Red Rocks Community College

BAS Controls Mitigation
2026-041M25

100% CD

November 3, 2026

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11/03/2026
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TITLE

Red Rocks Community College - Controls Upgrades
13300 W. 6th Ave, Lakewood, CO. 80228

DRAWING TITLE

COVER SHEET

REVISIONS:

100% CD

Date: 11/03/2026
DRAWN BY: Author
CHECKED BY: Checker
JOB NO: 2025-477

SHEET NO.

COVER

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GENERAL LEGEND
(Not all symbols listed below are used on these drawings)

ABBR.	SYMBOL	DESCRIPTION	ABBR.	SYMBOL	DESCRIPTION
	X / X-X	SECTION DESIGNATION SECTION CUT ON THIS SHEET			CAP END OF PIPE
				SLOPE	PITCH DOWN IN DIRECTION OF ARROW
					PIPE ANCHOR
	X / X-X	VIEW REFERENCE DESIGNATION VIEW REFERENCE ON THIS SHEET			PIPE ALIGNMENT GUIDE
					UNION OR FLANGE
	1-2.3	EQUIPMENT UNIT IDENTIFICATION EQUIPMENT UNIT NUMBER (UNIT SERVED - FLOOR - SEQUENCE #)			CONCENTRIC PIPE REDUCER
					ECCENTRIC PIPE REDUCER
	A 10 / 250	DIFFUSER IDENTIFICATION DIFFUSER NECK DIAMETER DIFFUSER CFM	PRV	PSV	PRESSURE REDUCING VALVE
			PTRV	P/T	PRESSURE AND/OR TEMPERATURE RELIEF VALVE
	E 8x24"L / 9999	LINEAR DIFFUSER IDENTIFICATION LINEAR DIFFUSER NECK DIAMETER LINEAR DIFFUSER LENGTH LINEAR DIFFUSER CFM			ISOLATION VALVE (RE: SPEC FOR TYPE)
					VERTICAL PIPE VALVE
			CV		CHECK VALVE
	2'-6" / 3'-0" FTR / 28	FINNED TUBE RADIATOR ACTIVE ELEMENT LENGTH EQUIPMENT UNIT IDENTIFICATION EQUIPMENT UNIT NUMBER RADIATOR ENCLOSURE LENGTH (OR W-W=WALL-TO-WALL)			SOLENOID / MOTORIZED VALVE
					SOLENOID VALVE
					HOSE END DRAIN VALVE
	X	KEY NOTE REFERENCE	P/T	P/T	PRESSURE / TEMPERATURE TAP
	T	KITCHEN/OWNER/MEDICAL EQUIPMENT REFERENCE			STRAINER
		TYPICAL ROOM REFERENCE (TOP = RM #, BOTTOM = FLR)			STRAINER W/ BLOWDOWN
		POINT OF CONNECTION, NEW TO EXISTING			BRAIDED FLEXIBLE PIPE CONNECTOR
		POINT OF DISCONNECTION, DEMO			DOUBLE-BOWL FLEXIBLE PIPE CONNECTOR
		DIRECTION OF FLOW IN PIPE			THERMOMETER
		DUCTWORK, PIPING AND EQUIPMENT TO BE REMOVED			PRESSURE GAUGE
(E)		EXISTING			SIGHT GLASS
(N)		NEW	C.A.P.		CEILING ACCESS PANEL
(R)		RELOCATED			PUMP
(F)		FUTURE	TB		THRUST BLOCK
DIA	Ø	DIAMETER	MAV		MANUAL AIR VENT
WAD		WALL ACCESS DOOR	AAV		AUTOMATIC AIR VENT
NIC		NOT IN CONTRACT			
AFF		ABOVE FINISHED FLOOR			
GC		GENERAL CONTRACTOR			
MC		MECHANICAL CONTRACTOR			
EC		ELECTRICAL CONTRACTOR			
UNO		UNLESS NOTED OTHERWISE			
C		COMMON			
NC		NORMALLY CLOSED			
NO		NORMALLY OPEN			

DOUBLE/SINGLE LINE DUCT LEGEND
(Not all symbols listed below are used on these drawings)

SINGLE LINE	DOUBLE LINE	SINGLE LINE	DOUBLE LINE	SINGLE LINE	DOUBLE LINE	SINGLE LINE	DOUBLE LINE
45° TEE (ROUND)		90° TEE (RECTANGULAR)		FLEX DUCT		90° RADIUS ELBOW	
45° TEE (RECTANGULAR)		90° TEE (ROUND)		MANUAL VOLUME DAMPER		90° ELBOW	
DUCT SPLIT		GRD RUNOUT		REDUCER		45° ELBOW	

HVAC LEGEND
(Not all symbols listed below are used on these drawings)

ABBR.	SYMBOL	DESCRIPTION	ABBR.	SYMBOL	DESCRIPTION
HWS	HWS	HEATING WATER SUPPLY PIPING			SUPPLY DUCT UP / DOWN
HWR	HWR	HEATING WATER RETURN PIPING			RETURN DUCT UP / DOWN
HTWS	HTWS	HIGH TEMPERATURE HEATING WATER SUPPLY PIPING			EXHAUST DUCT UP / DOWN
HTWR	HTWR	HIGH TEMPERATURE HEATING WATER RETURN PIPING			ROUND DUCT UP / ROUND DUCT DOWN
CHWS	CHWS	CHILLED WATER SUPPLY PIPING	48F12		FLAT OVAL DUCTWORK
CHWR	CHWR	CHILLED WATER RETURN PIPING			FLEXIBLE DUCT CONNECTION
D	D	COOLING COIL DRAIN PAN PIPING	BDD		BACKDRAFT DAMPER
CWS	CWS	CONDENSER WATER SUPPLY PIPING	TCD		TEMP. CONTROL DAMPER-OPPOSED BLADE
CWR	CWR	CONDENSER WATER RETURN PIPING	TCD		TEMP. CONTROL DAMPER- PARALLEL BLADE
GHWS	GHWS	GLYCOL HEATING WATER SUPPLY PIPING	MVD		MANUAL VOLUME DAMPER
GHWR	GHWR	GLYCOL HEATING WATER RETURN PIPING	MD		DUCT MOTORIZED DAMPER
PCWS	PCWS	PROCESS CHILLED WATER SUPPLY PIPING			CONICAL FITTING WITH MVD
PCWR	PCWR	PROCESS CHILLED WATER RETURN PIPING			SPIN-IN FITTING WITH MVD
LPS	LPS	LOW PRESSURE STEAM SUPPLY PIPING (0 - 15#)	FD		DUCT FIRE DAMPER
LPC	LPC	LOW PRESSURE CONDENSATE RETURN PIPING	FSD		COMBINATION DUCT FIRE/SMOKE DAMPER
MPS	MPS	MEDIUM PRESSURE STEAM SUPPLY PIPING (16# - 60#)	SD		DUCT SMOKE DAMPER
MPC	MPC	MEDIUM PRESSURE CONDENSATE RETURN PIPING			DUCT SMOKE DETECTOR
HPS	HPS	HIGH PRESSURE STEAM SUPPLY PIPING (61# - 125#)	DAD		DUCT ACCESS DOOR
HPC	HPC	HIGH PRESSURE CONDENSATE RETURN PIPING			TURNING VANES IN DUCT ELBOW
PC	PC	PUMPED CONDENSATE PIPING			
BBD	BBD	BOILER BLOWDOWN PIPING	EP		ELECTRIC-PNEUMATIC CONTROL VALVE
BF	BF	BOILER FEED WATER PIPING	PE		PNEUMATIC-ELECTRIC CONTROL SWITCH
RL	RL	REFRIGERANT LIQUID PIPING		S / ES	WALL SWITCH / EMERGENCY SWITCH
RS	RS	REFRIGERANT SUCTION PIPING		TS	TEMPERATURE SENSOR
RHG	RHG	REFRIGERANT HOT GAS PIPING		T	WALL MOUNTED THERMOSTAT
ERS	ERS	ENERGY RECOVERY SUPPLY PIPING		CO2	WALL MOUNTED CARBON DIOXIDE SENSOR
ERR	ERR	ENERGY RECOVERY RETURN PIPING		O	WALL MOUNTED OXYGEN SENSOR
TT	TT	THERMOSTATIC STEAM TRAP		H	HUMIDISTAT
F&T	F&T	FLOAT AND THERMOSTATIC STEAM TRAP			UNIT MOUNTED THERMOSTAT
IBT	IBT	INVERTED BUCKET STEAM TRAP		P / PM	PRESSURE SENSOR / PRESSURE MONITOR
TCV		(2 OR 3-WAY) TEMPERATURE CONTROL VALVE		U	UNDERCUT DOOR
		VENTURI METER		L	LOUVER IN DOOR
BV		CALIBRATED BALANCING VALVE		RISE	DUCT RISE
AFV		AUTO FLOW VALVE		DROP	DUCT DROP
RSV		REFRIGERANT SERVICE VALVE	A.L.		ACOUSTICALLY LINED DUCTWORK
DPS	DP	DIFFERENTIAL PRESSURE SWITCH	TCOAD		TEMPERATURE CONTROL OUTSIDE AIR DAMPER
FS		FLOW SWITCH	TCRAD		TEMPERATURE CONTROL RETURN AIR DAMPER
EJ		EXPANSION JOINT	TCEAD		TEMPERATURE CONTROL EXHAUST AIR DAMPER
BJ		BALL JOINT EXPANSION COMPENSATOR	SP IN WC		STATIC PRESSURE IN INCHES WATER COLUMN
SA		SUPPLY AIR	EOMD		END OF MAIN DRIP
RA		RETURN AIR	SCCR		SHORT CIRCUIT CURRENT RATING
EA		EXHAUST AIR	SD		SUPPLY AIR DEVICE
OA		OUTSIDE AIR	RG		RETURN AIR DEVICE
			RG		RETURN AIR DEVICE WITH SOUND BOOT
			EG		EXHAUST AIR DEVICE

BAS CONTROL LEGEND & NOTES
(Not all symbols listed below are used on these drawings)

ABBR.	SYMBOL	DESCRIPTION
D.I.	D.I.	DIGITAL INPUT
D.O.	D.O.	DIGITAL OUTPUT
A.I.	A.I.	ANALOG INPUT
A.O.	A.O.	ANALOG OUTPUT

GENERAL NOTES:
1. THE TEMPERATURE CONTROL MATRIX, CONTROL DIAGRAMS, AND THE SEQUENCE OF OPERATIONS ARE ALL BINDING AND COMPLEMENTARY. IF THERE IS A DISCREPANCY BETWEEN THEM, THE WORST CASE SCENARIO SHALL BE USED FOR BIDDING PURPOSES. ADDITIONAL COSTS WILL NOT BE ALLOWED FOR DISCREPANCIES BETWEEN THE SPECIFICATIONS AND THE DRAWINGS.
2. IN ADDITION TO THE DDC POINTS LISTED, THE CONTRACTOR SHALL CAREFULLY REVIEW ALL DRAWINGS, ALL SPECIFICATIONS, AND ALL SEQUENCES OF OPERATION. THE DOCUMENTS ARE ALL INCLUSIVE AND COMPLIMENTARY TO EACH OTHER. THE PROJECT SHALL INCLUDE ANY AND ALL NECESSARY DDC POINTS TO SUPPORT THE REQUIREMENTS OF ALL THE DOCUMENTS.
3. ALWAYS REFER TO DRAWINGS FOR QUANTITY.
4. PROVIDE OPEN PROTOCOL COMMUNICATION WITH FACTORY SUPPLIED CONTROLLER.
5. BAS CONTRACTOR SHALL COORDINATE STATUS LEVEL FOR EACH ALARM POINT WITH THE OWNER TO DETERMINE WHICH ONES REQUIRE IMMEDIATE ATTENTION.
6. IF THERE IS A DISCREPANCY BETWEEN ANY DOCUMENTATION, THE WORST CASE SCENARIO SHALL BE USED FOR BIDDING PURPOSES. ADDITIONAL COSTS WILL NOT BE ALLOWED FOR DISCREPANCIES BETWEEN THE SPECIFICATIONS AND DRAWINGS.

UNLESS NOTED OTHERWISE ALL SCHEDULED DATA IS LISTED AT ELEVATION 5000 FT

PROJECT SCOPE NOTES:

1. THIS PROJECT CONSISTS OF UPGRADING THE EXISTING PNEUMATIC HVAC CONTROL SYSTEM TO A NEW DIRECT DIGITAL CONTROL (DDC) SYSTEM. WORK INCLUDES REMOVAL AND REPLACEMENT OF PNEUMATIC CONTROL DEVICES AND ASSOCIATED COMPONENTS SERVING VAV BOXES, REHEAT CONTROL VALVES, PERIMETER HEAT CONTROL VALVES, FAN COIL UNITS, CABINET UNIT HEATERS, CONDENSER WATER ISOLATION VALVES, AND HEATING WATER MIXING VALVES, AND REPLACEMENT OF FAN COIL UNITS.
2. THE NEW DDC SYSTEM WILL PROVIDE IMPROVED CONTROL ACCURACY, MONITORING, AND INTEGRATION WITH THE BUILDING AUTOMATION SYSTEM (BAS). SCOPE INCLUDES NEW ELECTRONIC ACTUATORS, CONTROLLERS, SENSORS, CONTROL WIRING, PROGRAMMING, GRAPHICS INTEGRATION, TESTING, AND COMMISSIONING TO ENSURE PROPER SYSTEM OPERATION.
3. PROJECT ADD ALTERNATES:
   A. ADD ALTERNATE #1: KITCHEN FAN COIL UNITS
      a. BASE SCOPE: EXISTING FAN COIL UNITS ARE UPGRADED TO DDC CONTROL. PROVIDE NEW DDC THERMOSTAT FOR EACH FAN COIL UNIT.
      b. ADD ALTERNATE #1: REPLACE EXISTING FAN COIL UNIT WITH NEW UNIT AS SCHEDULED ON THE PLANS. REMOVE ALL ASSOCIATED PNEUMATIC TUBING. RECONNECT EXISTING HEATING WATER, CHILLED WATER AND DRAIN PIPING TO NEW FAN COIL UNIT.
   B. ADD ALTERNATE #2: BASEBOARD CONTROL VALVES
      a. BASE SCOPE: EXISTING BASEBOARD CONTROL VALVES AND ASSOCIATED THERMOSTATS TO REMAIN AS PNEUMATIC.
      b. ADD ALTERNATE #1: REPLACE EXISTING PNEUMATIC BASEBOARD CONTROL VALVES WITH NEW DDC CONTROL VALVES AND THERMOSTATS.

GENERAL NOTES:

1. WORK INCLUDED IN THE CONTRACT IS DENOTED IN BOLD. EXISTING CONDITIONS TO REMAIN ARE DENOTED LIGHTLY.
2. A DETAILED METHOD OF PROCEDURE IS REQUIRED WHEN A CONSTRUCTION ACTIVITY AFFECTS THE SAFETY OF THE OCCUPANTS, OWNER'S EQUIPMENT OR VALUABLE CONTENTS OR ANY SYSTEM WHICH SUPPORTS THESE SYSTEMS, OR ESSENTIALLY AFFECTS THE BUILDING MANAGEMENT, OPERATIONS OR SECURITY.
3. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFICATION OF ALL EXISTING CONDITIONS PRIOR TO COMMENCEMENT OF ANY WORK AND SHALL NOTIFY THE ENGINEER/ARCHITECT OF ANY DISCREPANCIES FOR RESOLUTION.
4. COORDINATE WORK WITH ALL TRADES.
5. COORDINATE ALL DUCTWORK AND PIPING WITH EQUIPMENT, STRUCTURE, ETC.
6. CONTRACTOR SHALL NOT SHUT DOWN / TAKE OUT OF SERVICE ANY SYSTEMS WITHOUT FIRST COORDINATING WITH OWNER AND PREPARING M.O.P.
7. DRAWINGS AND SPECIFICATIONS ARE COMPLEMENTARY. WHATEVER IS CALLED FOR IN EITHER IS BINDING AS THOUGH CALLED FOR IN BOTH. REPORT ANY DISCREPANCIES TO THE ENGINEER AND OBTAIN WRITTEN INSTRUCTIONS BEFORE PROCEEDING. WHERE ANY CONTRADICTIONS OCCUR BETWEEN THE SPECIFICATIONS AND THE DRAWINGS THE MORE STRINGENT REQUIREMENT SHALL APPLY. THE CONTRACTOR SHALL INCLUDE PRICING FOR THE MORE STRINGENT AND EXPENSIVE REQUIREMENTS.

DEMOLITION GENERAL NOTES:

1. EXISTING ITEMS TO REMAIN ARE DENOTED LIGHTLY UNLESS OTHERWISE NOTED. ALL ITEMS SHOWN DASHED & BOLD SHALL BE REMOVED UNLESS OTHERWISE NOTED.
2. CONTRACTOR SHALL NOT SHUT-OFF OR PUT-OUT OF SERVICE ANY SYSTEMS OR SERVICE WITHOUT FIRST COORDINATING WITH THE OWNER.
3. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VISIT THE SITE AND UNDERSTAND THE EXTENT OF THE REMODEL WORK REQUIRED PRIOR TO BID. NO EXTRAS WILL BE ALLOWED FOR WORK REQUIRED TO ACHIEVE THE END RESULT AS INDICATED BY THE CONTRACT DOCUMENT.
4. CONTRACTOR SHALL DETERMINE AND COORDINATE THE EXACT EXTENT OF DEMOLITION TO FACILITATE ALL WORK INDICATED BY THE CONTRACT DOCUMENT.
5. PRIOR TO COMMENCEMENT OF ANY DEMOLITION WORK, VERIFY EXISTING CONDITIONS AND NOTIFY ENGINEER OF ANY DISCREPANCIES FOR RESOLUTION.
6. ALL ITEMS IDENTIFIED TO BE REMOVED SHALL BE REMOVED IN THEIR ENTIRETY UNLESS OTHERWISE NOTED. REMOVED ITEMS SHALL BE TURNED OVER TO THE OWNER UNLESS OTHERWISE NOTED AND STORED IN THE AREA DESIGNATED BY THE OWNER. REMOVE FROM SITE AND LEGALLY DISPOSE OF ALL ITEMS THE OWNER CHOOSES NOT TO ACCEPT.
7. WHERE EXISTING PIPING, T.C. TUBING/WIRING ETC. ARE TO BE REMOVED FROM WALLS WHICH ARE REMAINING, THE WALLS SHALL BE REPAIRED TO MATCH ORIGINAL CONDITIONS.
8. WHERE EXISTING PIPING TO BE REMOVED PASSES THROUGH FLOORS, THEY SHALL BE CUT BACK TO WITHIN CONCRETE AND FILLED WITH GROUT TO ACHIEVE A SMOOTH AND EVEN FINISH WITH CONCRETE SURFACE.
9. REMOVE ALL EXISTING PNEUMATIC TUBING SERVING DEVICES WITHIN THE PROJECT SCOPE.

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TITLE

Red Rocks Community College - Controls Upgrades
13300 W. 6th Ave, Lakewood, CO. 80228

DRAWING TITLE

MECHANICAL LEGENDS & NOTES

REVISIONS:

100% CD

Date: 11/03/2026
DRAWN BY: DI
CHECKED BY: AA
JOB NO: 2025-477

SHEET NO.

