A1 RM. 1016 CEILING	12	20 TF	9	10		30 F	10	432ACU08-1 RM. 1100 W. WALL
WELDER RECEPT. RM. 1000 W. WALL	6	70 F	15	16		15 F ATB	12	432CD01 OUTSIDE N. OF BLDG.
432ACU03-A1 RM. 1000 CEILING	12	20 TF	21	22		15 ATB	12	432FHE07 (1) OUTSIDE E. RM. 1404
SPARE	60 RF	27	28			20 TF	12	432ACU04-A1 RM. 2022

BUS ENTRY T | FDR. BREAKER 200 | DATE INST. | LAST PM DATE: 2015
CONNECTED LOAD: PHASE "A" kW | PHASE "B" kW | PHASE "C" kW
ARC FLASH CATEGORY: 2
FEEDER SIZE: WIRE 3 - #4/0 THW | NEUT. NONE | GND. #4 B.C. | CONDUIT 3" C.
REVISION SUBMITTED BY: NFPA70E | J.O.W.T. 35983/PM:EBS:5200:53 | CAD REV. BY ML | CAD REV. DATE 6/2/15

432 PANELBOARD SCHEDULE

PANEL 828A13A-7 (EXISTING) BLDG. 432 LOCATION RM. 1400 N. WALL
MFR. G.E. PANEL TYPE NHB BREAKER TYPE TED VOLTS 480 AMPS 225
SUPPLY DISCONNECT CKT. 828A13A-7 LOCATION RM. 1400 N. WALL SUBSTATION 590
BREAKER KAIC (MIN.) 14K

(OLD 590A11B7)

DESCRIPTION	WIRE SIZE	BREAKER	CKT. NO. A	CKT. NO. B	CKT. NO. C	BREAKER	WIRE SIZE	DESCRIPTION
SPARE CKT. TO J-BOX RM. 1404 W. WALL	12	20	3	4		40	8	432ACS10 OUTSIDE NORTH WALL - E.
RECEPT. RM. 1300 E. WALL FORKLIFT CHARGER	10	30	9	10		30	10	480V. POWER FOR CRANE RM. 1400 DISCONNECT W. WALL
FORKLIFT BATTERY CHARGER RM. 1300 E. WALL	12	20	15	16		50		SPARE
432ACHPS03 OUTSIDE N. RM. 1404	8	40	21	22		20	12	432FHE06 (1) (3) OUTSIDE E. RM. 1404
30A. RECEPT. RM. 1300 E. WALL	10	30	27	28		50	6	WELDING OUTLET RM. 1300 BELOW STAIRS N. WALL
NO BUS								NO BUS

BUS ENTRY T | FDR. BREAKER 200 | DATE INST. | LAST PM DATE: 2015
CONNECTED LOAD: PHASE "A" kW | PHASE "B" kW | PHASE "C" kW
ARC FLASH CATEGORY: 2
FEEDER SIZE: WIRE 3 - #4/0 THHN | NEUT. NONE | GND. 1 - #4 THHN | CONDUIT 2" C.
REVISION SUBMITTED BY: NFPA70E | J.O.W.T. 35983/PM:EBS:5200:53 | CAD REV. BY ML | CAD REV. DATE 6/4/14

432 PANELBOARD SCHEDULE

PANEL 549A (EXISTING) BLDG. 432 LOCATION RM. 1204 N. WALL
MFR. G.E. PANEL TYPE CCB BREAKER TYPE TE, TEB, TED, TKF VOLTS 208/120 AMPS 400
SUPPLY DISCONNECT CKT. 590A11A-63A-39-9 MAIN LOCATION RM. 1204 N. WALL SUBSTATION 590
BREAKER KAIC (MIN.) 18K

DESCRIPTION	WIRE SIZE	BREAKER	CKT. NO. A	CKT. NO. B	CKT. NO. C	BREAKER	WIRE SIZE	DESCRIPTION
GFI RECEPT. O/S S. EQUIP. PAD FOR 432DAR02-P	12	20	1	2		20	12	432HEC01 O/S S. @432RCHS01-1 PAD; WALL RECEPTS. RM. 1204
SPARE		50 TEB	3	4		20	12	432DAR02-P O.S. SOUTH
			5	6		20	12	432DRU04 RM 1201 S. WALL
(2) SPACE			7	8				SPACE
(2) SPACE			9	10		20	12	MOISTURE DETECTOR S. SIDE RM. 1201
(2) SPACE			11	12				SPACE
	12					20	12	RECEPTS. WEST WALL RM. 1204
IPG LASER RM. 1204	12	20 TED	15	16		20 TED	12	RECEPTS. W. AND N. WALL RM. 1204
	12					20	12	RECEPTS. NORTH WALL RM. 1204
SPARE		40 TED	21	22		50 TEB		SPARE
SPARE		125 TFK	27	28		225 TFK		SPARE
SPARE		80 TED	33	34		40 TED		SPARE
SPACE			37	38		20	12	GFI RECEPT. O.S. PAD FOR AIR DRYER
SPACE			39	40				SPACE
SPACE			41	42				SPACE

BUS ENTRY T | FDR. BREAKER 150 | DATE INST. 1970 | LAST PM DATE: 2014
CONNECTED LOAD: PHASE "A" kW | PHASE "B" kW | PHASE "C" kW
ARC FLASH CATEGORY: 4
FEEDER SIZE: WIRE 3 - #500MCM THW | NEUT. 1 - #500MCM THW | GND. 1 - #2/0 B.C. | CONDUIT 4" C.
REVISION SUBMITTED BY: OUTAGE- G. ABAD | J.O.W.T. PW00756477 | CAD REV. BY LSF | CAD REV. DATE 5/3/17

432 PANELBOARD SCHEDULE

PANEL 590A11A-63A-4 (MODIFIED) BLDG. 432 LOCATION RM. 1000 W. WALL N. END - CTR.
MFR. COLUMBIA PANEL TYPE CDP BREAKER TYPE ATB, F VOLTS 480 AMPS 200
SUPPLY DISCONNECT CKT. 590A11A-63A-4 LOCATION RM. 1111 E. WALL SUBSTATION 590
BREAKER KAIC (MIN.) 14K

(OLD 590A11-25A-2)

DESCRIPTION	WIRE SIZE	BREAKER	CKT. NO. A	CKT. NO. B	CKT. NO. C	BREAKER	WIRE SIZE	DESCRIPTION
SPARE	12	30 F ATB	3	4		30 F	10	SPARE DISC. SW. RM. 1016 E. WALL
432ACU07-A1 RM. 1016 CEILING	12	20 TF	9	10		30 F	10	432ACU08-1 RM. 1100 W. WALL
WELDER RECEPT. RM. 1000 W. WALL	6	70 F	15	16		15 F ATB	12	432CD01 OUTSIDE N. OF BLDG.
432ACU03-A1 RM. 1000 CEILING	12	20 TF	21	22		15 ATB		SPARE
SPARE	60 RF	27	28			20 TF	12	432ACU04-A1 RM. 2022

BUS ENTRY T | FDR. BREAKER 200 | DATE INST. | LAST PM DATE: 2015
CONNECTED LOAD: PHASE "A" kW | PHASE "B" kW | PHASE "C" kW
ARC FLASH CATEGORY: 2
FEEDER SIZE: WIRE 3 - #4/0 THW | NEUT. NONE | GND. #4 B.C. | CONDUIT 3" C.
REVISION SUBMITTED BY: NFPA70E | J.O.W.T. 35983/PM:EBS:5200:53 | CAD REV. BY ML | CAD REV. DATE 6/2/15

