MONTANA STATE UNIVERSITY BOZEMAN
MILLER DINING AUXILIARIES OFFICES
HVAC UPGRADES

10/20/25

PREPARED BY:

Morrison Maierle

engineers ▪ surveyors ▪ planners ▪ scientists

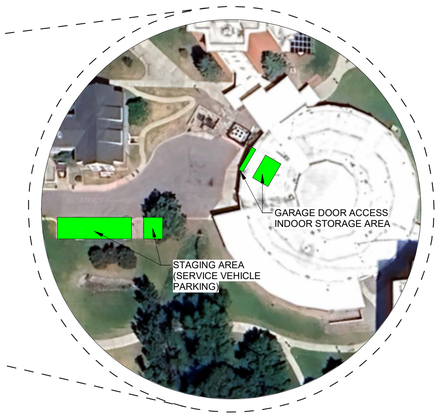
2880 Technology Blvd W, Bozeman, MT 59718
406.587.0721 www.m-m.net

LOCATION MAP

NOT TO SCALE

PROJECT VIEW

NOT TO SCALE



811

Know what's below.
Call before you dig.

VERIFY COLOR!
THIS SHEET IS INTENDED TO BE IN COLOR. RED, GREEN AND BLUE WILL BE VISIBLE IF REPRODUCED CORRECTLY.

Autodesk Docs://0747.087 MILLER HVAC/0747.087 MILLER HVAC_R23.rvt

PROJECT TEAM
OWNER
UNIVERSITY FACILITIES MANAGEMENT 6TH & GRANT STREET BOZEMAN, MT 59717
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ELECTRICAL ENGINEER
MORRISON MAIERLE INC. 2880 TECHNOLOGY BLVD. WEST BOZEMAN, MT 59718 (406) 587-0721

100% BID DOCUMENTS

MILLER DINING AUXILIARIES OFFICES HVAC UPGRADES

MONTANA STATE UNIVERSITY BOZEMAN

MONTANA STATE UNIVERSITY

Morrison Maierle
engineers - surveyors - planners - scientists

DRAWN BY: DRT		
REVIEWED BY: JRH		
REV.	DESCRIPTION	DATE

MONTANA
DANIEL R. TANASOU
No. 88138 PE
LICENSED PROFESSIONAL ENGINEER

PPA#24-1099

MMI PROJ #: 0747.087

SHEET TITLE
COVER SHEET

SHEET
M0.0

DATE
10/20/2025

ABBREVIATIONS

ACC	AIR COOLED CONDENSER
ACU	AIR CONDITIONING UNIT
AD	ACCESS DOOR
ADJ	ADJUSTABLE
AF	AIR FOIL
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AFR	ABOVE FINISHED ROOF
AFS	AIR FLOW STATION
AHU	AIR HANDLING UNIT
AP	ACCESS PANEL
ATC	AUTOMATIC TEMPERATURE CONTROL
ATM	ATMOSPHERE
AWG	AMERICAN WIRE GAUGE
B	BOILER
BB	BASEBOARD
BC	BACKWARD CURVED
BD	BACKDRAFT DAMPER
BF	BOILER FEED
BHP	BRAKE HORSEPOWER
BI	BACKWARD INCLINED
BMS	BUILDING MANAGEMENT SYSTEM
BOD	BOTTOM OF DUCT
BOJ	BOTTOM OF JOIST
BOS	BOTTOM OF STEEL
BTU	BRITISH THERMAL UNIT
C	COMMON
CAV	CONSTANT AIR VOLUME
CC	COOLING COIL
CCW	COUNTER CLOCKWISE
CFM	CUBIC FEET PER MINUTE
CH	CHILLER
C&I	CONTROLS & INSTRUMENTATION
CLG	CEILING
CMU	CONCRETE MASONRY UNIT
CND	CONDENSATE
CONT	CONTINUATION
CORR	CORRIDOR
CT	COOLING TOWER
CU	CONDENSING UNIT
CH	CABINET HEATER
CV	CONTROL VALVE
CVS	CONTROL VALVE STATION
CW	CLOCKWISE
dB	DECIBEL
DB	DRY BULB TEMPERATURE (°F)
DDC	DIRECT DIGITAL CONTROL
DH	DUCT HEATER
DP	DEW POINT TEMPERATURE (°F)
DX	DIRECT EXPANSION
E	EXHAUST
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE (°F)
EC	ELECTRICAL CONTRACTOR
EDR	EQUIVALENT DIRECT RADIATION
EER	ENERGY EFFICIENCY RATIO
EF	EXHAUST FAN
EFF	EFFICIENCY
ELEV	ELEVATION
ERV	ENERGY RECOVERY VENTILATOR
ESP	EXTERNAL STATIC PRESSURE
ET	EXPANSION TANK
EWT	ENTERING WATER TEMPERATURE (°F)
F&T	FLOAT & THERMOSTATIC
FA	FACE AREA
FC	FORWARD CURVED
FC	FAN COIL
FP	FIRE PROTECTION
FPM	FEET PER MINUTE
FT	FEET
GA	GAUGE OR GAGE
GC	GENERAL CONTRACTOR
GEN	GENERATOR
GH	GRAVITY HOOD
GPD	GALLONS PER DAY
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
H	HUMIDIFIER
HC	HEATING COIL
HG	MERCURY
HOA	HAND-OFF-AUTOMATIC
HP	HORSEPOWER
HR	HOUR
HX	HEAT EXCHANGER
ID	INSIDE DIAMETER
IFB	INTEGRAL FACE & BYPASS
IGV	INLET GUIDE VANES
IPS	IRON PIPE SIZE
IU	INDUCTION UNIT
KW	KILOWATTS
KWH	KILOWATT HOUR
LAT	LEAVING AIR TEMPERATURE (°F)
LF	LINEAR FEET
LWT	LEAVING WATER TEMPERATURE (°F)
M	MOTOR OPERATED
MAU	MAKEUP AIR UNIT
MB	MIXING BOX
MBH	1000 BTU/HR
MC	MECHANICAL CONTRACTOR
MFR	MANUFACTURER
MS	MINI-SPLIT
NC	NOISE CRITERIA
NC	NORMALLY CLOSED
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NPS	NOMINAL PIPE SIZE
OA	OUTSIDE AIR
OAD	OUTSIDE AIR DAMPER
OBD	OPPOSED BLADE DAMPER
P	PUMP
PC	PLUMBING CONTRACTOR
PD	PRESSURE DROP
PH	PHASE
PHC	PREHEAT COIL
PPM	PART PER MILLION
PROP	PROPELLER
PRV	PRESSURE REDUCING VALVE
PSIA	PSI, ABSOLUTE
PSIG	PSI, GAUGE
QTY	QUANTITY
R	REGISTER
RA	RETURN AIR
RD	RADIAL DAMPER
RF	RETURN/RELIEF AIR FAN
RH	RELATIVE HUMIDITY
RHC	REHEAT COIL
SA	SUPPLY AIR
SAF	SUPPLY AIR FAN
SC	SENSIBLE COOLER
SCFM	CFM, STANDARD CONDITIONS
SD	SMOKE DETECTOR
SEER	SEASONAL ENERGY EFFICIENCY RATIO
SENS	SENSIBLE
SP	STATIC PRESSURE
SPS	STATIC PRESSURE SENSOR
SS	STAINLESS STEEL
T	THERMOSTAT
TA	TRANSFER AIR
TCC	TEMPERATURE CONTROL CONTRACTOR
TCP	TEMPERATURE CONTROL PANEL
TG	TRANSFER GRILL
TOS	TOP OF STEEL
TSP	TOTAL STATIC PRESSURE
TYP	TYPICAL
UH	UNIT HEATER
UNC	UNDERCUT
UV	UNIT VENTILATOR
VA	VOLT-AMPERE
VAV	VARIABLE AIR VOLUME
VD	VOLUME DAMPER
VEL	VELOCITY
VFD	VARIABLE FREQUENCY DRIVE
VRF	VARIABLE REFRIGERANT FLOW
WB	WET BULB TEMPERATURE (°F)
WC	WATER COLUMN
WG	WATER GAUGE
WSHP	WATER SOURCE HEAT PUMP
ΔT	TEMPERATURE DIFFERENCE (°F)

MECHANICAL LEGEND

ANNOTATION SYMBOLS

- X / X — 3D VIEW NUMBER / SHEET NUMBER
- X / X — DETAIL NUMBER / SHEET NUMBER
- X / X — SECTION NUMBER / SHEET NUMBER
- X / CFM — AIR DEVICE MARK AND CFM
- X / CFM / OBD — AIR DEVICE MARK AND CFM - PROVIDE OPPOSED BLADE DAMPER
- X / CFM / RD — AIR DEVICE MARK AND CFM - PROVIDE RADIAL DAMPER
- ME-# — MECHANICAL EQUIPMENT MARK
- (E) ME-# — EXISTING MECHANICAL EQUIPMENT
- (D) ME-# — DEMOLISHED MECHANICAL EQUIPMENT
- POINT OF NEW CONNECTION
- POINT OF DISCONNECTION

HVAC CONTROL SYMBOLS

- T — ADJUSTABLE THERMOSTAT
- T* — ADJUSTABLE THERMOSTAT W/ EQUIPMENT MARK
- T — ADJUSTABLE THERMOSTAT W/ LOCKABLE COVER
- C — ADJUSTABLE CO2 SENSOR
- S — WALL SWITCH
- H — ADJUSTABLE HUMIDISTAT
- T — TEMPERATURE SENSOR
- H — HUMIDITY SENSOR
- C — CO2 SENSOR
- P — BUILDING PRESSURE SENSOR
- SP — STATIC PRESSURE SENSOR
- DP — DIFFERENTIAL PRESSURE SENSOR
- CO/NO — CARBON MONOXIDE / NITRIC OXIDE SENSOR

HVAC DUCTWORK

- W"xD" — RECTANGULAR DUCT WIDTH x DEPTH
- X"ø — ROUND DUCT DIAMETER
- W"/D" — OVAL DUCT WIDTH/DEPTH
- X"ø — FLEXIBLE DUCT DIAMETER
- FLOOR/CEILING SUPPLY DIFFUSER
- FLOOR/CEILING RETURN GRILLE
- FLOOR/CEILING EXHAUST GRILLE
- SIDEWALL SUPPLY DIFFUSER
- SIDEWALL RETURN/EXHAUST GRILLE

NOTE: THIS IS A STANDARD LEGEND. NOT ALL PIPE TYPES AND SYMBOLS ARE NECESSARILY UTILIZED IN THE DRAWINGS.

HVAC DUCTWORK (CONT.)

- SUPPLY DUCT (SECTION VIEW)
- RETURN DUCT (SECTION VIEW)
- EXHAUST DUCT (SECTION VIEW)
- OUTDOOR AIR DUCT (SECTION VIEW)
- DUCT UP (PLAN VIEW)
- DUCT DOWN (PLAN VIEW)
- R — INCLINED RISE - IN DIRECTION OF AIRFLOW
- D — INCLINED DROP - IN DIRECTION OF AIRFLOW
- INTERNAL DUCT LINING
- ELBOW WITH TURNING VANES
- RADIUS ELBOW
- MANUAL VOLUME DAMPER
- R — REMOTE VOLUME DAMPER
- BD — BACKDRAFT DAMPER
- N — ZONE DAMPER
- B — BYPASS DAMPER
- M — MOTORIZED DAMPER
- FL — FIRE DAMPER
- FS — FIRE/SMOKE DAMPER
- S — SMOKE DAMPER

GENERAL

- (E) NAME — EXISTING PIPE TO REMAIN
- (D) NAME — EXISTING PIPE TO BE DEMOLISHED
- NAME — NEW PIPING
- DIRECTION OF FLOW

HVAC PIPING

- HWS — HEATING WATER SUPPLY
- HWR — HEATING WATER RETURN
- CWS — CHILLED WATER SUPPLY
- CWR — CHILLED WATER RETURN
- CTS — COOLING TOWER SUPPLY
- CTR — COOLING TOWER RETURN
- HPWS — HEAT PUMP WATER SUPPLY
- HPWR — HEAT PUMP WATER RETURN
- HPS — HIGH PRESSURE STEAM
- MPS — MEDIUM PRESSURE STEAM
- LPS — LOW PRESSURE STEAM
- CND — STEAM CONDENSATE RETURN
- ATV — ATMOSPHERIC VENT
- REF — REFRIGERANT (LIQUID AND SUCTION)

PIPE FITTINGS

- ELBOW
- PIPE BREAK
- PIPE UP
- PIPE DOWN
- CHANGE IN ELEVATION OF PIPE
- SIDE CONNECTION, TEE FITTING
- TOP CONNECTION, TEE FITTING UP
- BOTTOM CONNECTION, TEE FITTING DOWN
- CAPPED OUTLET OR BLIND FLANGE
- CONCENTRIC REDUCER

VALVES

- MANUAL BALANCING VALVE
- AUTOMATIC BALANCING VALVE
- VENTURI VALVE
- ISOLATION VALVE
- MANUAL 3-WAY VALVE
- STRAINER
- CHECK VALVE
- BACKFLOW PREVENTER
- PRESSURE REDUCING VALVE
- GAS PRESSURE REGULATOR
- TEMPERATURE AND/OR PRESSURE RELIEF VALVE
- HOSE-END DRAIN W/ CAP
- BOILER DRAIN W/ CAP
- S — SOLENOID VALVE
- M — 2-WAY TEMPERATURE CONTROL VALVE
- M — 3-WAY TEMPERATURE CONTROL VALVE
- STEAM TRAP

PIPING SPECIALTIES

- AUTOMATIC AIR VENT
- MANUAL AIR VENT
- PRESSURE / TEMPERATURE PORT
- UNION OR FLANGE
- PIPE WELL - EMPTY
- T — TEMPERATURE SENSOR
- P — PRESSURE SENSOR
- FS — FLOW SWITCH
- PS — PRESSURE SWITCH
- P — PRESSURE GAUGE, SNUBBER & NEEDLE VALVE
- T — TEMPERATURE GAUGE
- FLEXIBLE CONNECTOR
- THERMAL/SEISMIC EXPANSION LOOP
- PIPE GUIDES
- ANCHOR
- F — FLOW METER

MECHANICAL GENERAL NOTES

INSTALLATION:

A. NEW PIPING, DUCTWORK AND EQUIPMENT TO BE INSTALLED IN ACCORDANCE WITH THE CURRENTLY ADOPTED INTERNATIONAL MECHANICAL AND INTERNATIONAL BUILDING CODES.
B. EQUIPMENT SHALL BE INSTALLED LEVEL, PLUMB, AND FIRMLY ANCHORED IN LOCATIONS INDICATED ON PLAN. OBSERVE MANUFACTURER'S INSTALLATION INSTRUCTIONS AND RECOGNIZED INDUSTRY PRACTICES TO ENSURE THAT PRODUCTS SERVE THEIR INTENDED FUNCTION.
C. INSTALL EQUIPMENT, DUCTWORK, AND PIPING SO AS TO MAINTAIN CODE REQUIRED CLEARANCES FOR ELECTRICAL AND TELECOMMUNICATION EQUIPMENT.
D. ELEMENTS PENETRATING BUILDING COMPONENTS (ROOF ASSEMBLIES, WALL ASSEMBLIES, ETC.) SHALL BE SEALED WEATHER AND WATER TIGHT. COORDINATE PENETRATIONS WITH GENERAL CONTRACTOR TO PATCH TO THE SATISFACTION OF THE ARCHITECT OR ENGINEER.
E. EQUIPMENT MANUFACTURED AFTER 1/1/2023 SHALL MEET MINIMUM SEER2 RATINGS.

COORDINATION:

A. IT SHALL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR TO FIELD COORDINATE THE LOCATION OF EQUIPMENT, ROUTING OF DUCTWORK, AND ROUTING OF PIPING WITH OTHER TRADES.
B. IT SHALL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR TO REVIEW THE DRAWINGS OF OTHER DISCIPLINES AND PROVIDE THE NECESSARY LABOR AND MATERIALS REQUIRED FOR A COMPLETE INSTALLATION.
C. COORDINATE THE INSTALLATION OF GRILLES, REGISTERS AND DIFFUSERS WITH THE ARCHITECTURAL REFLECTED CEILING PLANS, THE ELECTRICAL LIGHTING PLANS, AND IF RELEVANT, THE TELECOMMUNICATION AND FIRE SPRINKLER PLANS.

ELECTRICAL COORDINATION:

A. SEE THE MEP COORDINATION SCHEDULE FOR ELECTRICAL INFORMATION. COORDINATE WITH OTHER TRADES TO ENSURE THAT ELECTRICAL DISCONNECTS, MOTOR STARTERS, VARIABLE FREQUENCY DRIVES, CONTROLS, AND ELECTRICAL ACCESSORIES ARE FURNISHED AND/OR INSTALLED BY THE APPROPRIATE TRADE.

FREEZE PROTECTION:

A. THE MECHANICAL CONTRACTOR SHALL FILL THE HYDRONIC SYSTEMS WITH THE FOLLOWING SOLUTION:
   a. CONDENSER WATER SYSTEM: 30% PROPYLENE GLYCOL & 70% DISTILLED WATER - GLYCOL SHALL INCLUDE CORROSION INHIBITORS.
B. SEE SPECIFICATION SECTION 232113 FOR ADDITIONAL CHEMICAL TREATMENT REQUIREMENTS.

SITE ELEVATION:

A. EQUIPMENT SHALL BE SELECTED FOR THE PROJECT ELEVATION OF 4,800'.

MECHANICAL SHEET INDEX

100% BID DOCUMENTS

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engineers - surveyors - planners - scientists

DRAWN BY:	DRT
REVIEWED BY:	JRH

REV.	DESCRIPTION	DATE

MONTANA
DANIEL R TANASOU
No. 88138 PE
LICENSED
PROFESSIONAL ENGINEER

PPA#24-1099

MMI PROJ #: 0747.087

SHEET TITLE
MECHANICAL LEGEND & NOTES

SHEET
M0.1

DATE
10/20/2025

WATER-TO-AIR HEAT PUMP SCHEDULE

REMARKS:
1. PROVIDE PSC MOTORS.
2. COMPRESSOR SOUND BLANKET.
3. PUMP CONDENSATE FROM EACH HEAT PUMP AS SHOWN ON PIPING PLANS. PROVIDE CONDENSATE PUMP.
4. PROVIDE 2" FILTER RACK WITH 2" MERV 8 FILTER ON WATER AIR UNITS.
5. PROVIDE 4" CONCRETE HOUSEKEEPING PAD UNDER EACH UNIT.
6. PROVIDE NON-FUSED FACTORY WIRED DISCONNECT.
7. FACTORY PROVIDED PIPING ACCESSORIES: FLEXIBLE CONNECTIONS, AUTOMATIC FLOW CONTROL VALVE, WYE STRAINER, AND MOTORIZED CONTROL VALVE.

CONTROLS:
1. PROVIDE DXM2.5 ADVANCED COMMUNICATING CONTROL BOARD WITH MULTIPLE PROTOCOL INTERFACE BOARD FOR BACNET INTERFACING.
2. PROVIDE VOLUME DAMPER ON OUTSIDE AIR DUCT TO HEAT PUMP WHERE APPLICABLE.
3. T.C. CONTRACTOR SHALL PROVIDE JCI THERMOSTATS.

ELECTRICAL DATA:
SEE MEP COORDINATION SCHEDULE FOR STARTER/DISCONNECT AND ALL OTHER ELEC. DATA.