M-001

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FAN COIL SCHEDULE

REMARKS:

1. REFER TO ELECTRICAL DRAWINGS FOR POWER REQUIREMENTS, INCLUDING COORDINATION OF VOLTAGE, PHASE, SCCR, WIRE SIZES, AND OVERCURRENT PROTECTIVE DEVICES. REFER TO ELECTRICAL ONE-LINE DIAGRAM FOR MINIMUM FAULT CURRENT RATING THAT EACH UNIT SHALL EXCEED. UNIT NAMEPLATE SHALL INDICATE THE SHORT CIRCUIT CURRENT RATING.
2. EXTERNAL STATIC PRESSURE DOES NOT INCLUDE UNIT CASING, FILTERS OR COILS.
3. SUPPLY AIR CFM LISTED IS FOR MEDIUM SPEED SETTING.
4. AS CLEARANCE FOR BOTTOM ACCESS REMOVAL IS NOT AVAILABLE OR SEVERELY RESTRICTED.
5. FINAL GPM SHALL BE DETERMINED DURING BALANCING TO FLOW RATES IN LISTED PRODUCT DATA SUBMITTALS, BUT IN NO CASE SHALL BE LOWER THAN 0.5 GPM.
6. REFER TO MECHANICAL LEGENDS AND NOTES SHEET FOR PROJECT ELEVATION.
7. PROVIDE INTEGRAL CONDENSATE PUMP FOR EACH UNIT.
8. ADD ALTERNATE #1

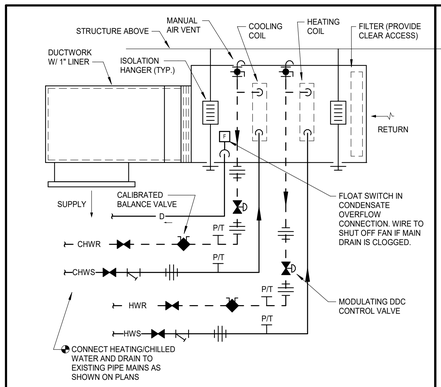
DESIG.							FAN DATA					COOLING COIL DATA											HEATING COIL DATA							FILTER DATA				SIZE (INCHES)					
								MOTOR				EAT		LAT		MBH			WATER					WATER														
NAME	NO.	MFR	MODEL	ARRANG.	AREA SERVED	ESP IN. W.C.	CFM AT ELEV	TYPE (ECM/PSC)	HP	VOLTAGE	PHASE	°F DB	°F WB	°F DB	°F WB	SENS	TOTAL	REFRIG COIL (YES/NO)	EWT (°F)	LWT (°F)	GPM	PROP GLYCOL %	WPD (FT WC)	EAT °F DB	LAT °F DB	MBH	EWT (°F)	LWT (°F)	GPM	PROP GLYCOL %	WPD (FT WC)	FLAT OR VEE ARRANG	TYPE	MERV-A	INCHES THICK	L	W	H	OPER WT (LBS)	CONTROL	REMARKS
FCU	1	MODINE	SCW 08	CEILING CASSETTE	CORRIDOR	0.00	300	ECM	0.125	277	1	75	62	52	50	3.7	5.0	No	45	55	1.5	0%	9.90	70	132	13.4	180	160	1.3	0%	4.20	FLAT	PLEATED	8	1	30	25	13	45	BAS	1-7
FCU	2	MODINE	SCW 08	CEILING CASSETTE	CORRIDOR	0.00	300	ECM	0.125	277	1	75	62	52	50	3.7	5.0	No	45	55	1.5	0%	9.90	70	132	13.4	180	160	1.3	0%	4.20	FLAT	PLEATED	8	1	30	25	13	45	BAS	1-7
FCU	3	MODINE	SCW 08	CEILING CASSETTE	CORRIDOR	0.00	300	ECM	0.125	277	1	75	62	52	50	3.7	5.0	No	45	55	1.5	0%	9.90	70	132	13.4	180	160	1.3	0%	4.20	FLAT	PLEATED	8	1	30	25	13	45	BAS	1-7
FCU	4	MODINE	SCW 08	CEILING CASSETTE	CORRIDOR	0.00	300	ECM	0.125	277	1	75	62	52	50	3.7	5.0	No	45	55	1.5	0%	9.90	70	132	13.4	180	160	1.3	0%	4.20	FLAT	PLEATED	8	1	30	25	13	45	BAS	1-7
FCU	5	MODINE	SCW 08	CEILING CASSETTE	CORRIDOR	0.00	300	ECM	0.125	277	1	75	62	52	50	3.7	5.0	No	45	55	1.5	0%	9.90	70	132	13.4	180	160	1.3	0%	4.20	FLAT	PLEATED	8	1	30	25	13	45	BAS	1-7
FCU	6	MODINE	SCW 08	CEILING CASSETTE	CORRIDOR	0.00	300	ECM	0.125	277	1	75	62	52	50	3.7	5.0	No	45	55	1.5	0%	9.90	70	132	13.4	180	160	1.3	0%	4.20	FLAT	PLEATED	8	1	30	25	13	45	BAS	1-7
FCU	7	MODINE	SCW 08	CEILING CASSETTE	CORRIDOR	0.00	300	ECM	0.125	277	1	75	62	52	50	3.7	5.0	No	45	55	1.5	0%	9.90	70	132	13.4	180	160	1.3	0%	4.20	FLAT	PLEATED	8	1	30	25	13	45	BAS	1-7
FCU	8	MODINE	SCW 08	CEILING CASSETTE	CORRIDOR	0.00	300	ECM	0.125	277	1	75	62	52	50	3.7	5.0	No	45	55	1.5	0%	9.90	70	132	13.4	180	160	1.3	0%	4.20	FLAT	PLEATED	8	1	30	25	13	45	BAS	1-7
FCU	9	MODINE	SCW 08	CEILING CASSETTE	CORRIDOR	0.00	300	ECM	0.125	277	1	75	62	52	50	3.7	5.0	No	45	55	1.5	0%	9.90	70	132	13.4	180	160	1.3	0%	4.20	FLAT	PLEATED	8	1	30	25	13	45	BAS	1-7
FCU	10	IEC	HPY 12	HORIZONTAL CONCEALED	DINING	0.40	1200	ECM	0.6	277	1	78	62	52	51	31.4	46.5	No	45	55	5.9	0%	13.00	65	90	41.0	180	160	4.1	0%	10.00	FLAT	PLEATED	8	1	36	31	16	170	BAS	1-8
FCU	11	IEC	HPY 06	HORIZONTAL CONCEALED	CAFETERIA	0.25	475	ECM	0.6	277	1	78	62	52	51	14.0	17.6	No	45	55	2.8	0%	2.00	65	90	10.7	180	160	1.5	0%	3.00	FLAT	PLEATED	8	1	36	28	16	94	BAS	1-8
FCU	12	IEC	HPY 06	HORIZONTAL CONCEALED	CAFETERIA	0.25	475	ECM	0.6	277	1	78	62	52	51	14.0	17.6	No	45	55	2.8	0%	2.00	65	90	10.7	180	160	1.5	0%	3.00	FLAT	PLEATED	8	1	36	28	16	94	BAS	1-8
FCU	13	IEC	HPY 06	HORIZONTAL CONCEALED	CAFETERIA	0.25	475	ECM	0.6	277	1	78	62	52	51	14.0	17.6	No	45	55	2.8	0%	2.00	65	90	10.7	180	160	1.5	0%	3.00	FLAT	PLEATED	8	1	36	28	16	94	BAS	1-8
FCU	14	IEC	HPY 06	HORIZONTAL CONCEALED	CAFETERIA	0.25	475	ECM	0.6	277	1	78	62	52	51	14.0	17.6	No	45	55	2.8	0%	2.00	65	90	10.7	180	160	1.5	0%	3.00	FLAT	PLEATED	8	1	36	28	16	94	BAS	1-8
FCU	15	IEC	HPY 06	HORIZONTAL CONCEALED	CAFETERIA	0.25	475	ECM	0.6	277	1	78	62	52	51	14.0	17.6	No	45	55	2.8	0%	2.00	65	90	10.7	180	160	1.5	0%	3.00	FLAT	PLEATED	8	1	36	28	16	94	BAS	1-8
FCU	16	IEC	HPY 06	HORIZONTAL CONCEALED	KITCHEN	0.25	475	ECM	0.6	277	1	78	62	52	51	14.0	17.6	No	45	55	2.8	0%	2.00	65	90	10.7	180	160	1.5	0%	3.00	FLAT	PLEATED	8	1	36	28	16	94	BAS	1-8
FCU	17	IEC	HPY 06	HORIZONTAL CONCEALED	KITCHEN	0.25	475	ECM	0.6	277	1	78	62	52	51	14.0	17.6	No	45	55	2.8	0%	2.00	65	90	10.7	180	160	1.5	0%	3.00	FLAT	PLEATED	8	1	36	28	16	94	BAS	1-8
FCU	18	IEC	HPY 06	HORIZONTAL CONCEALED	KITCHEN	0.25	475	ECM	0.6	277	1	78	62	52	51	14.0	17.6	No	45	55	2.8	0%	2.00	65	90	10.7	180	160	1.5	0%	3.00	FLAT	PLEATED	8	1	36	28	16	94	BAS	1-8

AIR COMPRESSOR SCHEDULE

REMARKS:

1. REFER TO ELECTRICAL DRAWINGS FOR POWER REQUIREMENTS, INCLUDING COORDINATION OF VOLTAGE, PHASE, SCCR, WIRE SIZES, AND OVERCURRENT PROTECTIVE DEVICES.
2. PROVIDE COMPLETE PACKAGED SYSTEM INCLUDING ASME RECIEVER, HEATLESS AIR DRYER, AUTO TANK DRAIN.
3. PROVIDE WITH DA40IM HEATLESS DRYER

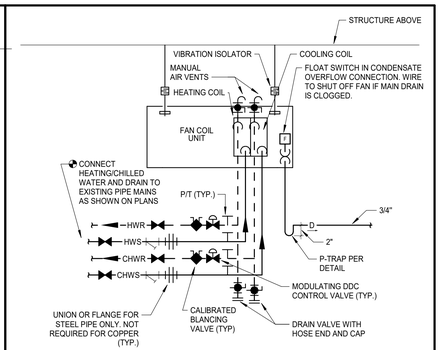
DESIG.						OPPERATING PRESSURE (PSI)	RECEIVER CAPACITY (GAL)	ELECTRICAL					SIZE (INCHES)			OPER. WEIGHT (LBS)	REMARKS
NAME	NO.	MFR.	MODEL	SERVICE	SCFM			NUMBER OF MOTORS	HP EACH	TOTAL HP	VOLTAGE	PHASE	L	W	H		
AC	1	INGERSOLL RAND	2475N5	CONTROL AIR	17	175	80.0	1	5	5	208	3	28	38	69	700	1-4



DUCTED FAN COIL UNIT PIPING DETAIL

SCALE: NONE

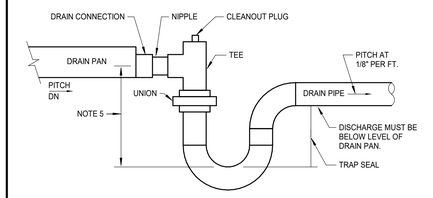
8000-25 3.25.24



DUCTLESS CEILING FAN COIL UNIT PIPING DETAIL

SCALE: NONE

8000-23 3.25.24



NOTES:

1. ALLOW SUFFICIENT SPACE BELOW DRAIN PAN FOR TRAP.
2. PITCH DRAIN FOR PROPER RUN-OFF.
3. MANUALLY PRIME FILL TRAP BEFORE START-UP TO FORM INITIAL DRY SEAL.
4. SUPPORT DRAIN LINES TO PREVENT SAG AND CONDENSATE OVERFLOW.
5. TRAP SEAL MUST BE APPROX. 1-1/2" GREATER THAN STATIC PRESSURE AT SUPPLY AIR PLENUM. (TYPICAL ALL CHILLED WATER COILS)

CONDENSATE DRAIN PIPING DETAIL

SCALE: NONE

8000-19

COLORADO LICENSED JOSEPH A. ANTOL 48424 PE 11/03/2026 PROFESSIONAL ENGINEER Mechanical

CATOR · RUMA & ASSOCIATES, CO.
8061 Teller Street, Lakewood, CO 80403
(303) 232-6374 ● www.catorruma.com

TITLE

Red Rocks Community College - Controls Upgrades

13300 W. 6th Ave, Lakewood, CO. 80228

DRAWING TITLE

MECHANICAL SCHEDULES

REVISIONS:

100% CD

Date: 11/03/2026
DRAWN BY: DI
CHECKED BY: AA
JOB NO: 2025-477

SHEET NO.

M-002

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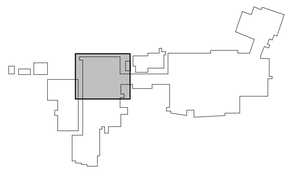
KEYNOTES

M1	EXISTING PNEUMATIC VAV BOX AND REHEAT COIL TO BE CONVERTED TO DDC CONTROL. REMOVE ALL EXISTING PNEUMATIC DEVICES AND ASSOCIATED PNEUMATIC TUBING. RE: CONTROLS SCHEMATICS. BALANCE AIR AND WATER TO THE FLOWS INDICATED ON THE PLANS.
M2	ADD ALTERNATE SCOPE: ADD ALTERNATE #2: REMOVE EXISTING PNEUMATIC CONTROL VALVE IN BASEBOARD AND REPLACE WITH NEW DDC CONTROL VALVE AND ASSOCIATED DDC THERMOSTAT. EXISTING CONTROL VALVE SIZE AND THERMOSTAT LOCATIONTO BE FIELD VERIFIED BY CONTRACTOR. NEW CONTROL VALVES TO MATCH EXISTING LINE SIZES. REMOVE ALL ASSOCIATED PNEUMATIC TUBING. RE: CONTROL SCHEMATICS. BALANCE THE FLOW TO THE GPM SHOWN ON THE PLANS. IF ALTERNATE IS NOT ACCEPTED, EXISTING PNEUMATIC THERMOSTAT IS TO REMAIN.
M3	EXISTING PNEUMATIC THERMOSTAT TO BE REPLACED WITH NEW DDC T-STAT IN THE SAME LOCATION. REMOVE ALL ASSOCIATED PNEUMATIC TUBING. RE: CONTROL SCHEMATICS.



NOTE:
INSTALL NEW CONTROL VALVES AND BALANCE THE HEATING WATER FLOW AND AIR FLOW FOR THE EXISTING VAV BOXES TO THAT INDICATED.



1"
IF LINE DOES NOT MEASURE 1 INCH, DRAWING IS NOT TO SCALE

LOWER LEVEL HVAC PLAN

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

COLORADO LICENSED PROFESSIONAL ENGINEER
JOSEPH ARPE
46424
11/03/2026
Mechanical

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8900 Tabor Street, Lakewood, CO 80401
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TITLE

Red Rocks Community College - Controls Upgrades

13300 W. 6th Ave, Lakewood, CO. 80228

DRAWING TITLE

LOWER LEVEL HVAC PLAN

REVISIONS:

100% CD

Date:	11/03/2026
DRAWN BY:	BS
CHECKED BY:	AA
JOB NO:	2025-477

SHEET NO.

M-10.00

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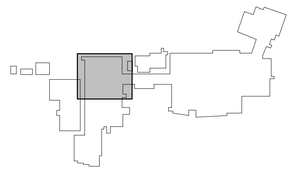
KEYNOTES

M1	EXISTING PNEUMATIC VAV BOX AND REHEAT COIL TO BE CONVERTED TO DDC CONTROL. REMOVE ALL EXISTING PNEUMATIC DEVICES AND ASSOCIATED PNEUMATIC TUBING. RE: CONTROLS SCHEMATICS. BALANCE AIR AND WATER TO THE FLOWS INDICATED ON THE PLANS.
M2	ADD ALTERNATE SCOPE: ADD ALTERNATE #2: REMOVE EXISTING PNEUMATIC CONTROL VALVE IN BASEBOARD AND REPLACE WITH NEW DDC CONTROL VALVE AND ASSOCIATED DDC THERMOSTAT. EXISTING CONTROL VALVE SIZE AND THERMOSTAT LOCATIONTO BE FIELD VERIFIED BY CONTRACTOR. NEW CONTROL VALVES TO MATCH EXISTING LINE SIZES. REMOVE ALL ASSOCIATED PNEUMATIC TUBING. RE: CONTROL SCHEMATICS. BALANCE THE FLOW TO THE GPM SHOWN ON THE PLANS. IF ALTERNATE IS NOT ACCEPTED, EXISTING PNEUMATIC THERMOSTAT IS TO REMAIN.
M3	EXISTING PNEUMATIC THERMOSTAT TO BE REPLACED WITH NEW DDC T-STAT IN THE SAME LOCATION. REMOVE ALL ASSOCIATED PNEUMATIC TUBING. RE: CONTROL SCHEMATICS.
M4	EXISTING DDC THERMOSTAT TO REMAIN.
M5	EXISTING VAV BOX AND REHEAT COIL WITH DDC CONTROL TO REMAIN.
M8	PERFORM TAB MEASUREMENTS ON TERMINAL BOX AND CONNECTED DIFFUSERS AND REPORT READINGS TO ENGINEER. BALANCE EXISTING LINEAR SLOT DIFFUSERS TO EQUAL AIRFLOW AND REBALANCE ASSOCIATED TERMINAL BOX SERVING THEM.



NOTE:
INSTALL NEW CONTROL VALVES AND BALANCE THE HEATING WATER FLOW AND AIR FLOW FOR THE EXISTING VAV BOXES TO THAT INDICATED.