432 (PREVIOUSLY 828A13A-7) PANELBOARD SCHEDULE

PANEL 590A11B-16 (MODIFIED) BLDG. 432 LOCATION RM. 1400 N. WALL
MFR. G.E. PANEL TYPE NHB BREAKER TYPE TED VOLTS 480 AMPS 225
SUPPLY DISCONNECT CKT. 828A13A-7 LOCATION RM. 1400 N. WALL SUBSTATION 590
BREAKER KAIC (MIN.) 14K

(OLD 590A11B7)

DESCRIPTION	WIRE SIZE	BREAKER	CKT. NO. A	CKT. NO. B	CKT. NO. C	BREAKER	WIRE SIZE	DESCRIPTION
SPARE CKT. TO J-BOX RM. 1404 W. WALL	12	20	3	4		40	8	432ACS10 OUTSIDE NORTH WALL - E.
RECEPT. RM. 1300 E. WALL FORKLIFT CHARGER	10	30	9	10		30	10	480V. POWER FOR CRANE RM. 1400 DISCONNECT W. WALL
FORKLIFT BATTERY CHARGER RM. 1300 E. WALL	12	20	15	16		50		SPARE
432ACHPS03 OUTSIDE N. RM. 1404	8	40	21	22		30	12	432HEA02-4
30A. RECEPT. RM. 1300 E. WALL	10	30	27	28		50	6	WELDING OUTLET RM. 1300 BELOW STAIRS N. WALL
NO BUS								NO BUS

BUS ENTRY T | FDR. BREAKER 200 | DATE INST. | LAST PM DATE: 2015
CONNECTED LOAD: PHASE "A" kW | PHASE "B" kW | PHASE "C" kW
ARC FLASH CATEGORY: 2
FEEDER SIZE: WIRE 3 - #4/0 THHN | NEUT. NONE | GND. 1 - #4 THHN | CONDUIT 2" C.
REVISION SUBMITTED BY: NFPA70E | J.O.W.T. 35983/PM:EBS:5200:53 | CAD REV. BY ML | CAD REV. DATE 6/4/14

432 PANELBOARD SCHEDULE

PANEL 549A (MODIFIED) BLDG. 432 LOCATION RM. 1204 N. WALL
MFR. G.E. PANEL TYPE CCB BREAKER TYPE TE, TEB, TED, TKF VOLTS 208/120 AMPS 400
SUPPLY DISCONNECT CKT. 590A11A-63A-39-9 MAIN LOCATION RM. 1204 N. WALL SUBSTATION 590
BREAKER KAIC (MIN.) 18K

DESCRIPTION	WIRE SIZE	BREAKER	CKT. NO. A	CKT. NO. B	CKT. NO. C	BREAKER	WIRE SIZE	DESCRIPTION
GFI RECEPT. O/S S. EQUIP. PAD FOR 432DAR02-P	12	20	1	2		20	12	432HEC01 O/S S. @432RCHS01-1 PAD; WALL RECEPTS. RM. 1204
SPARE		50 TEB	3	4		20	12	432DAR02-P O.S. SOUTH
			5	6		20	12	432DRU04 RM 1201 S. WALL
RECEPTS. S. BUILDING EXTERIOR	10	20	7	8				SPACE
120/24V CONTROLS TRANSFORMER	12	20	9	10		20	12	MOISTURE DETECTOR S. SIDE RM. 1201
120/24V CONTROLS TRANSFORMER	12	20	11	12				SPACE
	12					20	12	RECEPTS. WEST WALL RM. 1204
IPG LASER RM. 1204	12	20 TED	15	16		20 TED	12	RECEPTS. W. AND N. WALL RM. 1204
	12					20	12	RECEPTS. NORTH WALL RM. 1204
SPARE		40 TED	21	22		50 TEB		SPARE
SPARE		125 TFK	27	28		225 TFK		SPARE
SPARE		80 TED	33	34		40 TED		SPARE
SPACE			37	38		20	12	GFI RECEPT. O.S. PAD FOR AIR DRYER
SPACE			39	40				SPACE
SPACE			41	42				SPACE

BUS ENTRY T | FDR. BREAKER 150 | DATE INST. 1970 | LAST PM DATE: 2014
CONNECTED LOAD: PHASE "A" kW | PHASE "B" kW | PHASE "C" kW
ARC FLASH CATEGORY: 4
FEEDER SIZE: WIRE 3 - #500MCM THW | NEUT. 1 - #500MCM THW | GND. 1 - #2/0 B.C. | CONDUIT 4" C.
REVISION SUBMITTED BY: OUTAGE- G. ABAD | J.O.W.T. PW00756477 | CAD REV. BY LSF | CAD REV. DATE 5/3/17

GENERAL NOTES

1. FOR GENERAL NOTES, SYMBOLS, AND ABBREVIATIONS, REFER TO SHEET E-001.
2. UNLESS OTHERWISE NOTED, LIGHT LINEWEIGHT INDICATES EXISTING EQUIPMENT TO REMAIN AND HEAVY LINEWEIGHT INDICATES EQUIPMENT TO BE MODIFIED.
3. SUBCONTRACTORS MUST FIELD VERIFY LOCATION OF EXISTING EQUIPMENT AND EQUIPMENT TO BE INSTALLED.
4. SUBCONTRACTOR MUST FIELD VERIFY CIRCUITS INDICATED AND LOADS SERVED BY THEM.
5. SUBCONTRACTOR MUST UPDATE MODIFIED PANELBOARD SCHEDULES.
6. PANEL SCHEDULES FOR AFFECTED PANELS ARE SHOWN. COORDINATE EQUIPMENT SHUTDOWN WITH CONSTRUCTION MANAGER / SUBCONTRACT TECHNICAL REPRESENTATIVE DURING CONSTRUCTION.
7. CONDUCTOR SPLICES ARE NOT ALLOWED WITHOUT LEAD ELECTRICAL ENGINEER APPROVAL