MARK	SPACES SERVED	MANUF.	MODEL	UNIT ORIENTATION	AIRFLOW DATA		WATER FLOW DATA		REFRIGERANT	COOLING					HEATING				WORKING FLUID	BRANCH PIPE SIZE (IN)	CONTROL VALVE	UNIT PHYSICAL DATA			
					AIRFLOW (CFM)	ESP (IN WC)	FLOW (GPM)	WPD (FT)		EAT / LAT (°F)	EWT / LWT (°F)	TOTAL CAPACITY (MBH)	SENSIBLE CAPACITY (MBH)	EER	EAT / LAT (°F)	EWT / LWT (°F)	CAPACITY (MBH)	COP				LENGTH (IN)	WIDTH (IN)	HEIGHT (IN)	WEIGHT (LB)
HP-1A	0137, 0138, 0139, 0140	CLIMATE MASTER	SC-036	VERTICAL	941	0.4	7.5	4.6	R-454B	75.0 / 52.9	85.0 / 95.7	30.2	22.5	12	65.0 / 103.2	65.0 / 56.9	38.8	3.7	30% P.G.	1-1/4	2-WAY	26.0	21.6	45.0	203
HP-2A	0136	CLIMATE MASTER	SC-036	VERTICAL	941	0.4	7.5	4.6	R-454B	75.0 / 52.9	85.0 / 95.7	30.2	22.5	12	65.0 / 103.2	65.0 / 56.9	38.8	3.7	30% P.G.	1-1/4	2-WAY	26.0	21.6	45.0	203
HP-3A	0129, 0131, 0133, 0135	CLIMATE MASTER	SC-024	VERTICAL	684	0.4	5.0	3.6	R-454B	75.0 / 54.0	85.0 / 96.7	22.0	15.5	12	65.0 / 105.0	65.0 / 56.1	27.3	4	30% P.G.	1	2-WAY	21.5	21.6	40.0	189
HP-4A	0126A, 0126B, 0128, 0130	CLIMATE MASTER	SC-030	VERTICAL	833	0.4	6.3	5.8	R-454B	75.0 / 54.3	85.0 / 95.8	25.3	18.6	11.8	65.0 / 102.1	65.0 / 57.3	30.7	3.6	30% P.G.	1-1/4	3-WAY	21.5	21.6	40.0	197
HP-5A	0102CU	CLIMATE MASTER	SC-012	HORIZONTAL	360	0.4	2.5	9.8	R-454B	75.0 / 61.1	85.0 / 97.0	10.6	5.4	11.4	65.0 / 100.2	65.0 / 56.3	13.7	3.7	30% P.G.	3/4	2-WAY	19.0	19.1	22.0	114
HP-6A	0104ME	CLIMATE MASTER	SC-024	VERTICAL	684	0.4	5.0	3.6	R-454B	75.0 / 54.0	85.0 / 96.7	22.0	15.5	12	65.0 / 105.0	65.0 / 56.1	27.3	4	30% P.G.	1	2-WAY	21.5	21.6	40.0	189
HP-7A	0202FF, 0203FF, 0204FF	CLIMATE MASTER	SC-030	VERTICAL	833	0.4	6.3	5.8	R-454B	75.0 / 54.3	85.0 / 95.8	25.3	18.6	11.8	65.0 / 102.1	65.0 / 57.3	30.7	3.6	30% P.G.	1-1/4	2-WAY	21.5	21.6	40.0	197
HP-8A	299S1, 299LB	CLIMATE MASTER	SC-036	VERTICAL	941	0.4	7.5	4.6	R-454B	75.0 / 52.9	85.0 / 95.7	30.2	22.5	12	65.0 / 105.0	65.0 / 56.1	27.3	3.7	30% P.G.	1-1/4	2-WAY	26.0	21.6	45.0	203

GRILLE, REGISTER AND DIFFUSER SCHEDULE

REMARKS:
1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL FITTINGS AND ACCESSORIES REQUIRED FOR A COMPLETE INSTALLATION.
2. THE N.C. VALUES LISTED ARE VALID FOR THE SCHEDULED AIRFLOW ONLY AND REPRESENT A MAXIMUM ACCEPTABLE VALUE. SUBSTITUTE EQUIPMENT SHALL HAVE N.C. VALUE EQUAL TO OR BELOW THE VALUE SCHEDULED.
3. PAINT INTERIOR OF VISIBLE RETURN DUCTS & PLENUMS BLACK.
4. COORDINATE LINEAR SLOT WIDTHS WITH THE WIDTH OF THE WOOD SLAT CEILINGS THEY WILL BE INSTALLED IN PRIOR TO ORDERING.

ACCESSORIES:
1. PROVIDE FRAME FOR INSTALLATION IN RELEVANT CEILING TYPE. REFER TO ARCHITECTURAL RCP FOR CEILING TYPE.
2. REMOTE DAMPERS SHALL BE GREENHECK MODEL RBDR-50 WITH REMOTE WALL PLATE(S) IN LOCATION(S) SHOWN ON DRAWINGS.
3. REMOTE DAMPERS SHALL BE MECHANICAL CABLE DRIVEN WITH CEILING ADJUSTMENT PLATES. COLOR SELECTED BY ARCHITECT.
4. PROVIDE PRICE MODEL VCS3 OPPOSED BLADE DAMPER (OBD) WHERE INDICATED ON THE FLOOR PLANS. BALANCE TO AIRFLOW SPECIFIED.
5. PROVIDE PRICE MODEL VCR9 RADIAL DAMPER (RD) WHERE INDICATED ON THE FLOOR PLANS. BALANCE TO THE AIRFLOW SPECIFIED.
6. PROVIDE RUSKIN MODEL CFD7T CEILING RADIATION DAMPER FOR SQUARE NECK DIFFUSERS INSTALLED IN A FIRE RATED CEILING ASSEMBLY. CEILING RADIATION DAMPER TO MEET UL 55C LISTING R8039.

MARK	MANUF.	MODEL	FUNCTION	DESCRIPTION	NECK SIZE (ø" / W"XH")	PROJECT MAX AIRFLOW (CFM)	PERFORMANCE DATA AT PUBLISHED AIRFLOW						MOUNTING & FINISH		
							PUBLISHED AIRFLOW (CFM)	SOUND DATA (N.C.)	PRESSURE DROP (IN WC)	THROW AT 50 FPM (FT)	CORE VELOCITY (FPM)	THROW DIRECTION	MOUNTING	MATERIAL	FINISH
E-10	PRICE	PDR	EXHAUST	24" X 12" PERFORATED RETURN DIFFUSER	22" X 10"	100	760	15	0.07	- -	500	- -	ACT CEILING	STEEL	ARCH SELECT
R-10	PRICE	PDR	RETURN	24" X 12" PERFORATED RETURN DIFFUSER	22" X 10"	1000	760	15	0.07	- -	500	- -	ACT CEILING	STEEL	ARCH SELECT
R-20	PRICE	PDR	RETURN	24" X 24" PERFORATED RETURN DIFFUSER	22" X 22"	915	2000	22	0.10	- -	600	- -	ACT CEILING	STEEL	ARCH SELECT
S-10	PRICE	SCDA	SUPPLY	24" X 24" SQUARE CONE DIFFUSER - ADJUSTABLE	6"ø	110	110	- -	0.03	5	560	VERTICAL	ACT CEILING	STEEL	ARCH SELECT
S-11	PRICE	SCDA	SUPPLY	24" X 24" SQUARE CONE DIFFUSER - ADJUSTABLE	8"ø	230	230	15	0.06	8	660	VERTICAL	ACT CEILING	STEEL	ARCH SELECT
S-12	PRICE	SCDA	SUPPLY	24" X 24" SQUARE CONE DIFFUSER - ADJUSTABLE	10"ø	400	410	22	0.09	11	750	VERTICAL	ACT CEILING	STEEL	ARCH SELECT

MEP COORDINATION SCHEDULE

CONTROL TYPE:

BAS	BUILDING AUTOMATION SYSTEM
CO	CARBON MONOXIDE DETECTOR
CONT	CONTINUOUS OPERATION
EF	INTERLOCK WITH EXHAUST FAN
HCP	HOOD CONTROL PANEL
INT	INTEGRAL
L	LIGHT SWITCH
MS	MANUAL SWITCH
OS	OCCUPANCY SENSOR
PS	PRESSURE SWITCH
T	THERMOSTAT
TC	TIME CLOCK
UC	UNIT CONTROLLER
VE	VEHICLE EXHAUST DETECTION SYSTEM
N/A	NOT APPLICABLE

DISCONNECT/STARTER TYPE:

CB	PANELBOARD CIRCUIT BREAKER WITHIN SIGHT OF EQUIPMENT
CSFD	COMBINATION STARTER/DISCONNECT - HOA
FD	FUSED DISCONNECT
FST	FUSTAT
FW	FACTORY-WIRED SINGLE POINT CONNECTION
MOCP	MOTOR OVER-CURRENT PROTECTION
MSS	MANUAL STARTER SWITCH WITH THERMAL OVERLOADS (1-, 2- OR 3-POLE AS REQUIRED)
NFD	NON-FUSED DISCONNECT
RCPT	20A DUPLEX RECEPTACLE (GFCI PROTECTED AS REQUIRED), CORD AND PLUG
RVSS	REDUCED VOLTAGE SOLID-STATE
VFD	VARIABLE FREQUENCY DRIVE - HOA
N/A	NOT APPLICABLE

DIVISION OF RESPONSIBILITIES:

22/22	FURNISHED AND INSTALLED BY DIV. 22, WIRED BY DIV. 22
22/26	FURNISHED AND INSTALLED BY DIV. 22, WIRED BY DIV. 26
23/23	FURNISHED AND INSTALLED BY DIV. 23, WIRED BY DIV. 23
23/26	FURNISHED AND INSTALLED BY DIV. 23, WIRED BY DIV. 26
26/26	FURNISHED AND INSTALLED BY DIV. 26, WIRED BY DIV. 26

NOTES:
1. INTEGRAL DISCONNECTS AND OVERLOADS
2. INTEGRAL OVERLOADS
3. SINGLE POINT CONNECTION
4. MOUNT ON UNI-STRUT IN FRONT OF UNIT
5. SIZE FUSES IN ACCORDANCE WITH MANUFACTURER'S GUIDELINES FOR INSTALLED EQUIPMENT
6. INTEGRAL VARIABLE FREQUENCY DRIVE
7. DUCT SMOKE DETECTOR(S) REQUIRED
8. IN ADDITION TO UNIT POWER, PROVIDE 120V CIRCUIT FOR CONDENSATE PUMP POWER.

GENERAL NOTES:
A. CONTROL WIRING SHALL BE CONCEALED WITHIN WALL CONSTRUCTION, ABOVE CEILING, OR RUN IN CONDUIT. EXPOSED CONTROL WIRING IS UNACCEPTABLE.
B. UNLESS SPECIFICALLY NOTED, ALL FEEDERS SHALL INCLUDE A FULL SIZE NEUTRAL. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY WITH THE MANUFACTURER OF THE ACTUAL EQUIPMENT BEING SUPPLIED WHETHER A NEUTRAL IS REQUIRED PRIOR TO ROUGH-IN.
C. ALL DUCT SMOKE DETECTORS FURNISHED BY DIV. 26, INSTALLED BY DIV. 23, AND WIRED BY DIV. 26. DIV. 26 SHALL WIRE ALL FANS TO SHUT DOWN WHEN ALARM IS INITIATED BY ANY DUCT SMOKE DETECTOR.

MARK	DESCRIPTION	ELECTRICAL DATA		CONTROL		NOTES	DISCONNECT / STARTER		DISCONNECT				FEEDER	
		LOAD	VOLT-PHASE	TYPE	DIV		TYPE	DIV	SIZE (NEMA)	SWITCH (AMPS)	FUSE (AMPS)	ENCLOSURE (NEMA)	COPPER WIRE (AWG)	CONDUIT (INCHES)
HP-1A	WATER SOURCE HEAT PUMP	17 FLA / 35 MOCP	208-1	BAS	23/23	1, 8	FW	23/26	-	-	-	1	#8	3/4"
HP-2A	WATER SOURCE HEAT PUMP	17 FLA / 35 MOCP	208-1	BAS	23/23	1, 8	FW	23/26	-	-	-	1	#8	3/4"
HP-3A	WATER SOURCE HEAT PUMP	12.9 FLA / 25 MOCP	208-1	BAS	23/23	1, 8	FW	23/26	-	-	-	1	#10	3/4"
HP-4A	WATER SOURCE HEAT PUMP	15.4 FLA / 30 MOCP	208-1	BAS	23/23	1, 8	FW	23/26	-	-	-	1	#10	3/4"
HP-5A	WATER SOURCE HEAT PUMP	6.4 FLA / 15 MOCP	208-1	BAS	23/23	1, 8	FW	23/26	-	-	-	1	#12	3/4"
HP-6A	WATER SOURCE HEAT PUMP	12.9 FLA / 25 MOCP	208-1	BAS	23/23	1, 8	FW	23/26	-	-	-	1	#10	3/4"
HP-7A	WATER SOURCE HEAT PUMP	15.4 FLA / 30 MOCP	208-1	BAS	23/23	1, 8	FW	23/26	-	-	-	1	#10	3/4"
HP-8A	WATER SOURCE HEAT PUMP	17 FLA / 35 MOCP	208-1	BAS	23/23	1, 8	FW	23/26	-	-	-	1	#8	3/4"

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BOZEMAN

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engineers - surveyors - planners - scientists

DRAWN BY: DRT
REVIEWED BY: JRH

REV.	DESCRIPTION	DATE

MONTANA
DANIEL R. TANASOU
No. 88138 PE
LICENSED PROFESSIONAL ENGINEER

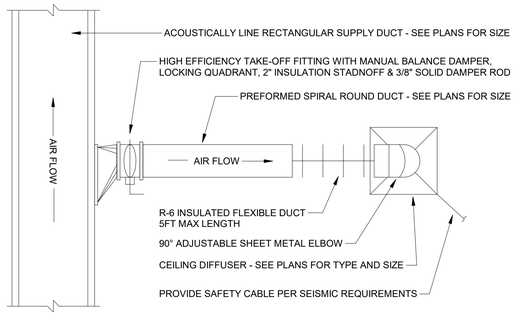
PPA#24-1099

MMI PROJ #: 0747.087

SHEET TITLE
MECHANICAL SCHEDULES

SHEET
M0.2

DATE
10/20/2025



1 CEILING SUPPLY DIFFUSER DETAIL
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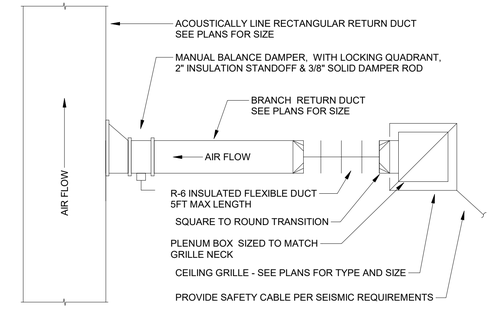

2 CEILING RETURN AIR GRILLE DETAIL
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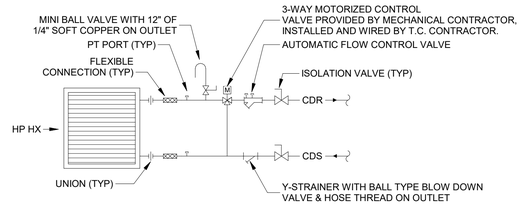
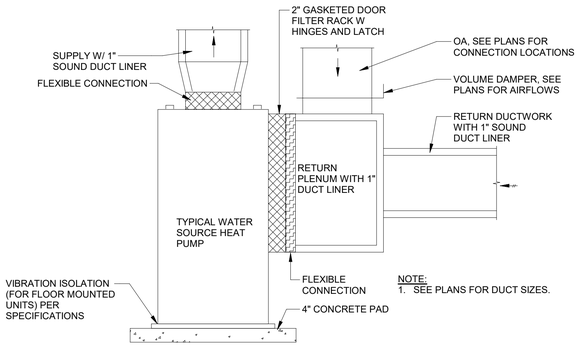
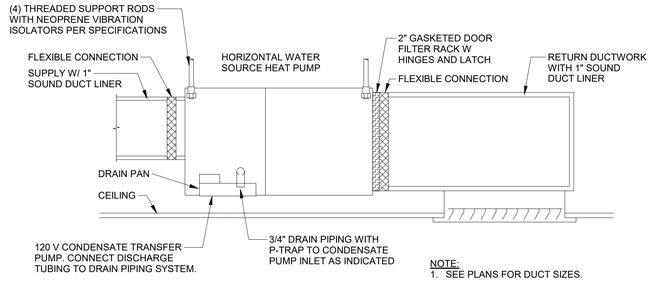


NOTE: SEE HEAT PUMP SCHEDULE FOR FACTORY PROVIDED ACCESSORIES.

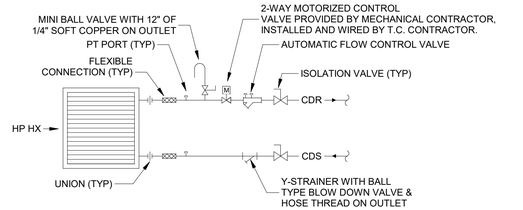
3 HEAT PUMP 3-WAY PIPING DETAIL
N.T.S.



4 HEAT PUMP DETAIL
N.T.S.

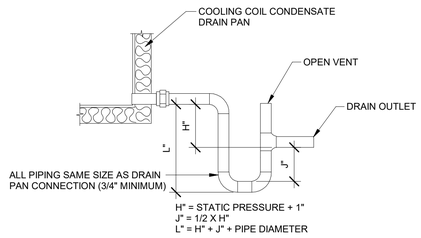


5 TYPICAL FAN COIL UNIT DETAIL
N.T.S.



NOTE: SEE HEAT PUMP SCHEDULE FOR FACTORY PROVIDED ACCESSORIES.

6 HEAT PUMP 2-WAY PIPING DETAIL
N.T.S.



7 CONDENSATE DETAIL
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MMI PROJ #: 0747.087

SHEET TITLE
MECHANICAL DETAILS

SHEET
M0.3

DATE
10/20/2025

DDC POINTS GENERAL NOTES, LEGEND, ABBREVIATIONS

DDC GENERAL NOTES:

GENERAL
- REFER TO SPEC. SECTION 230900 HVAC CONTROLS FOR MORE INFORMATION.
- CONTRACTOR REQUIRED TO PROVIDE ALL LOW AND LINE VOLTAGE WIRING FOR A COMPLETE AND FUNCTIONAL SYSTEM.

BUILDING SCHEDULE
- BUILDING SCHEDULE DICTATES OCCUPIED AND UNOCCUPIED PERIODS OF THE BUILDING.
- COORDINATE WITH OWNER TO DETERMINE BUILDING SCHEDULE.
- BUILDING TO ENTER OCCUPIED PERIOD PRIOR TO BUILDING OCCUPIED TIMES TO ENSURE BUILDING IS AT OCCUPIED TEMPERATURE SETPOINT WHEN OCCUPANTS ARRIVE.

SPACE TEMPERATURE CONTROL
- EACH SPACE WITH TEMPERATURE CONTROL SHALL HAVE AN OCCUPIED TEMPERATURE SETPOINT (ADJ.) AND UNOCCUPIED HIGH / LOW LIMIT TEMPERATURE SETPOINTS (ADJ.)
- HVAC EQUIPMENT TO CONDITION EACH SPACE TO TEMPERATURE SETPOINT DURING OCCUPIED PERIODS.
- HVAC EQUIPMENT SHALL ALLOW THE SPACE TEMPERATURE TO FLOAT BETWEEN HIGH AND LOW LIMIT TEMPERATURE SETPOINTS (ADJ.) DURING UNOCCUPIED PERIODS
- EACH SPACE WITH TEMPERATURE CONTROL SHALL HAVE A BUILDING SCHEDULE MANUAL OVERRIDE SWITCH THAT PLACES THE SPACE TEMPERATURE INTO OCCUPIED TEMPERATURE SETPOINT (ADJ.) AND SERVING HVAC EQUIPMENT INTO OCCUPIED MODE

TEMPERATURE CONTROL PANELS
- SEE PLANS FOR LOCATIONS. COORDINATE NEW OR ADDITIONAL TEMPERATURE CONTROL PANEL LOCATIONS WITH ENGINEER.
- ALL TEMPERATURE CONTROL PANELS ARE TO BE BACKED UP WITH UPS BATTERY BACKUP.

TEMPERATURE SENSORS
- SEE PLANS FOR LOCATIONS.
- PROVIDE SENSOR TYPE AS SHOWN ON PLANS. IN SOME CASES PROVIDE A NON-ADJUSTABLE, BLANK, WALL PLATE TEMPERATURE SENSOR AND IN SOME CASES PROVIDE AN ADJUSTABLE SENSOR WITH DISPLAY. REGARDLESS OF WHAT TYPE IS SPECIFIED, RUN ENOUGH CONDUCTORS TO BE ABLE TO USE THE ADJUSTABLE WITH DISPLAY VERSION IN ALL LOCATIONS IN CASE IT IS DESIRED AT A LATER DATE TO SWITCH.