LEVEL 1 HVAC PLAN - WEST WING NORTH

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

1"
IF LINE DOES NOT MEASURE 1 INCH, DRAWING IS NOT TO SCALE

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COLORADO LICENSED JOSEPH A. ANTOLIN 48424 PE 11/03/2026 PROFESSIONAL ENGINEER
Mechanical

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896 Teller Street, Lakewood, CO 80401
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TITLE

Red Rocks Community College - Controls Upgrades
13300 W. 6th Ave, Lakewood, CO. 80228

DRAWING TITLE

LEVEL 1 HVAC PLAN - WEST WING NORTH

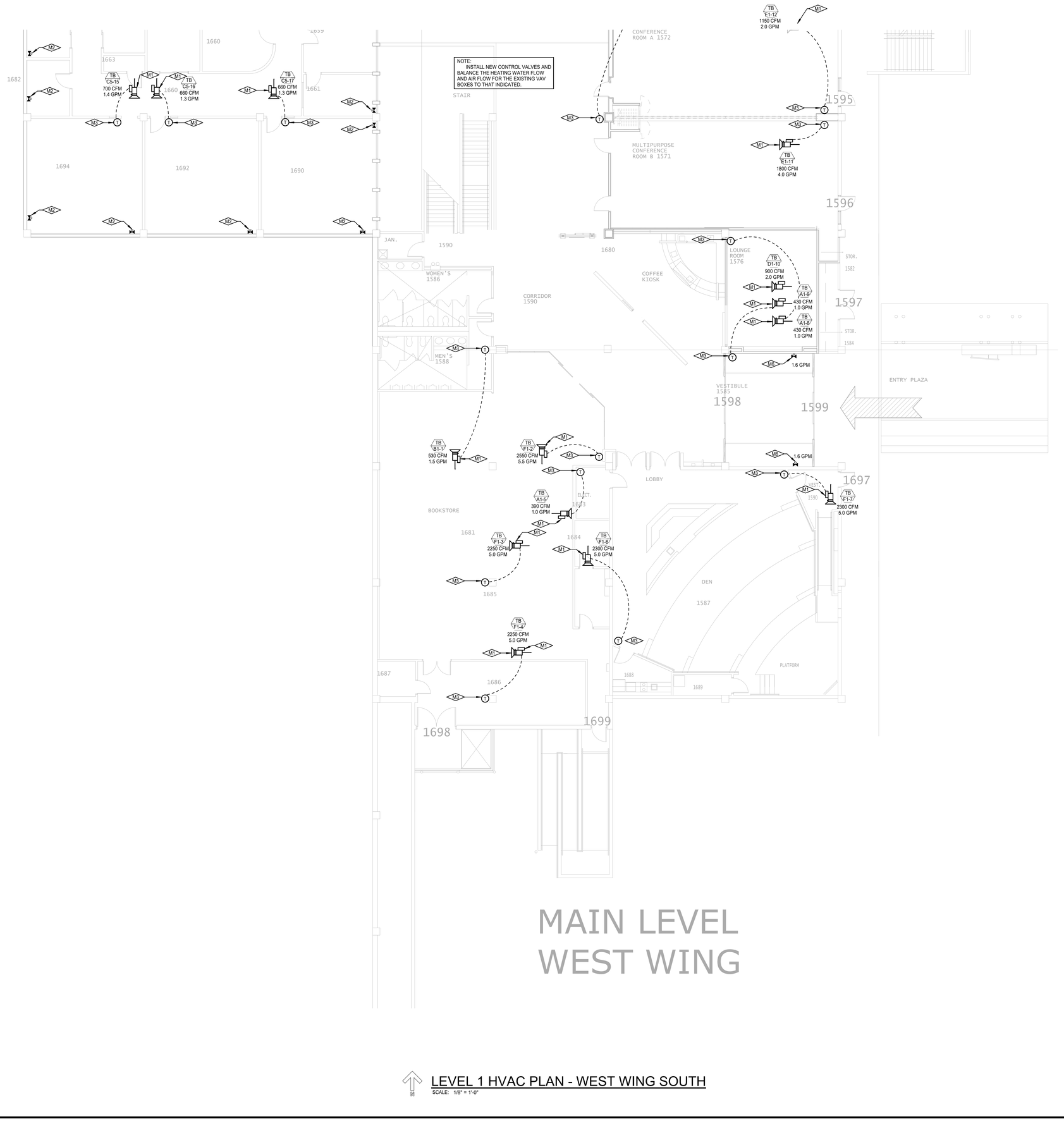
REVISIONS:

100% CD

Date: 11/03/2026
DRAWN BY: DI
CHECKED BY: AA
JOB NO: 2025-477

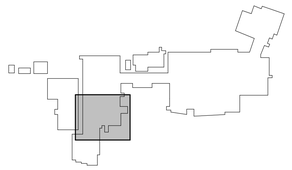
SHEET NO.

M-11.00



KEYNOTES

M1	EXISTING PNEUMATIC VAV BOX AND REHEAT COIL TO BE CONVERTED TO DDC CONTROL. REMOVE ALL EXISTING PNEUMATIC DEVICES AND ASSOCIATED PNEUMATIC TUBING. RE: CONTROLS SCHEMATICS. BALANCE AIR AND WATER TO THE FLOWS INDICATED ON THE PLANS.
M2	ADD ALTERNATE SCOPE: ADD ALTERNATE #2: REMOVE EXISTING PNEUMATIC CONTROL VALVE IN BASEBOARD AND REPLACE WITH NEW DDC CONTROL VALVE AND ASSOCIATED DDC THERMOSTAT. EXISTING CONTROL VALVE SIZE AND THERMOSTAT LOCATIONTO BE FIELD VERIFIED BY CONTRACTOR. NEW CONTROL VALVES TO MATCH EXISTING LINE SIZES. REMOVE ALL ASSOCIATED PNEUMATIC TUBING. RE: CONTROL SCHEMATICS. BALANCE THE FLOW TO THE GPM SHOWN ON THE PLANS. IF ALTERNATE IS NOT ACCEPTED, EXISTING PNEUMATIC THERMOSTAT IS TO REMAIN.
M3	EXISTING PNEUMATIC THERMOSTAT TO BE REPLACED WITH NEW DDC T-STAT IN THE SAME LOCATION. REMOVE ALL ASSOCIATED PNEUMATIC TUBING. RE: CONTROL SCHEMATICS.
M6	REMOVE EXISTING PNEUMATIC CONTROL VALVE IN CABINET UNIT HEATER AND REPLACE WITH NEW DDC CONTROL VALVE. REMOVE ALL ASSOCIATED PIPING. RE: CONTROL SCHEMATICS.



LEVEL 1 HVAC PLAN - WEST WING SOUTH
SCALE: 1/8" = 1'-0"

COLORADO LICENSED
JOSEPH A. ANTOLL
48424
11/03/2026
PROFESSIONAL ENGINEER
Mechanical

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TITLE

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13300 W. 6th Ave, Lakewood, CO. 80228

DRAWING TITLE

LEVEL 1 HVAC PLAN - WEST WING SOUTH

REVISIONS:

100% CD

Date:	11/03/2026
DRAWN BY:	DI
CHECKED BY:	AA
JOB NO:	2025-477

SHEET NO.

M-11.01

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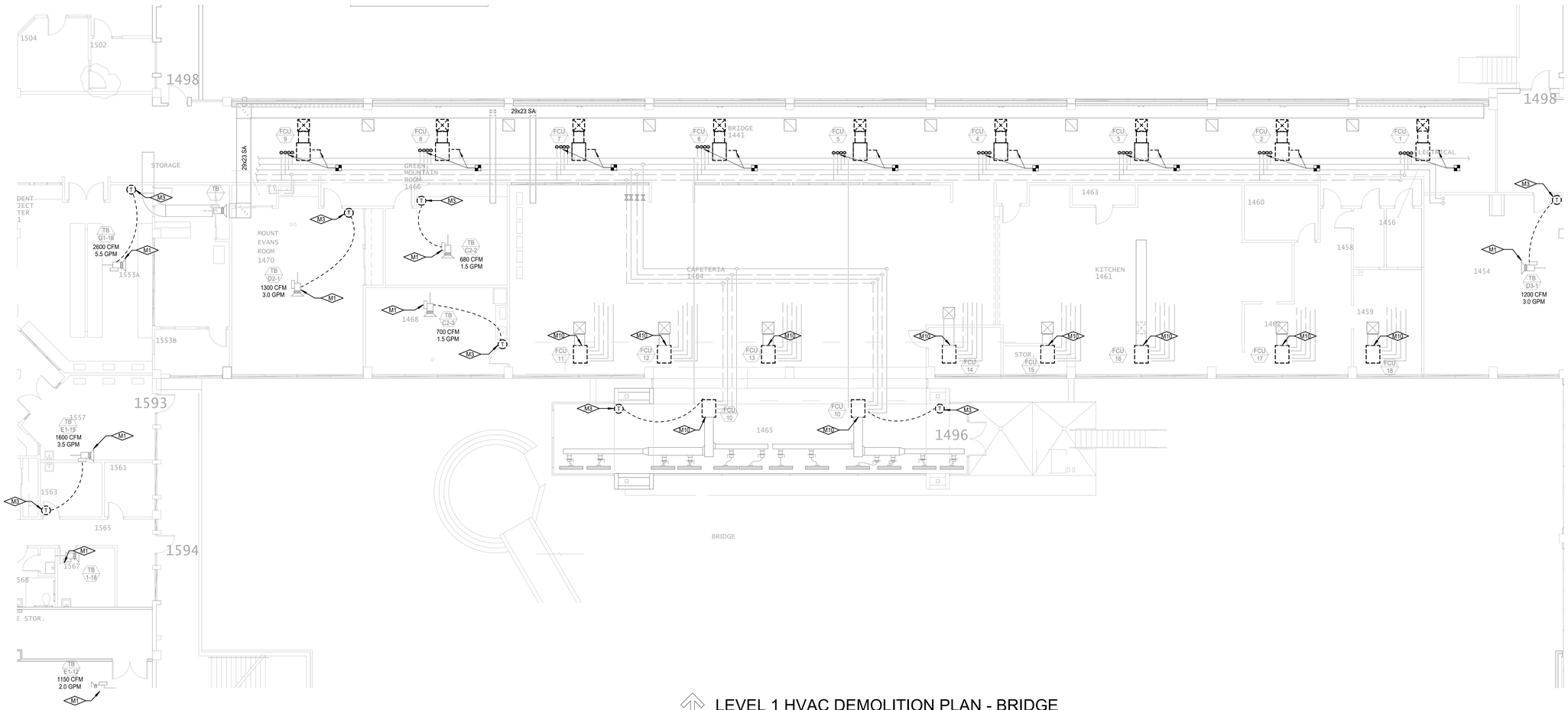
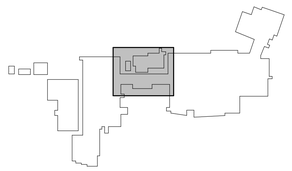
KEYNOTES

M1	EXISTING PNEUMATIC VAV BOX AND REHEAT COIL TO BE CONVERTED TO DDC CONTROL. REMOVE ALL EXISTING PNEUMATIC DEVICES AND ASSOCIATED PNEUMATIC TUBING. RE: CONTROLS SCHEMATICS. BALANCE AIR AND WATER TO THE FLOWS INDICATED ON THE PLANS.
M3	EXISTING PNEUMATIC THERMOSTAT TO BE REPLACED WITH NEW DDC T-STAT IN THE SAME LOCATION. REMOVE ALL ASSOCIATED PNEUMATIC TUBING. RE: CONTROL SCHEMATICS.
M10	EXISTING FAN COIL TO BE DEMOLISHED. REMOVE ALL EXISTING THERMOSTAT, PNEUMATIC DEVICES AND ASSOCIATED PNEUMATIC TUBING. RE: CONTROLS SCHEMATICS.



LEVEL 1 HVAC DEMOLITION PLAN - BRIDGE

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



1"

IF LINE DOES NOT MEASURE 1 INCH, DRAWING IS NOT TO SCALE

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COLORADO LICENSED PROFESSIONAL ENGINEER
PAUL JOSEPH KAPER
46424
11/03/2026
Mechanical

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Red Rocks Community College - Controls Upgrades

13300 W. 6th Ave, Lakewood, CO. 80228

DRAWING TITLE

LEVEL 1 HVAC DEMOLITION PLAN - BRIDGE

REVISIONS:

100% CD

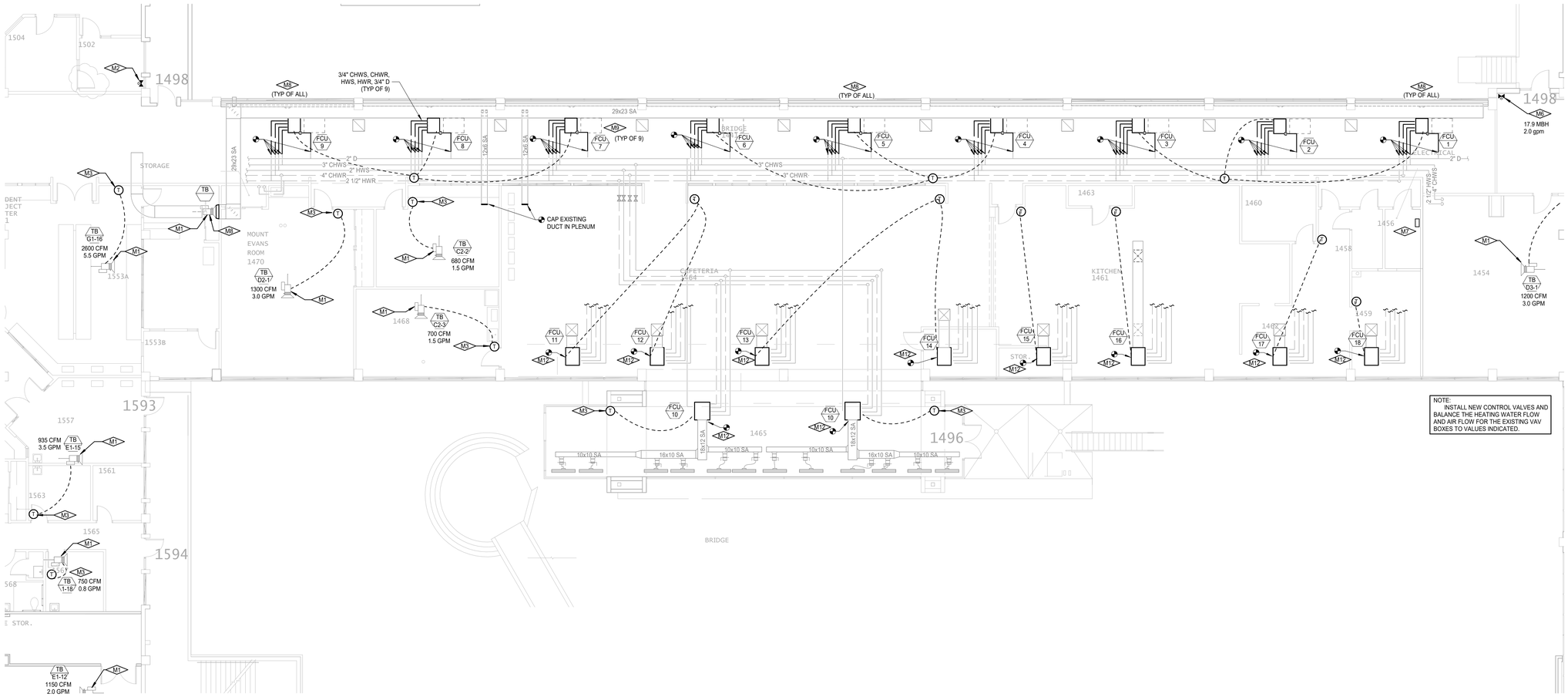
Date:	11/03/2026
DRAWN BY:	DI
CHECKED BY:	AA
JOB NO:	2025-477

SHEET NO.

MD-11.02

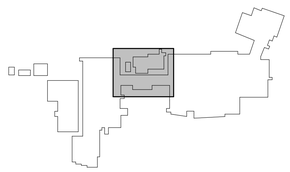
KEYNOTES

M1	EXISTING PNEUMATIC VAV BOX AND REHEAT COIL TO BE CONVERTED TO DDC CONTROL. REMOVE ALL EXISTING PNEUMATIC DEVICES AND ASSOCIATED PNEUMATIC TUBING. RE: CONTROLS SCHEMATICS. BALANCE AIR AND WATER TO THE FLOWS INDICATED ON THE PLANS.
M2	ADD ALTERNATE SCOPE: ADD ALTERNATE #2: REMOVE EXISTING PNEUMATIC CONTROL VALVE IN BASEBOARD AND REPLACE WITH NEW DDC CONTROL VALVE AND ASSOCIATED DDC THERMOSTAT. EXISTING CONTROL VALVE SIZE AND THERMOSTAT LOCATIONTO BE FIELD VERIFIED BY CONTRACTOR. NEW CONTROL VALVES TO MATCH EXISTING LINE SIZES. REMOVE ALL ASSOCIATED PNEUMATIC TUBING. RE: CONTROL SCHEMATICS. BALANCE THE FLOW TO THE GPM SHOWN ON THE PLANS. IF ALTERNATE IS NOT ACCEPTED, EXISTING PNEUMATIC THERMOSTAT IS TO REMAIN.
M3	EXISTING PNEUMATIC THERMOSTAT TO BE REPLACED WITH NEW DDC T-STAT IN THE SAME LOCATION. REMOVE ALL ASSOCIATED PNEUMATIC TUBING. RE: CONTROL SCHEMATICS.
M6	REMOVE EXISTING PNEUMATIC CONTROL VALVE IN CABINET UNIT HEATER AND REPLACE WITH NEW DDC CONTROL VALVE. REMOVE ALL ASSOCIATED PIPING. RE: CONTROL SCHEMATICS.
M7	NEW TEMPERATURE CONTROL PANEL. FIELD COORDINATE LOCATION WITHIN EXISTING ELECTRICAL ROOM.
M8	PERFORM TAB MEASUREMENTS ON TERMINAL BOX AND CONNECTED DIFFUSERS AND REPORT READINGS TO ENGINEER. BALANCE EXISTING LINEAR SLOT DIFFUSERS TO EQUAL AIRFLOW AND REBALANCE ASSOCIATED TERMINAL BOX SERVING THEM.
M9	LOCATE CEILING FCU IN SAME PLACE AS PREVIOUS CEILING DIFFUSER.
M12	ADD ALTERNATE SCOPE: ADD ALTERNATE #1: REPLACE EXISTING FAN COIL UNIT WITH NEW UNIT AS SCHEDULED. PROVIDE TRANSITION AS NEEDED TO CONNECT NEW FAN COIL TO EXISTING DUCTWORK. RECONNECT EXISTING HEATING WATER, CHILLED WATER AND DRAIN PIPING TO NEW FAN COIL UNIT. IF ADD ALTERNATE IS NOT ACCEPTED, EXISTING FAN COIL UNIT AND ASSOCIATED THERMOSTAT SHALL BE CONVERTED TO DDC CONTROL.



LEVEL 1 HVAC PLAN - BRIDGE

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



1"

IF LINE DOES NOT MEASURE 1 INCH, DRAWING IS NOT TO SCALE

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CALORADO LICENSED PROFESSIONAL ENGINEER
ADAM JOSEPH ACKERT
46424
11/03/2026
Mechanical

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8905 Tabor Street, Lakewood, CO 80401
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TITLE

Red Rocks Community College - Controls Upgrades

13300 W. 6th Ave, Lakewood, CO. 80228

DRAWING TITLE

LEVEL 1 HVAC PLAN - BRIDGE

REVISIONS:

100% CD

Date:	11/03/2026
DRAWN BY:	DI
CHECKED BY:	AA
JOB NO:	2025-477

SHEET NO.