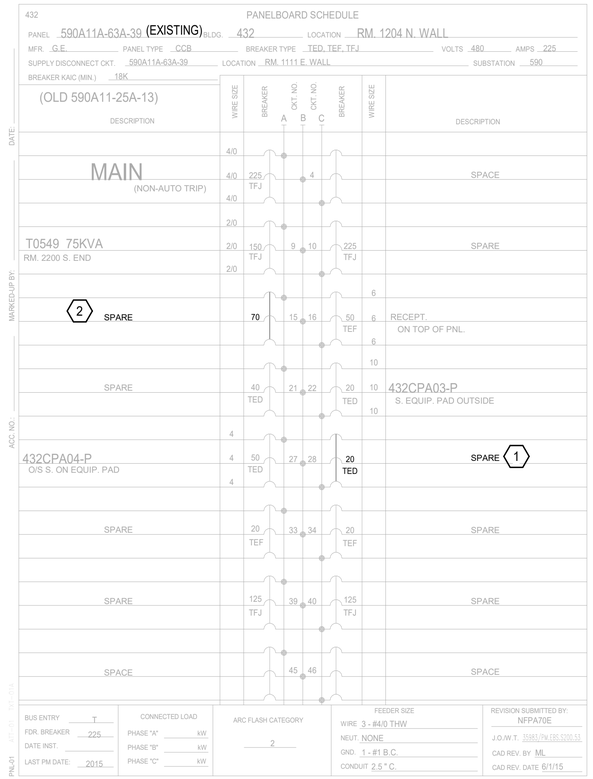
(#) KEYED NOTES

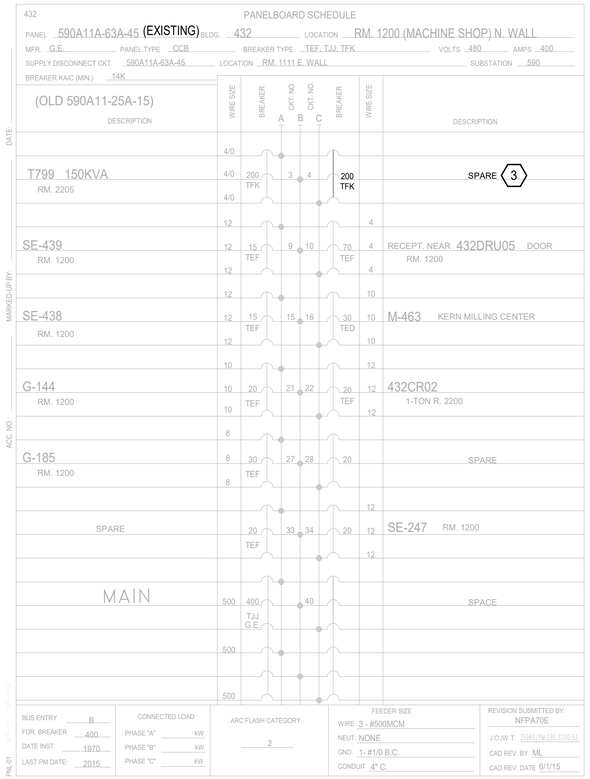
1. EXISTING LOAD TO BE DISCONNECTED AND REMOVED BACK TO SOURCE.
2. UTILIZE EXISTING SPACE IN EXISTING PANEL TO SERVE NEW LOAD.
3. DISCONNECT AND REMOVE EXISTING CIRCUIT BREAKER IN EXISTING PANEL. REPLACE WITH NEW 3P-480V-30A CIRCUIT BREAKER IN EXISTING PANEL TO SERVE NEW LOAD.