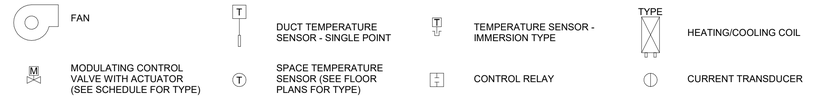
DEFINITIONS

HARDWARE POINTS				SOFTWARE POINTS						
AI	AO	BI	BO	AV	BV	ADJ	SCH	TRD	ALM	DISP
ANALOG INPUT	ANALOG OUTPUT	BINARY INPUT	BINARY OUTPUT	ANALOG VALUE	BINARY VALUE	ADJUSTABLE	SCHEDULE	TREND	ALARM	DISPLAY

ABBREVIATIONS

A	ALARM	H	HUMIDITY SENSOR	SPT	SETPOINT
C	COMMAND	HTG	HEATING	SS	SAIL SWITCH
CLG	COOLING	NC	NORMALLY CLOSED	S/S	START/STOP
CO	CARBON MONOXIDE	NO	NORMALLY OPEN	T	TEMPERATURE SENSOR
CO2	CARBON DIOXIDE	P	PRESSURE	VFD	VARIABLE FREQ. DRIVE
CS	COMMAND STATUS	R	RELAY	ZN	ZONE
CT	CURRENT TRANSDUCER	S	STATUS		
DP	DIFFERENTIAL PRESSURE	SP	STATIC PRESSURE		

LEGEND



WATER SOURCE HEAT PUMP W/ AUX HEATER - SINGLE ZONE

POINT NAME	HARDWARE POINTS				SOFTWARE POINTS							NOTES
	AI	AO	BI	BO	AV	BV	ADJ	SCH	TRD	ALM	DISP	
HEAT PUMP FACTORY CONTROLLER BACNET POINTS												
CONDENSER WATER VALVE POSITION												HEAT PUMP CONTROLLER (V-CDW)
FAN - ENABLE												HEAT PUMP CONTROLLER
UNIT CONTROLLER - FAULT RESET CONTACTS				X	X						X	HEAT PUMP CONTROLLER
TEMPERATURE - SUPPLY AIR	X								X	X	X	HEAT PUMP CONTROLLER
DDC CONTROLLER												
TEMPERATURE - SPACE	X								X	X	X	JCI THERMOSTAT (T-SP1)
TEMPERATURE - SPACE SETPOINT					X		X	X	X		X	ADJUSTABLE SOFTWARE POINT
TEMPERATURE - MIXED AIR	X								X		X	TEMPERATURE SENSOR (T-MA)
TEMPERATURE - VENTILATION AIR (FROM HRV)	X								X		X	TEMPERATURE SENSOR (T-HRV)*
HEATING - COMMAND				X					X		X	OUTPUT RELAY (R)
COOLING - COMMAND				X					X		X	OUTPUT RELAY (R)
FAN - STATUS			X						X		X	CURRENT TRANSDUCER (CT)
COMPRESSOR - STATUS			X						X		X	CURRENT TRANSDUCER (CT)
AUX HEATER - TEMPERATURE - SPACE	X								X		X	SPACE TEMPERATURE SENSOR (T-SP2)
AUX HEATER - TEMPERATURE - SPACE SETPOINT					X		X	X	X		X	ADJUSTABLE SOFTWARE POINT
AUX HEATER - TEMP. - HEATING WATER RETURN					X		X	X	X		X	ADJUSTABLE SOFTWARE POINT
AUX HEATER - HOT WATER VALVE POSITION				X					X		X	TWO POSITION CONTROL VALVE (V-HC)

SEQUENCE OF OPERATION: HP-7A & HP-8A

UNIT CONTROLLER SHALL INTERFACE WITH BAS VIA BACNET IP.

FAN
- FAN STATUS TO BE MONITORED BY CURRENT TRANSDUCER.

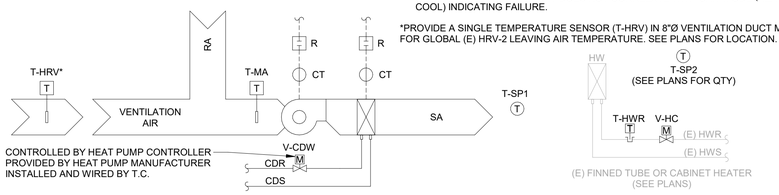
COMPRESSOR
- COMPRESSOR STATUS TO BE MONITORED BY CURRENT TRANSDUCER.

LOCKOUT RESET
- PROVIDE REMOTE RESET USING HEAT PUMP CONTROL BOARD FAULT RESET BACNET POINT.

HOT WATER VALVE (V-HC)
- OPEN VALVE WHEN SPACE TEMPERATURE (T-SP2) DROPS BELOW SPACE TEMPERATURE SETPOINT BY 2°F. (ADJ.)
- VALVE TO BE CLOSED WHEN SPACE TEMPERATURE (T-SP2) IS AT OR ABOVE SPACE TEMPERATURE SETPOINT BY 2°F. (ADJ.)
- VALVE TO BE CLOSED WHEN HEAT PUMP THERMOSTAT (T-SP1) READS TEMPERATURE AT OR ABOVE SPACE TEMPERATURE SETPOINT (ADJ.). HEAT PUMP THERMOSTAT SHALL SERVE AS MASTER OVER SPACE TEMPERATURE SENSORS.
- AUXILIARY HEATER SHALL SERVE AS FIRST STAGE HEATING.

ALARMS
- GENERATE ALARM WHEN SPACE TEMPERATURE DROPS BELOW SPACE LOW TEMPERATURE ALARM SETPOINT (ADJ.)
- GENERATE ALARM WHEN SPACE TEMPERATURE RISES ABOVE SPACE HIGH TEMPERATURE ALARM SETPOINT (ADJ.)
- GENERATE ALARM WHEN SAT DOES NOT CORRELATE WITH UNIT MODE (HEAT/ COOL) INDICATING FAILURE.

*PROVIDE A SINGLE TEMPERATURE SENSOR (T-HRV) IN 8"Ø VENTILATION DUCT MAIN FOR GLOBAL (E) HRV-2 LEAVING AIR TEMPERATURE. SEE PLANS FOR LOCATION.



WATER SOURCE HEAT PUMP - SINGLE ZONE

POINT NAME	HARDWARE POINTS				SOFTWARE POINTS							NOTES
	AI	AO	BI	BO	AV	BV	ADJ	SCH	TRD	ALM	DISP	
HEAT PUMP FACTORY CONTROLLER BACNET POINTS												
CONDENSER WATER VALVE POSITION												HEAT PUMP CONTROLLER (V-CDW)
FAN - ENABLE												HEAT PUMP CONTROLLER
UNIT CONTROLLER - FAULT RESET CONTACTS				X	X						X	HEAT PUMP CONTROLLER
TEMPERATURE - SUPPLY AIR	X								X	X	X	HEAT PUMP CONTROLLER
DDC CONTROLLER												
TEMPERATURE - SPACE	X								X	X	X	JCI THERMOSTAT (T-SP1)
TEMPERATURE - SPACE SETPOINT					X		X	X	X		X	ADJUSTABLE SOFTWARE POINT
TEMPERATURE - MIXED AIR	X								X		X	TEMPERATURE SENSOR (T-MA)
TEMPERATURE - VENTILATION AIR (FROM HRV)	X								X		X	TEMPERATURE SENSOR (T-HRV)*
HEATING - COMMAND				X					X		X	OUTPUT RELAY (R)
COOLING - COMMAND				X					X		X	OUTPUT RELAY (R)
FAN - STATUS			X						X		X	CURRENT TRANSDUCER (CT)
COMPRESSOR - STATUS			X						X		X	CURRENT TRANSDUCER (CT)

SEQUENCE OF OPERATION: HP-1A, HP-2A, HP-3A AND HP-4A

UNIT CONTROLLER SHALL INTERFACE WITH BAS VIA BACNET IP.

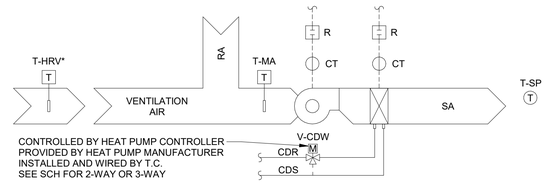
FAN
- FAN STATUS TO BE MONITORED BY CURRENT TRANSDUCER.

COMPRESSOR
- COMPRESSOR STATUS TO BE MONITORED BY CURRENT TRANSDUCER.

LOCKOUT RESET
- PROVIDE REMOTE RESET USING HEAT PUMP CONTROL BOARD FAULT RESET BACNET POINT.

ALARMS
- GENERATE ALARM WHEN SPACE TEMPERATURE DROPS BELOW SPACE LOW TEMPERATURE ALARM SETPOINT BY 2°F. (ADJ.)
- GENERATE ALARM WHEN SPACE TEMPERATURE RISES ABOVE SPACE HIGH TEMPERATURE ALARM SETPOINT BY 2°F. (ADJ.)
- GENERATE ALARM WHEN SAT DOES NOT CORRELATE WITH UNIT MODE (HEAT/ COOL) INDICATING FAILURE.

*PROVIDE A SINGLE TEMPERATURE SENSOR (T-HRV) IN 12"Ø VENTILATION DUCT MAIN FOR GLOBAL (E) HRV-1 LEAVING AIR TEMPERATURE. SEE PLANS FOR LOCATION.



WATER SOURCE HEAT PUMP - SINGLE ZONE

POINT NAME	HARDWARE POINTS				SOFTWARE POINTS							NOTES
	AI	AO	BI	BO	AV	BV	ADJ	SCH	TRD	ALM	DISP	
HEAT PUMP FACTORY CONTROLLER BACNET POINTS												
CONDENSER WATER VALVE POSITION												HEAT PUMP CONTROLLER (V-CDW)
FAN - ENABLE												HEAT PUMP CONTROLLER
UNIT CONTROLLER - FAULT RESET CONTACTS				X	X						X	HEAT PUMP CONTROLLER
TEMPERATURE - SUPPLY AIR	X								X	X	X	HEAT PUMP CONTROLLER
DDC CONTROLLER												
TEMPERATURE - SPACE	X								X	X	X	JCI THERMOSTAT (T-SP1)
TEMPERATURE - SPACE SETPOINT					X		X	X	X		X	ADJUSTABLE SOFTWARE POINT
HEATING - COMMAND				X					X		X	OUTPUT RELAY (R)
COOLING - COMMAND				X					X		X	OUTPUT RELAY (R)
FAN - STATUS			X						X		X	CURRENT TRANSDUCER (CT)
COMPRESSOR - STATUS			X						X		X	CURRENT TRANSDUCER (CT)

SEQUENCE OF OPERATION: HP-5A & HP-6A

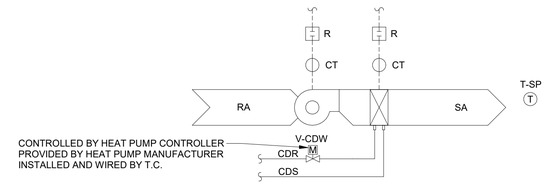
UNIT CONTROLLER SHALL INTERFACE WITH BAS VIA BACNET IP.

FAN
- FAN STATUS TO BE MONITORED BY CURRENT TRANSDUCER.

COMPRESSOR
- COMPRESSOR STATUS TO BE MONITORED BY CURRENT TRANSDUCER.

LOCKOUT RESET
- PROVIDE REMOTE RESET USING HEAT PUMP CONTROL BOARD FAULT RESET BACNET POINT.

ALARMS
- GENERATE ALARM WHEN SPACE TEMPERATURE DROPS BELOW SPACE LOW TEMPERATURE ALARM SETPOINT BY 2°F. (ADJ.)
- GENERATE ALARM WHEN SPACE TEMPERATURE RISES ABOVE SPACE HIGH TEMPERATURE ALARM SETPOINT BY 2°F. (ADJ.)
- GENERATE ALARM WHEN SAT DOES NOT CORRELATE WITH UNIT MODE (HEAT/ COOL) INDICATING FAILURE.



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engineers - surveyors - planners - scientists

DRAWN BY: DRT		
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MONTANA
DANIEL R. TANASCU
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LICENSED PROFESSIONAL ENGINEER

PPA#24-1099

MMI PROJ #: 0747.087

SHEET TITLE
MECHANICAL CONTROLS

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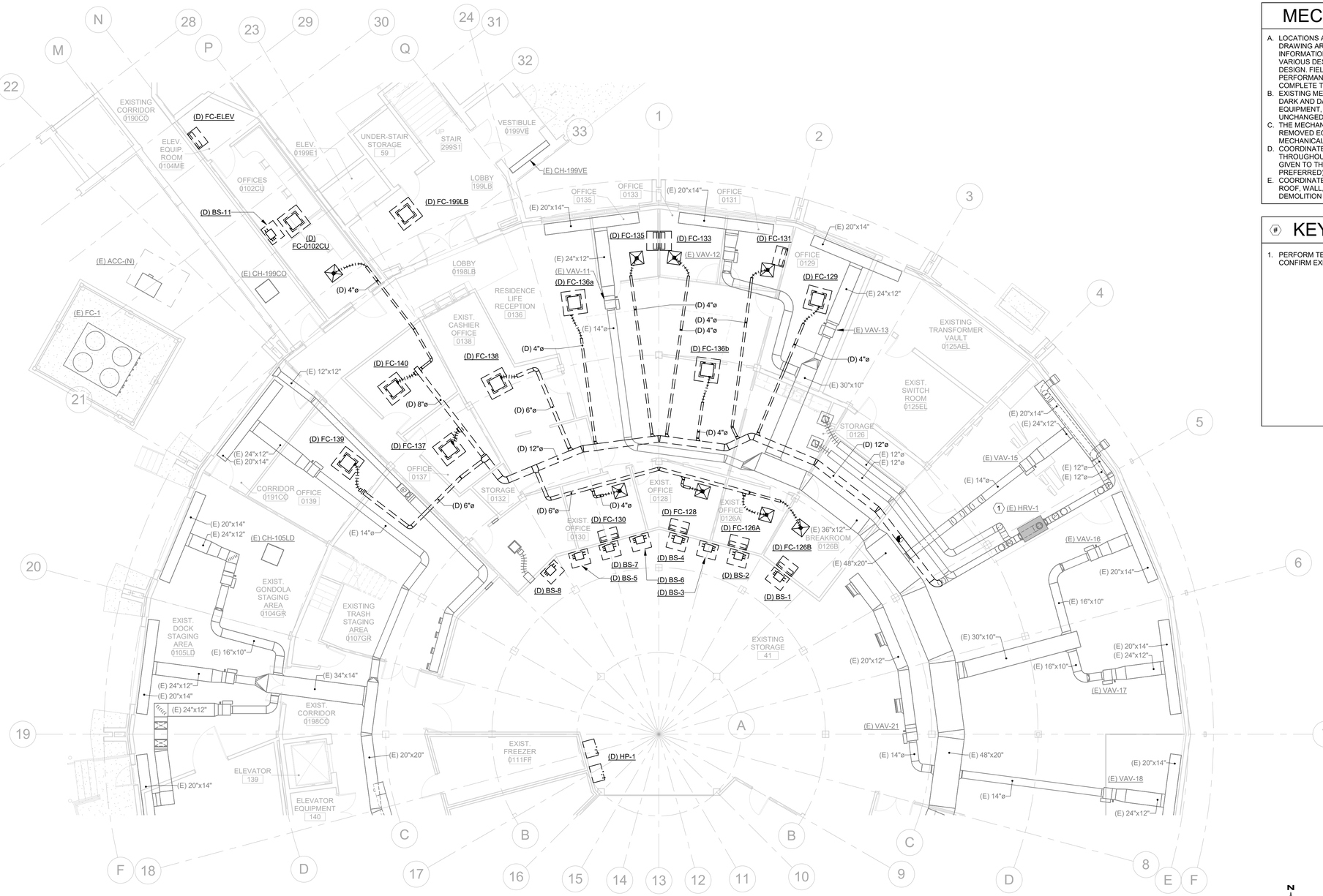

1 LOWER LEVEL - HVAC DEMOLITION PLAN
1/8" = 1'-0"

MECHANICAL DEMO NOTES

A. LOCATIONS AND DIMENSIONS OF EXISTING FACILITIES IDENTIFIED ON THIS DRAWING ARE APPROXIMATE AND REPRESENT THE BEST AVAILABLE INFORMATION BASED ON A COMBINATION OF FIELD INVESTIGATIONS AND VARIOUS DESIGN AND RECORD DRAWINGS AVAILABLE AT THE TIME OF THE DESIGN. FIELD VERIFY LOCATIONS AND DIMENSIONS PRIOR TO AND DURING PERFORMANCE OF THE WORK. PROVIDE DEMOLITION WORK NECESSARY TO COMPLETE THE SCOPE OUTLINED IN THE CONSTRUCTION DOCUMENTS.
B. EXISTING MECHANICAL EQUIPMENT, DUCTWORK, AND PIPING SHOWN AS DARK AND DASHED SHALL BE DEMOLISHED. EXISTING MECHANICAL EQUIPMENT, DUCTWORK, AND PIPING SHOWN LIGHT SHALL REMAIN UNCHANGED.
C. THE MECHANICAL CONTRACTOR SHALL COORDINATE SALVAGE OF REMOVED EQUIPMENT IN GOOD CONDITION WITH THE OWNER. THE MECHANICAL CONTRACTOR SHALL DISPOSE OF UNWANTED EQUIPMENT.
D. COORDINATE UTILITY OUTAGES WITH THE GENERAL CONTRACTOR THROUGHOUT THE DURATION OF CONSTRUCTION. NOTIFICATION MUST BE GIVEN TO THE OWNER AT MINIMUM 3 WORKING DAYS (5 WORKING DAYS PREFERRED) BEFORE ANY PLANNED OUTAGES.
E. COORDINATE WITH THE GENERAL CONTRACTOR TO PATCH AND REPAIR ROOF, WALL, CEILING, OR FLOOR PENETRATIONS ASSOCIATED WITH THE DEMOLITION OF THE EXISTING MECHANICAL SYSTEMS.

(#) KEY NOTES:

1. PERFORM TEST AND BALANCE ON (E) HRV-1 PRIOR TO DEMOLITION TO CONFIRM EXISTING AIRFLOWS.

N

8' 4' 0' 8' 16'
SCALE : 1/8" = 1'-0"

100% BID DOCUMENTS

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SHEET TITLE
LOWER LEVEL - MECHANICAL DEMOLITION PLAN

SHEET
MD1.0

DATE
10/20/2025

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B. EXISTING MECHANICAL EQUIPMENT, DUCTWORK, AND PIPING SHOWN AS DARK AND DASHED SHALL BE DEMOLISHED. EXISTING MECHANICAL EQUIPMENT, DUCTWORK, AND PIPING SHOWN LIGHT SHALL REMAIN UNCHANGED.
C. THE MECHANICAL CONTRACTOR SHALL COORDINATE SALVAGE OF REMOVED EQUIPMENT IN GOOD CONDITION WITH THE OWNER. THE MECHANICAL CONTRACTOR SHALL DISPOSE OF UNWANTED EQUIPMENT.
D. COORDINATE UTILITY OUTAGES WITH THE GENERAL CONTRACTOR THROUGHOUT THE DURATION OF CONSTRUCTION. NOTIFICATION MUST BE GIVEN TO THE OWNER AT MINIMUM 3 WORKING DAYS (5 WORKING DAYS PREFERRED) BEFORE ANY PLANNED OUTAGES.
E. COORDINATE WITH THE GENERAL CONTRACTOR TO PATCH AND REPAIR ROOF, WALL, CEILING, OR FLOOR PENETRATIONS ASSOCIATED WITH THE DEMOLITION OF THE EXISTING MECHANICAL SYSTEMS.