M-11.02

KEYNOTES

M1	EXISTING PNEUMATIC VAV BOX AND REHEAT COIL TO BE CONVERTED TO DDC CONTROL. REMOVE ALL EXISTING PNEUMATIC DEVICES AND ASSOCIATED PNEUMATIC TUBING. RE: CONTROLS SCHEMATICS. BALANCE AIR AND WATER TO THE FLOWS INDICATED ON THE PLANS.
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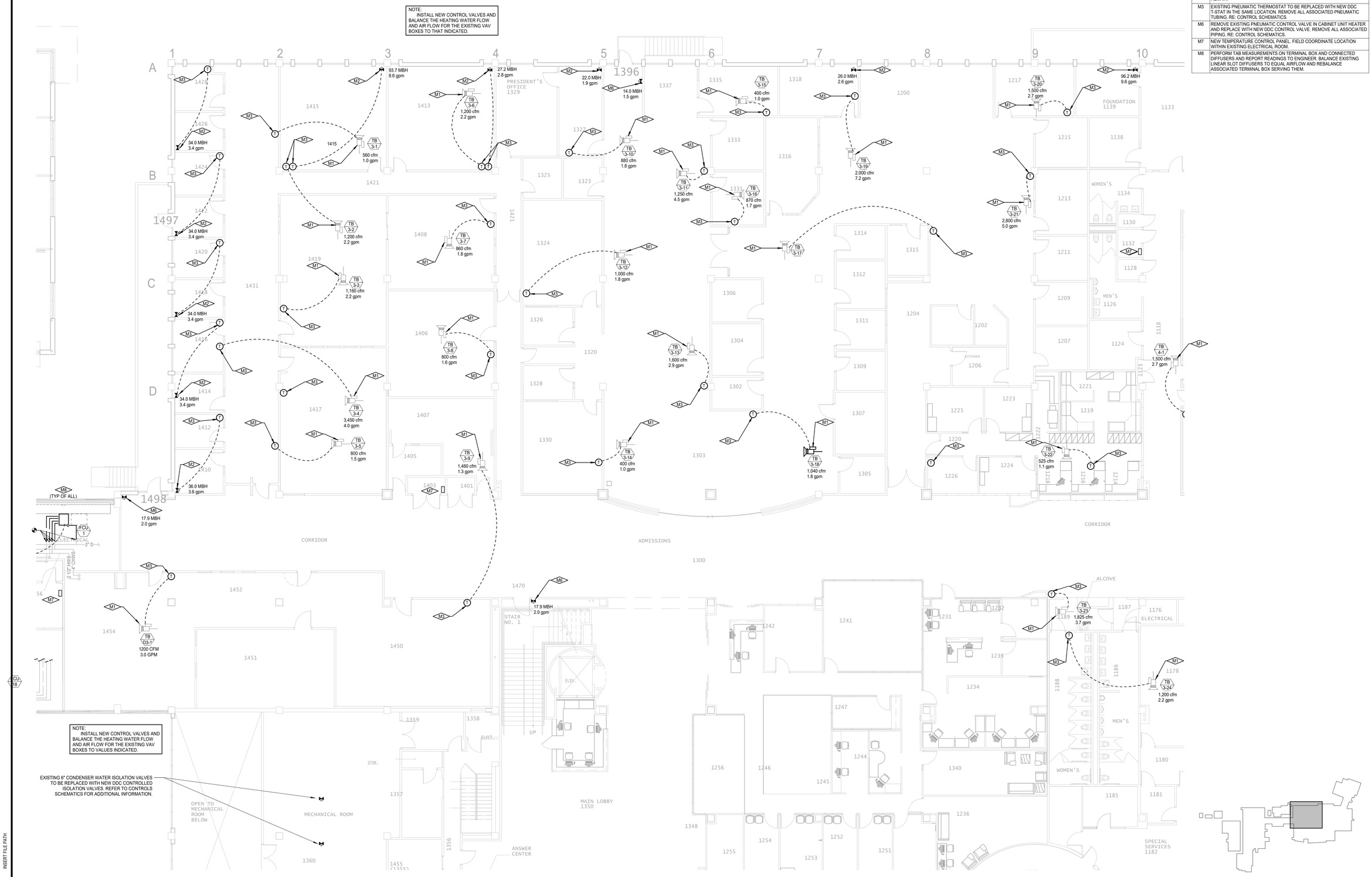
M7	NEW TEMPERATURE CONTROL PANEL. FIELD COORDINATE LOCATION WITHIN EXISTING ELECTRICAL ROOM.
M8	PERFORM TAB MEASUREMENTS ON TERMINAL BOX AND CONNECTED DIFFUSERS AND REPORT READINGS TO ENGINEER. BALANCE EXISTING LINEAR SLOT DIFFUSERS TO EQUAL AIRFLOW AND REBALANCE ASSOCIATED TERMINAL BOX SERVING THEM.



LEVEL 1 HVAC PLAN - MAIN BUILDING A

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

1"

IF LINE DOES NOT MEASURE 1 INCH, DRAWING IS NOT TO SCALE

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COLORADO LICENSED PROFESSIONAL ENGINEER
JOSEPH LOSEPH
46424
11/03/2026
Mechanical

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8900 Tabor Street, Lakewood, CO 80401
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TITLE

Red Rocks Community College - Controls Upgrades

13300 W. 6th Ave, Lakewood, CO. 80228

DRAWING TITLE

LEVEL 1 HVAC PLAN - MAIN BUILDING A

REVISIONS:

100% CD

Date:	11/03/2026
DRAWN BY:	BS
CHECKED BY:	AA
JOB NO:	2025-477

SHEET NO.

M-11.03

NOTE:
INSTALL NEW CONTROL VALVES AND BALANCE THE HEATING WATER FLOW AND AIR FLOW FOR THE EXISTING VAV BOXES TO THAT INDICATED.

KEYNOTES

M1	EXISTING PNEUMATIC VAV BOX AND REHEAT COIL TO BE CONVERTED TO DDC CONTROL. REMOVE ALL EXISTING PNEUMATIC DEVICES AND ASSOCIATED PNEUMATIC TUBING. RE: CONTROLS SCHEMATICS. BALANCE AIR AND WATER TO THE FLOWS INDICATED ON THE PLANS.
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M3	EXISTING PNEUMATIC THERMOSTAT TO BE REPLACED WITH NEW DDC T-STAT IN THE SAME LOCATION. REMOVE ALL ASSOCIATED PNEUMATIC TUBING. RE: CONTROL SCHEMATICS.
M6	REMOVE EXISTING PNEUMATIC CONTROL VALVE IN CABINET UNIT HEATER AND REPLACE WITH NEW DDC CONTROL VALVE. REMOVE ALL ASSOCIATED PIPING. RE: CONTROL SCHEMATICS.
M7	NEW TEMPERATURE CONTROL PANEL. FIELD COORDINATE LOCATION WITHIN EXISTING ELECTRICAL ROOM.



1" IF LINE DOES NOT MEASURE 1 INCH, DRAWING IS NOT TO SCALE

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LEVEL 1 HVAC PLAN - MAIN BUILDING B

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

COLORADO LICENSED JOSEPH A. ANTOL 48424 11/03/2026 PROFESSIONAL ENGINEER Mechanical

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896 Teller Street, Lakewood, CO 80401
(303) 232-6374 ● www.catorruma.com

TITLE

Red Rocks Community College - Controls Upgrades
13300 W. 6th Ave, Lakewood, CO. 80228

DRAWING TITLE

LEVEL 1 HVAC PLAN - MAIN BUILDING B

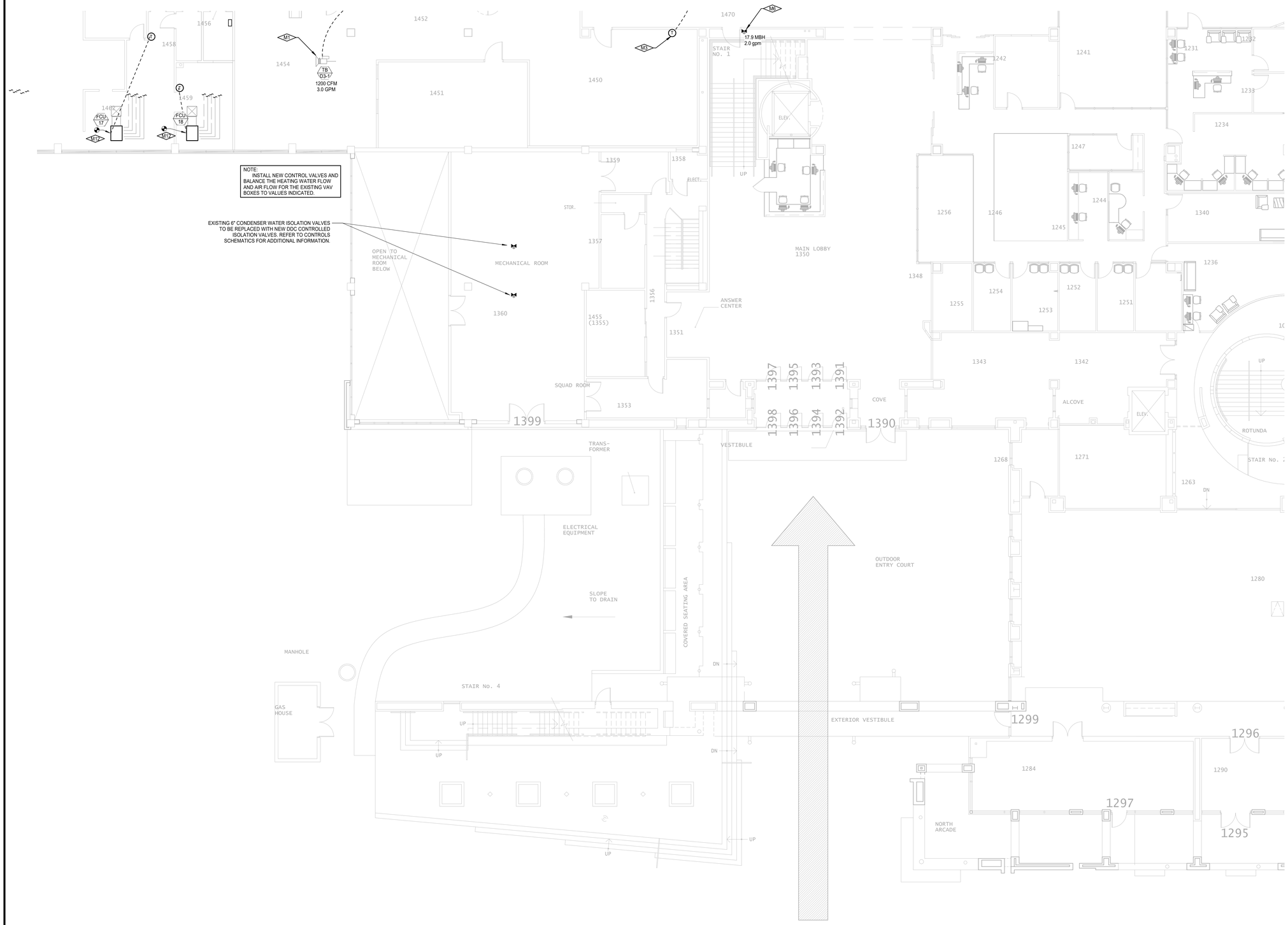
REVISIONS:

100% CD

Date: 11/03/2026
DRAWN BY: BS
CHECKED BY: AA
JOB NO: 2025-477

SHEET NO.

M-11.04



KEYNOTES

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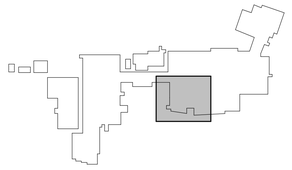
M6	REMOVE EXISTING PNEUMATIC CONTROL VALVE IN CABINET UNIT HEATER AND REPLACE WITH NEW DDC CONTROL VALVE. REMOVE ALL ASSOCIATED PIPING. RE: CONTROL SCHEMATICS.
M12	ADD ALTERNATE SCOPE: ADD ALTERNATE #1: REPLACE EXISTING FAN COIL UNIT WITH NEW UNIT AS SCHEDULED. PROVIDE TRANSITION AS NEEDED TO CONNECT NEW FAN COIL TO EXISTING DUCTWORK. RECONNECT EXISTING HEATING WATER, CHILLED WATER AND DRAIN PIPING TO NEW FAN COIL UNIT. IF ADD ALTERNATE IS NOT ACCEPTED, EXISTING FAN COIL UNIT AND ASSOCIATED THERMOSTAT SHALL BE CONVERTED TO DDC CONTROL.



1"
IF LINE DOES NOT MEASURE 1 INCH, DRAWING IS NOT TO SCALE

LEVEL 1 HVAC PLAN - MAIN BUILDING C
SCALE: 1/8" = 1'-0"

COLORADO LICENSED PROFESSIONAL ENGINEER
JOSEPH ACKER
46424
11/03/2026
Mechanical

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1900 Tabor Street, Lakewood, CO 80401
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TITLE

Red Rocks Community College - Controls Upgrades
13300 W. 6th Ave, Lakewood, CO. 80228

DRAWING TITLE

LEVEL 1 HVAC PLAN - MAIN BUILDING C

REVISIONS:

100% CD

Date:	11/03/2026
DRAWN BY:	BS
CHECKED BY:	AA
JOB NO:	2025-477

SHEET NO.

M-11.05

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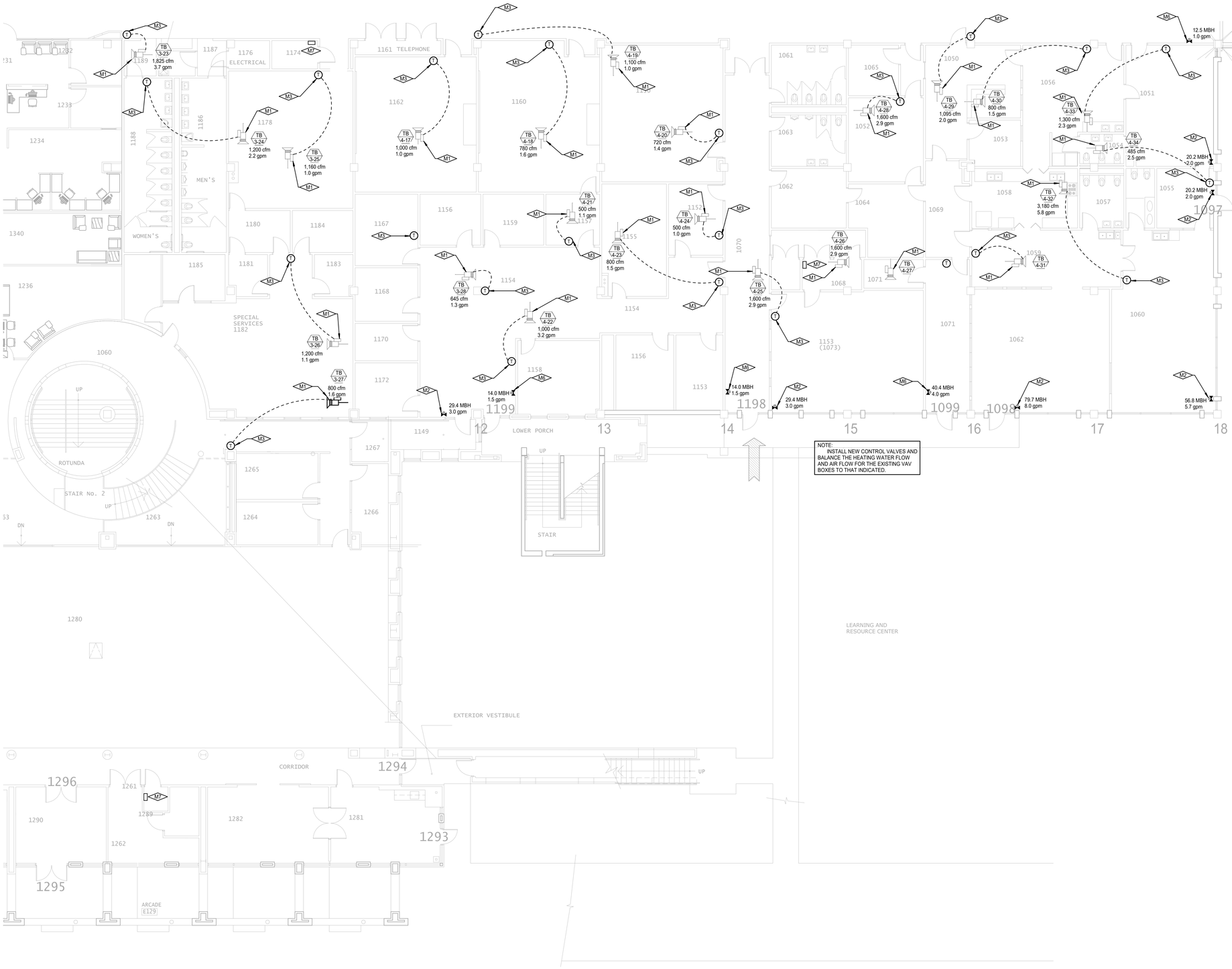

NOTE:
INSTALL NEW CONTROL VALVES AND BALANCE THE HEATING WATER FLOW AND AIR FLOW FOR THE EXISTING VAV BOXES TO THAT INDICATED.

KEYNOTES

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M2	ADD ALTERNATE SCOPE: ADD ALTERNATE #2: REMOVE EXISTING PNEUMATIC CONTROL VALVE IN BASEBOARD AND REPLACE WITH NEW DDC CONTROL VALVE AND ASSOCIATED DDC THERMOSTAT. EXISTING CONTROL VALVE SIZE AND THERMOSTAT LOCATIONTO BE FIELD VERIFIED BY CONTRACTOR. NEW CONTROL VALVES TO MATCH EXISTING LINE SIZES. REMOVE ALL ASSOCIATED PNEUMATIC TUBING. RE: CONTROL SCHEMATICS. BALANCE THE FLOW TO THE GPM SHOWN ON THE PLANS. IF ALTERNATE IS NOT ACCEPTED, EXISTING PNEUMATIC THERMOSTAT IS TO REMAIN.
M3	EXISTING PNEUMATIC THERMOSTAT TO BE REPLACED WITH NEW DDC T-STAT IN THE SAME LOCATION. REMOVE ALL ASSOCIATED PNEUMATIC TUBING. RE: CONTROL SCHEMATICS.
M6	REMOVE EXISTING PNEUMATIC CONTROL VALVE IN CABINET UNIT HEATER AND REPLACE WITH NEW DDC CONTROL VALVE. REMOVE ALL ASSOCIATED PIPING. RE: CONTROL SCHEMATICS.
M7	NEW TEMPERATURE CONTROL PANEL. FIELD COORDINATE LOCATION WITHIN EXISTING ELECTRICAL ROOM.

1"
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LEVEL 1 HVAC PLAN - MAIN BUILDING D
SCALE: 1/8" = 1'-0"



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TITLE

Red Rocks Community College - Controls Upgrades
13300 W. 6th Ave, Lakewood, CO. 80228

DRAWING TITLE

LEVEL 1 HVAC PLAN - MAIN BUILDING D

REVISIONS:

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Date:	11/03/2026
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JOB NO:	2025-477

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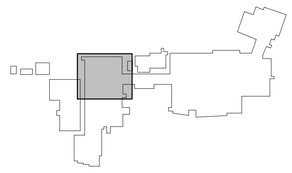
KEYNOTES

M1	EXISTING PNEUMATIC VAV BOX AND REHEAT COIL TO BE CONVERTED TO DDC CONTROL. REMOVE ALL EXISTING PNEUMATIC DEVICES AND ASSOCIATED PNEUMATIC TUBING. RE: CONTROLS SCHEMATICS. BALANCE AIR AND WATER TO THE FLOWS INDICATED ON THE PLANS.
M2	ADD ALTERNATE SCOPE: ADD ALTERNATE #2: REMOVE EXISTING PNEUMATIC CONTROL VALVE IN BASEBOARD AND REPLACE WITH NEW DDC CONTROL VALVE AND ASSOCIATED DDC THERMOSTAT. EXISTING CONTROL VALVE SIZE AND THERMOSTAT LOCATIONTO BE FIELD VERIFIED BY CONTRACTOR. NEW CONTROL VALVES TO MATCH EXISTING LINE SIZES. REMOVE ALL ASSOCIATED PNEUMATIC TUBING. RE: CONTROL SCHEMATICS. BALANCE THE FLOW TO THE GPM SHOWN ON THE PLANS. IF ALTERNATE IS NOT ACCEPTED, EXISTING PNEUMATIC THERMOSTAT IS TO REMAIN.
M3	EXISTING PNEUMATIC THERMOSTAT TO BE REPLACED WITH NEW DDC T-STAT IN THE SAME LOCATION. REMOVE ALL ASSOCIATED PNEUMATIC TUBING. RE: CONTROL SCHEMATICS.