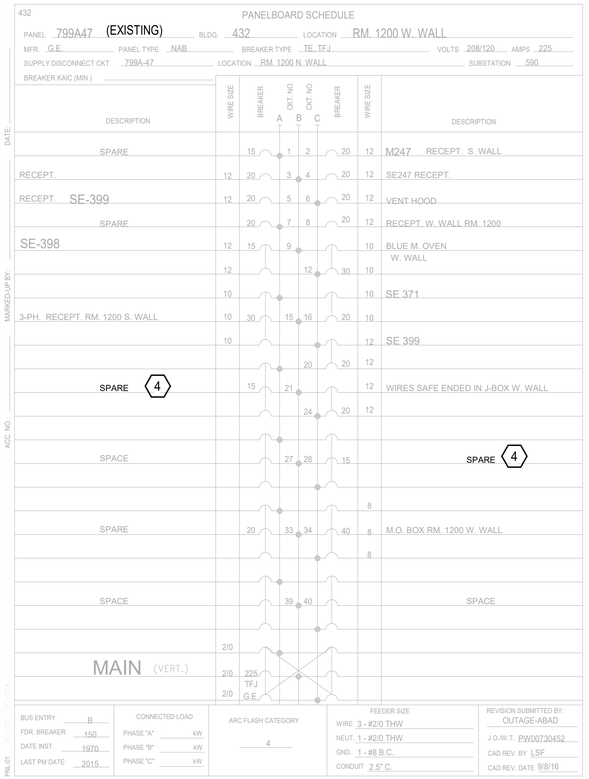
Sheet Title
ELECTRICAL PANEL SCHEDULES

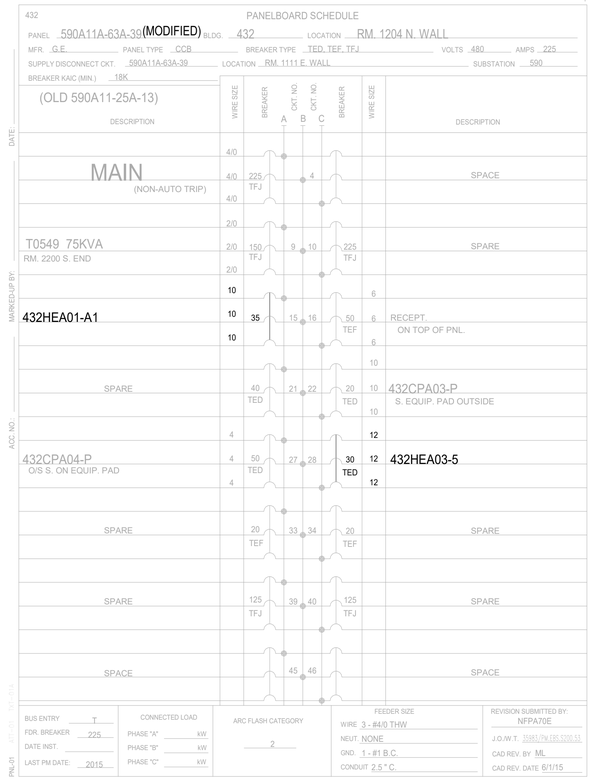
Dwg. No.
PLE2021-0432-0016D

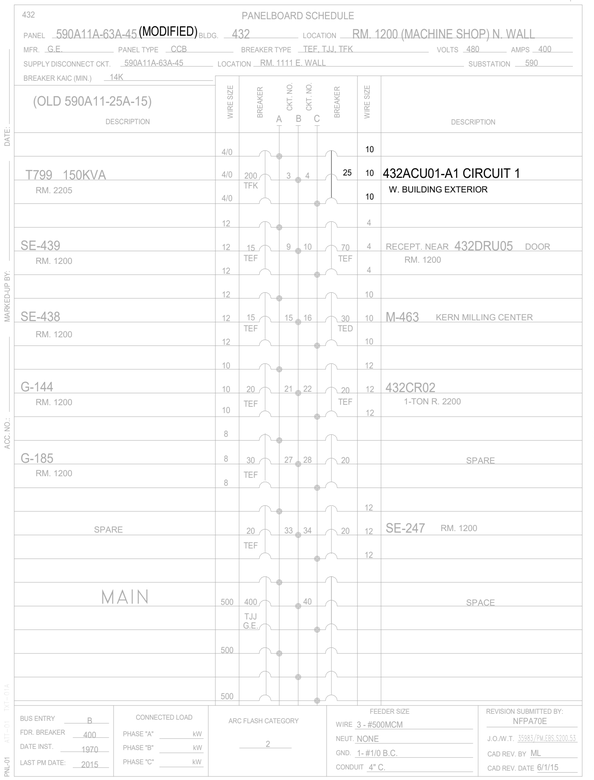
Sht. No.
E-803

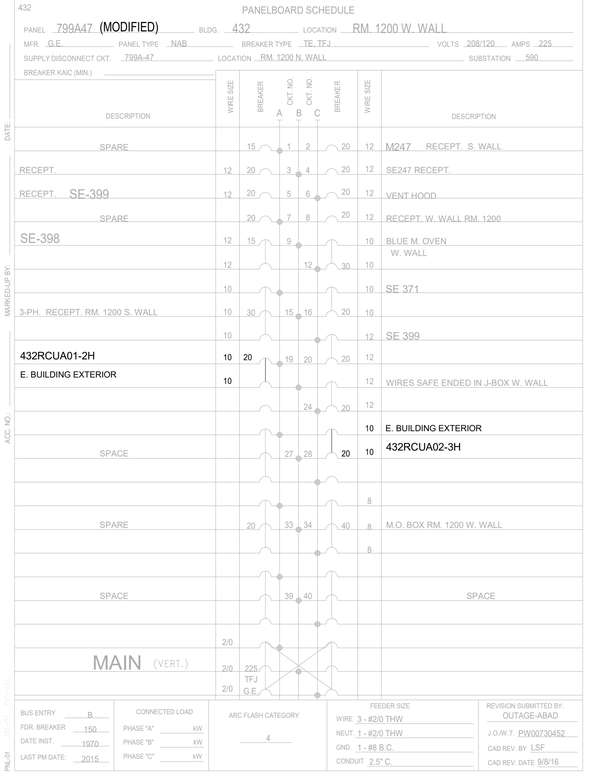












GENERAL NOTES

1. FOR GENERAL NOTES, SYMBOLS, AND ABBREVIATIONS, REFER TO SHEET E-001.
2. UNLESS OTHERWISE NOTED, LIGHT LINEWEIGHT INDICATES EXISTING EQUIPMENT TO REMAIN AND HEAVY LINEWEIGHT INDICATES EQUIPMENT TO BE MODIFIED.
3. SUBCONTRACTORS MUST FIELD VERIFY LOCATION OF EXISTING EQUIPMENT AND EQUIPMENT TO BE INSTALLED.
4. SUBCONTRACTOR MUST FIELD VERIFY CIRCUITS INDICATED AND LOADS SERVED BY THEM.
5. SUBCONTRACTOR MUST UPDATE MODIFIED PANELBOARD SCHEDULES.
6. PANEL SCHEDULES FOR AFFECTED PANELS ARE SHOWN. COORDINATE EQUIPMENT SHUTDOWN WITH CONSTRUCTION MANAGER / SUBCONTRACT TECHNICAL REPRESENTATIVE DURING CONSTRUCTION.
7. CONDUCTOR SPLICES ARE NOT ALLOWED WITHOUT LEAD ELECTRICAL ENGINEER APPROVAL.

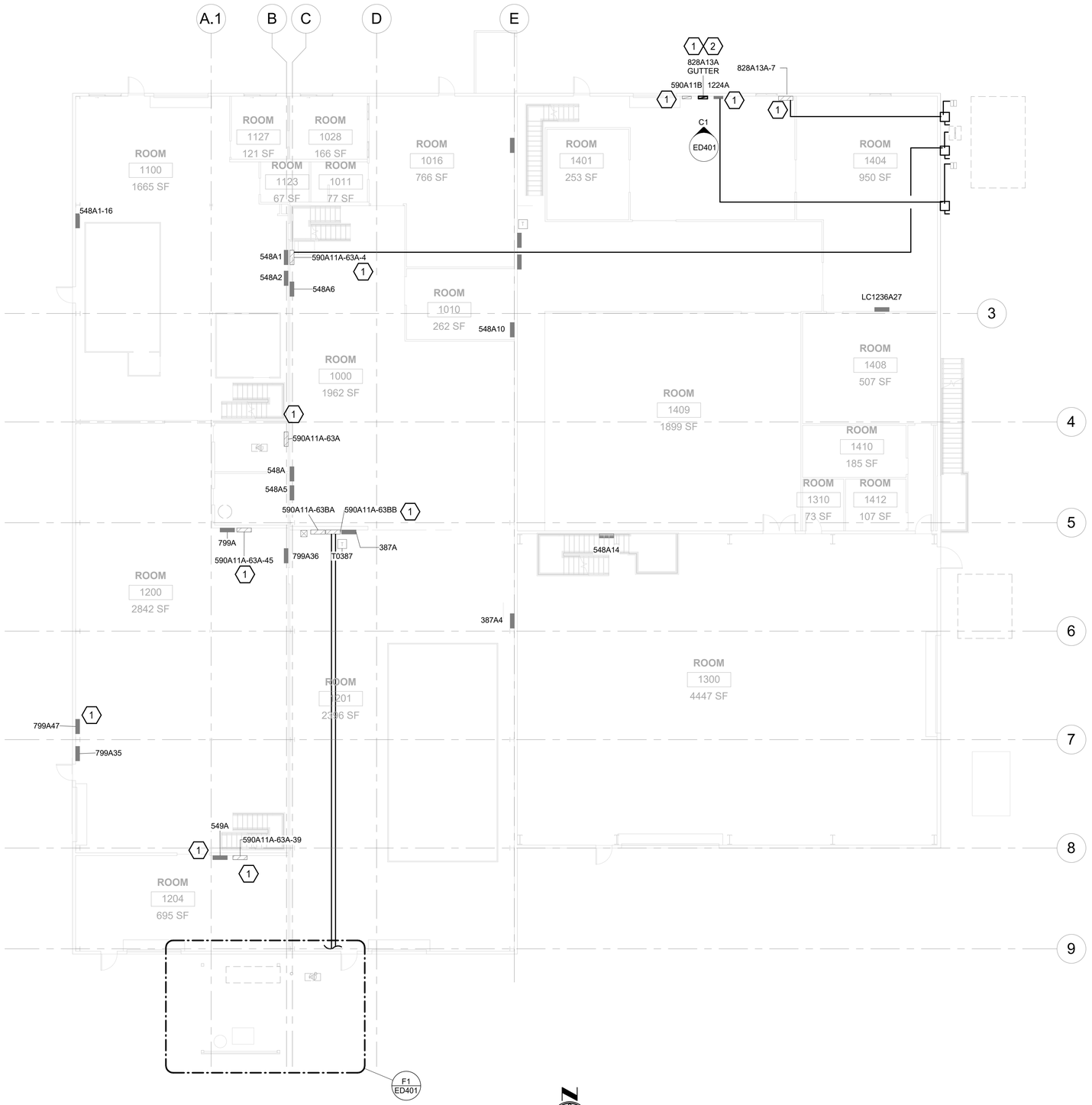
KEYED NOTES

1. DISCONNECT AND REMOVE EXISTING CIRCUIT BREAKER IN EXISTING PANEL. REPLACE WITH NEW 2P-208V-30A CIRCUIT BREAKER IN EXISTING PANEL TO SERVE NEW LOAD.
2. DISCONNECT AND REMOVE EXISTING CIRCUIT BREAKER IN EXISTING PANEL. REPLACE WITH NEW 3P-480V-80A CIRCUIT BREAKER TO SERVE NEW LOAD. NEW CIRCUIT BREAKER CHARACTERISTICS MUST MATCH EXISTING.
3. DISCONNECT AND REMOVE EXISTING CIRCUIT BREAKER IN EXISTING PANEL. REPLACE WITH NEW 3P-480V-110A CIRCUIT BREAKER TO SERVE NEW LOAD. NEW CIRCUIT BREAKER CHARACTERISTICS MUST MATCH EXISTING.
4. DISCONNECT AND REMOVE EXISTING CIRCUIT BREAKER IN EXISTING PANEL. REPLACE WITH NEW 2P-208V-20A CIRCUIT BREAKER IN EXISTING PANEL TO SERVE NEW LOAD.