(#) KEY NOTES:

1. PERFORM TEST AND BALANCE ON (E) HRV-1 PRIOR TO DEMOLITION TO CONFIRM EXISTING AIRFLOWS.

2 MECHANICAL PENTHOUSE - HVAC DEMOLITION PLAN
N.T.S.

1 MAIN LEVEL - HVAC DEMOLITION PLAN
1/8" = 1'-0"

8' 4' 0' 8' 16'
SCALE : 1/8" = 1'-0"

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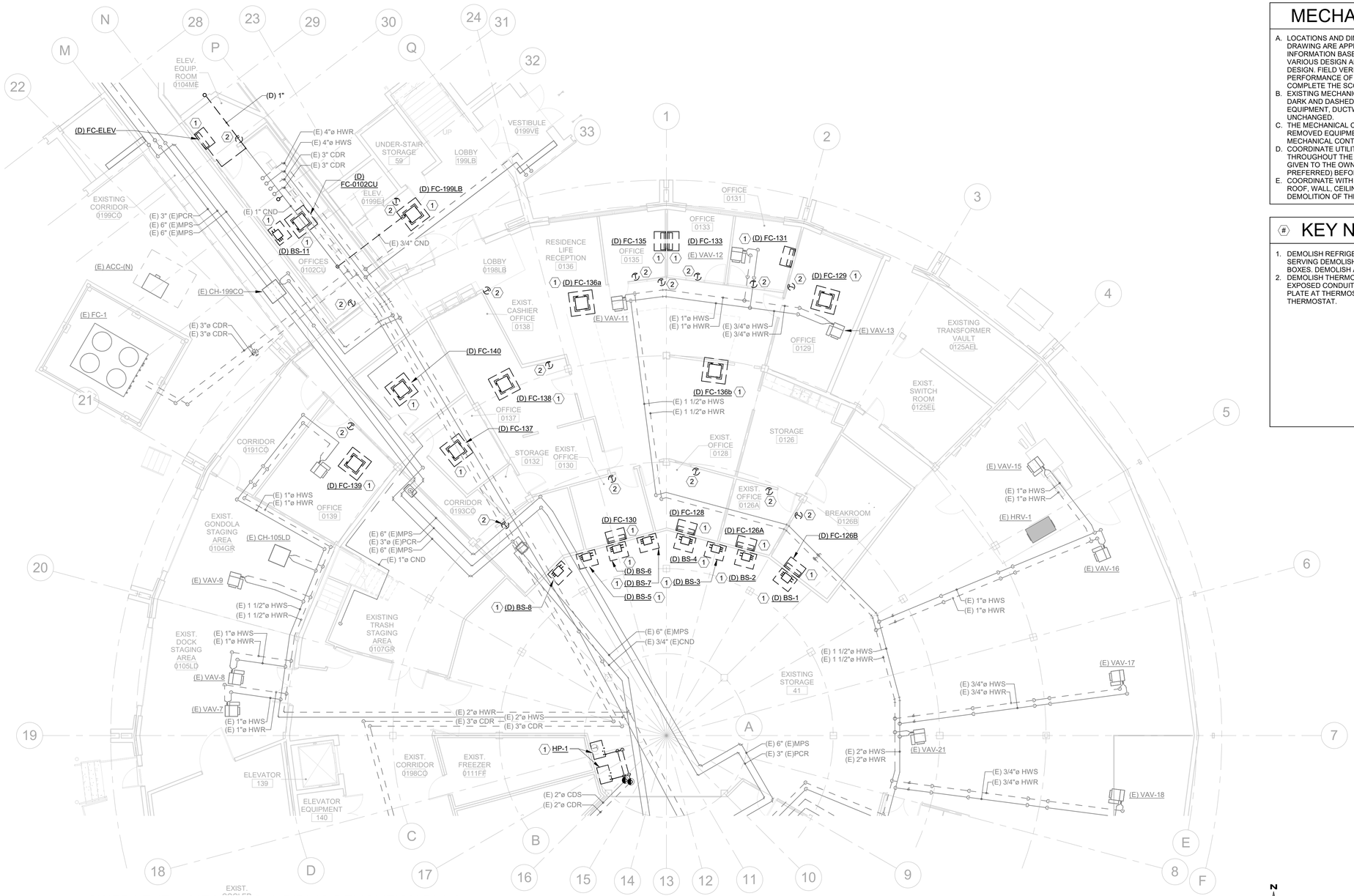
SHEET TITLE
MAIN LEVEL & PENTHOUSE - MECHANICAL DEMOLITION PLAN

SHEET
MD1.1

DATE
10/20/2025



1 LOWER LEVEL - MECHANICAL PIPING DEMOLITION PLAN
1/8" = 1'-0"

MECHANICAL DEMO NOTES

A. LOCATIONS AND DIMENSIONS OF EXISTING FACILITIES IDENTIFIED ON THIS DRAWING ARE APPROXIMATE AND REPRESENT THE BEST AVAILABLE INFORMATION BASED ON A COMBINATION OF FIELD INVESTIGATIONS AND VARIOUS DESIGN AND RECORD DRAWINGS AVAILABLE AT THE TIME OF THE DESIGN. FIELD VERIFY LOCATIONS AND DIMENSIONS PRIOR TO AND DURING PERFORMANCE OF THE WORK. PROVIDE DEMOLITION WORK NECESSARY TO COMPLETE THE SCOPE OUTLINED IN THE CONSTRUCTION DOCUMENTS.
B. EXISTING MECHANICAL EQUIPMENT, DUCTWORK, AND PIPING SHOWN AS DARK AND DASHED SHALL BE DEMOLISHED. EXISTING MECHANICAL EQUIPMENT, DUCTWORK, AND PIPING SHOWN LIGHT SHALL REMAIN UNCHANGED.
C. THE MECHANICAL CONTRACTOR SHALL COORDINATE SALVAGE OF REMOVED EQUIPMENT IN GOOD CONDITION WITH THE OWNER. THE MECHANICAL CONTRACTOR SHALL DISPOSE OF UNWANTED EQUIPMENT.
D. COORDINATE UTILITY OUTAGES WITH THE GENERAL CONTRACTOR THROUGHOUT THE DURATION OF CONSTRUCTION. NOTIFICATION MUST BE GIVEN TO THE OWNER AT MINIMUM 3 WORKING DAYS (5 WORKING DAYS PREFERRED) BEFORE ANY PLANNED OUTAGES.
E. COORDINATE WITH THE GENERAL CONTRACTOR TO PATCH AND REPAIR ROOF, WALL, CEILING, OR FLOOR PENETRATIONS ASSOCIATED WITH THE DEMOLITION OF THE EXISTING MECHANICAL SYSTEMS.

(#) KEY NOTES:

1. DEMOLISH REFRIGERATION PIPING AND HANGERS (NOT SHOWN ON PLAN) SERVING DEMOLISHED FAN COILS FROM HP-1 AND BRANCH SELECTOR BOXES. DEMOLISH ASSOCIATED CONDENSATE PIPING.
2. DEMOLISH THERMOSTAT. DEMOLISH EXISTING CONTROLS WIRING AND EXPOSED CONDUIT THAT CANNOT BE REUSED. PROVIDE BLANK COVER PLATE AT THERMOSTAT LOCATIONS THAT WILL NOT BE REUSED FOR NEW THERMOSTAT.

8' 4' 0' 8' 16'
SCALE : 1/8" = 1'-0"

100% BID DOCUMENTS

MILLER DINING AUXILIARIES OFFICES HVAC UPGRADES

MONTANA STATE UNIVERSITY BOZEMAN

MONTANA STATE UNIVERSITY

Morrison Maierle
engineers - surveyors - planners - scientists

DRAWN BY: DRT		
REVIEWED BY: JRH		
REV.	DESCRIPTION	DATE

DANIEL R. TANASOU
No. 88138 PE
LICENSED PROFESSIONAL ENGINEER
MONTANA

PPA#24-1099

MMI PROJ #: 0747.087

SHEET TITLE
LOWER LEVEL - MECHANICAL PIPING DEMOLITION PLAN

SHEET
MPD1.0

DATE
10/20/2025

MECHANICAL DEMO NOTES

A. LOCATIONS AND DIMENSIONS OF EXISTING FACILITIES IDENTIFIED ON THIS DRAWING ARE APPROXIMATE AND REPRESENT THE BEST AVAILABLE INFORMATION BASED ON A COMBINATION OF FIELD INVESTIGATIONS AND VARIOUS DESIGN AND RECORD DRAWINGS AVAILABLE AT THE TIME OF THE DESIGN. FIELD VERIFY LOCATIONS AND DIMENSIONS PRIOR TO AND DURING PERFORMANCE OF THE WORK. PROVIDE DEMOLITION WORK NECESSARY TO COMPLETE THE SCOPE OUTLINED IN THE CONSTRUCTION DOCUMENTS.
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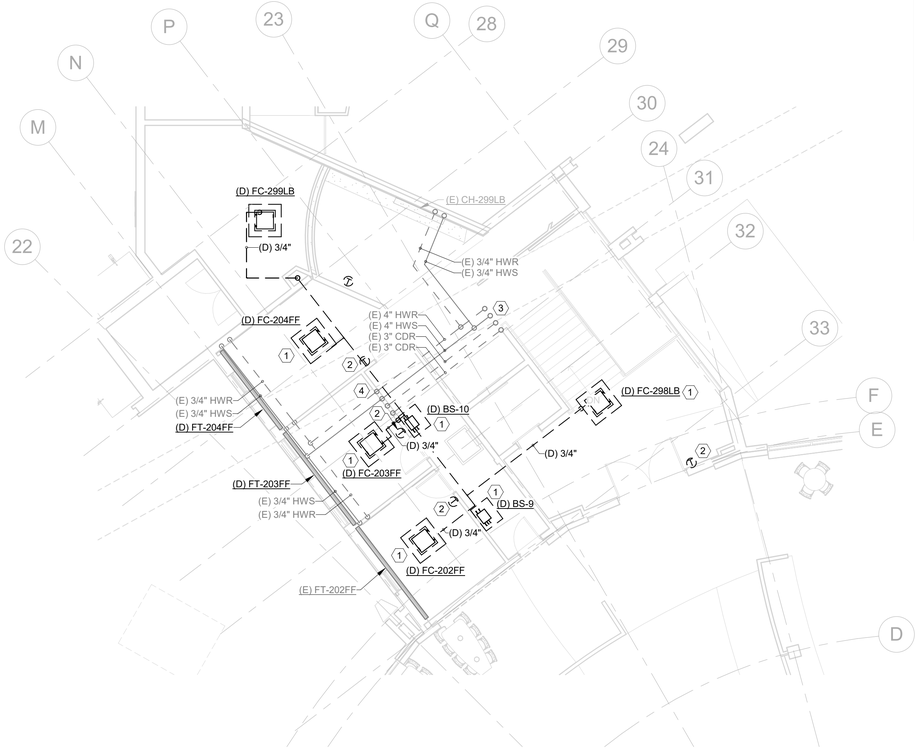
2. DEMOLISH THERMOSTAT. DEMOLISH EXISTING CONTROLS WIRING AND EXPOSED CONDUIT THAT CANNOT BE REUSED. PROVIDE BLANK COVER PLATE AT THERMOSTAT LOCATIONS THAT WILL NOT BE REUSED FOR NEW THERMOSTAT OR TEMPERATURE SENSOR.
3. (E) 4" HWS/R AND (E) 3" CDS/R UP.
4. (E) 4" HWS/R AND (E) 3" CDS/R DOWN.

2 MECHANICAL PENTHOUSE - MECHANICAL PIPING DEMO PLAN
N.T.S.



1 MAIN LEVEL - MECHANICAL PIPING DEMOLITION PLAN
1/8" = 1'-0"

8' 4' 0' 8' 16'
SCALE : 1/8" = 1'-0"

100% BID DOCUMENTS

MILLER DINING AUXILIARIES
OFFICES HVAC UPGRADES
MONTANA STATE UNIVERSITY
BOZEMAN

MONTANA STATE UNIVERSITY

Morrison Maierle
engineers · surveyors · planners · scientists

DRAWN BY: DRT		
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MONTANA
DANIEL R. TANASOU
No. 88138 PE
LICENSED PROFESSIONAL ENGINEER

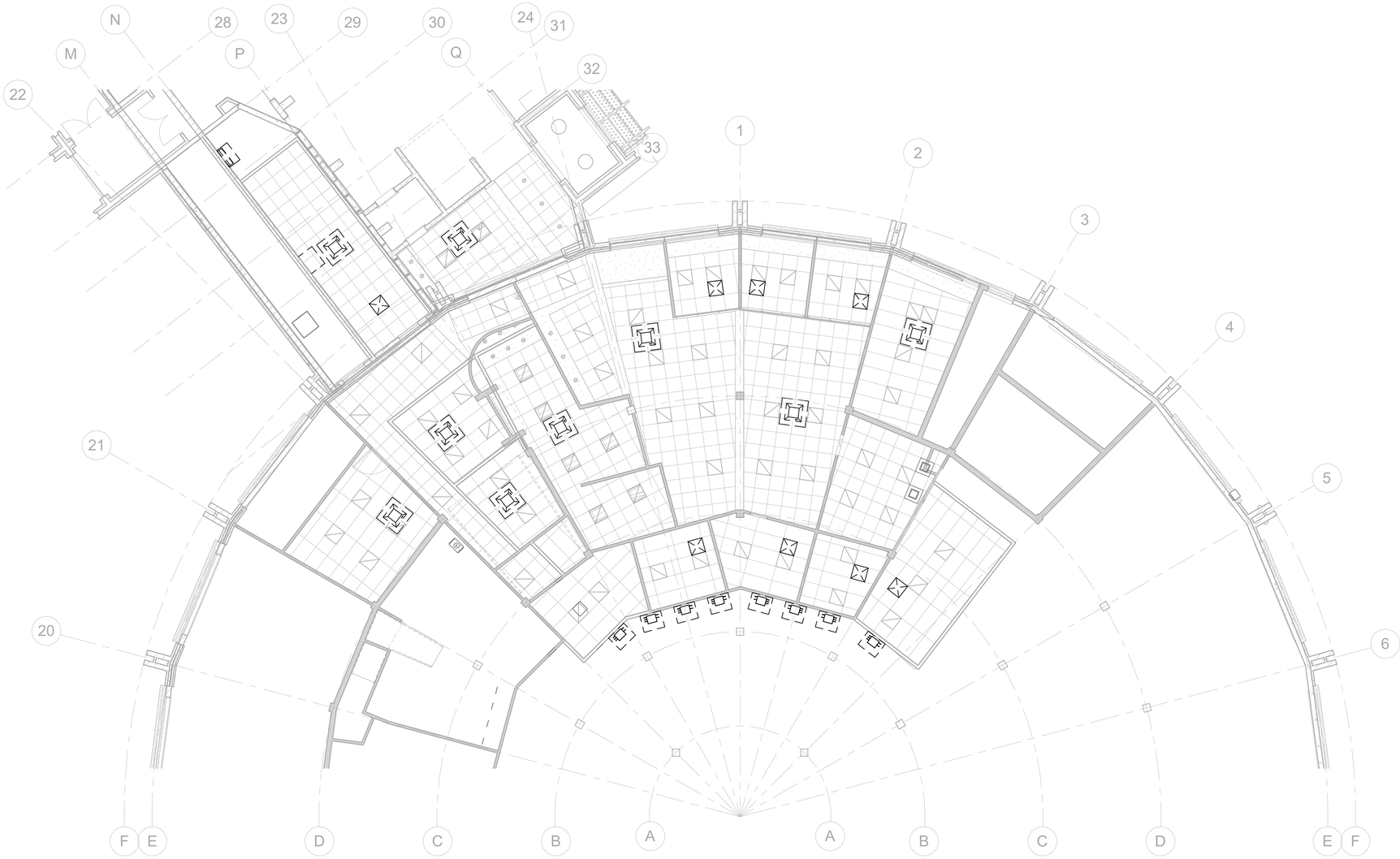
PPA#24-1099

MMI PROJ #: 0747.087

SHEET TITLE
MAIN LEVEL - MECHANICAL PIPING DEMOLITION PLAN

SHEET
MPD1.1

DATE
10/20/2025



1 LOWER LEVEL - MECHANICAL DEMO RCP
1/8" = 1'-0"

MECHANICAL DEMO NOTES

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

100% BID DOCUMENTS

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LICENSED PROFESSIONAL ENGINEER

PPA#24-1099

MMI PROJ #: 0747.087

SHEET TITLE
LOWER LEVEL - MECHANICAL DEMO REFLECTED CEILING PLAN

SHEET
MD2.0

DATE
10/20/2025

MECHANICAL DEMO NOTES

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1 MAIN LEVEL - MECHANICAL DEMO RCP
1/8" = 1'-0"

N

8' 4' 0' 8' 16'
SCALE : 1/8" = 1'-0"

100% BID DOCUMENTS

MILLER DINING AUXILIARIES OFFICES HVAC UPGRADES

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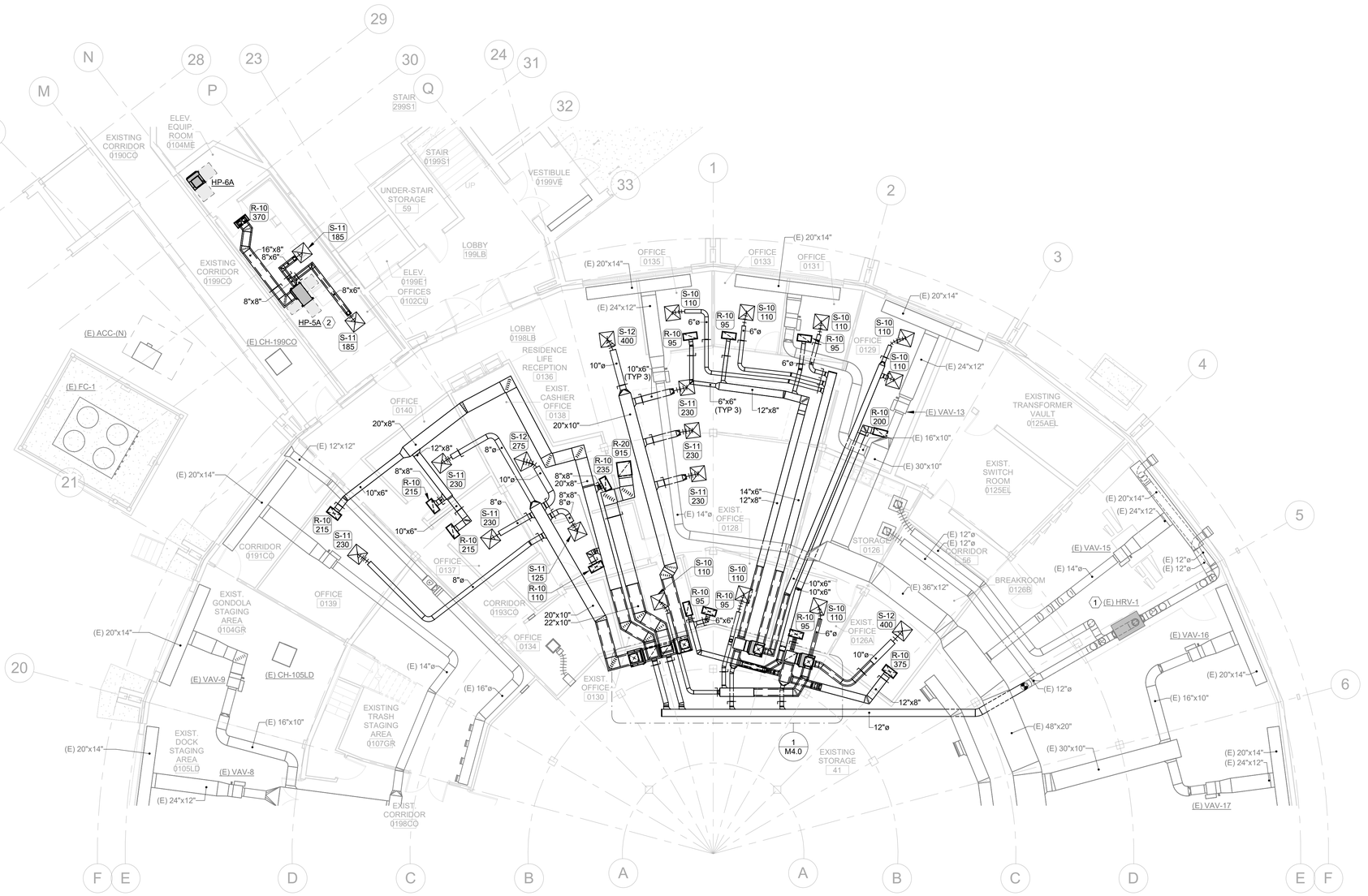
PPA#24-1099

MMI PROJ #: 0747.087

SHEET TITLE
MAIN LEVEL - MECHANICAL DEMO REFLECTED CEILING PLAN

SHEET
MD2.1

DATE
10/20/2025



1 LOWER LEVEL - HVAC FLOOR PLAN
1/8" = 1'-0"

MECHANICAL PLAN NOTES

A. VERIFY THE LOCATION OF THERMOSTATS AND SENSORS WITH THE ARCHITECT AND ENGINEER PRIOR TO INSTALLATION. INSTALL THERMOSTATS 48" ABOVE FINISHED FLOOR PER ADA REQUIREMENTS.
B. PROVIDE AND INSTALL SEISMIC BRACING FOR EQUIPMENT, DUCTWORK AND PIPING PER THE REQUIREMENTS OF THE CURRENTLY ADOPTED INTERNATIONAL BUILDING CODE.
C. FLEXIBLE DUCTWORK BETWEEN BRANCH DUCTS AND GRILLES, REGISTERS, OR DIFFUSERS SHALL BE LIMITED TO 5 FT. FLEXIBLE DUCT SHALL NOT BE USED IN PLACE OF ELBOWS.
D. MAINTAIN THE INTEGRITY OF DRAFTSTOPPING WHERE DUCTWORK AND PIPING PENETRATE DRAFTSTOPPING MATERIALS.
E. PROVIDE ACCESS DOORS TO ALLOW SERVICE AND INSPECTION OF EQUIPMENT, VALVES, DAMPERS AND DEVICES INSTALLED IN INACCESSIBLE LOCATIONS. COORDINATE SUCH INSTALLATIONS WITH THE ARCHITECT AND ENGINEER.
F. DUCTWORK DIMENSIONS INDICATE THE CLEAR WIDTH/HEIGHT AND HAVE NOT BEEN INCREASED TO ACCOMMODATE DUCT LINER. INSTALLED DUCT SHALL BE INCREASED TO ACCOMMODATE LINER THICKNESS WHERE LINER IS INDICATED IN THE DRAWINGS OR SPECIFICATIONS.
G. EXPOSED DUCTWORK TO BE HOT DIPPED GALVANIZED STEEL AND PAINTED PER ARCHITECTURAL. CONTRACTOR TO CLEAN AND DRY DUCTWORK PRIOR TO PAINTING.
H. GAS PIPING TO BE WELDED IN CONCEALED SPACES.
I. PIPING SHALL BE IDENTIFIED WITH PIPE LABELS MARKED AT A MAXIMUM OF EVERY 25 FT. VALVES SHALL BE IDENTIFIED WITH BRASS OR ALUMINUM VALVE TAGS.
J. PROVIDE AND INSTALL PIPE GUIDES, EXPANSION JOINTS, AND HANGERS PER MANUFACTURER'S RECOMMENDATIONS.
K. PIPING WALL PENETRATIONS SHALL SHALL BE FINISHED WITH A CHROME ESCUTCHEON PLATE.
L. MINIMUM TERMINAL DEVICE BRANCH PIPE SIZE IS 3/4"ø UNLESS OTHERWISE NOTED.
M. PROVIDE HIGH POINT AIR VENTS, LOW POINT DRAINS (WITH CAPPED HOSE CONNECTIONS), AND SLOPE PIPING AS NECESSARY TO ALLOW FOR COMPLETE DRAINAGE OF THE HYDRONIC SYSTEMS.