NOTE:
INSTALL NEW CONTROL VALVES AND BALANCE THE HEATING WATER FLOW AND AIR FLOW FOR THE EXISTING VAV BOXES TO THAT INDICATED.



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LEVEL 2 HVAC PLAN - CONSTRUCTION TECHNOLOGY NORTH

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

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LEVEL 2 HVAC PLAN - CONSTRUCTION TECHNOLOGY NORTH

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Date:	11/03/2026
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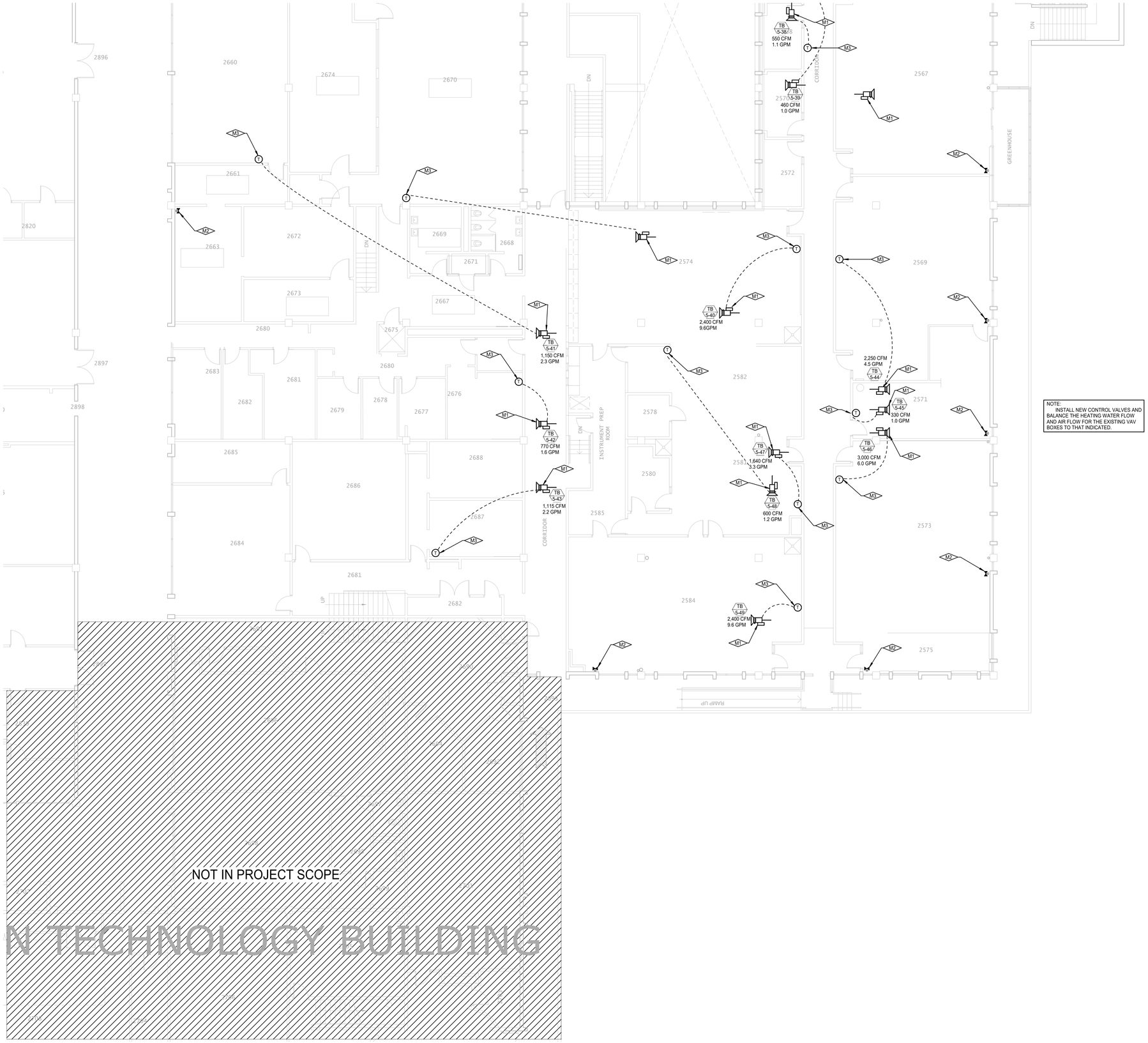
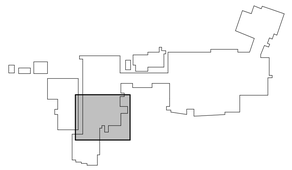


NOTE:
INSTALL NEW CONTROL VALVES AND BALANCE THE HEATING WATER FLOW AND AIR FLOW FOR THE EXISTING VAV BOXES TO THAT INDICATED.

KEYNOTES

M1	EXISTING PNEUMATIC VAV BOX AND REHEAT COIL TO BE CONVERTED TO DDC CONTROL. REMOVE ALL EXISTING PNEUMATIC DEVICES AND ASSOCIATED PNEUMATIC TUBING. RE: CONTROLS SCHEMATICS. BALANCE AIR AND WATER TO THE FLOWS INDICATED ON THE PLANS.
M2	ADD ALTERNATE SCOPE: ADD ALTERNATE #2: REMOVE EXISTING PNEUMATIC CONTROL VALVE IN BASEBOARD AND REPLACE WITH NEW DDC CONTROL VALVE AND ASSOCIATED DDC THERMOSTAT. EXISTING CONTROL VALVE SIZE AND THERMOSTAT LOCATIONTO BE FIELD VERIFIED BY CONTRACTOR. NEW CONTROL VALVES TO MATCH EXISTING LINE SIZES. REMOVE ALL ASSOCIATED PNEUMATIC TUBING. RE: CONTROL SCHEMATICS. BALANCE THE FLOW TO THE GPM SHOWN ON THE PLANS. IF ALTERNATE IS NOT ACCEPTED, EXISTING PNEUMATIC THERMOSTAT IS TO REMAIN.
M3	EXISTING PNEUMATIC THERMOSTAT TO BE REPLACED WITH NEW DDC T-STAT IN THE SAME LOCATION. REMOVE ALL ASSOCIATED PNEUMATIC TUBING. RE: CONTROL SCHEMATICS.



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LEVEL 2 HVAC PLAN - CONSTRUCTION TECHNOLOGY CENTRAL
SCALE: 1/8" = 1'-0"

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LEVEL 2 HVAC PLAN - CONSTRUCTION TECHNOLOGY CENTRAL

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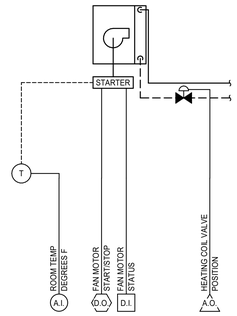


CABINET UNIT HEATER - HYDRONIC

SCALE: NONE

BAS CONTROL MATRIX

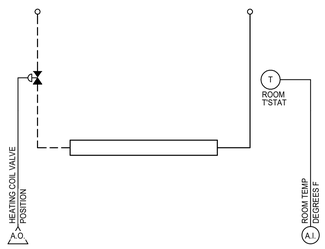
SYSTEM SPECIFIC REMARKS:

1.

EQUIPMENT, SYSTEM, AND POINT	POINT TYPE: DIGITAL INPUT	DIGITAL OUTPUT	ANALOG INPUT	ANALOG OUTPUT	STATUS	ALARM	NETWORK COMMUNICATIONS	REMARKS
CABINET UNIT HEATER - HYDRONIC								
FAN MOTOR, START/STOP		X						
FAN MOTOR, STATUS	X				X	X		CURRENT SWITCH
HEATING COIL VALVE, POSITION				X				
ROOM TEMP, DEGREES F			X			X		

CABINET UNIT HEATERS:

1. OPERATION
   a. A WALL MOUNTED ROOM THERMOSTAT WILL MODULATE THE CABINET UNIT HEATER CONTROL VALVE AND CYCLE THE FAN MOTOR TO MAINTAIN ROOM THERMOSTAT TEMPERATURE SETTING.
2. ALARMS AND SAFETIES
   a. GENERATE A MAINTENANCE INTERVAL ALARM WHEN FAN HAS OPERATED FOR MORE THAN 1,500 HOURS.
   b. GENERATE A FAN FAILURE ALARM IF THE STATUS BEING DIFFERENT FROM THE COMMAND FOR A PERIOD OF 15 SECONDS.
   c. COLD ZONE - PROVIDE AN ALARM IF THE ZONE TEMPERATURE IS MORE THAN 10 DEG F BELOW SETPOINT FOR MORE THAN 15 MIN (ADJ).



FINNED TUBE RADIATION - HYDRONIC

SCALE: NONE

BAS CONTROL MATRIX

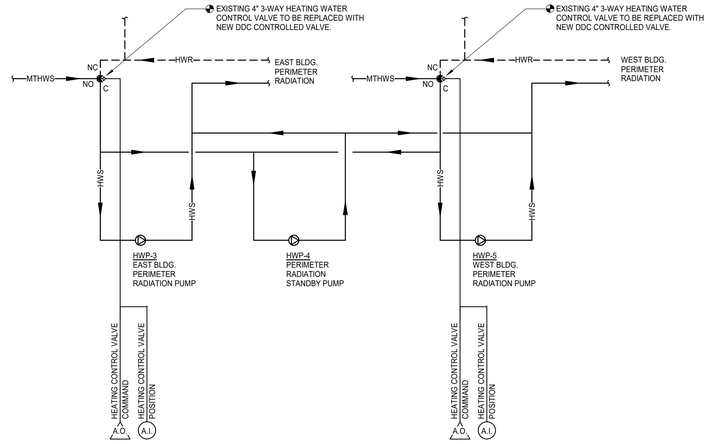
SYSTEM SPECIFIC REMARKS:

1.

EQUIPMENT, SYSTEM, AND POINT	POINT TYPE: DIGITAL INPUT	DIGITAL OUTPUT	ANALOG INPUT	ANALOG OUTPUT	STATUS	ALARM	NETWORK COMMUNICATIONS	REMARKS
FINNED TUBE RADIATION - HYDRONIC								
HEATING COIL VALVE, POSITION				X				
ROOM TEMP, DEGREES F			X			X		

HOT WATER HEATING BASEBOARD:

1. PROVIDE WALL MOUNTED THERMOSTAT TO AUTOMATICALLY MODULATE A NORMALLY OPEN TWO-WAY CONTROL VALVE TO MAINTAIN THE SPACE TEMPERATURE SETTING.
2. IN ROOMS WHICH ALSO HAVE A TERMINAL-HEATING COIL, THERMOSTAT SHALL SEQUENCE THE BBR VALVE FIRST, THEN MODULATE THE AIRSIDE HEATING COIL VALVE TO MAINTAIN STAT SET TEMPERATURE.
3. ALARMS
   a. COLD ZONE - PROVIDE AN ALARM IF THE ZONE TEMPERATURE IS MORE THAN 10 DEG F BELOW SETPOINT FOR MORE THAN 15 MIN (ADJ).



HEATING SYSTEM

SCALE: NONE

BAS CONTROL MATRIX

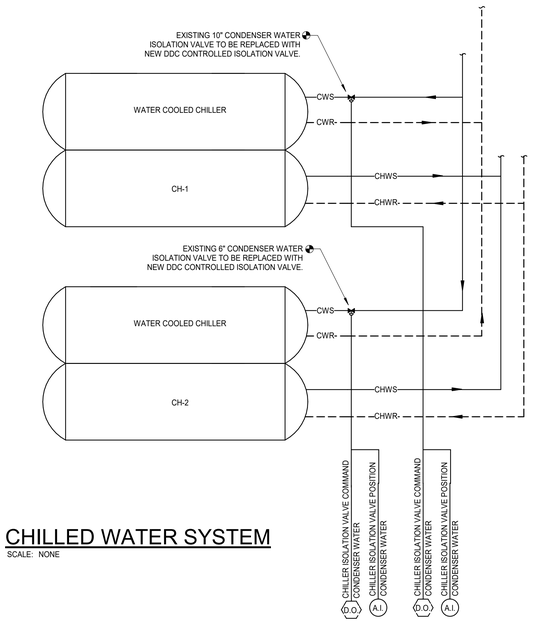
SYSTEM SPECIFIC REMARKS:

1.

EQUIPMENT, SYSTEM, AND POINT	POINT TYPE: DIGITAL INPUT	DIGITAL OUTPUT	ANALOG INPUT	ANALOG OUTPUT	STATUS	ALARM	NETWORK COMMUNICATIONS	REMARKS
HEATING SYSTEM								
HEATING CONTROL VALVE, COMMAND				X				
HEATING CONTROL VALVE, COMMAND				X				
HEATING CONTROL VALVE, POSITION			X					
HEATING CONTROL VALVE, POSITION			X					

HEATING WATER SYSTEM:

1. MATCH EXISTING SEQUENCE OF OPERATION FOR CONTROL OF 3-WAY PERIMETER HEATING CONTROL VALVES.



CHILLED WATER SYSTEM

SCALE: NONE

BAS CONTROL MATRIX

SYSTEM SPECIFIC REMARKS:

1.

EQUIPMENT, SYSTEM, AND POINT	POINT TYPE: DIGITAL INPUT	DIGITAL OUTPUT	ANALOG INPUT	ANALOG OUTPUT	STATUS	ALARM	NETWORK COMMUNICATIONS	REMARKS
CHILLED WATER SYSTEM - WATER COOLED CHILLER								
CHILLER ISOLATION VALVE COMMAND, CONDENSER WATER		X						
CHILLER ISOLATION VALVE COMMAND, CONDENSER WATER		X						
CHILLER ISOLATION VALVE POSITION, CONDENSER WATER			X					
CHILLER ISOLATION VALVE POSITION, CONDENSER WATER			X					

TEMPERATURE CONTROL AIR COMPRESSOR:

1. MATCH EXISTING SEQUENCE OF OPERATION FOR CONTROL OF CONDENSER WATER ISOLATION VALVES.

BAS SYSTEM NOTES:

1. IN ADDITION TO THE DDC POINTS LISTED BELOW, THE CONTRACTOR SHALL CAREFULLY REVIEW ALL DRAWINGS, ALL SPECIFICATIONS, AND ALL SEQUENCES OF OPERATION. THE DOCUMENTS ARE ALL INCLUSIVE AND COMPLIMENTARY TO EACH OTHER. THE PROJECT SHALL INCLUDE ANY AND ALL NECESSARY DDC POINTS TO SUPPORT THE REQUIREMENTS OF ALL THE DOCUMENTS.
2. ALWAYS REFER TO DRAWINGS FOR QUANTITY.
3. PROVIDE OPEN PROTOCOL COMMUNICATION WITH FACTORY SUPPLIED CONTROLLER.
4. BAS CONTRACTOR SHALL COORDINATE STATUS LEVEL FOR EACH ALARM POINT WITH THE OWNER TO DETERMINE WHICH ONES REQUIRE IMMEDIATE ATTENTION.
5. IF THERE IS A DISCREPANCY BETWEEN ANY DOCUMENTATION, THE WORST CASE SCENARIO SHALL BE USED FOR BIDDING PURPOSES. ADDITIONAL COSTS WILL NOT BE ALLOWED FOR DISCREPANCIES BETWEEN THE SPECIFICATIONS AND DRAWINGS.

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TITLE

Red Rocks Community College - Controls Upgrades

13300 W. 6th Ave, Lakewood, CO. 80228

DRAWING TITLE

MECHANICAL CONTROL DIAGRAMS

REVISIONS:

100% CD

Date: 11/03/2026
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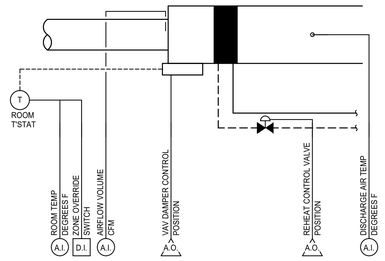


TERMINAL BOX - HYDRONIC

SCALE: NONE

BAS CONTROL MATRIX

SYSTEM SPECIFIC REMARKS:

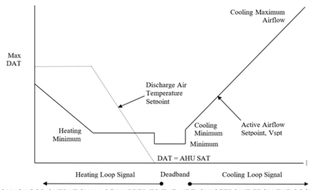
1.

EQUIPMENT, SYSTEM, AND POINT	POINT TYPE: DIGITAL INPUT	DIGITAL OUTPUT	ANALOG INPUT	ANALOG OUTPUT	STATUS	ALARM	NETWORK COMMUNICATIONS	REMARKS
TERMINAL BOX - HYDRONIC								
AIRFLOW VOLUME, CFM			X					
DISCHARGE AIR TEMP, DEGREES F			X					
REHEAT CONTROL VALVE, POSITION				X				
ROOM TEMP, DEGREES F			X			X		
VAV DAMPER CONTROL, POSITION				X				
ZONE OVERRIDE, SWITCH	X							

VAV TERMINAL BOX CONTROL SEQUENCES – HOT WATER REHEAT:

A. GENERAL
   1. REFER TO THE TERMINAL UNIT SCHEDULE FOR THE FOLLOWING SETPOINTS:
      a. ZONE MAXIMUM COOLING AIRFLOW SETPOINT (VCOOL-MAX)
      b. ZONE MINIMUM AIRFLOW SETPOINT (VMIN)
      c. ZONE MAXIMUM HEATING AIRFLOW SETPOINT (VHEAT-MAX)
      d. ZONE MINIMUM HEATING AIRFLOW SETPOINT (VHEAT-MIN)
   2. REFER TO FLOOR PLANS FOR SPACE SENSOR REQUIREMENTS. SOME SPACES (NOT ALL) MAY BE EQUIPPED WITH:
      a. CO2 MONITORING
      b. OCCUPANCY MONITORING
      c. RELATIVE HUMIDITY
      d. TEMPERATURE
      e. OTHER SPECIAL SYSTEMS (GAS CONCENTRATION, O2, ETC.)

B. HEATING AND COOLING
   1. CONTROL LOGIC IS DEPICTED SCHEMATICALLY IN THE FIGURE BELOW AND DESCRIBED IN THE FOLLOWING SECTIONS. RELATIVE LEVELS OF VARIOUS SETPOINTS ARE DEPICTED FOR OCCUPIED MODE OPERATION.