Sheet Title
ELECTRICAL PANEL SCHEDULES

Dwg. No.
PLE2021-0432-0017D

Sht. No.
E-804



F1 ELECTRICAL DEMOLITION PLAN - FIRST FLOOR

F1 / ED101

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

0 8' 16' 24'

SCALE IN FEET

GENERAL NOTES

1. FOR GENERAL NOTES, SYMBOLS, AND ABBREVIATIONS, REFER TO SHEET E-001.
2. UNLESS OTHERWISE NOTED, LIGHT LINEWEIGHT INDICATES EXISTING EQUIPMENT TO REMAIN AND HEAVY LINEWEIGHT INDICATES DEMOLITION WORK.
3. SUBCONTRACTORS MUST FIELD VERIFY LOCATION OF EXISTING EQUIPMENT AND EQUIPMENT TO BE DISCONNECTED AND REMOVED.
4. SUBCONTRACTOR MUST FIELD VERIFY CIRCUITS INDICATED AND LOADS SERVED BY THEM.
5. SUBCONTRACTORS MUST WORK CLOSELY WITH MECHANICAL SUBCONTRACTOR TO VERIFY PHASING OF DEMOLITION. THIS IS TO AVOID ANY UNNECESSARY OR UNPLANNED OUTAGES FOR EQUIPMENT OR THE FACILITY.
6. SUBCONTRACTOR MUST REFER TO DIVISION 1 SPECIFICATIONS FOR CONSTRUCTION SEQUENCING AND PHASING.
7. REFER TO SHEETS E-801, E-802 AND E-803 FOR ADDITIONAL WORK AT ELECTRICAL PANELS.
8. CONDUIT ROUTING IS FOR DIAGRAMMATIC PURPOSE ONLY. SUBCONTRACTOR MUST VERIFY EXACT CONDUIT ROUTES
9. DEMOLITION WORK MUST COMPLY WITH NEC ARTICLE 725.25 AND 800.25.

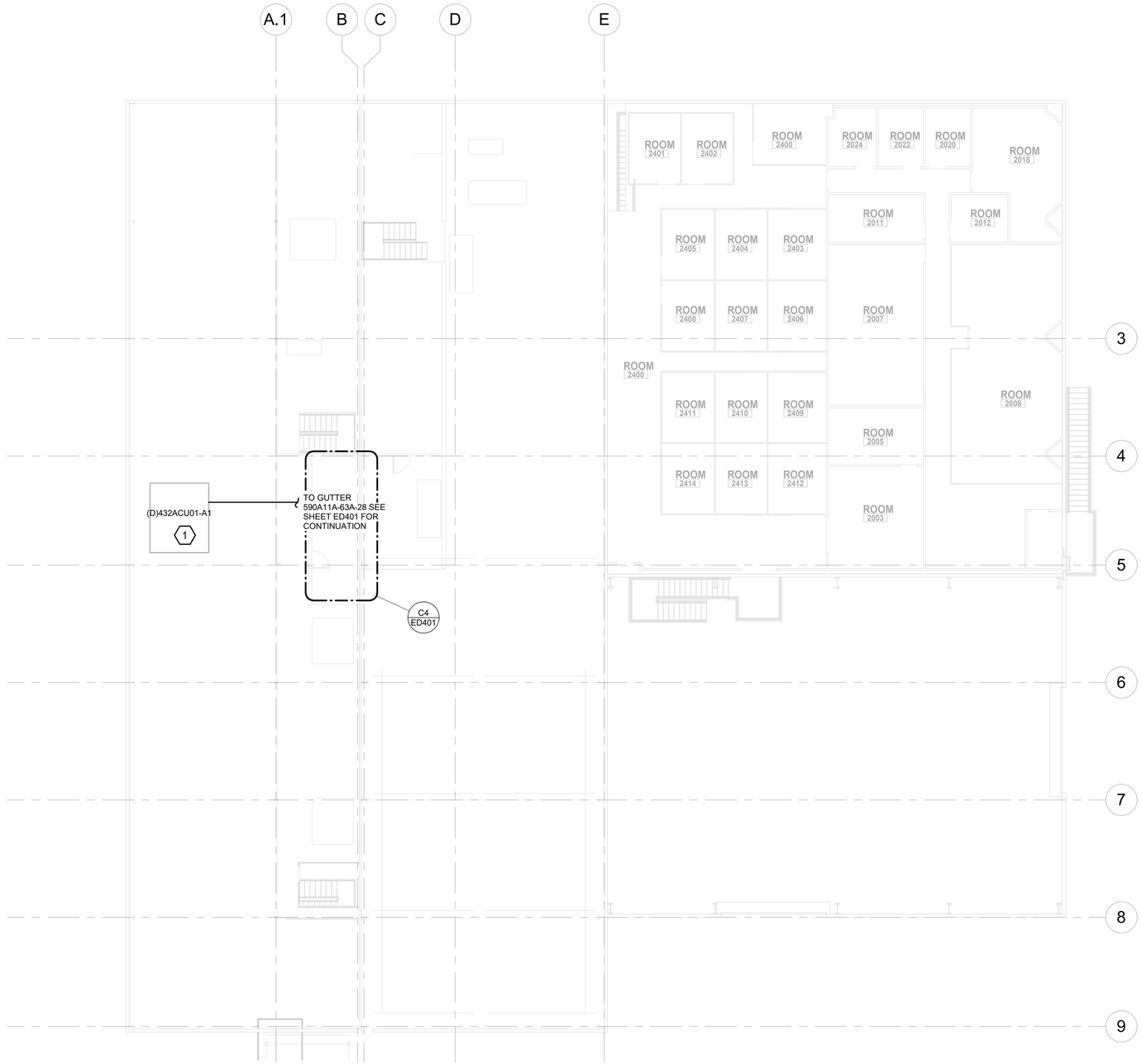
(#) KEYED NOTES

1. EXISTING PANEL TO BE AFFECTED BY THIS PROJECT. COORDINATE SHUTDOWN WITH SUBCONTRACT TECHNICAL REPRESENTATIVE DURING CONSTRUCTION. SEE SHEET E-801, E-802 AND E-803 FOR ADDITIONAL WORK.
2. DISCONNECT AND REMOVE EXISTING GUTTER, CONDUCTORS, DISCONNECT SWITCH, VFDS AND PLATFORM SERVING EXISTING EQUIPMENT BACK TO SOURCE PANEL. EXISTING CONDUIT MUST REMAIN AND TO BE REUSED FOR NEW WORK.

Sheet Title
ELECTRICAL DEMOLITION PLAN - FIRST FLOOR

Dwg. No.
PLE2021-0432-0004D

Sht. No.
ED101



GENERAL NOTES

1. FOR GENERAL NOTES, SYMBOLS, AND ABBREVIATIONS, REFER TO SHEET E-001.
2. UNLESS OTHERWISE NOTED, LIGHT LINEWEIGHT INDICATES EXISTING EQUIPMENT TO REMAIN AND HEAVY LINEWEIGHT INDICATES DEMOLITION WORK.
3. SUBCONTRACTORS MUST FIELD VERIFY LOCATION OF EXISTING EQUIPMENT AND EQUIPMENT TO BE DISCONNECTED AND REMOVED.
4. SUBCONTRACTOR MUST FIELD VERIFY CIRCUITS INDICATED AND LOADS SERVED BY THEM.
5. SUBCONTRACTORS MUST WORK CLOSELY WITH MECHANICAL SUBCONTRACTOR TO VERIFY PHASING OF DEMOLITION. THIS IS TO AVOID ANY UNNECESSARY OR UNPLANNED OUTAGES FOR EQUIPMENT OR THE FACILITY.
6. SUBCONTRACTOR MUST REFER TO DIVISION 1 SPECIFICATIONS FOR CONSTRUCTION SEQUENCING AND PHASING.
7. REFER TO SHEETS E-801, E-802 AND E-803 FOR ADDITIONAL WORK AT ELECTRICAL PANELS.
8. CONDUIT ROUTING IS FOR DIAGRAMMATIC PURPOSE ONLY. SUBCONTRACTOR MUST VERIFY EXACT CONDUIT ROUTES
9. DEMOLITION WORK MUST COMPLY WITH NEC ARTICLE 725.25 AND 800.25.