(#) KEY NOTES:

1. TEST AND BALANCE (E) HRV-1 AND CONNECTED GRD'S.
2. MAINTAIN MANUFACTURER'S MINIMUM CLEARANCES AROUND UNIT. FIELD COORDINATE LOCATION WITH EXISTING ITEMS IN CEILING. RELOCATE ITEMS IN CONFLICT AS NECESSARY.

8' 4' 0' 8' 16'
SCALE : 1/8" = 1'-0"

100% BID DOCUMENTS

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MMI PROJ #: 0747.087

SHEET TITLE
LOWER LEVEL - HVAC FLOOR PLAN

SHEET
M1.0

DATE
10/20/2025

MECHANICAL PLAN NOTES

A. VERIFY THE LOCATION OF THERMOSTATS AND SENSORS WITH THE ARCHITECT AND ENGINEER PRIOR TO INSTALLATION. INSTALL THERMOSTATS 48" ABOVE FINISHED FLOOR PER ADA REQUIREMENTS.
B. PROVIDE AND INSTALL SEISMIC BRACING FOR EQUIPMENT, DUCTWORK AND PIPING PER THE REQUIREMENTS OF THE CURRENTLY ADOPTED INTERNATIONAL BUILDING CODE.
C. FLEXIBLE DUCTWORK BETWEEN BRANCH DUCTS AND GRILLES, REGISTERS, OR DIFFUSERS SHALL BE LIMITED TO 5 FT. FLEXIBLE DUCT SHALL NOT BE USED IN PLACE OF ELBOWS.
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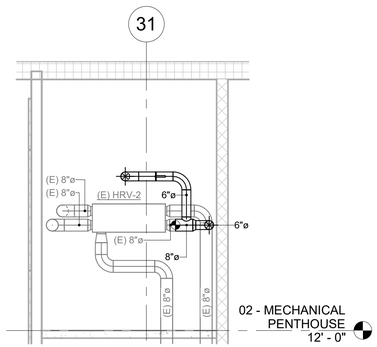
M. PROVIDE HIGH POINT AIR VENTS, LOW POINT DRAINS (WITH CAPPED HOSE CONNECTIONS), AND SLOPE PIPING AS NECESSARY TO ALLOW FOR COMPLETE DRAINAGE OF THE HYDRONIC SYSTEMS.

(#) KEY NOTES:

1. REBALANCE EXISTING EXHAUST DAMPER TO 80 CFM.
2. T-HRV TEMPERATURE SENSOR FOR HRV-2 VENTILATION AIR TEMPERATURE. SEE CONTROLS DIAGRAM ON SHEET M0.4.
3. PROVIDE SOUND LINING WITHIN 10' OF HEAT PUMP.

2 MECHANICAL PENTHOUSE - HVAC FLOOR PLAN
1/8" = 1'-0"

1 MAIN LEVEL - HVAC FLOOR PLAN
1/8" = 1'-0"



3 (E) HRV-2 DUCT CONNECTIONS
N.T.S.

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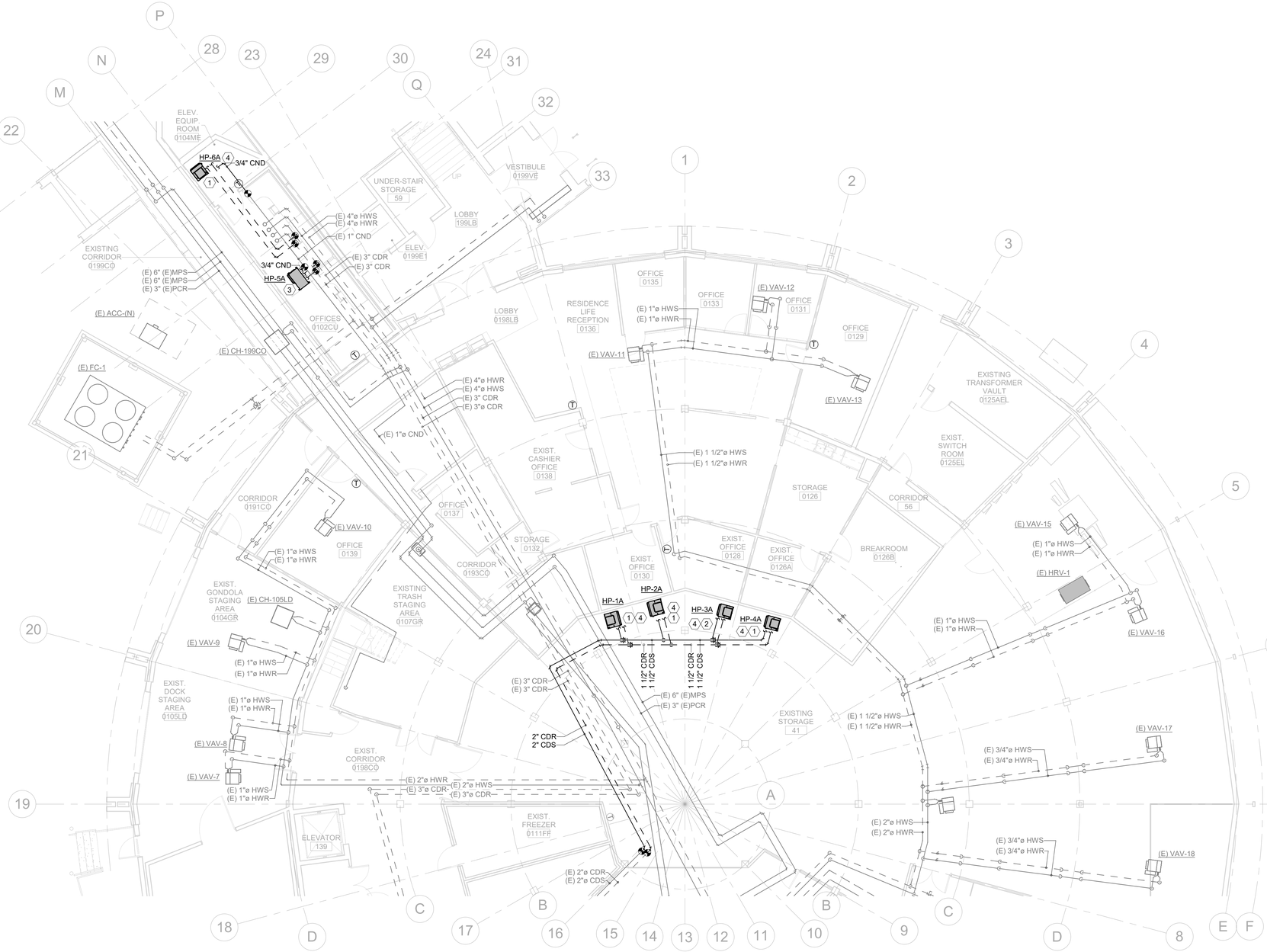
PPA#24-1099

MMI PROJ #: 0747.087

SHEET TITLE
MAIN LEVEL & PENTHOUSE - HVAC FLOOR PLAN

SHEET
M1.1

DATE
10/20/2025



1 LOWER LEVEL - MECHANICAL PIPING FLOOR PLAN
1/8" = 1'-0"

MECHANICAL PLAN NOTES

A. VERIFY THE LOCATION OF THERMOSTATS AND SENSORS WITH THE ARCHITECT AND ENGINEER PRIOR TO INSTALLATION. INSTALL THERMOSTATS 48" ABOVE FINISHED FLOOR PER ADA REQUIREMENTS.
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(#) KEY NOTES:

1. 1-1/4" CDS/R PIPING TO HEAT PUMP.
2. 1" CDS/R PIPING TO HEAT PUMP.
3. 3/4" CDS/R PIPING TO HEAT PUMP.
4. PUMP CONDENSATE FROM UNIT TO EXISTING CONDENSATE DRAIN LINE OVERHEAD.

N

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100% BID DOCUMENTS

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No. 88138 PE
LICENSED PROFESSIONAL ENGINEER

PPA#24-1099

MMI PROJ #: 0747.087

SHEET TITLE
LOWER LEVEL - MECHANICAL PIPING FLOOR PLAN

SHEET
MP1.0

DATE
10/20/2025

MECHANICAL PLAN NOTES

A. VERIFY THE LOCATION OF THERMOSTATS AND SENSORS WITH THE ARCHITECT AND ENGINEER PRIOR TO INSTALLATION. INSTALL THERMOSTATS 48" ABOVE FINISHED FLOOR PER ADA REQUIREMENTS.
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(#) KEY NOTES:

1. 1-1/4" CDS/R TO HEAT PUMP.
2. NEW TEMPERATURE SENSOR FOR EXISTING FINNED TUBE HEATER. SEE CONTROLS SEQUENCE.
3. NEW TEMPERATURE SENSOR FOR EXISTING CABINET HEATER. SEE CONTROLS SEQUENCE.
4. ADD 3" CLOSELY SPACED TEES TO CONDENSER WATER RETURN FOR FUTURE HEAT INJECTION CONNECTION. PROVIDE 3" BUTTERFLY VALVE AND CAP.
5. PROVIDE CONDENSATE PUMP AND ROUTE TO EXISTING FLOOR SINK. TERMINATE WITH AIR GAP.

2 MECHANICAL PENTHOUSE - MECHANICAL PIPING FLOOR PLAN
1/8" = 1'-0"

1 MAIN LEVEL - MECHANICAL PIPING FLOOR PLAN
1/8" = 1'-0"

8' 4' 0' 8' 16'
SCALE : 1/8" = 1'-0"

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SHEET TITLE
MAIN LEVEL & PENTHOUSE - MECHANICAL PIPING FLOOR PLAN

SHEET
MP1.1

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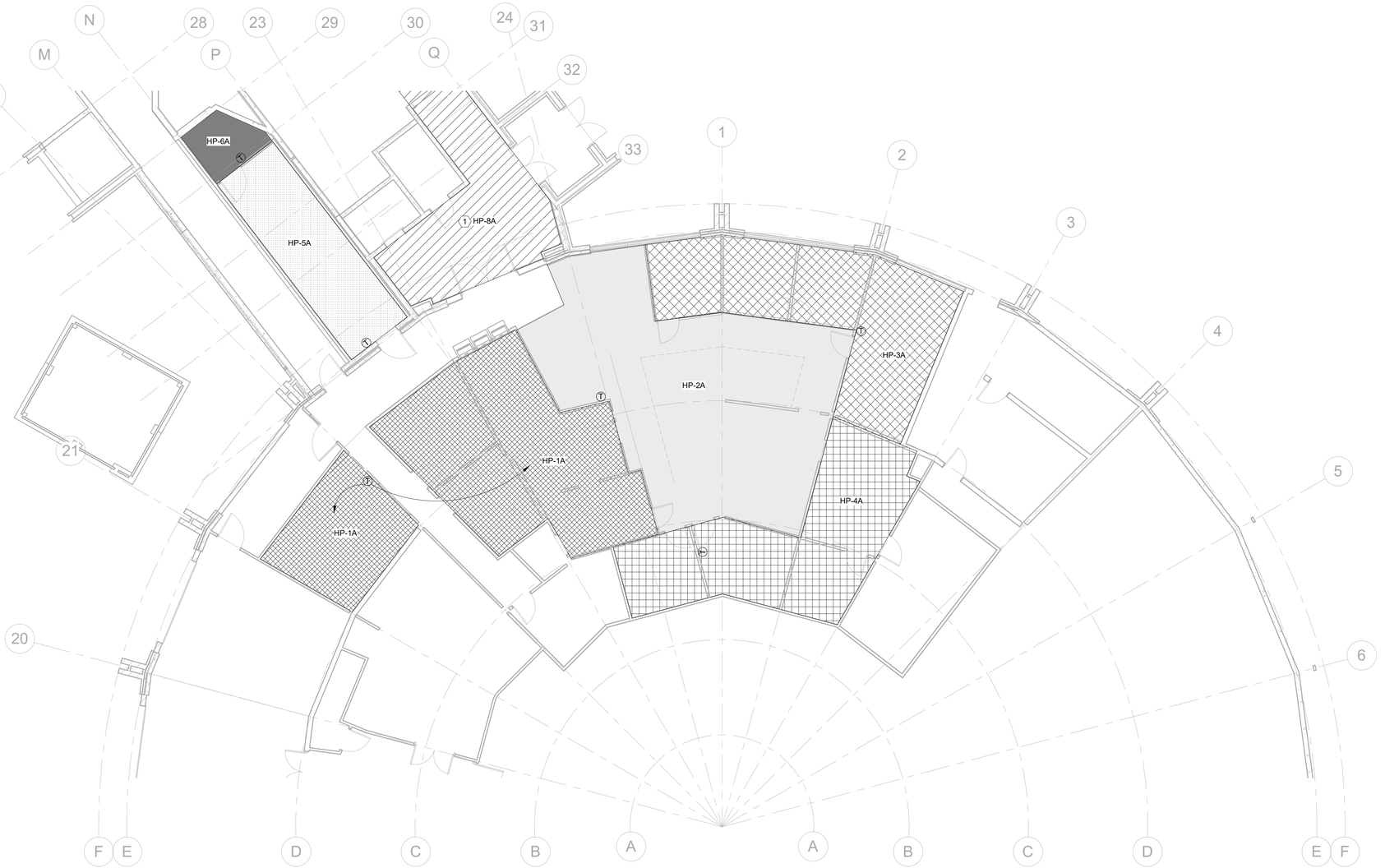

1 LOWER LEVEL - MECHANICAL ZONING PLAN
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MECHANICAL PLAN NOTES

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M. PROVIDE HIGH POINT AIR VENTS, LOW POINT DRAINS (WITH CAPPED HOSE CONNECTIONS), AND SLOPE PIPING AS NECESSARY TO ALLOW FOR COMPLETE DRAINAGE OF THE HYDRONIC SYSTEMS.

(#) KEY NOTES:

1. THERMOSTAT LOCATED ON MAIN LEVEL.

8' 4' 0' 8' 16'
SCALE : 1/8" = 1'-0"

100% BID DOCUMENTS

MILLER DINING AUXILIARIES OFFICES HVAC UPGRADES

MONTANA STATE UNIVERSITY
BOZEMAN

MONTANA STATE UNIVERSITY

Morrison Maierle
engineers - surveyors - planners - scientists

DRAWN BY: DRT		
REVIEWED BY: JRH		
REV.	DESCRIPTION	DATE

MONTANA
DANIEL R. TANASOU
No. 88138 PE
LICENSED PROFESSIONAL ENGINEER

PPA#24-1099

MMI PROJ #: 0747.087

SHEET TITLE
LOWER LEVEL - MECHANICAL ZONING PLAN

SHEET
M2.0

DATE
10/20/2025

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SHEET TITLE
MAIN LEVEL - MECHANICAL ZONING PLAN

SHEET
M2.1

DATE
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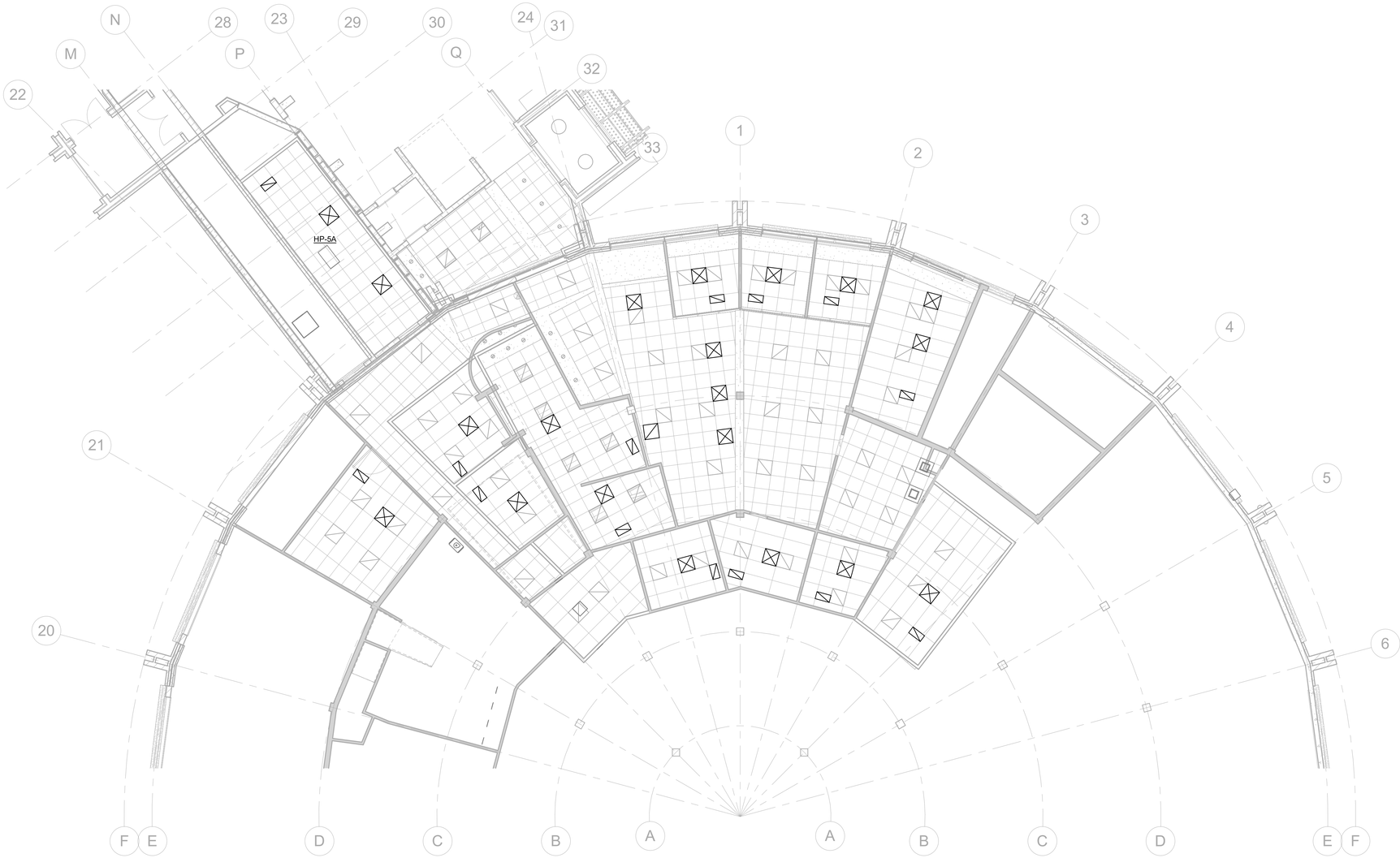