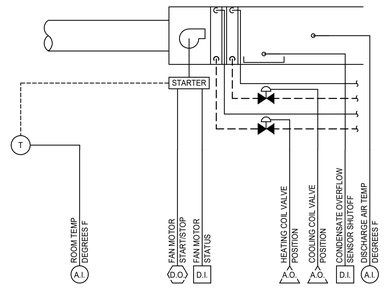
   2. WHEN THE ZONE STATE IS COOLING, THE COOLING LOOP OUTPUT SHALL BE MAPPED TO THE AIRFLOW SETPOINT FROM THE COOLING MINIMUM TO THE COOLING MAXIMUM AIRFLOW SETPOINTS. HEATING IS DISABLED.
      a. IN COOLING THE DAT RESET OF THE AHU IS STILL ACTIVE. IF SUPPLY AIR TEMPERATURE FROM THE AIR HANDLER IS GREATER THAN ROOM TEMPERATURE, COOLING SUPPLY AIRFLOW SETPOINT SHALL BE NO HIGHER THAN THE MINIMUM TO PREVENT OVERHEATING.
   3. WHEN THE ZONE STATE IS DEADBAND, THE ACTIVE AIRFLOW SETPOINT SHALL BE THE MINIMUM AIRFLOW SETPOINT. HEATING COIL IS DISABLED. THE TOTAL DEADBAND SHALL BE 5°F BETWEEN HEATING AND COOLING SET POINTS.
   4. WHEN THE ZONE STATE IS HEATING, THE HEATING LOOP SHALL MAINTAIN SPACE TEMPERATURE AT THE HEATING SETPOINT AS FOLLOWS:
      a. FROM 0-50%, THE HEATING LOOP OUTPUT SHALL MODULATE THE HOT WATER VALVE TO MEET A DISCHARGE AIR TEMPERATURE SETPOINT BETWEEN 60 DEG F AND 110 DEG F(ADJ). THE AIRFLOW SETPOINT SHALL BE THE HEATING MINIMUM.
      b. FROM 51%-100%, IF THE DISCHARGE AIR TEMPERATURE SETPOINT IS AT MAXIMUM, THE HEATING LOOP OUTPUT SHALL RESET THE AIRFLOW SETPOINT FROM THE HEATING MINIMUM AIRFLOW SETPOINT TO THE HEATING MAXIMUM AIRFLOW SETPOINT.
      c. THE HEATING COIL SHALL BE MODULATED TO MAINTAIN THE DISCHARGE TEMPERATURE AT SETPOINT. (DIRECTLY CONTROLLING HEATING OFF THE ZONE TEMPERATURE CONTROL LOOP IS NOT ACCEPTABLE).
   5. WHERE THE ZONE HAS A LOCAL SETPOINT ADJUSTMENT KNOB/BUTTON:
      a. THE SETPOINT ADJUSTMENT OFFSETS ESTABLISHED BY THE OCCUPANT SHALL BE SOFTWARE POINTS THAT ARE PERSISTENT (E.G., NOT RESET DAILY), BUT THE ACTUAL OFFSET USED IN CONTROL LOGIC SHALL BE ADJUSTED BASED ON LIMITS AND MODES AS DESCRIBE BELOW.
         1. THE ADJUSTMENT SHALL BE CAPABLE OF BEING LIMITED IN SOFTWARE.
         2. AS A DEFAULT, THE ACTIVE OCCUPIED COOLING SETPOINT SHALL BE LIMITED BETWEEN 70°F AND 80°F.
         3. AS A DEFAULT, THE ACTIVE OCCUPIED HEATING SETPOINT SHALL BE LIMITED BETWEEN 65°F AND 72°F.
      b. THE ACTIVE HEATING AND COOLING SETPOINTS SHALL BE INDEPENDENTLY ADJUSTABLE, RESPECTING THE LIMITS AND ANTI-OVERLAP LOGIC DESCRIBED ABOVE. IF ZONE THERMOSTAT PROVIDES ONLY A SINGLE SETPOINT ADJUSTMENT, THEN THE ADJUSTMENT SHALL MOVE BOTH THE ACTIVE HEATING AND COOLING SETPOINTS UPWARDS OR DOWNWARDS BY THE SAME AMOUNT, WITHIN THE LIMITS DESCRIBED ABOVE.
      c. THE ADJUSTMENT SHALL ONLY AFFECT OCCUPIED SETPOINTS IN OCCUPIED MODE, WARMUP MODE, AND COOL-DOWN MODE AND SHALL HAVE NO IMPACT ON SETPOINTS IN ALL OTHER MODES.
   6. WHERE VAV TERMINALS SERVE THE SAME SPACE OR INTERACT WITH BASEBOARD OR RADIANT HEAT:
      a. MODULATE THE BASEBOARD RADIANT VALVE FULLY OPEN AT 10% HEATING SIGNAL AND MAINTAIN THE RADIANT SYSTEM IN HEATING MODE UNTIL THE HEATING DEMAND DROPS TO 0%.

C. SYSTEM REQUESTS
   1. EACH VAV TERMINAL UNIT WILL PROVIDE FEEDBACK TO THE AIR HANDLING UNIT (OR RTU) THAT IT IS ASSOCIATED WITH FOR THE PURPOSES OF DISCHARGE AIR TEMPERATURE RESET AND DUCT STATIC PRESSURE RESET. THE FOLLOWING PROGRAMMING IS REQUIRED TO SUPPORT THOSE FUNCTIONS.
   2. IMPORTANCE MULTIPLIER
      a. EACH ZONE IS CONFIGURED WITH AN INDIVIDUAL IMPORTANCE MULTIPLIER. IMPORTANCE MULTIPLIER IS USED TO SCALE THE NUMBER OF REQUESTS THE ZONE/SYSTEM IS GENERATING. A VALUE OF ZERO CAUSES THE REQUESTS FROM THAT ZONE OR SYSTEM TO BE IGNORED. A VALUE GREATER THAN ONE CAN BE USED TO EFFECTIVELY INCREASE THE NUMBER OF REQUESTS FROM THE ZONE/SYSTEM BASED ON THE CRITICAL NATURE OF THE SPACES SERVED.
   3. COOLING SAT RESET REQUESTS
      a. IF THE ZONE TEMPERATURE EXCEEDS THE ZONE'S COOLING SETPOINT BY 5°F FOR 2 MINUTES SEND 3 REQUESTS
      b. IF THE ZONE TEMPERATURE EXCEEDS THE ZONE'S COOLING SETPOINT BY 3°F FOR 2 MINUTES SEND 2 REQUESTS
      c. IF THE COOLING LOOP IS GREATER THAN 95%, SEND 1 REQUEST UNTIL THE COOLING LOOP IS LESS THAN 85%
      d. IF THE COOLING LOOP IS LESS THAN 95%, SEND 0 REQUESTS
   4. STATIC PRESSURE RESET REQUESTS
      a. IF THE MEASURED AIRFLOW IS LESS THAN 50% OF SETPOINT WHILE SETPOINT IS GREATER THAN ZERO AND THE DAMPER POSITION IS GREATER THAN 95% FOR 1 MINUTE, SEND 3 REQUESTS
      b. IF THE MEASURED AIRFLOW IS LESS THAN 70% OF SETPOINT WHILE SETPOINT IS GREATER THAN ZERO AND THE DAMPER POSITION IS GREATER THAN 95% FOR 1 MINUTE, SEND 2 REQUESTS
      c. IF THE DAMPER POSITION IS GREATER THAN 95%, SEND 1 REQUEST UNTIL THE DAMPER POSITION IS LESS THAN 85%
      d. IF THE DAMPER POSITION IS LESS THAN 95%, SEND 0 REQUESTS
   5. HOT WATER RESET REQUESTS
      a. SEND THE HEATING HOT WATER PLANT THAT SERVES THE ZONE A HEATING HOT WATER PLANT REQUEST AS FOLLOWS:
         1. IF THE HW VALVE POSITION IS GREATER THAN 95%, SEND 1 REQUEST UNTIL THE HW VALVE POSITION IS LESS THAN 50%.
         2. IF THE HW VALVE POSITION IS LESS THAN 95%, SEND 0 REQUESTS.
   6. MULTIPLY THE NUMBER OF REQUESTS DETERMINED FROM ZONE/SYSTEM LOGIC TIMES THE IMPORTANCE MULTIPLIER AND SEND TO THE SYSTEM/PLANT THAT SERVES THE ZONE/SYSTEM. SEE SYSTEM/PLANT LOGIC TO SEE HOW REQUESTS ARE USED IN TRIM & RESPOND LOGIC.

D. OCCUPANCY SENSING
   1. WHERE INDICATED TERMINAL UNIT CONTROLS WILL INCLUDE AN OCCUPANCY SENSOR. WHEN A ZONE IS SCHEDULED TO BE OCCUPIED (IE THE ASSOCIATED AIR HANDLING UNIT IS IN OCCUPIED MODE) AND THE OCCUPANCY SENSOR INDICATES THE ZONE IS UNOCCUPIED:
      a. WIDEN THE HEATING AND COOLING SPACE TEMPERATURE SETPOINTS BY 5 DEG F (ADJ).
      b. MODULATE THE PRIMARY AIRFLOW TO MINIMUM UNTIL A CALL FOR COOLING IS GENERATED AT THE NEW HIGHER COOLING SETPOINT
   2. WHEN OCCUPANCY IS INDICATED BY THE OCCUPANCY SENSOR RETURN SETPOINTS AND OPERATION OF THE TERMINAL UNIT TO OCCUPIED CONTROL AS DESCRIBED ABOVE.

E. UNOCCUPIED HEATING AND COOLING:
   1. WHEN THE SPACE IS SCHEDULED TO BE UNOCCUPIED THE ASSOCIATED AHU IS OFF THE TEMPERATURE IN THE SPACE WILL NATURALLY DRIFT. THE VAV AND ASSOCIATED SPACE SENSOR WILL BE UTILIZED TO PREVENT OVER COOLING OR OVERHEATING THE SPACE IN THIS MODE.
   2. WHEN A VAV SPACE TEMPERATURE DROPS BELOW 55 DEG F (ADJ) THE VAV SHALL SEND AN UNOCCUPIED HEATING REQUEST TO ITS ASSOCIATED AHU. THE AHU SHALL OPERATE IN NIGHT SETBACK (NSB) HEATING MODE (SEE AHU SEQUENCE).
      a. THE AFFECT VAV (THE VAV THAT IS BELOW THE NSB HEATING SETPOINT) SHALL MODULATE TO MAX HEATING AIRFLOW AND HOT WATER VALVES SHALL MODULATE 100% OPEN.
      b. ALL OTHER VAVS SHALL MODULATE BASED ON THE HEATING CONTROL LOOP USING 60 DEG F (ADJ) AS THE SPACE SETPOINT. ALL VAVS SHOULD HAVE AIRFLOW SETPOINTS OF AT LEAST V_{MIN}.
      c. THE NSB HEATING REQUEST SHALL PERSIST UNTIL THE ZONE IS 5 DEG F ABOVE THE UNOCCUPIED SETPOINT.
   3. WHEN A VAV SPACE TEMPERATURE RISES ABOVE 80 DEG F (ADJ) THE VAV SHALL SEND AN UNOCCUPIED COOLING REQUEST TO ITS ASSOCIATED AHU. THE AHU SHALL OPERATE IN NIGHT SETBACK (NSB) COOLING MODE (SEE AHU SEQUENCE).
      a. THE AFFECT VAV (THE VAV THAT IS ABOVE THE NSB COOLING SETPOINT) SHALL MODULATE TO MAX COOLING AIRFLOW.
      b. ALL OTHER VAVS SHALL CONTROL TO MINIMUM AIRFLOW.
      c. THE NSB COOLING REQUEST SHALL PERSIST UNTIL THE ZONE IS 5 DEG F BELOW THE UNOCCUPIED SETPOINT.

F. ALARMS – PROVIDE THE FOLLOWING ALARMS FOR EACH TERMINAL UNIT
   1. LOW AIRFLOW - IF THE MEASURED AIRFLOW IS LESS THAN 70% OF SETPOINT FOR 5 MINUTES WHILE SETPOINT IS GREATER THAN ZERO, GENERATE A LEVEL 3 ALARM.
   2. LOW DISCHARGE AIR TEMPERATURE - IF HEATING HOT WATER PLANT IS PROVEN ON AND THE DISCHARGE AIR TEMPERATURE IS 15°F LESS THAN SETPOINT FOR 10 MINUTES, GENERATE A LEVEL 3 ALARM.
   3. LEAKING VALVE - IF THE VALVE POSITION IS 0% FOR 15 MINUTES, DISCHARGE AIR TEMPERATURE IS ABOVE AHU SAT BY 5°F, AND THE FAN SERVING THE ZONE IS PROVEN ON, GENERATE A LEVEL 4 ALARM.
   4. CARBON MONOXIDE DETECTED – THE TERMINAL UNIT CLOSEST TO A GAS FIRED ROOF TOP UNIT IS EQUIPPED WITH A CARBON MONOXIDE DETECTOR (SEE SCHEDULE). IF A HIGH CONCENTRATION OF CARBON MONOXIDE IS PRESENT GENERATE A LEVEL 1 ALARM AND SHUT DOWN THE ASSOCIATED ROOF TOP UNIT.



FAN COIL - 4-PIPE DUCTED

SCALE: NONE

BAS CONTROL MATRIX

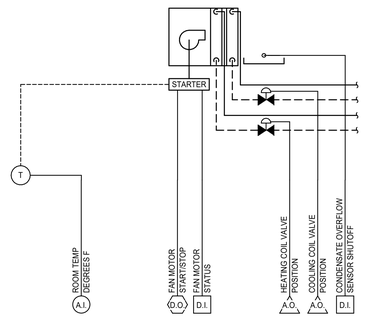
SYSTEM SPECIFIC REMARKS:

1.

EQUIPMENT, SYSTEM, AND POINT	POINT TYPE: DIGITAL INPUT	DIGITAL OUTPUT	ANALOG INPUT	ANALOG OUTPUT	STATUS	ALARM	NETWORK COMMUNICATIONS	REMARKS
FAN COIL - 4-PIPE DUCTED								
CONDENSATE OVERFLOW, SENSOR SHUTOFF	X					X		
COOLING COIL VALVE, POSITION				X				
DISCHARGE AIR TEMP, DEGREES F			X					
FAN MOTOR, START/STOP		X						
FAN MOTOR, STATUS	X				X	X		
HEATING COIL VALVE, POSITION				X				
ROOM TEMP, DEGREES F			X			X		

HOT WATER / CHILLED WATER FAN COIL UNITS AND BLOWER COIL UNITS:

1. START THE FAN AND CYCLE THE NORMALLY OPEN HEATING CONTROL VALVE AND NORMALLY CLOSED COOLING CONTROL VALVE AS NECESSARY TO MAINTAIN THE TEMPERATURE SETPOINT IN THE SPACE. WHEN THE SPACE IS SATISFIED CLOSE THE VALVE (S) AND TURN OFF THE BLOWER.
2. SEQUENCE THE HEATING AND COOLING CONTROL VALVES TO PREVENT BOTH BEING OPEN AT THE SAME TIME.
3. ALARMS
   a. FAN FAILURE - PROVIDE AN ALARM IF THE FAN STATUS DOES NOT MATCH THE FAN COMMAND
   b. COLD ZONE - PROVIDE AN ALARM IF THE ZONE TEMPERATURE IS MORE THAN 10 DEG F BELOW SETPOINT FOR MORE THAN 15 MIN (ADJ)
   c. HOT ZONE - PROVIDE AN ALARM IF THE ZONE TEMPERATURE IS MORE THAN 10 DEG F ABOVE SETPOINT FOR MORE THAN 15 MIN (ADJ)
   d. CONDENSATE OVERFLOW - PROVIDE AN ALARM IF THE OVERFLOW CONDENSATE SWITCH SENSES AN EXCESS OF CONDENSATE IN THE PAN. IMMEDIATELY CLOSE ALL VALVES AND TURN THE FAN OFF WHEN THIS ALARM IS ACTIVE. DO NOT RESET THIS ALARM UNTIL IT IS MANUALLY CLEARED BY AN OPERATOR.



FAN COIL - 4-PIPE NON-DUCTED

SCALE: NONE

BAS CONTROL MATRIX

SYSTEM SPECIFIC REMARKS:

1.

EQUIPMENT, SYSTEM, AND POINT	POINT TYPE: DIGITAL INPUT	DIGITAL OUTPUT	ANALOG INPUT	ANALOG OUTPUT	STATUS	ALARM	NETWORK COMMUNICATIONS	REMARKS
FAN COIL - 4-PIPE NON-DUCTED								
CONDENSATE OVERFLOW, SENSOR SHUTOFF	X					X		
COOLING COIL VALVE, POSITION				X				
FAN MOTOR, START/STOP		X						
FAN MOTOR, STATUS	X				X	X		CURRENT SWITCH
HEATING COIL VALVE, POSITION				X				
ROOM TEMP, DEGREES F			X			X		

HOT WATER / CHILLED WATER FAN COIL UNITS AND BLOWER COIL UNITS:

1. START THE FAN AND CYCLE THE NORMALLY OPEN HEATING CONTROL VALVE AND NORMALLY CLOSED COOLING CONTROL VALVE AS NECESSARY TO MAINTAIN THE TEMPERATURE SETPOINT IN THE SPACE. WHEN THE SPACE IS SATISFIED CLOSE THE VALVE (S) AND TURN OFF THE BLOWER.
2. SEQUENCE THE HEATING AND COOLING CONTROL VALVES TO PREVENT BOTH BEING OPEN AT THE SAME TIME.
3. ALARMS
   a. FAN FAILURE - PROVIDE AN ALARM IF THE FAN STATUS DOES NOT MATCH THE FAN COMMAND
   b. COLD ZONE - PROVIDE AN ALARM IF THE ZONE TEMPERATURE IS MORE THAN 10 DEG F BELOW SETPOINT FOR MORE THAN 15 MIN (ADJ)
   c. HOT ZONE - PROVIDE AN ALARM IF THE ZONE TEMPERATURE IS MORE THAN 10 DEG F ABOVE SETPOINT FOR MORE THAN 15 MIN (ADJ)
   d. CONDENSATE OVERFLOW - PROVIDE AN ALARM IF THE OVERFLOW CONDENSATE SWITCH SENSES AN EXCESS OF CONDENSATE IN THE PAN. IMMEDIATELY CLOSE ALL VALVES AND TURN THE FAN OFF WHEN THIS ALARM IS ACTIVE. DO NOT RESET THIS ALARM UNTIL IT IS MANUALLY CLEARED BY AN OPERATOR.

BAS CONTROL MATRIX

SYSTEM SPECIFIC REMARKS:

1.