KEYED NOTES

1. DEMOLISH EXISTING EQUIPMENT AND ALL ASSOCIATED DISCONNECTS, CONDUCTORS AND CONDUITS.

F1 / ED102 **ELECTRICAL DEMOLITION PLAN - SECOND FLOOR**

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

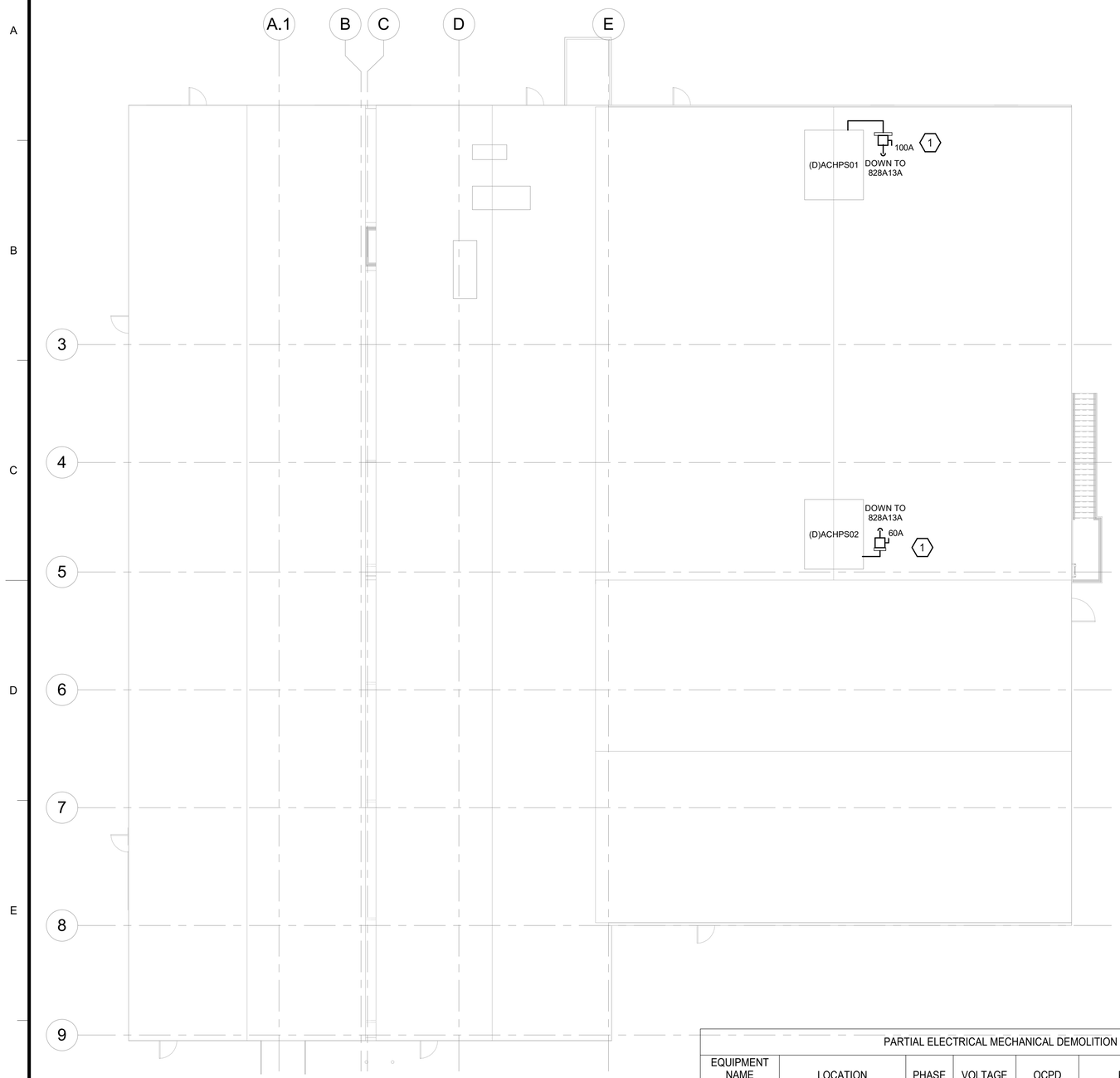
0 8' 16' 24'

SCALE IN FEET

Sheet Title
ELECTRICAL DEMOLITION PLAN - SECOND FLOOR

Dwg. No.
PLE2021-0432-0005D

Sht. No.
ED102



F1
ED103

ELECTRICAL DEMOLITION PLAN - ROOF

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

0 8' 16' 24'

SCALE IN FEET

PARTIAL ELECTRICAL MECHANICAL DEMOLITION SCHEDULE

EQUIPMENT NAME	LOCATION	PHASE	VOLTAGE	OCPD	PANEL	CKT #	FEEDER
432ACHPS01	ROOF	3	480 V	70	828A13A	2	(3) #4, #8G, 1"
432ACHPS02	ROOF	3	480 V	40	828A13A	3	(3) #8, #10G, 1"
432ACU01-A1	RM 1200 CEILING	3	480 V	100	590A11A-63A	28	(3) #2, #8G, 1"
432FHE05	E. BUILDING EXTERIOR	1	120 V	20	828A13A-7	14	(2) #12, #12G, 3/4"C
432FHE06	E. BUILDING EXTERIOR	1	240 V	20	590A11A-63A-4	22	(2) #12, #12G, 3/4"C
432FHE07	E. BUILDING EXTERIOR	1	480 V	15	1224A	22	(3) #12, #12G, 1"C
432PCHW01-4	S. BUILDING EXTERIOR	3	480 V	30	590A11A-63BB	22	(3) #12, #12G, 1"C
432RCHCW01-4	S. BUILDING EXTERIOR	3	480 V	175	590A11A-63BB	34	(3) #2/0, #6G, 1-1/2"C

GENERAL NOTES

1. FOR GENERAL NOTES, SYMBOLS, AND ABBREVIATIONS, REFER TO SHEET E-001.
2. UNLESS OTHERWISE NOTED, LIGHT LINEWEIGHT INDICATES EXISTING EQUIPMENT TO REMAIN AND HEAVY LINEWEIGHT INDICATES DEMOLITION WORK. .
3. SUBCONTRACTORS MUST FIELD VERIFY LOCATION OF EXISTING EQUIPMENT AND EQUIPMENT TO BE DISCONNECTED AND REMOVED.
4. SUBCONTRACTOR MUST FIELD VERIFY CIRCUITS INDICATED AND LOADS SERVED BY THEM.
5. SUBCONTRACTORS MUST WORK CLOSELY WITH MECHANICAL SUBCONTRACTOR TO VERIFY PHASING OF DEMOLITION. THIS IS TO AVOID ANY UNNECESSARY OR UNPLANNED OUTAGES FOR EQUIPMENT OR THE FACILITY.
6. SUBCONTRACTOR MUST REFER TO DIVISION 1 SPECIFICATIONS FOR CONSTRUCTION SEQUENCING AND PHASING.
7. REFER TO SHEETS E-801, E-802 AND E-803 FOR ADDITIONAL WORK AT ELECTRICAL PANELS.
8. CONDUIT ROUTING IS FOR DIAGRAMMATIC PURPOSE ONLY. SUBCONTRACTOR MUST VERIFY EXACT CONDUIT ROUTES
9. DEMOLITION WORK MUST COMPLY WITH NEC ARTICLE 725.25 AND 800.25.