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MILLER DINING AUXILIARIES
OFFICES HVAC UPGRADES
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MMI PROJ #: 0747.087

SHEET TITLE
LOWER LEVEL - MECHANICAL REFLECTED CEILING PLAN

SHEET
M3.0

DATE
10/20/2025

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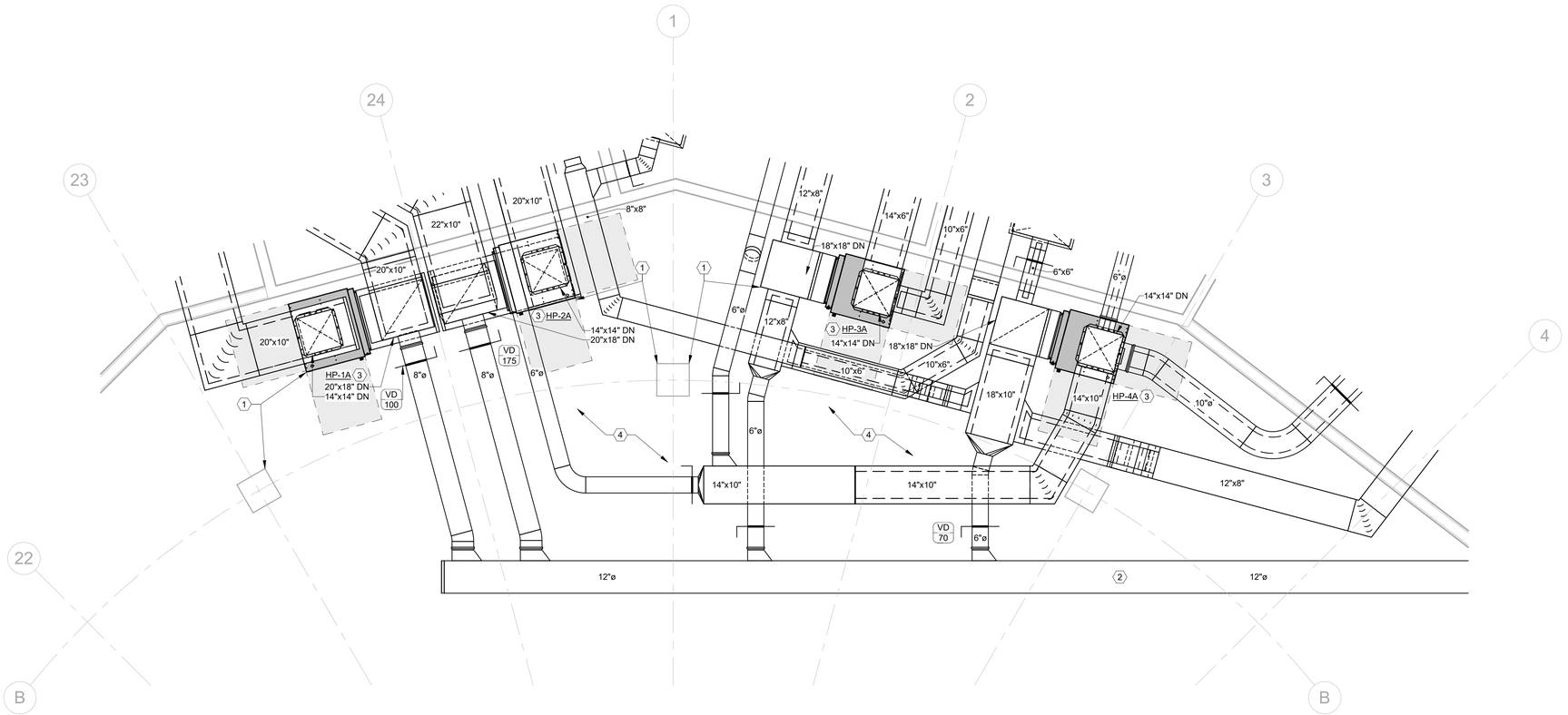

1 LOWER LEVEL STORAGE ROOM - ENLARGED HVAC PLAN
1/2" = 1'-0"

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(#) KEY NOTES:

1. MAINTAIN AS MUCH CLEAR SPACE BETWEEN COLUMN AND DUCTWORK/ PIPING/ EQUIPMENT AS POSSIBLE.
2. T-HRV TEMPERATURE SENSOR FOR HRV-1 VENTILATION AIR TEMPERATURE. SEE CONTROLS DIAGRAM ON SHEET M0.4.
3. PROVIDE SOUND LINING WITHIN 10' OF HEAT PUMP.
4. INSTALL DUCTWORK TO MAINTAIN HEAD SPACE OF AT LEASE 6'-8" THROUGH THIS AREA.

2" 1" 0' 2" 4"
SCALE : 1/2" = 1'-0"

100% BID DOCUMENTS

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SHEET TITLE
MECHANICAL
ENLARGED VIEWS

SHEET
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ELECTRICAL ABBREVIATIONS LEGEND

A, AMP	AMPERES
AC	ALTERNATING CURRENT
A/C	AIR CONDITIONING
AF	AMP FUSE
AFC	AVAILABLE FAULT CURRENT
AFCI	ARC FAULT CIRCUIT INTERRUPTER
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHU	AIR HANDLING UNIT
AL	ALUMINUM
AS	AMP SWITCH
ATS	AUTOMATIC TRANSFER SWITCH
BAS	BUILDING AUTOMATION SYSTEM
BKR	BREAKER
BOF	BOTTOM OF FIXTURE
C	RACEWAY/CONDUIT
CB	CIRCUIT BREAKER
CCT	COLOR RENDERING TEMPERATURE
CCTV	CLOSED CIRCUIT TELEVISION
CKT	CIRCUIT
CLG	CEILING
C.O.	RACEWAY/CONDUIT ONLY, WITH PULL STRING
COD	CENTER OF DEVICE
CNTRL	CONTROL
CU	COPPER
(D)	EXISTING TO BE DEMOLISHED
DISC	DISCONNECT
DIST	DISTRIBUTION
DPDT	DOUBLE POLE DOUBLE THROW
DWG	DRAWING
EA	EACH
EC	ELECTRICAL CONTRACTOR
EF	EXHAUST FAN
ELEC	ELECTRIC
EMT	ELECTRICAL METALLIC TUBING
EQUIP	EQUIPMENT
EX, EXIST	EXISTING
FA	FIRE ALARM
FAA	FIRE ALARM ANNUNCIATOR
FACP	FIRE ALARM CONTROL PANEL
FD	FUSED DISCONNECT
FLR	FLOOR
FO	FIBER OPTIC
FSD	FIRE SMOKE DAMPER RELAY, CONTROLLED BY ASSOCIATED SMOKE DETECTOR AND CIRCUITED BACK TO FACP
FVNR	FULL VOLTAGE NON-REVERSING
FVR	FULL VOLTAGE REVERSING
GEC	GROUNDED ELECTRODE CONDUCTOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFI	GROUND FAULT INTERRUPTER
GFP	GROUND FAULT PROTECTION
GND	GROUND
GRC	GALVANIZED RIGID CONDUIT
HID	HIGH INTENSITY DISCHARGE
HOA	HAND-OFF-AUTOMATIC
HP	HORSEPOWER
HPS	HIGH PRESSURE SODIUM
HTR	HEATER
HVAC	HEATING, VENTILATION & AIR CONDITIONING
HZ	HERTZ
J-BOX	JUNCTION BOX
KVA	KILOVOLT-AMPERES
KW	KILOWATTS
LCP	LIGHTING CONTROL PANEL
LPW	LUMENS PER WATT
LTG	LIGHTING
LM	LUMENS
LV	LOW VOLTAGE
MAG	MAGNETIC STARTER
MAN	MANUAL
MAX	MAXIMUM
MC	MECHANICAL CONTRACTOR
MCA	MINIMUM CIRCUIT AMPACITY
MCC	MOTOR CONTROL CENTER
MDP	MAIN DISTRIBUTION PANEL
MECH	MECHANICAL
MEP	MECHANICAL, ELECTRICAL, PLUMBING
MH	METAL HALIDE
MIN	MINIMUM
MOCP	MAXIMUM OVERCURRENT PROTECTION
MSS	MOTOR STARTER SWITCH WITH THERMAL OVERLOADS
N	NEUTRAL
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRIC CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NFD	NON-FUSED DISCONNECT
NL	NIGHT LIGHT, UN-SWITCHED 24/7 OPERATION
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
#	NUMBER
OAE	OR APPROVED EQUAL
OC	ON CENTER
OCPD	OVERCURRENT PROTECTIVE DEVICE
OH	OVERHEAD
P	POLE
PB	PUSHBUTTON
PC	PLUMBING CONTRACTOR
PH	PHASE
PNL	PANEL
PVC	POLYVINYL CHLORIDE CONDUIT
PWR	POWER
(R)	EXISTING TO BE RELOCATED
RCPT	RECEPTACLE
RECEPT	RECEPTACLE
RGS	RIGID GALVANIZED STEEL
RM	ROOM
RVNR	REDUCED VOLTAGE NON-REVERSING
RVR	REDUCED VOLTAGE REVERSING
SP	SINGLE POLE TOGGLE SWITCH
SPD	SURGE PROTECTIVE DEVICE (TVSS)
SPEC	SPECIFICATION
SPST	SINGLE POLE SINGLE THROW
SSPB	START-STOP PUSHBUTTON
SW	SWITCH
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
TB	TELEPHONE BOARD
TC	TIME CLOCK
TD	TIME DELAY
TEL	TELEPHONE
TR	TAMPER RESISTANT
TSP	TWISTED SHIELDED PAIR
TTB	TELEPHONE TERMINAL BOARD
TYP	TYPICAL
UG	UNDERGROUND
UH	UNIT HEATER
UNO	UNLESS NOTED OTHERWISE
V	VOLT
VA	VOLT-AMPERES
VFD	VARIABLE FREQUENCY DRIVE
W	WATTS
WAO	WORK AREA OUTLET
WP	WEATHERPROOF
WPI	WEATHERPROOF WHILE-IN-USE
WR	WEATHER RESISTANT
W/O	WITHOUT
XFMR	TRANSFORMER
Y	WYE-CONNECTED
Δ	DELTA-CONNECTED
ø	PHASE

ELECTRICAL ONE-LINE LEGEND

- CT AND CUSTOMER POWER METER
- MOTOR
- UTILITY ELECTRIC METER AND BASE (BASE BY CUSTOMER)
- SURGE PROTECTION DEVICE
- LIGHTNING ARRESTER, TYPE 1 SPD, MOUNTED ON EXTERIOR OF MAIN SWITCHGEAR (SQUARE D. SDSA SERIES, OAE)
- STRESS RELIEF CONE
- PFC — POWER FACTOR CORRECTION CAPACITOR
- $X — EQUIPMENT TOGGLE DISCONNECT SWITCH
  "X" INDICATES TYPE:
  F - FUSTAT
  M - MOTOR STARTER SWITCH W/ THERMAL OVERLOADS
- CONTACTOR NORMALLY OPEN, NORMALLY CLOSED
- TRANSFORMER, 3-PH, 3-WIRE DELTA CONNECTION
- TRANSFORMER, 3-PH, 4-WIRE GROUNDED WYE CONNECTION
- AUTOMATIC TRANSFER SWITCH
- VFD — VARIABLE FREQUENCY DRIVE
- FIXED MOUNT LV BREAKER
- FUSED SWITCH ("XXAS/XXAF" - SW AND FUSE AMP RATING)
- G — GENERATOR
- CB — WALL MOUNTED BREAKER
- THERMAL OVERLOAD ELEMENT
- DISCONNECT SWITCH ("XXAS" = SWITCH AMP RATING)
- FUSED DISCONNECT SWITCH ("XXAS/XXAF" = SW AND FUSE AMP RATING)
- COMBINATION MOTOR STARTER (STR SIZE, TYP, AS, AF, SEE MEP COORDINATION SCHEDULE)
- SWITCHBOARD OR PANELBOARD; NAME, VOLTAGE, PHASE, NUMBER OF WIRES WHEN INDICATED

ELECTRICAL POWER LEGEND

- D-1 X — PANEL AND CIRCUIT DESIGNATION ARE NEXT TO EACH DEVICE (PANEL NAME - CIRCUIT NUMBER). MINIMUM BRANCH CIRCUIT WIRE SIZE IS #12, UNO. A SINGLE INSULATED GREEN GROUND CONDUCTOR SHALL BE PROVIDED WITH EACH HOME RUN. PROVIDE A SEPARATE NEUTRAL FOR EACH CIRCUIT. HOME RUNS SHALL HAVE NO MORE THAN THREE CIRCUITS. LINE VOLTAGE AND LOW VOLTAGE WIRING IS NOT SHOWN ON PLANS.
  "X" INDICATES TYPE:
  C - AUTOMATIC CONTROL
  GFI - GROUND FAULT INTERRUPTER
  WP - WEATHERPROOF FLIP COVER
  WPI - WEATHERPROOF WHILE-IN-USE COVER
  WR - WEATHER-RESISTANT TYPE
  U - PROVIDE WITH (2) USB PORTS
  TR - TAMPER RESISTANT
- SIMPLEX RECEPTACLE - CEILING MOUNT, WALL MOUNT (+18", UNO)
- DUPLEX RECEPTACLE - CEILING MOUNT, WALL MOUNT (+18", UNO)
- QUADRUPLEX RECEPTACLE - CEILING MOUNT, WALL MOUNT (+18", UNO)
- ABOVE COUNTER RECEPTACLE - MOUNT AT +4" ABOVE BACKSPLASH
- X — FLOOR BOX WITH (2) DUPLEX RECEPTACLES - FURNISH WITH (1) 3/4" MIN. CONDUIT FOR POWER FROM BOX. INCLUDE ALL HARDWARE/ACCESSORIES AS REQUIRED FOR COMPLETE INSTALLATION. PROVIDE COVER (COORDINATE WITH ARCHITECT FOR FLOORING TYPE AND FINISH).
  "X" INDICATES TYPE:
  A - 4-GANG FLOOR BOX, CORROSION RESISTANT COATING FOR CONCRETE FLOORS (3" MIN. POUR DEPTH), (HUBBELL NO. CFB4G30CR, OAE)
  B - 4-GANG FLOOR BOX FOR RAISED ACCESS FLOORS, (HUBBELL NO. AFB4G50, OAE)
  C - FIRE RATED POKE-THROUGH FLOOR BOX FOR ELEVATED CONCRETE SLABS, 3" DIA. CORE (HUBBELL NO. PT7FSD, OAE)
  D - 8" DIA., FIRE RATED POKE-THROUGH FLOOR BOX FOR ELEVATED CONCRETE* SLABS, (HUBBELL NO. S1R8PTFIT1, OAE)
  E - FLUSH, ROUND SINGLE SERVICE FLOOR BOX FOR CONCRETE* FLOORS, UP TO 1" CONDUIT FEED (HUBBELL NO. B2506, OAE)
  F - TOMBSTONE PEDESTAL FLOOR BOX, 1" CONDUIT FEED (HUBBELL NO. 6301, OAE)
  *POKE-THROUGH FLOOR BOXES CAN ALSO BE USED FOR TILE, CARPET, OR WOOD FLOORS.
- FLOOR BOX WITH ADDITIONAL C.O. FOR DATA. FURNISH (1) 1-1/4" DEDICATED CONDUIT FROM EACH DATA COMPARTMENT, COMPLETE WITH PULL STRINGS OVER TO AND UP WALL INTO ACCESSIBLE CEILING SPACE, UNO.
- PANELBOARD OR LOAD CENTER
- SPECIAL PURPOSE RECEPTACLE (MOUNT AT +18", UNO)
  "X" INDICATES TYPE:
  A - NEMA 5-20R, #12 CU; B - NEMA 5-30R, #10 CU;
  C - NEMA 5-50R, #6 CU; D - NEMA 6-20R, #12 CU;
  E - NEMA 6-30R, #10 CU; F - NEMA 6-50R, #6 CU;
  G - NEMA 14-20R, #12 CU; H - NEMA 14-30R, #10 CU;
  I - NEMA 14-50R, #6 CU*
  * +4" AFF FOR RANGE
- PUSHBUTTON (MOUNT AT +48", UNO)
  "X" INDICATES TYPE:
  EPO - EMERGENCY POWER OFF
  ADA - HANDICAPPED ACCESSIBLE DOOR (DEVICE BY OTHERS)
  ODO - OVERHEAD DOOR OPERATOR (DEVICE BY OTHERS)
- RECESSED TV BOX, WITH BLANK COVERS FOR LOW VOLTAGE OPENINGS. MOUNT AT +72", UNO.
  X INDICATES TYPE:
  A - 2-GANG, WITH DUPLEX RECEPTACLE & SINGLE GANG DATA OPENING.
  HUBBELL RACO NSAV62M, WITH NSAV6C COVER
  B - 3-GANG, WITH DUPLEX RECEPTACLE, LOW VOLTAGE DIVIDER, SINGLE GANG FOR DATA (CENTER), AND REMOVABLE SINGLE GANG FOR AUDIO/VISUAL (SIDE).
  ARLINGTON TVBS507
  NOTE: ROUTE (1) 1" C. TO DATA OPENING AND (1) 1-1/4" C. TO AUDIO/VISUAL OPENING, FROM TOP OF GANG IN WALL INTO ACCESSIBLE CEILING SPACE. ALSO ROUTE 1-1/4" C. FROM AUDIO/VISUAL OPENING TO FLOOR BOX WHERE APPLICABLE.
- J — JUNCTION BOX
- J — DROP-DOWN RECEPTACLE
- PS-X — SURFACE MOUNTED PLUGSTRIP
  "X" INDICATES TYPE:
  A - PLUGSTRIP, POWER ONLY, OUTLET EVERY 3' OC
  B - WIREMOLD SERIES 4000 POWER AND DATA
  C - WIREMOLD SERIES 5000 POWER AND DATA
- SURFACE MOUNTED RACEWAY
- RACEWAY CONCEALED IN WALL, FLOOR, OR CEILING IN FINISHED SPACES, EXPOSED IN UNFINISHED SPACES
- RACEWAY BELOW FLOOR OR BELOW GRADE
- RACEWAY STUB-OUT WITH CAPPED END
- RACEWAY STUB-OUT WITH BUSHED END
- GROUNDING BUS

ABBREVIATIONS AND SYMBOLS GENERAL NOTES

A. THE ABBREVIATIONS ON THIS SHEET COMPRISE A STANDARD LIST; NOT ALL ABBREVIATIONS APPEAR ON THIS PROJECT.
B. THE SYMBOLS ON THIS SHEET COMPRISE A STANDARD LIST; NOT ALL SYMBOLS APPEAR ON THIS PROJECT.
C. ALL MOUNTING HEIGHTS ARE TO CENTER OF DEVICE ABOVE FINISHED FLOOR, UNLESS NOTED OTHERWISE. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH OTHER CONTRACTORS, MAKING ADJUSTMENTS AS REQUIRED TO AVOID INTERFERENCE WITH EQUIPMENT SUCH AS BASEBOARD FIN-TUBE, CABINET UNIT HEATERS, ETC. ARCHITECT/ENGINEER SHALL BE NOTIFIED OF ALL SUCH HEIGHT ADJUSTMENTS. MOUNTING HEIGHTS INDICATED ON ARCHITECTURAL WALL ELEVATIONS OR AS NOTED SPECIFICALLY ON THE DRAWINGS OR IN THE SPECIFICATIONS SHALL TAKE PRECEDENCE OVER MOUNTING HEIGHTS LISTED.