EQUIPMENT, SYSTEM, AND POINT	POINT TYPE: DIGITAL INPUT	DIGITAL OUTPUT	ANALOG INPUT	ANALOG OUTPUT	STATUS	ALARM	NETWORK COMMUNICATIONS	REMARKS
PLANT AIR COMPRESSOR								
COMPRESSOR MOTOR, STATUS	X				X	X		CURRENT TRANSDUCER

TEMPERATURE CONTROL AIR COMPRESSOR:

1. OBTAIN STATUS AND ALARM FROM THE TC AIR COMPRESSOR.

BAS SYSTEM NOTES:

1. IN ADDITION TO THE DDC POINTS LISTED BELOW, THE CONTRACTOR SHALL CAREFULLY REVIEW ALL DRAWINGS, ALL SPECIFICATIONS, AND ALL SEQUENCES OF OPERATION. THE DOCUMENTS ARE ALL INCLUSIVE AND COMPLIMENTARY TO EACH OTHER. THE PROJECT SHALL INCLUDE ANY AND ALL NECESSARY DDC POINTS TO SUPPORT THE REQUIREMENTS OF ALL THE DOCUMENTS.
2. ALWAYS REFER TO DRAWINGS FOR QUANTITY.
3. PROVIDE OPEN PROTOCOL COMMUNICATION WITH FACTORY SUPPLIED CONTROLLER.
4. BAS CONTRACTOR SHALL COORDINATE STATUS LEVEL FOR EACH ALARM POINT WITH THE OWNER TO DETERMINE WHICH ONES REQUIRE IMMEDIATE ATTENTION.
5. IF THERE IS A DISCREPANCY BETWEEN ANY DOCUMENTATION, THE WORST CASE SCENARIO SHALL BE USED FOR BIDDING PURPOSES. ADDITIONAL COSTS WILL NOT BE ALLOWED FOR DISCREPANCIES BETWEEN THE SPECIFICATIONS AND DRAWINGS.

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TITLE

Red Rocks Community College - Controls Upgrades

13300 W. 6th Ave, Lakewood, CO. 80228

DRAWING TITLE

MECHANICAL CONTROL DIAGRAMS

REVISIONS:

100% CD

Date: 11/03/2026
DRAWN BY: DI
CHECKED BY: AA
JOB NO: 2025-477

SHEET NO.

M-402

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POWER LEGEND
(Not all symbols listed below are used on these drawings)

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	SINGLE RECEPTACLE		ELECTRICAL PANELBOARD, CONTROL PANEL, OR OTHER CABINET AS NOTED
	DUPLEX RECEPTACLE; WALL, CEILING, FLOOR MOUNTED	PM	PLUG MOLD (MULTI-OUTLET ASSEMBLY)
	DOUBLE DUPLEX RECEPTACLE; WALL, CEILING, FLOOR MOUNTED	WM	WIREMOLD (SURFACE RACEWAY)
	SPECIAL RECEPTACLE; WALL, CEILING, FLOOR MOUNTED		CONDUIT CONCEALED
	JUNCTION BOX; WALL, CEILING, FLOOR MOUNTED	UG	CONDUIT, UNDERGROUND OR CONCEALED IN FLOOR AS ALLOWED PER SPECIFICATIONS
	DUPLEX RECEPTACLE, HALF CONTROLLED		CONDUIT TURNING DOWN
	DUPLEX RECEPTACLE, FULL CONTROLLED		CONDUIT TURNING UP
	DOUBLE DUPLEX RECEPTACLE, HALF CONTROLLED		CONDUIT CAPPED
	DOUBLE DUPLEX RECEPTACLE, FULL CONTROLLED		GROUND BAR
A-1	SHADING INDICATES EMERGENCY SYSTEM TEXT INDICATES PANEL AND CIRCUIT DESIGNATION		MAIN SWITCHBOARD/DISTRIBUTION CENTER
	DISCONNECT SWITCH (NON-FUSED)	T	TRANSFORMER
	DISCONNECT SWITCH (FUSED)	CT	CURRENT TRANSFORMER
	VARIABLE SPEED DRIVE WITH DISCONNECT	T	THERMOSTAT
	ENCLOSED CIRCUIT BREAKER	GANN	GENERATOR ANNUNCIATOR PANEL
S	TOGGLE SWITCH	M	UTILITY METER
			POWER POLE

REFERENCE SYMBOLS LEGEND
(Not all symbols listed below are used on these drawings)

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
2	KEY NOTE REFERENCE	1	KITCHEN/OWNER/MEDICAL/GENERAL EQUIPMENT REFERENCE
LPA-#	TYPICAL CIRCUIT NUMBER	1	EXISTING TO BE REMOVED
TGR	TYPICAL LUMINAIRE TYPE	1	EXISTING TO BE RELOCATED
2/P1	TYPICAL ROOM REFERENCE (TOP = RM #, BOTTOM = FLR)	1	EXISTING TO REMAIN - REPLACE DEVICE
M-1	MECHANICAL EQUIPMENT REFERENCE	FB1	ELECTRICAL ACCESSORIES REFERENCE
LC1	LIGHTING CONTROL / MATRIX REFERENCE		

ABBREVIATIONS LEGEND
(Not all symbols listed below are used on these drawings)

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
A	AMPERES	MCP	MOTOR CIRCUIT PROTECTOR
AC	ABOVE COUNTER, +6" ABOVE COUNTER OR BACK SPLASH	MEC	SEE MECHANICAL EQUIPMENT SCHEDULE
AFF	ABOVE FINISHED FLOOR	MIN	MINIMUM
AFG	ABOVE FINISHED GRADE	MLO	MAIN LUGS ONLY
ANN	ANNUNCIATOR	MTS	MANUAL TRANSFER SWITCH
ARF	ABOVE RAISED FLOOR	NC	NORMALLY CLOSED
ASSD	AIR SAMPLING SMOKE DETECTION	NIC	NOT IN CONTRACT
ATS	AUTOMATIC TRANSFER SWITCH	NL	NIGHT LIGHT
BFG	BELOW FINISHED GRADE	NO	NORMALLY OPEN
C	CONDUIT	NTS	NOT TO SCALE
CATV	CABLE TELEVISION	OC	ON CENTER
CB	CIRCUIT BREAKER	OFCI	OWNER FURNISHED, CONTRACTOR INSTALLED
CCTV	CLOSED CIRCUIT TELEVISION	OFOI	OWNER FURNISHED, OWNER INSTALLED
(E)	EXISTING	OSWF	ON SITE WORK FORCE
EM	EMERGENCY	PB	PULL BOX
EMDC	EMERGENCY MAIN DISTRIBUTION CENTER	SB	STAND-BY
EP	EXPLOSION PROOF	SDC	SUB-DISTRIBUTION CENTER
EPO	EMERGENCY POWER OFF	TP	TAMPER PROOF
EVO	EMERGENCY VENTILATION ON/OFF	TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSER
EWC	ELECTRIC WATER COOLER	TYP	TYPICAL
FA	FIRE ALARM	UF	UNDER FLOOR
G	GROUND	UG	UNDER GROUND
GCP	GENERATOR CONTROL PANEL	UON	UNLESS OTHERWISE NOTED
GFCI	GROUND FAULT CIRCUIT INTERRUPTER	UPS	UNINTERRUPTIBLE POWER SUPPLY
HOA	HAND OFF AUTOMATIC	V	VOLTS
IG	ISOLATED GROUND	VFD	VARIABLE FREQUENCY DRIVE
MAX	MAXIMUM	W/	WITH
MCB	MAIN CIRCUIT BREAKER	W/O	WITHOUT
MCC	MOTOR CONTROL CENTER	WP	WEATHER PROOF
MDC	MAIN DISTRIBUTION CENTER	XFMR	TRANSFORMER

ONE-LINE DIAGRAM LEGEND
(Not all symbols listed below are used on these drawings)

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	DISCONNECT SWITCH	A	PANELBOARD "A"
	DISCONNECT SWITCH, FUSED	PM	EM=ENERGY METER, PM=POWER METER, CM=CIRCUIT MONITOR
	CIRCUIT BREAKER	VS	VOLTMETER TEST SWITCH
	FUSE	AS	AMMETER TEST SWITCH
	GROUND	V	VOLTMETER
T ## TK ##	STEP DOWN TRANSFORMER, ## INDICATES KVA K-RATED STEP DOWN TRANSFORMER ## INDICATES KVA, # INDICATES K RATING	A	AMMETER
	CURRENT TRANSFORMER	XXX	SEE FEEDER/MEC/TRANSFORMER SCHEDULES FOR FEEDER SIZE
	POTENTIAL TRANSFORMER	G	ENGINE GENERATOR
OR	SERVICE ENTRANCE TRANSFORMER		CONTACTOR/RELAY/CAPACITOR (AS NOTED)
	METER		TRANSFER SWITCH - ATS=AUTOMATIC, MTS=MANUAL
	EQUIPMENT ENCLOSURE	GFI	GROUND FAULT INTERRUPTER
	SERVICE WEATHERHEAD	SPD	SURGE PROTECTIVE DEVICE
RICA	SHORT CIRCUIT CURRENT AVAILABLE	ST	SHUNT TRIP
KS	KIRK KEY INTERLOCK, SUBSCRIPT INDICATES INTERLOCKED GROUP		TERMINATIONS LB=LOAD BREAK, NLB=NO LOAD BREAK
ES	ELECTRICAL INTERLOCK, SUBSCRIPT INDICATES INTERLOCKED GROUP		DRAW-OUT DEVICE
MI	MECHANICAL INTERLOCK		PLUG-IN DEVICE
		EO	ELECTRICALLY OPERATED
		ERMS	ENERGY REDUCING MAINTENANCE SWITCH

GENERAL NOTES:

1. FOR REMODELING, WORK INCLUDED IS DENOTED IN BOLD. EXISTING CONDITIONS TO REMAIN ARE DENOTED LIGHTLY.
2. PROTECT STRUCTURE AND OWNER EQUIPMENT FROM DAMAGE. IMMEDIATELY REPLACE OR REPAIR, TO ORIGINAL CONDITION, DAMAGE CAUSED BY THE CONTRACTOR WHETHER EQUIPMENT APPEARS TO BE CURRENTLY IN USE OR NOT, UNLESS WRITTEN AUTHORIZATION FROM THE OWNER INDICATED OTHERWISE. PREPARE LISTING OF ALL EXISTING DAMAGED ITEMS AND SUBMIT TO OWNER PRIOR TO BEGINNING WORK.
3. INSTALL CONDUIT CONCEALED IN FINISHED AREAS UNLESS OTHERWISE NOTED. PAINT EXPOSED CONDUIT TO MATCH EXISTING FINISHES WITHIN THE SURROUNDING AREA.
4. FIRE SEAL ALL FIRE RATED WALL AND FLOOR PENETRATIONS. REFER TO ARCHITECTURAL DRAWINGS FOR FIRE RATED WALLS.
5. COORDINATE EXACT REQUIREMENTS AND LOCATIONS OF MECHANICAL EQUIPMENT WITH MECHANICAL DRAWINGS AND MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN AND ORDERING MATERIALS OR EQUIPMENT.
6. A DETAILED WRITTEN METHOD OF PROCEDURE IS REQUIRED WHEN A CONSTRUCTION ACTIVITY OR AN OUTAGE AFFECTS THE SAFETY OF OCCUPANTS, TELEPHONE/DATA/FIRE ALARM EQUIPMENT OR COMPONENTS OF ANY SYSTEM WHICH SUPPORTS THIS EQUIPMENT OR ESSENTIALLY AFFECTS THE BUILDING MANAGEMENT, OPERATIONS OR SECURITY. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION.
7. EXISTING INFORMATION SHOWN ON THE DRAWINGS HAS BEEN TAKEN FROM OWNER FURNISHED DRAWINGS AND/OR LIMITED FIELD OBSERVATIONS. CATOR, RUMA & ASSOCIATES IS NOT RESPONSIBLE FOR THE ACCURACY OF ANY INFORMATION OR THE ADEQUACY, SAFETY AND CONFORMANCE TO CURRENT PREVAILING CODES OF ANY WORK SHOWN AS EXISTING ON THESE DRAWINGS.
8. PROVIDE SEPARATE INSULATED EQUIPMENT GROUNDING CONDUCTOR IN ALL FEEDER, HOMERUN AND BRANCH CIRCUITS.

POWER PLAN NOTES:

1. MAKE ALL FINAL ELECTRICAL CONNECTIONS TO EQUIPMENT REQUIRING ELECTRICAL CONNECTION. THIS SHALL INCLUDE BUT NOT BE LIMITED TO ALL MECHANICAL AND OTHER EQUIPMENT INCLUDED IN THIS PROJECT.
2. COORDINATE EXACT REQUIREMENTS AND LOCATIONS OF MECHANICAL EQUIPMENT WITH MECHANICAL DRAWINGS AND MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN.
3. PROVIDE FUSES SIZED PER EQUIPMENT MANUFACTURER'S REQUIREMENTS.
4. DISCONNECT SWITCH LOCATIONS ARE SHOWN DIAGRAMMATICALLY AND SHALL BE INSTALLED IN ACCESSIBLE LOCATIONS TO SUIT EQUIPMENT AND SPACE. DISCONNECT SWITCHES SHALL BE WITHIN SIGHT OF THE EQUIPMENT THEY SERVE AND MOUNTED AT 6'-3", MAXIMUM, TO TOP OF CABINET. MAINTAIN NEC WORK SPACE REQUIREMENTS.
5. PROVIDE A DEDICATED NEUTRAL CONDUCTOR FOR EACH 120V CIRCUIT.
6. 120V POWER HAS BEEN SHOWN ON DRAWINGS TO J-BOXES IDENTIFIED FOR BAS CONTROLS, DAMPER ACTUATORS AND OTHER MISCELLANEOUS POWER TO OPERATE MECHANICAL CONTROLS AND DEVICES. COORDINATE ALL 120V REQUIREMENTS WITH MECHANICAL CONTROLS AND EQUIPMENT AND MAKE ALL CONNECTIONS REQUIRED TO THESE OR OTHER 120V MECHANICAL CIRCUITS AS REQUIRED. DO NOT CONNECT THESE LOADS TO OTHER CIRCUITS WITH LOADS OTHER THAN THOSE IDENTIFIED HERE.

DEMOLITION NOTES:

1. UNLESS NOTED OTHERWISE, BOLD ITEMS INDICATE EQUIPMENT, DEVICES, ETC. TO BE REMOVED. SEE SPECIFICATION SECTION 260500 FOR REMODEL/DEMOLITION DETAILED REQUIREMENTS.
2. DEMOLITION DRAWINGS MAY NOT SHOW EVERY ITEM TO BE DEMOLISHED. CONTRACTOR SHALL VISIT SITE TO DETERMINE AND COORDINATE THE EXACT EXTENT OF DEMOLITION TO FACILITATE ALL WORK INDICATED BY THE CONTRACT DOCUMENTS PRIOR TO QUOTATION. NO EXTRAS WILL BE ALLOWED FOR WORK REQUIRED TO ACHIEVE THE END RESULT AS INDICATED BY THE CONTRACT DOCUMENTS. REWORK EXISTING TERMINATIONS, CONNECTIONS, CONDUIT, WIRING, ETC. TO ACCEPT NEW WORK. MAINTAIN CIRCUIT CONTINUITY TO EXISTING CIRCUITS AND DEVICES TO REMAIN OR REMODEL/DEMOLITION DETAILED REQUIREMENTS TO BE RELOCATED. PRIOR TO COMMENCEMENT OF ANY DEMO WORK, CONFIRM EXISTING CONDITIONS AND NOTIFY ENGINEER OF ANY DISCREPANCIES FOR RESOLUTION.
3. ALL ITEMS IDENTIFIED TO BE REMOVED SHALL BE REMOVED IN THEIR ENTIRETY INCLUDING ALL WIRING AND EXPOSED CONDUIT AND CONDUIT SUPPORTS BACK TO POINT OF ORIGIN OR NEXT DEVICE TO REMAIN. REMOVED ITEMS SHALL BE TURNED OVER TO THE OWNER, UNLESS NOTED OTHERWISE, AND STORED IN THE AREA DESIGNATED BY THE OWNER. REMOVE FROM SITE AND LEGALLY DISPOSE OF ALL ITEMS THE OWNER CHOOSES NOT TO ACCEPT.
4. WHERE EXISTING CONDUITS ARE SHOWN TO BE REMOVED AND HAVE BEEN ROUTED IN CONCRETE FLOOR SLABS, CONCRETE WALLS OR CONCRETE CEILINGS, THEY SHALL BE CUT BACK FLUSH WITH CONCRETE. FILL WITH GROUT TO ACHIEVE A SMOOTH AND EVEN FINISH FLUSH WITH CONCRETE SURFACE AFTER CONDUCTORS HAVE BEEN REMOVED.
5. REUSE EXISTING CONDUIT WHERE CURRENT NEC AND LOCAL CODE REQUIREMENTS ARE MAINTAINED. PROVIDE NEW CONDUIT AND WIRE FOR NEW INSTALLATIONS AND EXTENSION OF EXISTING INSTALLATIONS. REUSE EXISTING CONDUIT IN PLACE, DO NOT REINSTALL EXISTING CONDUIT. PROVIDE LABELING PER SPECIFICATIONS FOR REUSED CONDUIT.
6. RELOCATED EQUIPMENT AND DEVICES ARE TO BE CLEANED OF ALL FOREIGN MATERIAL. REPLACE EQUIPMENT OR DEVICES WHICH ARE DEFECTIVE OR DAMAGED DURING RELOCATION.
7. WHERE EXISTING DEVICES, SWITCHES, MOTOR CONNECTIONS, ETC. ARE TO BE REMOVED FROM WALLS WHICH ARE REMAINING, WALLS SHALL BE PATCHED TO MATCH ORIGINAL FINISH. BLANK COVERPLATES OVER EXISTING BOXES ARE NOT ACCEPTABLE, UNLESS NOTED OTHERWISE.

ONE-LINE DIAGRAM NOTES:

1. PANELBOARDS INDICATED ON ONE-LINE DIAGRAMS DO NOT SHOW ALL BRANCH CIRCUITS. REFER TO PANELBOARD SCHEDULE(S).
2. EQUIPMENT SHOWN SHADED REPRESENTS STANDBY POWERED SERVICES.
3. EXISTING ONE-LINE DIAGRAM TAKEN FROM OWNER FURNISHED DRAWINGS. EXISTING INFORMATION SHOWN OTHER THAN LOCATIONS IMPACTED BY NEW WORK HAS NOT BEEN VERIFIED.

MECHANICAL EQUIPMENT SCHEDULE

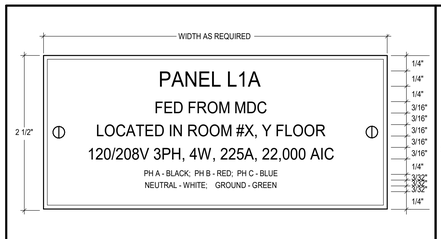
COMMON NOTES:

A. PRIOR TO WORK, VERIFY ELECTRICAL REQUIREMENTS (VOLTAGE, AMPERAGE, RECOMMENDED OCPD, CONDUCTORS, AND DISCONNECT) FOR EACH PIECE OF EQUIPMENT.
B. PRIOR TO WORK, VERIFY EXACT LOCATION FOR EACH PIECE OF EQUIPMENT.
C. COORDINATE AND PROVIDE ALL FIELD CONNECTIONS AS REQUIRED.

SPECIFIC REMARKS:

1.