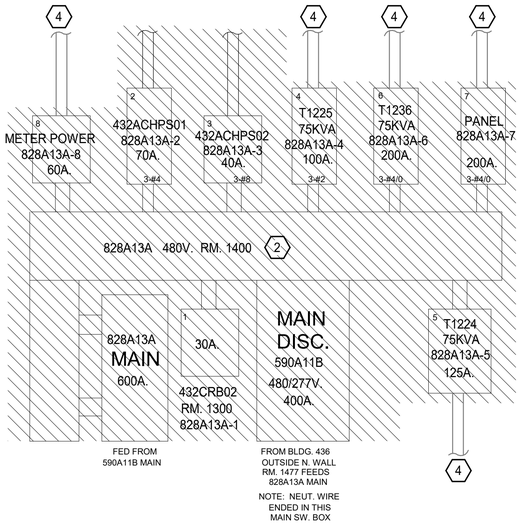
KEYED NOTES

1. DISCONNECT AND REMOVE EXISTING CONDUIT, CONDUCTORS AND DISCONNECT SWITCH SERVING EXISTING EQUIPMENT. PROVIDING SEALING FOR CONDUIT PENETRATIONS UPON EQUIPMENT REMOVAL.

Sheet Title
ELECTRICAL DEMOLITION PLAN - ROOF

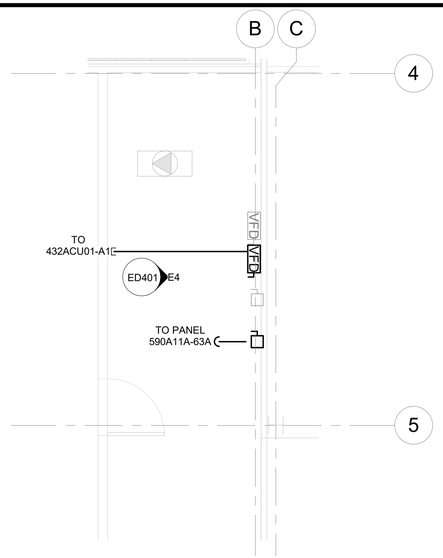
Dwg. No.
PLE2021-0432-0006D

Sht. No.
ED103



C1 ED401 — **828A13A ELEVATION**

SCALE: NO SCALE SHOWN

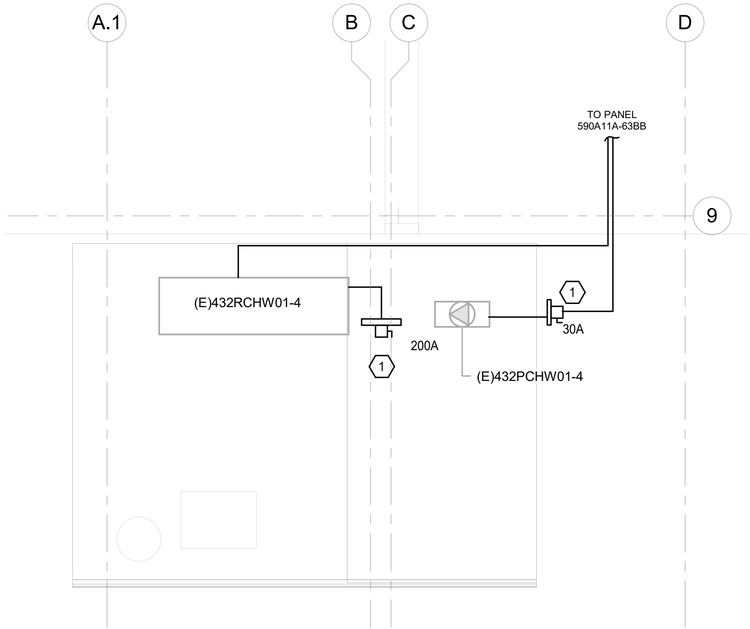


C4 ED401 — **ENLARGED DEMOLITION PLAN - ROOM 2205**

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

0 2' 4' 8'

SCALE IN FEET

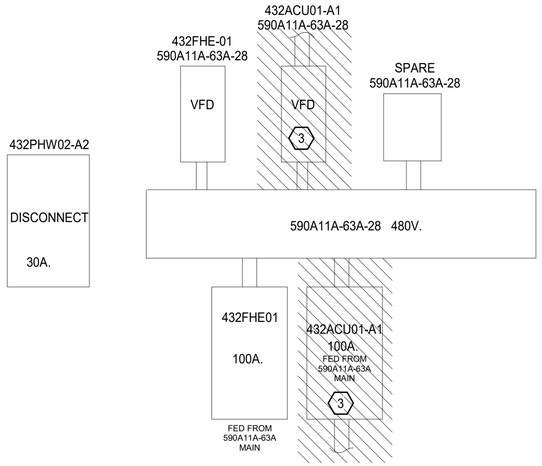


F1 ED401 — **ENLARGED CHILLER YARD DEMOLITION**

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

0 2' 4' 8'

SCALE IN FEET



E4 ED401 — **590A11A-63A-28 ELEVATION**

SCALE: NO SCALE SHOWN

ELECTRICAL MECHANICAL DEMOLITION SCHEDULE

EQUIPMENT NAME	LOCATION	PHASE	VOLTAGE	OCPD	PANEL	CKT #	FEEDER	DISCONNECT SIZE	DISCONNECT RATING
432ACHPS01	ROOF	3	480 V	70	828A13A	2	(3) #4, #8G, 1"	100	NEMA 3R
432ACHPS02	ROOF	3	480 V	40	828A13A	3	(3) #8, #10G, 1"	60	NEMA 3R
432ACU01-A1	RM 1200 CEILING	3	480 V	100	590A11A-63A	28	(3) #2, #8G, 1"	100	NEMA 1
432FHE05	E. BUILDING EXTERIOR	1	120 V	20	828A13A-7	14	(2) #12, #12G, 3/4"C	30	NEMA 3R
432FHE06	E. BUILDING EXTERIOR	1	240 V	20	590A11A-63A-4	22	(2) #12, #12G, 3/4"C	60	NEMA 3R
432FHE07	E. BUILDING EXTERIOR	1	480 V	15	1224A	22	(3) #12, #12G, 1"C	30	NEMA 3R
432PCHW01-4	S. BUILDING EXTERIOR	3	480 V	30	590A11A-63BB	22	(3) #12, #12G, 1"C	30	NEMA 3R
432RCHCW01-4	S. BUILDING EXTERIOR	3	480 V	175	590A11A-63BB	34	(3) #2/0, #6G, 1-1/2"C	100	NEMA 3R

GENERAL NOTES

1. FOR GENERAL NOTES, SYMBOLS, AND ABBREVIATIONS, REFER TO SHEET E-001.
2. UNLESS OTHERWISE NOTED, LIGHT LINEWEIGHT INDICATES EXISTING EQUIPMENT TO REMAIN AND HEAVY LINEWEIGHT/HATCHED AREA INDICATES DEMOLITION WORK.
3. SUBCONTRACTORS MUST FIELD VERIFY LOCATION OF EXISTING EQUIPMENT AND EQUIPMENT TO BE DISCONNECTED AND REMOVED.
4. SUBCONTRACTOR MUST FIELD VERIFY CIRCUITS INDICATED AND LOADS SERVED BY THEM.
5. SUBCONTRACTORS MUST WORK CLOSELY WITH MECHANICAL SUBCONTRACTOR TO VERIFY PHASING OF DEMOLITION. THIS IS TO AVOID ANY UNNECESSARY OR UNPLANNED OUTAGES FOR EQUIPMENT OR THE FACILITY.
6. SUBCONTRACTOR MUST REFER TO DIVISION 1 SPECIFICATIONS FOR CONSTRUCTION SEQUENCING AND PHASING.
7. REFER TO SHEETS E-801 AND E-802 FOR ADDITIONAL WORK AT ELECTRICAL PANELS.
8. CONDUIT ROUTING IS FOR DIAGRAMMATIC PURPOSE ONLY. SUBCONTRACTOR MUST VERIFY EXACT CONDUIT ROUTES.
9. VERIFY EXISTING CONDITIONS MEET NEC STANDARDS.
10. DEMOLITION WORK MUST COMPLY WITH NEC ARTICLE 725.25 AND 800.25.