ELECTRICAL PROJECT GENERAL NOTES

A. PRIOR TO BID CONTRACTOR SHALL VISIT THE SITE. NOT ALL WORK REQUIRED TO COMPLETE THE PROJECT IS SHOWN ON THE DRAWINGS. THE CONTRACTOR SHALL BECOME THOROUGHLY FAMILIAR WITH ALL THE WORK REQUIRED TO COMPLETE THE PROJECT IN ADDITION TO THE LOCAL CONDITIONS AND INCLUDE SAID WORK IN THE BID.
B. GENERAL WORK PRACTICES FOR ELECTRICAL CONSTRUCTION SHALL BE IN ACCORDANCE WITH NECA 1, "STANDARD PRACTICES FOR GOOD WORKMANSHIP IN ELECTRICAL CONTRACTING." THIS PUBLICATION IS AVAILABLE FROM NECA BY TELEPHONE AT 301-657-3110 OR ON-LINE AT WWW.NECANET.ORG.
C. FIRE-RESISTANCE: PROVIDE A MINIMUM HORIZONTAL DISTANCE OF 24" BETWEEN OUTLET BOXES LOCATED ON OPPOSITE SIDES OF FIRE-RESISTANCE RATED WALLS. WHERE THIS IS NOT POSSIBLE INSTALL UL LISTED PUTTY PADS ON ALL OUTLET BOXES NOT MEETING THE 24" SEPARATION. PROVIDE A UL LISTED THROUGH -PENETRATION FIRESTOP FOR PENETRATIONS OF FIRE-RESISTANCE RATED ASSEMBLIES.
D. CONDUCTORS ARE SIZED PER THE 75 DEGREE C RATING COLUMN OF NEC TABLE 310.16. IF THE TERMINAL USED FOR A TERMINATION OF A PARTICULAR CONDUCTOR IS NOT MARKED, OR THE TERMINAL IS MARKED FOR 60 DEGREE C CONDUCTORS, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO EITHER ADJUST THE AMPACITY OF THE CONDUCTOR TO MATCH THE 60 DEGREE COLUMN OF TABLE 310.16, OR REPLACE THE TERMINAL WITH ONE RATED FOR AT LEAST 75 DEGREES C.
E. BASED ON ACTUAL HOMERUN LENGTHS REQUIRED IN THE FIELD, THE CONTRACTOR SHALL CALCULATE AND INCREASE THE WIRE SIZES AS REQUIRED TO LIMIT BRANCH CIRCUIT VOLTAGE DROP TO 3%. FOR 20A BRANCH CIRCUITS THE MINIMUM CONDUCTOR SIZES SHALL BE AS FOLLOWS: #10 AWG CU FOR RUNS BETWEEN 100 AND 200 LINEAR FEET, #8 AWG CU FOR RUNS BETWEEN 200 AND 325 LINEAR FEET, AND AS CALCULATED BY THE CONTRACTOR FOR CIRCUITS EXTENDING BEYOND 325 LINEAR FEET. IN ALL CASES WHERE WIRE SIZES INCREASE, THE CONTRACTOR SHALL PROVIDE LARGER CONDUITS AS REQUIRED.
F. PROVIDE A DEDICATED NEUTRAL CONDUCTOR FOR EACH 120V BRANCH CIRCUIT.

ELECTRICAL PROJECT DEMO NOTES

A. DURING DEMOLITION, THE CONTRACTOR SHALL NOTE ALL EXISTING RACEWAY (BOTH SURFACE AND CONCEALED) TO THE EXTENT POSSIBLE. THESE RACEWAYS SHALL BE REUSED TO THE GREATEST EXTENT POSSIBLE TO ENSURE A CLEAN FINISHED PRODUCT.
B. ALL POWER INTERRUPTIONS SHALL BE COORDINATED WITH OWNER A MINIMUM OF 72 HOURS IN ADVANCE. ANY DISRUPTION OF WORKERS IN THE SPACE SHALL BE KEPT TO A MINIMUM AND BE COORDINATED WITH THE OWNER PRIOR TO WORK COMMENCING IN THAT SPACE.
C. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIR OF ANY EXISTING CONDUIT OR FEEDER CIRCUITS THAT ARE INTENDED TO REMAIN THAT ARE SAW-CUT, OR OTHERWISE DAMAGED, AS PART OF THE DEMOLITION PROCESS. PROVISION FOR THIS WORK SHALL INCLUDE, BUT NOT BE LIMITED TO: ALL NECESSARY CONDUIT AND CONDUCTORS, MOUNTING ACCESSORIES AND LABOR, TO RESTORE THE SYSTEM TO ITS INTENDED FUNCTION.
D. ELECTRICAL DRAWINGS SHOWING EXISTING BUILDING CONDITIONS, SUCH AS DEMOLITION DRAWINGS, EXISTING PANEL SCHEDULES, ETC ARE BASED ON RECORD DRAWINGS AND SITE VISITS. IF ACTUAL EXISTING CONDITIONS DIFFER FROM THOSE SHOWN ON DRAWINGS, PLEASE NOTIFY ENGINEER.

ELECTRICAL SHEET INDEX

100% BID DOCUMENTS

MILLER DINING AUXILIARIES
OFFICES HVAC UPGRADES
MONTANA STATE UNIVERSITY
BOZEMAN

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Morrison Maierle
engineers - surveyors - planners - scientists

DRAWN BY: CDC		
REVIEWED BY: RPM		
REV.	DESCRIPTION	DATE

MONTANA
RYAN P. MAHONEY
No. 60006 PE
LICENSED PROFESSIONAL ENGINEER

PPA#24-1099

MMI PROJ #: 0747.087

SHEET TITLE
ELECTRICAL LEGENDS AND ABBREVIATIONS

SHEET
E0.1

DATE
10/20/2025

MEP COORDINATION SCHEDULE

CONTROL TYPE:

BAS	BUILDING AUTOMATION SYSTEM
CO	CARBON MONOXIDE DETECTOR
CONT	CONTINUOUS OPERATION
EF	INTERLOCK WITH EXHAUST FAN
HCP	HOOD CONTROL PANEL
INT	INTEGRAL
L	LIGHT SWITCH
MS	MANUAL SWITCH
OS	OCCUPANCY SENSOR
PS	PRESSURE SWITCH
T	THERMOSTAT
TC	TIME CLOCK
UC	UNIT CONTROLLER
VE	VEHICLE EXHAUST DETECTION SYSTEM
N/A	NOT APPLICABLE

DISCONNECT/STARTER TYPE:

CB	PANELBOARD CIRCUIT BREAKER WITHIN SIGHT OF EQUIPMENT
CSFD	COMBINATION STARTER/DISCONNECT - HOA
FD	FUSED DISCONNECT
FST	FUSTAT
FW	FACTORY-WIRED SINGLE POINT CONNECTION
MOCP	MOTOR OVER-CURRENT PROTECTION
MSS	MANUAL STARTER SWITCH WITH THERMAL OVERLOADS (1-, 2- OR 3-POLE AS REQUIRED)
NFD	NON-FUSED DISCONNECT
RCPT	20A DUPLEX RECEPTACLE (GFCI PROTECTED AS REQUIRED), CORD AND PLUG
RVSS	REDUCED VOLTAGE SOLID-STATE
VFD	VARIABLE FREQUENCY DRIVE - HOA
N/A	NOT APPLICABLE

DIVISION OF RESPONSIBILITIES:

22/22	FURNISHED AND INSTALLED BY DIV. 22, WIRED BY DIV. 22
22/26	FURNISHED AND INSTALLED BY DIV. 22, WIRED BY DIV. 26
23/23	FURNISHED AND INSTALLED BY DIV. 23, WIRED BY DIV. 23
23/26	FURNISHED AND INSTALLED BY DIV. 23, WIRED BY DIV. 26
26/26	FURNISHED AND INSTALLED BY DIV. 26, WIRED BY DIV. 26

NOTES:

1. INTEGRAL DISCONNECTS AND OVERLOADS
2. INTEGRAL OVERLOADS
3. SINGLE POINT CONNECTION
4. MOUNT ON UNI-STRUT IN FRONT OF UNIT
5. SIZE FUSES IN ACCORDANCE WITH MANUFACTURER'S GUIDELINES FOR INSTALLED EQUIPMENT
6. INTEGRAL VARIABLE FREQUENCY DRIVE
7. DUCT SMOKE DETECTOR(S) REQUIRED
8. IN ADDITION TO UNIT POWER, PROVIDE 120V CIRCUIT FOR CONDENSATE PUMP POWER.

GENERAL NOTES:

A. CONTROL WIRING SHALL BE CONCEALED WITHIN WALL CONSTRUCTION, ABOVE CEILING, OR RUN IN CONDUIT. EXPOSED CONTROL WIRING IS UNACCEPTABLE.
B. UNLESS SPECIFICALLY NOTED, ALL FEEDERS SHALL INCLUDE A FULL SIZE NEUTRAL. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY WITH THE MANUFACTURER OF THE ACTUAL EQUIPMENT BEING SUPPLIED WHETHER A NEUTRAL IS REQUIRED PRIOR TO ROUGH-IN.
C. ALL DUCT SMOKE DETECTORS FURNISHED BY DIV. 26, INSTALLED BY DIV. 23, AND WIRED BY DIV. 26. DIV. 26 SHALL WIRE ALL FANS TO SHUT DOWN WHEN ALARM IS INITIATED BY ANY DUCT SMOKE DETECTOR.

MARK	DESCRIPTION	ELECTRICAL DATA		CONTROL		NOTES	DISCONNECT / STARTER		DISCONNECT				FEEDER	
		LOAD	VOLT-PHASE	TYPE	DIV		TYPE	DIV	SIZE (NEMA)	SWITCH (AMPS)	FUSE (AMPS)	ENCLOSURE (NEMA)	COPPER WIRE (AWG)	CONDUIT (INCHES)
HP-1A	WATER SOURCE HEAT PUMP	17 FLA / 35 MOCP	208-1	BAS	23/23	1, 8	FW	23/26	-	-	-	1	#8	3/4"
HP-2A	WATER SOURCE HEAT PUMP	17 FLA / 35 MOCP	208-1	BAS	23/23	1, 8	FW	23/26	-	-	-	1	#8	3/4"
HP-3A	WATER SOURCE HEAT PUMP	12.9 FLA / 25 MOCP	208-1	BAS	23/23	1, 8	FW	23/26	-	-	-	1	#10	3/4"
HP-4A	WATER SOURCE HEAT PUMP	15.4 FLA / 30 MOCP	208-1	BAS	23/23	1, 8	FW	23/26	-	-	-	1	#10	3/4"
HP-5A	WATER SOURCE HEAT PUMP	6.4 FLA / 15 MOCP	208-1	BAS	23/23	1, 8	FW	23/26	-	-	-	1	#12	3/4"
HP-6A	WATER SOURCE HEAT PUMP	12.9 FLA / 25 MOCP	208-1	BAS	23/23	1, 8	FW	23/26	-	-	-	1	#10	3/4"
HP-7A	WATER SOURCE HEAT PUMP	15.4 FLA / 30 MOCP	208-1	BAS	23/23	1, 8	FW	23/26	-	-	-	1	#10	3/4"
HP-8A	WATER SOURCE HEAT PUMP	17 FLA / 35 MOCP	208-1	BAS	23/23	1, 8	FW	23/26	-	-	-	1	#8	3/4"

100% BID DOCUMENTS

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DRAWN BY: CDC		
REVIEWED BY: RPM		
REV.	DESCRIPTION	DATE

MONTANA
RYAN P. MAHONEY
No. 26006 PE
LICENSED PROFESSIONAL ENGINEER

PPA#24-1099

MMI PROJ #: 0747.087

SHEET TITLE
MEP COORINATION SCHEDULE

SHEET
E0.2

DATE
10/20/2025

Branch Panel: L1A

Location: EXISTING STORAGE 0123FF
Supply From:
Mounting: Surface
Enclosure: Type 1

Volts: 120/208 Wye
Phases: 3
Wires: 4

Mains Type: MCB
Mains Rating: 225 A
MCB Rating: 225 A

Notes:
THIS IS AN EXISTING GE A-SERIES PANEL.

CKT	Circuit Description	Load Classification	Trip	Poles	A		B		C		Poles	Trip	Load Classification	Circuit Description	CKT
1	EXISTING LOAD	--	20 A	1	0	0					1	20 A	--	EXISTING LOAD	2
3	EXISTING LOAD	--	20 A	1			0	0			1	20 A	--	SPARE	4
5	EXISTING LOAD	--	20 A	1					0	0	1	20 A	--	EXISTING LOAD	6
7	EXISTING LOAD	--	20 A	1	0	0					1	20 A	--	EXISTING LOAD	8
9	EXISTING LOAD	--	20 A	1			0	0			1	20 A	--	EXISTING LOAD	10
11	EXISTING LOAD	--	20 A	1					0	0	1	20 A	--	EXISTING LOAD	12
13	EXISTING LOAD	--	20 A	1	0	0					1	20 A	--	EXISTING LOAD	14
15	EXISTING LOAD	--	20 A	1			0	0			1	20 A	--	EXISTING LOAD	16
17	EXISTING LOAD	--	20 A	1					0	0	1	20 A	--	EXISTING LOAD	18
19	EXISTING LOAD	--	20 A	1	0	0					1	20 A	--	EXISTING LOAD	20
21							0	0							22
23	EXISTING LOAD	--	30 A	3					0	0	3	30 A	--	EXISTING LOAD	24
25					0	0									26
27							0	0							28
29	EXISTING LOAD	--	30 A	3					0	0	3	30 A	--	EXISTING LOAD	30
31					0	0									32
33							0	0			1	20 A	--	EXISTING LOAD	34
35	EXISTING LOAD	--	30 A	3					0	0	1	20 A	--	SPARE	36
37					0	0					1	20 A	--	EXISTING LOAD	38
39	EXISTING LOAD	--	20 A	1			0	0			1	20 A	--	EXISTING LOAD	40
41	EXISTING LOAD	--	20 A	1					0	0	1	20 A	--	EXISTING LOAD	42
43	SPARE	--	20 A	1	0	0					1	20 A	--	EXISTING LOAD	44
45	EXISTING LOAD	--	20 A	1			0	0			1	20 A	--	EXISTING LOAD	46
47	EXISTING LOAD	--	20 A	1					0	0	1	20 A	--	EXISTING LOAD	48
49	SPARE	--	15 A	1	0	0					1	20 A	--	EXISTING LOAD	50
51	SPARE	--	20 A	1			0	0			1	20 A	--	EXISTING LOAD	52
53	SPARE	--	20 A	1					0	0	1	20 A	--	EXISTING LOAD	54
55	SPARE	--	20 A	1	0	0					1	20 A	--	EXISTING LOAD	56
57	EXISTING LOAD	--	20 A	1			0	0			1	20 A	--	EXISTING LOAD	58
59	EXISTING LOAD	--	20 A	1					0	0	1	20 A	--	EXISTING LOAD	60
61	SPARE	--	20 A	1	0	0					1	20 A	--	SPARE	62
63	<1> CONDENSATE PUMP (HP-7A,8A)	Power	20 A	1			1700	0			1	20 A	--	EXISTING LOAD	64
65	SPARE	--	20 A	1					0	1750	2	35 A	Power	<2> HP-8A	66
67	SPARE	--	20 A	1	0	1750									68
69	<2> HP-7A	Power	30 A	2			1600	0			1	20 A	--	EXISTING LOAD	70
71									1600	0	1	20 A	--	SPARE	72
			Total Load:		1750 VA		3300 VA		3350 VA						
			Total Amps:		15 A		29 A		30 A						

Legend:
<1> USE EXISTING SPARE CIRCUIT BREAKER FOR LOAD
<2> PROVIDE NEW CIRCUIT BREAKER FOR LOAD

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
Power	8400 VA	100.00%	8400 VA		
				Total Conn. Load:	8400 VA
				Total Est. Demand:	8400 VA
				Total Conn.:	23 A
				Total Est. Demand:	23 A

Notes:
RETURN ALL EXISTING SPARE BREAKERS REMOVED FROM PANEL TO OWNER FOR STOCK.

Branch Panel: L1B

Location: EXISTING STORAGE 0123FF
Supply From: (EX)2MDP
Mounting: Surface
Enclosure: Type 1

Volts: 120/208 Wye
Phases: 3
Wires: 4

Mains Type: MCB
Mains Rating: 225 A
MCB Rating: 225 A

Notes:
THIS IS AN EXISTING GE A-SERIES PANEL.

CKT	Circuit Description	Load Classification	Trip	Poles	A		B		C		Poles	Trip	Load Classification	Circuit Description	CKT
1	(D) EXISTING LOAD (BSMNT FC & BS BOXES)	--	20 A	2	0	0					1	20 A	--	EXISTING LOAD	2
3							0	0			1	20 A	--	EXISTING LOAD	4
5	EXISTING LOAD	--	20 A	2					0	0					6
7					0	0					3	30 A	--	(D) EXISTING LOAD (HP-1A)	8
9	EXISTING LOAD	--	20 A	1			0	0							10
11	EXISTING LOAD	--	20 A	1					0	0	1	20 A	--	EXISTING LOAD	12
13	EXISTING LOAD	--	20 A	1	0	0					1	20 A	--	EXISTING LOAD	14
15	EXISTING LOAD	--	20 A	1			0	0			1	20 A	--	EXISTING LOAD	16
17	EXISTING LOAD	--	20 A	1					0	0	1	20 A	--	EXISTING LOAD	18
19	EXISTING LOAD	--	20 A	1	0	0					1	20 A	--	EXISTING LOAD	20
21	EXISTING LOAD	--	20 A	1			0	1350							22
23	<1>CONDENSATE PUMP (HP-1A,2A)	Power	20 A	1					1700	1350	2	25 A	Power	<2> HP-3A	24
25	EXISTING LOAD	--	20 A	1	0	0									26
27							0	0			3	20 A	--	EXISTING LOAD	28
29	(D) EXISTING LOAD (HP-1B)	--	30 A	3					0	0					30
31					0	1750									32
33	<1> CONDENSATE PUMP (HP-3A,4A)	Power	20 A	1			1700	1750			2	35 A	Power	<2> HP-1A	34
35	EXISTING LOAD	--	20 A	1					0	1750					36
37	EXISTING LOAD	--	20 A	1	0	1750					2	35 A	Power	<2> HP-2A	38
39	EXISTING LOAD	--	20 A	1			0	675							40
41	<1> CONDENSATE PUMP (HP-5A,6A)	Power	20 A	1					1700	675	2	15 A	Power	<2> HP-5A	42
43	EXISTING LOAD	--	20 A	1	0	0									44
45	EXISTING LOAD	--	20 A	1			0	0			3	100 A	--	EXISTING LOAD	46
47	EXISTING LOAD	--	20 A	1					0	0					48
49	EXISTING LOAD	--	20 A	1	0	0									50
51	EXISTING LOAD	--	20 A	1			0	0			3	100 A	--	EXISTING LOAD	52
53	SPARE	--	20 A	1					0	0					54
55	EXISTING LOAD	--	20 A	1	0	1600									56
57	<2> HP-6A	Power	25 A	2			1350	1600			2	30 A	Power	<1> HP-4A	58
59									1350	0					60
61	EXISTING LOAD	--	20 A	1	0	0					3	50 A	--	SPARE	62
63	EXISTING LOAD	--	20 A	1			0	0							64
65	EXISTING LOAD	--	20 A	1					0	0	1	20 A	--	SPARE	66
67	SPARE	--	20 A	1	0	0					1	20 A	--	EXISTING LOAD	68
69	EXISTING LOAD	--	20 A	1			0	0			1	20 A	--	EXISTING LOAD	70
71	SPARE	--	20 A	1					0	0	1	20 A	--	SPARE	72
			Total Load:		5100 VA		8425 VA		8525 VA						
			Total Amps:		43 A		74 A		75 A						

Legend:
<1> USE EXISTING SPARE CIRCUIT BREAKER FOR LOAD
<2> PROVIDE NEW CIRCUIT BREAKER FOR LOAD

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
Power	22050 VA	100.00%	22050 VA		
				Total Conn. Load:	22050 VA
				Total Est. Demand:	22050 VA
				Total Conn.:	61 A
				Total Est. Demand:	61 A

Notes:
RETURN ALL EXISTING SPARE BREAKERS REMOVED FROM PANEL TO OWNER FOR STOCK. LEAVE CIRCUIT BREAKERS TO EXISTING LOADS TO BE DEMOLISHED '(D)' IN PANEL AS A SPARE.

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MONTANA STATE UNIVERSITY
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Morrison Maierle
engineers - surveyors - planners - scientists

DRAWN BY: CDC
REVIEWED BY: RPM

REV.	DESCRIPTION	DATE

MONTANA
RYAN P. MAHONEY
No. 23006 PE
LICENSED PROFESSIONAL ENGINEER

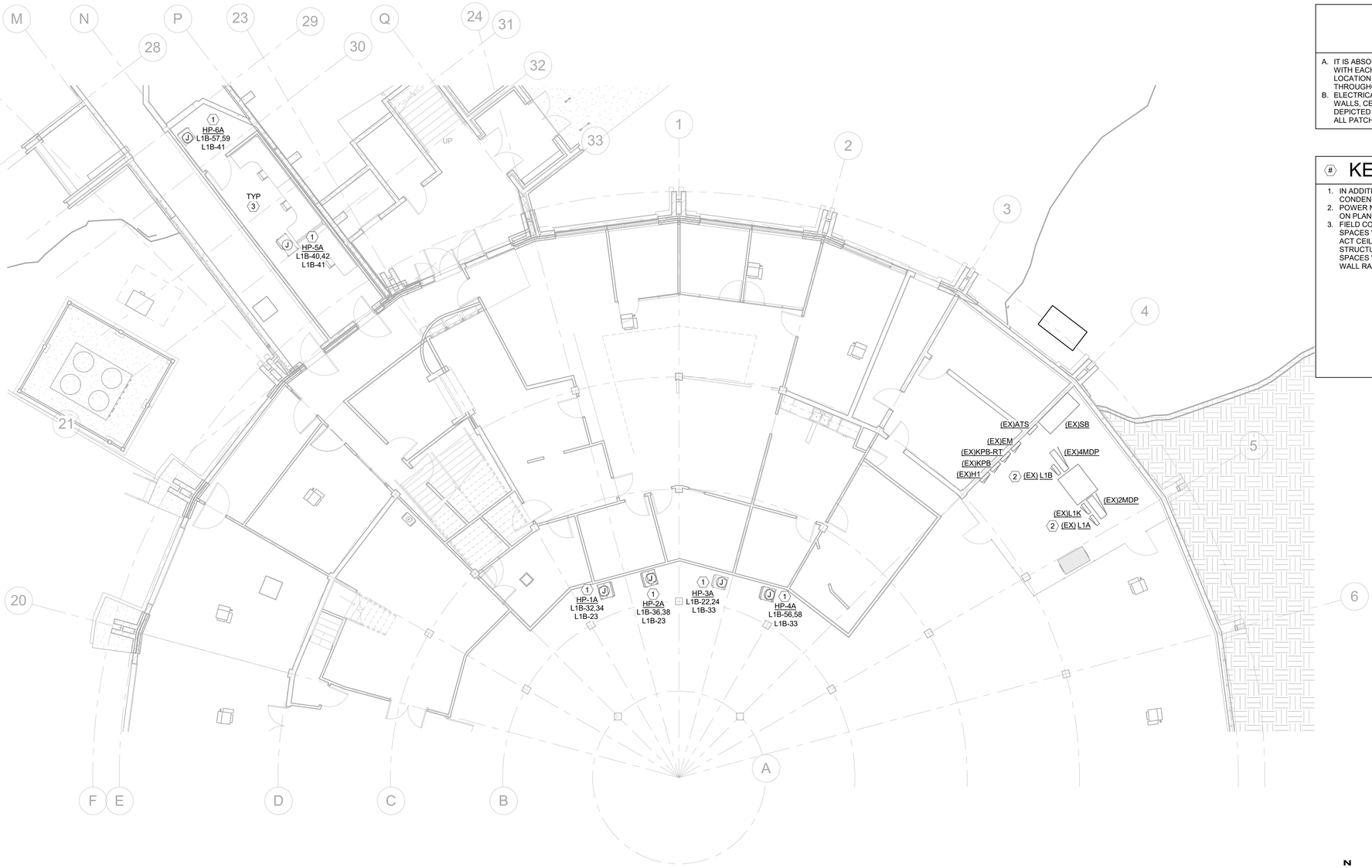
PPA#24-1099

MMI PROJ #: 0747.087

SHEET TITLE
ELECTRICAL SCHEDULES

SHEET
E0.3

DATE
10/20/2025



1 LOWER LEVEL - ELECTRICAL FLOOR PLAN
1/8" = 1'-0"

8' 4' 0' 8' 16'
SCALE : 1/8" = 1'-0"

POWER PLAN GENERAL NOTES

A. IT IS ABSOLUTELY NECESSARY FOR ALL TRADES INVOLVED TO COORDINATE WITH EACH OTHER AND VERIFY THAT THERE ARE NO CONFLICTS IN LOCATION OF DUCTS, CONDUITS, DIFFUSERS, BOXES, AND OTHER ITEMS THROUGHOUT THIS PROJECT BEFORE FINAL PLACEMENT OF MATERIALS.
B. ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR ALL CUTTING OF FLOORS, WALLS, CEILINGS, AND ROOFS TO PERFORM THE REQUIRED WORK DEPICTED IN THESE DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE FOR ALL PATCHING OF HOLES TO THE SATISFACTION OF THE ENGINEER.

(#) KEY NOTES:

1. IN ADDITION TO 208V POWER FOR UNIT, ALSO PROVIDE 120V CIRCUIT FOR CONDENSATE PUMP POWER.
2. POWER NEW BRANCH CIRCUITS FROM EXISTING PANELBOARD AS TAGGED ON PLANS. SEE PANEL SCHEDULE ON SHEET E0.3.
3. FIELD COORDINATE ROUTING OF NEW CIRCUITS THROUGH EXISTING SPACES WITHIN BUILDING WITH OWNER. RUN CONDUIT CONCEALED ABOVE ACT CEILINGS IN FINISHED SPACES AND KEEP CONDUIT TIGHT TO CEILING STRUCTURE IN BACK-OF-HOUSE SPACES. COORDINATE ACCESS TO SPACES WITH OWNER. FOR ALL NEW PENETRATIONS, MAINTAIN EXISTING WALL RATINGS AS APPLICABLE.

MONTANA STATE UNIVERSITY

100% BID DOCUMENTS

MILLER DINING AUXILIARIES OFFICES HVAC UPGRADES

MONTANA STATE UNIVERSITY BOZEMAN

Morrison Maierle
engineers - surveyors - planners - scientists

DRAWN BY: CDC		
REVIEWED BY: RPM		
REV.	DESCRIPTION	DATE

MONTANA
RYAN P. MARONEY
No. 49006 PE
LICENSED PROFESSIONAL ENGINEER

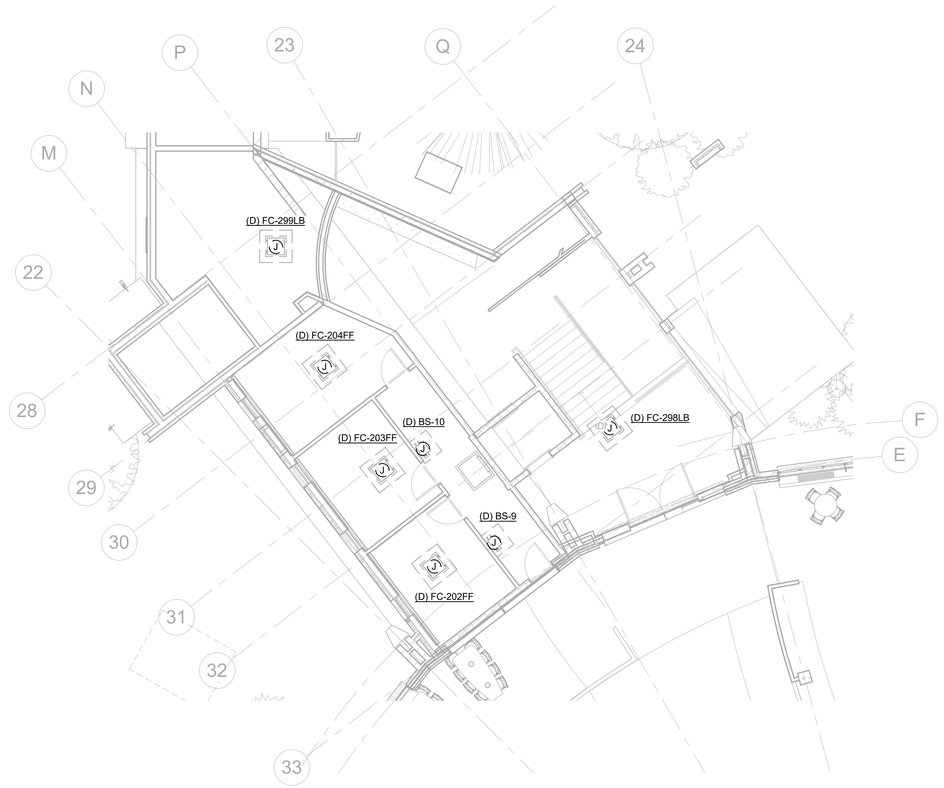
PPA#24-1099

MMI PROJ #: 0747.087

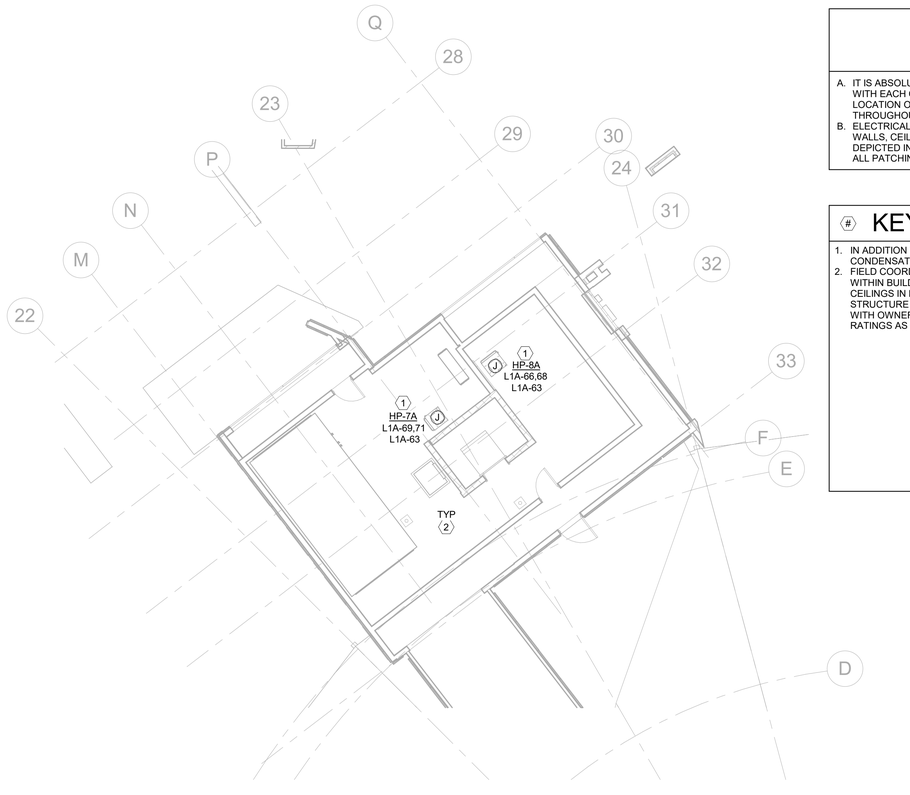
SHEET TITLE
LOWER LEVEL - ELECTRICAL FLOOR PLAN

SHEET
E1.0

DATE
10/20/2025



1 MAIN LEVEL - ELECTRICAL DEMOLITION PLAN
1/8" = 1'-0"



2 MECHANICAL PENTHOUSE - ELECTRICAL FLOOR PLAN
1/8" = 1'-0"

ELECTRICAL DEMO NOTES

A. IT IS ABSOLUTELY NECESSARY FOR ALL TRADES INVOLVED TO COORDINATE WITH EACH OTHER AND VERIFY THAT THERE ARE NO CONFLICTS IN LOCATION OF DUCTS, CONDUITS, DIFFUSERS, BOXES, AND OTHER ITEMS THROUGHOUT THIS PROJECT BEFORE FINAL PLACEMENT OF MATERIALS.
B. ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR ALL CUTTING OF FLOORS, WALLS, CEILINGS, AND ROOFS TO PERFORM THE REQUIRED WORK DEPICTED IN THESE DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE FOR ALL PATCHING OF HOLES TO THE SATISFACTION OF THE ARCHITECT/ENGINEER.
C. DASHED EQUIPMENT, FIXTURES AND DEVICES SHOWN BLACK, OR BLACK AND DASHED WITH A '(D)' ARE EXISTING FOR DEMO, AND ITEMS IN GRAY AND SOLID ARE EXISTING TO REMAIN, UNLESS SPECIFICALLY NOTED OTHERWISE.
D. ALL ITEMS NOTED FOR DEMO SHALL BE COMPLETELY DEMO'D, INCLUDING DISCONNECTS, CONDUIT AND CONDUCTORS BACK TO SOURCE, UNLESS SPECIFICALLY NOTED OTHERWISE.
E. NOT ALL EXISTING DEVICE LOCATIONS HAVE BEEN VERIFIED OR SHOWN ON THESE PLANS. THE CONTRACTOR SHALL FIELD-VERIFY EXISTING CONDITIONS, PRIOR TO BID.

POWER PLAN GENERAL NOTES

A. IT IS ABSOLUTELY NECESSARY FOR ALL TRADES INVOLVED TO COORDINATE WITH EACH OTHER AND VERIFY THAT THERE ARE NO CONFLICTS IN LOCATION OF DUCTS, CONDUITS, DIFFUSERS, BOXES, AND OTHER ITEMS THROUGHOUT THIS PROJECT BEFORE FINAL PLACEMENT OF MATERIALS.
B. ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR ALL CUTTING OF FLOORS, WALLS, CEILINGS, AND ROOFS TO PERFORM THE REQUIRED WORK DEPICTED IN THESE DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE FOR ALL PATCHING OF HOLES TO THE SATISFACTION OF THE ENGINEER.

(#) KEY NOTES:

1. IN ADDITION TO 208V POWER FOR UNIT, ALSO PROVIDE 120V CIRCUIT FOR CONDENSATE PUMP POWER.
2. FIELD COORDINATE ROUTING OF NEW CIRCUITS THROUGH EXISTING SPACES WITHIN BUILDING WITH OWNER. RUN CONDUIT CONCEALED ABOVE ACT CEILINGS IN FINISHED SPACES AND KEEP CONDUIT TIGHT TO CEILING STRUCTURE IN BACK-OF-HOUSE SPACES. COORDINATE ACCESS TO SPACES WITH OWNER. FOR ALL NEW PENETRATIONS, MAINTAIN EXISTING WALL RATINGS AS APPLICABLE.

8' 4' 0' 8' 16'
SCALE : 1/8" = 1'-0"

100% BID DOCUMENTS

MILLER DINING AUXILIARIES OFFICES HVAC UPGRADES

MONTANA STATE UNIVERSITY BOZEMAN

MONTANA STATE UNIVERSITY

Morrison Maierle
engineers - surveyors - planners - scientists

DRAWN BY: CDC		
REVIEWED BY: RPM		
REV.	DESCRIPTION	DATE

MONTANA
RYAN P. MAROney
No. 49006 PE
LICENSED PROFESSIONAL ENGINEER

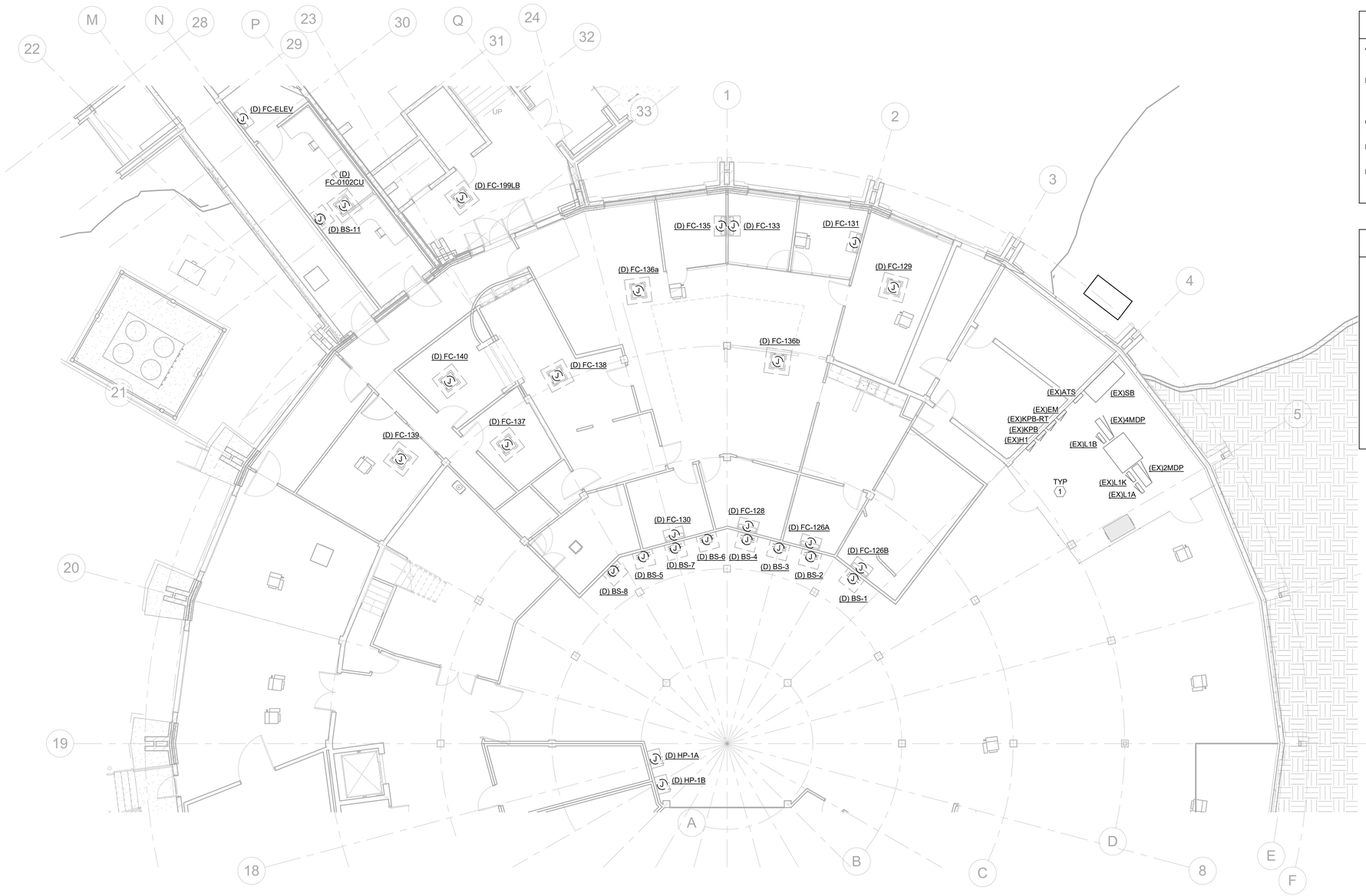
PPA#24-1099

MMI PROJ #: 0747.087

SHEET TITLE
MAIN LEVEL & PENTHOUSE - ELECTRICAL PLAN

SHEET
E1.1

DATE
10/20/2025



1 LOWER LEVEL - ELECTRICAL DEMOLITION PLAN
1/8" = 1'-0"

ELECTRICAL DEMO NOTES

A. IT IS ABSOLUTELY NECESSARY FOR ALL TRADES INVOLVED TO COORDINATE WITH EACH OTHER AND VERIFY THAT THERE ARE NO CONFLICTS IN LOCATION OF DUCTS, CONDUITS, DIFFUSERS, BOXES, AND OTHER ITEMS THROUGHOUT THIS PROJECT BEFORE FINAL PLACEMENT OF MATERIALS.
B. ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR ALL CUTTING OF FLOORS, WALLS, CEILINGS, AND ROOFS TO PERFORM THE REQUIRED WORK DEPICTED IN THESE DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE FOR ALL PATCHING OF HOLES TO THE SATISFACTION OF THE ARCHITECT/ENGINEER.
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D. ALL ITEMS NOTED FOR DEMO SHALL BE COMPLETELY DEMO'D, INCLUDING DISCONNECTS, CONDUIT AND CONDUCTORS BACK TO SOURCE, UNLESS SPECIFICALLY NOTED OTHERWISE.
E. NOT ALL EXISTING DEVICE LOCATIONS HAVE BEEN VERIFIED OR SHOWN ON THESE PLANS. THE CONTRACTOR SHALL FIELD-VERIFY EXISTING CONDITIONS, PRIOR TO BID.

(#) KEY NOTES:

1. FOLLOWING DEMOLITION, UPDATE EXISTING PANEL SCHEDULE(S) WITHIN EXISTING PANELBOARD(S) AS REQUIRED. FOR CIRCUITS WHICH WERE DEMOLISHED IN THEIR ENTIRETY, MARK ASSOCIATED CIRCUIT BREAKER(S) AS 'SPARE'.

N

8' 4' 0' 8' 16'
SCALE : 1/8" = 1'-0"

100% BID DOCUMENTS

MILLER DINING AUXILIARIES
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MONTANA STATE UNIVERSITY
BOZEMAN

MONTANA STATE UNIVERSITY

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engineers - surveyors - planners - scientists

DRAWN BY: CDC		
REVIEWED BY: RPM		
REV.	DESCRIPTION	DATE

MONTANA
RYAN P. MAROney
No. 60006 PE
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PPA#24-1099

MMI PROJ #: 0747.087

SHEET TITLE
LOWER LEVEL - ELECTRICAL DEMOLITION PLAN

SHEET
ED1.0

DATE
10/20/2025