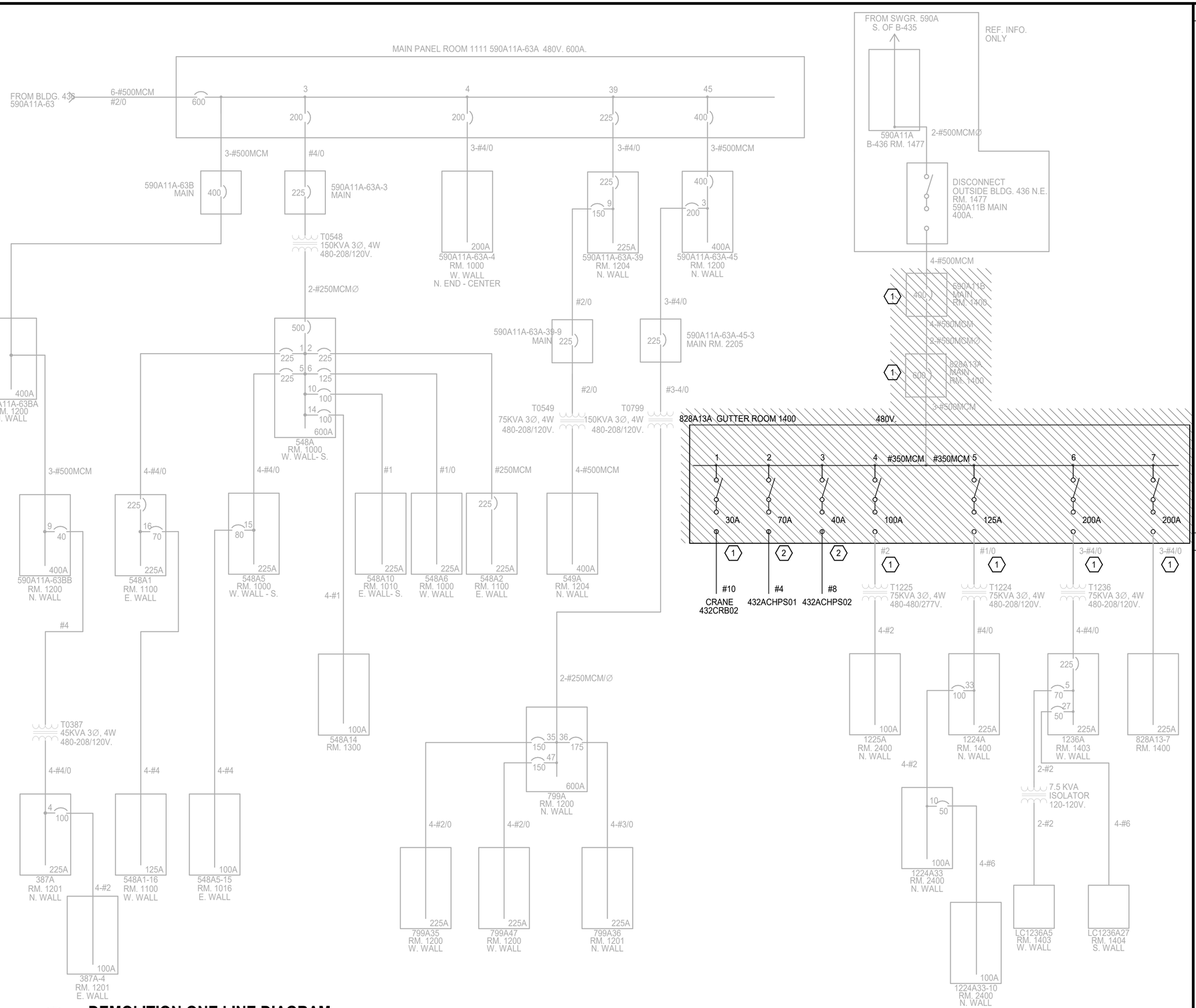
KEYED NOTES

1. DISCONNECT AND REMOVE EXISTING CONDUIT, CONDUCTORS, DISCONNECT SWITCH, VFD AND PLATFORM SERVING EXISTING EQUIPMENT BACK TO SOURCE PANEL.
2. DISCONNECT AND REMOVE EXISTING CONDUIT, GUTTER, CONDUCTORS, DISCONNECT SWITCHES, VFDS AND PLATFORM SERVING EXISTING EQUIPMENT.
3. DISCONNECT AND REMOVE EXISTING CONDUIT, CONDUCTORS AND DISCONNECT SWITCH SERVING EXISTING EQUIPMENT.
4. EXISTING CONDUIT MUST REMAIN AND TO BE REUSED FOR NEW WORK. FIELD VERIFY THAT ALL EXISTING CONDUITS BEING RE-USED ARE SECURED AND SUPPORTED PROPERLY PER NEC STANDARDS.

Sheet Title
ELECTRICAL ENLARGED PLANS - DEMOLITION

Dwg. No.
PLE2021-0432-0007D

Sht. No.
ED401



F1
ED701

DEMOLITION ONE LINE DIAGRAM

SCALE: NO SCALE SHOWN

GENERAL NOTES

1. FOR GENERAL NOTES, SYMBOLS, AND ABBREVIATIONS, REFER TO SHEET E-001.
2. UNLESS OTHERWISE NOTED, LIGHT LINEWEIGHT INDICATES EXISTING EQUIPMENT TO REMAIN AND HEAVY LINEWEIGHT INDICATES DEMOLITION WORK. HATCHED AREA INDICATE EQUIPMENT TO BE DEMOLISHED.
3. REFER TO SHEETS E-801 AND E-802 FOR ADDITIONAL WORK AT ELECTRICAL PANELS.
4. VERIFY EXISTING CONDITIONS MEET NEC STANDARDS.

KEYED NOTES

1. DISCONECT AND REMOVE EXISTING CONDUCTORS AND DISCONNECT SWITCH SERVING EXISING EQUPIMENT. EXISTING CONDUIT TO REMAIN AND BE REUSED IN NEW WORK. FIELD VERIFY THAT ALL EXISTING CONDUITS BEING RE-USED ARE SECURED AND SUPPORTED PROPERLY PER NEC STANDARDS.
2. DISCONECT AND REMOVE EXISTING CONDUCTORS AND DISCONNECT SWITCH SERVING EXISING EQUPIMENT.

Sheet Title
ELECTRICAL DEMOLITION ONE LINE DIAGRAM

Dwg. No.
PLE2021-0432-0008D

Sht. No.
ED701