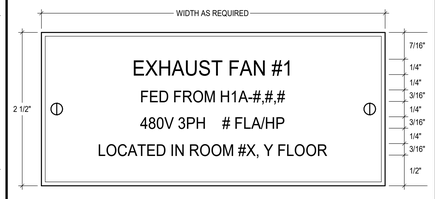
KEY	#	ITEM	HP	FLA	LOAD	EQ LOAD (VA)	VOLTAGE	FEEDERS			PROTECTION			REMARKS
								WIRE	GROUND	CONDUIT	BREAKER	DISCONNECT	FUSE	
AC	1	AIR COMPRESSOR	5	0 A	0 VA	6016 VA	208 V/ 3ph	3#10	#10G	3/4"	30 A	30 A	30 A	
FCU	1	FAN COIL UNIT	0	2 A	0 VA	554 VA	277 V/ 1ph	2#12	#12G	3/4"	20 A	S		
FCU	2	FAN COIL UNIT	0	2 A	0 VA	554 VA	277 V/ 1ph	2#12	#12G	3/4"	20 A	S		
FCU	3	FAN COIL UNIT	0	2 A	0 VA	554 VA	277 V/ 1ph	2#12	#12G	3/4"	20 A	S		
FCU	4	FAN COIL UNIT	0	2 A	0 VA	554 VA	277 V/ 1ph	2#12	#12G	3/4"	20 A	S		
FCU	5	FAN COIL UNIT	0	2 A	0 VA	554 VA	277 V/ 1ph	2#12	#12G	3/4"	20 A	S		
FCU	6	FAN COIL UNIT	0	2 A	0 VA	554 VA	277 V/ 1ph	2#12	#12G	3/4"	20 A	S		
FCU	7	FAN COIL UNIT	0	2 A	0 VA	554 VA	277 V/ 1ph	2#12	#12G	3/4"	20 A	S		
FCU	8	FAN COIL UNIT	0	2 A	0 VA	554 VA	277 V/ 1ph	2#12	#12G	3/4"	20 A	S		
FCU	9	FAN COIL UNIT	0	2 A	0 VA	554 VA	277 V/ 1ph	2#12	#12G	3/4"	20 A	S		
FCU	10	FAN COIL UNIT	0.75	0 A	0 VA	1662 VA	277 V/ 1ph	2#12	#12G	3/4"	20 A	S		
FCU	10	FAN COIL UNIT	0.75	0 A	0 VA	1662 VA	277 V/ 1ph	2#12	#12G	3/4"	20 A	S		
FCU	11	FAN COIL UNIT	0.75	0 A	0 VA	1662 VA	277 V/ 1ph	2#12	#12G	3/4"	20 A	S		
FCU	12	FAN COIL UNIT	0.75	0 A	0 VA	1662 VA	277 V/ 1ph	2#12	#12G	3/4"	20 A	S		
FCU	13	FAN COIL UNIT	0.75	0 A	0 VA	1662 VA	277 V/ 1ph	2#12	#12G	3/4"	20 A	S		
FCU	14	FAN COIL UNIT	0.75	0 A	0 VA	1662 VA	277 V/ 1ph	2#12	#12G	3/4"	20 A	S		
FCU	15	FAN COIL UNIT	0.75	0 A	0 VA	1662 VA	277 V/ 1ph	2#12	#12G	3/4"	20 A	S		
FCU	16	FAN COIL UNIT	0.75	0 A	0 VA	1662 VA	277 V/ 1ph	2#12	#12G	3/4"	20 A	S		
FCU	17	FAN COIL UNIT	0.75	0 A	0 VA	1662 VA	277 V/ 1ph	2#12	#12G	3/4"	20 A	S		
FCU	18	FAN COIL UNIT	0.75	0 A	0 VA	1662 VA	277 V/ 1ph	2#12	#12G	3/4"	20 A	S		



SUB-DISTRIBUTION CENTER AND BRANCH PANELBOARD NAMEPLATE DETAIL

SCALE: FULL

NOTES:
1. SEE SPECIFICATIONS FOR ADDITIONAL NAMEPLATE INFORMATION.
2. REWORD NAMEPLATE FOR FIELD CONDITIONS.
3. AMP RATING SHALL INDICATE BUS RATING.
4. CONFIRM ROOM NUMBER (X) AND FLOOR (Y) WITH OWNER AND ARCHITECT PRIOR TO PRINTING LABEL.
5. REFER TO SPECIFICATIONS FOR 277/480V PHASE CONDUCTOR COLOR REQUIREMENTS.



UTILIZATION EQUIPMENT NAMEPLATE DETAIL

SCALE: FULL

NOTES:
1. SEE SPECIFICATIONS FOR ADDITIONAL NAMEPLATE INFORMATION.
2. REWORD NAMEPLATE FOR FIELD CONDITIONS.
3. HP SHALL INDICATE HORSEPOWER; FLA SHALL INDICATE FULL LOAD AMPS.
4. CONFIRM ROOM NUMBER (X) AND FLOOR (Y) WITH OWNER AND ARCHITECT PRIOR TO PRINTING LABEL.

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TITLE

Red Rocks Community College - Controls Upgrades

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DRAWING TITLE

ELECTRICAL LEGENDS, SCHEDULES, DETAILS & NOTES

REVISIONS:

100% CD

Date: 11/03/2026
DRAWN BY: JAH
CHECKED BY: JAH
JOB NO: 2025-477

SHEET NO.

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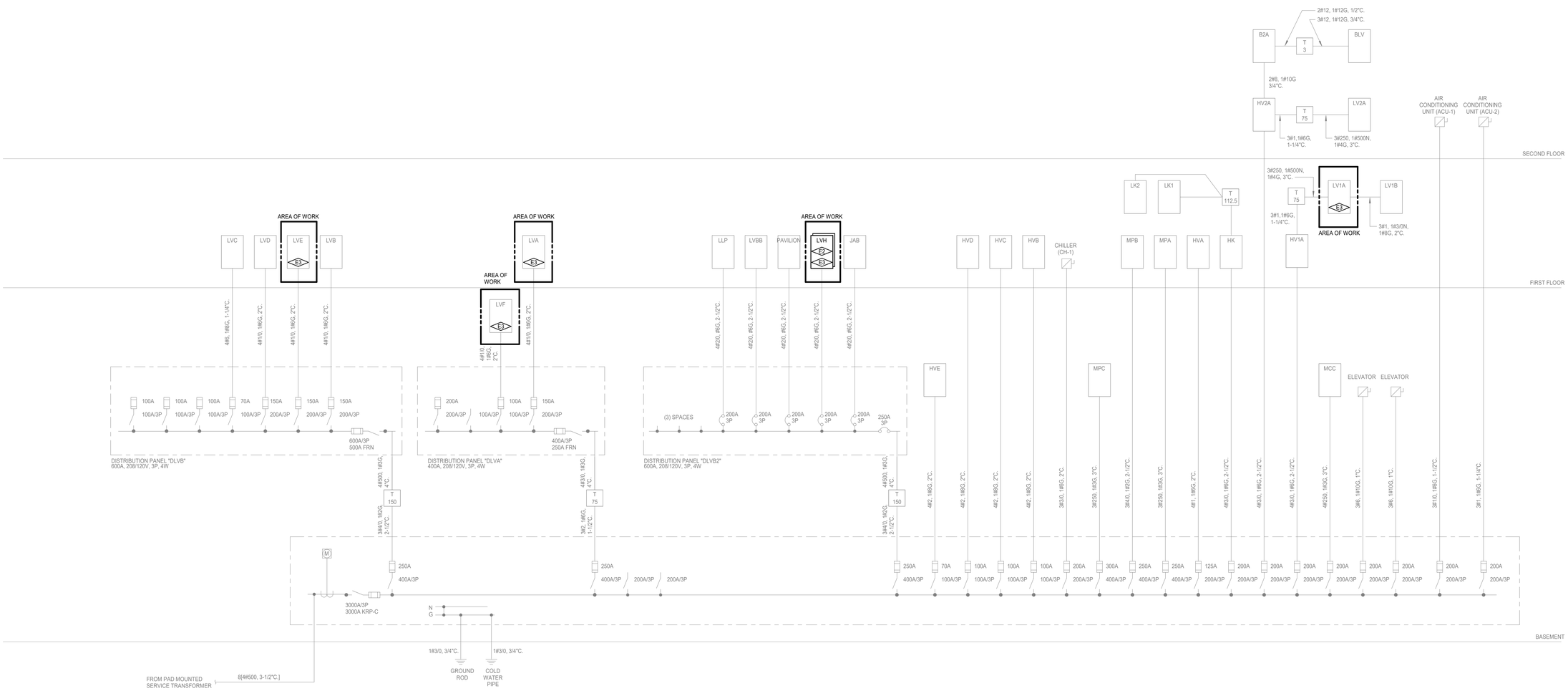
KEYNOTES

E2	DISCONNECT EXISTING PANELBOARD FOR REMOVAL AND REPLACMENT. PROVIDE NEW 2-SECTION PANELBOARD. RECONNECT EXISTING FEEDER AND BRANCH CIRCUITS.
E3	PROVIDE 3-PHASE DIGITAL RECORDING METER AT LOCATION INDICATED FOR A PERIOD OF 30 DAYS PRIOR TO SUBMITTING FOR PERMIT TO VERIFY EXISTING LOAD. METER SHALL RECORD VOLTAGE AMPERAGE, KVA AND POWER FACTOR FOR EACH PHASE AND SUM OF THE PHASES. THE METER SHALL CONTINUALLY AVERAGE THE POWER DEMAND OVER MAXIMUM 15 MINUTE INTERVALS AS REQUIRED BY NEC 220.87. COMPILE A METERING SUMMARY REPORT AND DELIVER RESULTS TO ENGINEER AFTER 7 DAYS AND AFTER 30 DAYS. VERIFY EXISTING LOADS AT AND DOWNSTREAM OF THE METERING LOCATION AND PROVIDE LIST TO ENGINEER OF WHAT LOADS ARE NOT ON DURING THE 30 DAY METERING AND THE REASON WHY. ORGANIZE LIST BY EQUIPMENT NAME. IF ANY LOADS HAVE BEEN REMOVED OR PERMANENTLY ABANDONED, TURN CIRCUIT BREAKER OFF AND RELABEL AS SPARE.



ELECTRICAL ONE-LINE DIAGRAM - EAST BUILDING (EXISTING)

SCALE: NONE

COLORADO LICENSED PROFESSIONAL ENGINEER
0040442
11/03/2026
Electrical

CATOR RUMA & ASSOCIATES, CO.
8905 Tabor Street, Lakewood, CO 80401
(303) 232-6300 • www.catorruma.com

TITLE

Red Rocks Community College - Controls Upgrades

13300 W. 6th Ave, Lakewood, CO. 80228

DRAWING TITLE

ELECTRICAL ONE-LINE DIAGRAM

REVISIONS:

100% CD

Date:	11/03/2026
DRAWN BY:	JAH
CHECKED BY:	JAH
JOB NO:	2025-477

SHEET NO.

E-002

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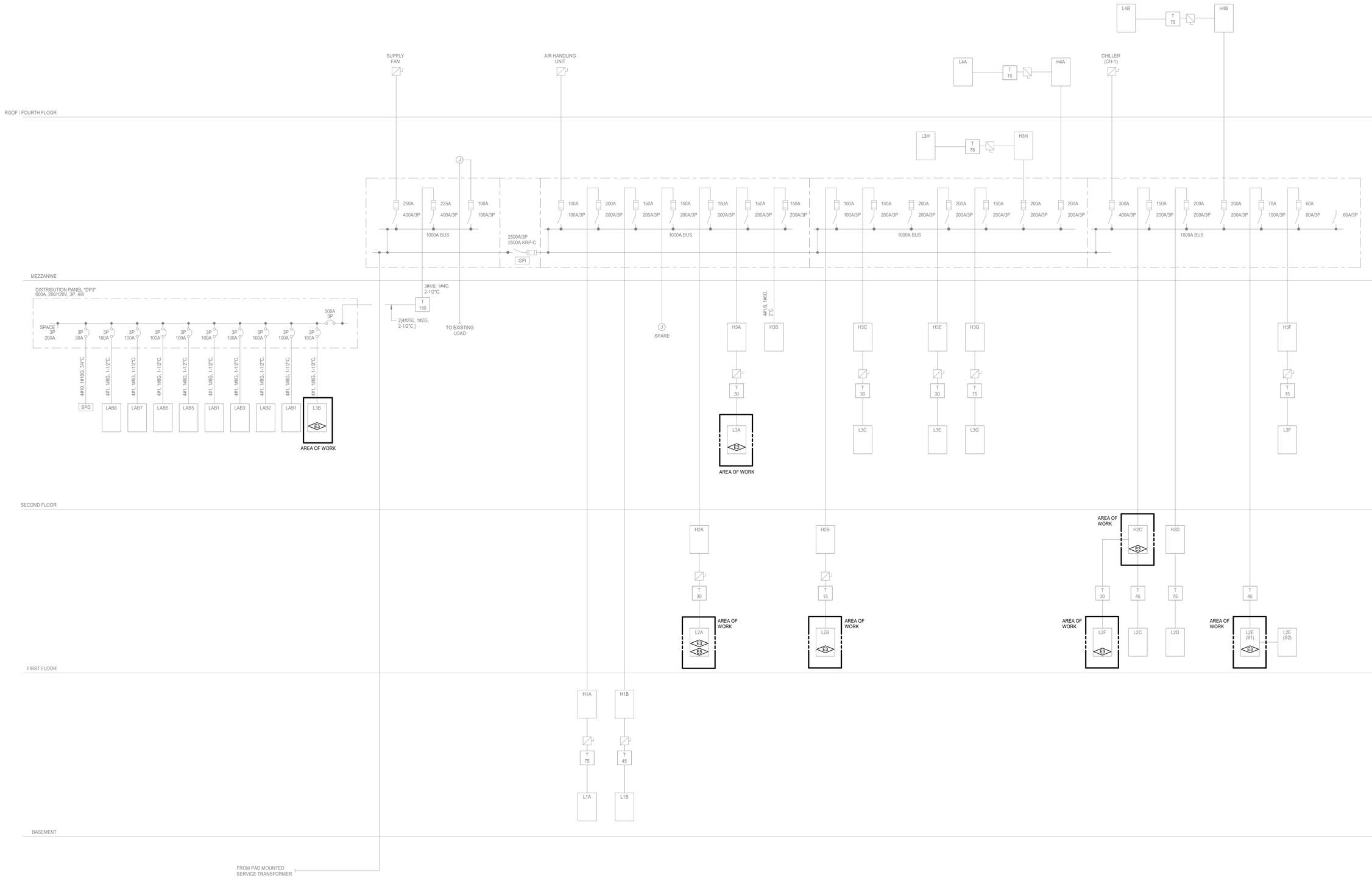
KEYNOTES

E3	PROVIDE 3-PHASE DIGITAL RECORDING METER AT LOCATION INDICATED FOR A PERIOD OF 30 DAYS PRIOR TO SUBMITTING FOR PERMIT TO VERIFY EXISTING LOAD. METER SHALL RECORD VOLTAGE AMPERAGE, KVA AND POWER FACTOR FOR EACH PHASE AND SUM OF THE PHASES. THE METER SHALL CONTINUALLY AVERAGE THE POWER DEMAND OVER MAXIMUM 15 MINUTE INTERVALS AS REQUIRED BY NEC 220.87. COMPILE A METERING SUMMARY REPORT AND DELIVER RESULTS TO ENGINEER AFTER 7 DAYS AND AFTER 30 DAYS. VERIFY EXISTING LOADS AT AND DOWNSTREAM OF THE METERING LOCATION AND PROVIDE LIST TO ENGINEER OF WHAT LOADS ARE NOT ON DURING THE 30 DAY METERING AND THE REASON WHY. ORGANIZE LIST BY EQUIPMENT NAME. IF ANY LOADS HAVE BEEN REMOVED OR PERMANENTLY ABANDONED, TURN CIRCUIT BREAKER OFF AND RELABEL AS SPARE.
E5	CONTRACTOR SHALL FIELD VERIFY EXISTING CIRCUITING AND AVAILABLE SPARES/SPACES IN THIS PANELBOARD. PROVIDE UPDATED, TYPE WRITTEN PANELBOARD DIRECTORY. PROVIDE RESULTS OF THE EXISTING CIRCUITING INVESTIGATION TO THE ENGINEER OF RECORD.



ELECTRICAL ONE-LINE DIAGRAM - MIDDLE BUILDING (EXISTING)

SCALE: NONE

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COLORADO LICENSED JAMES A. HELLER 0040442 11/03/2026 PROFESSIONAL ENGINEER
Electrical

CATOR | RUMA & ASSOCIATES, CO.
806 Teller Street, Lakewood, CO 80401
(303) 232-6200 ● www.catorruma.com

TITLE

Red Rocks Community College - Controls Upgrades

13300 W. 6th Ave, Lakewood, CO. 80228

DRAWING TITLE

ELECTRICAL ONE-LINE DIAGRAM

REVISIONS:

100% CD

Date: 11/03/2026
DRAWN BY: JAH
CHECKED BY: JAH
JOB NO: 2025-477

SHEET NO.

E-003

PANEL H2C — EXISTING

LOCATION: | **VOLTAGE:** 480/277 WYE | **A.I.C. RATING:**
SUPPLY FROM: | **PHASE:** 3 | **MAINS TYPE:** MLO
MOUNTING: SURFACE | **WIRE:** 4 | **BUS RATING:** 225 A
ENCLOSURE: Type 1

NOTES:
1. NEW LOAD ON EXISTING SPARE CIRCUIT BREAKER. FIELD VERIFY AVAILABILITY OF THIS CIRCUIT.
2. REMOVE EXISTING CIRCUIT BREAKER AND PROVIDE NEW CIRCUIT BREAKER INDICATED TO MATCH EXISTING. FIELD VERIFY AVAILABILITY OF THIS CIRCUIT.

NOTE	CKT	LOAD	TYPE	AMP	P	A	B	C	P	AMP	TYPE	LOAD	CKT	NOTE
	1	LIGHTING	--	20	1	0 0			1	20	--	LIGHTING 1448, 1452, 1453	2	
	3	LIGHTING	--	20	1		0 0		1	20	--	EXT LIGHTING	4	
	5	LIGHTING	--	20	1			0 --	1	--	--	SPACE	6	
1	7	**FAN COIL UNITS - FCU-11 /...**	**M**	20	1	3324 0							8	
1	9	**FAN COIL UNITS - (2) FCU-10**	**M**	20	1		3324 0		3	50	--	PANELBOARD L2F (VIA TRANSFORMER)	10	
	11	SPARE/TVSS	--	20	1			0 0					12	
	13					0 0							14	
	15	DISHWASHER	--	30	3		0 0		3	20	--	BOOSTER HEATER	16	
	17							0 0					18	
	19					0 3324			**1**	**20**	**M**	**FAN COIL UNITS - FCU-13 /...**	20	**1**
	21	#1452 RECEP, SERVER RM	--	30	3		0 3324		**1**	**20**	**M**	**FAN COIL UNITS - FCU-15 /...**	22	**1**
	23							0 3324	**1**	**20**	**M**	**FAN COIL UNITS - FCU-17 /...**	24	**1**
2	25	**FAN COIL UNITS - FCU-7, 8 ,9**	**M**	**20**	**1**	1662 0							26	
2	27	**FAN COIL UNITS - FCU-4, 5, 6**	**M**	**20**	**1**		1662 0		3	70	--	PANELBOARD L2C (VIA TRANSFORMER)	28	
2	29	**FAN COIL UNITS - FCU-1, 2, 3**	**M**	**20**	**1**			1662 0					30	
			TOTAL LOAD:			8310 VA	8310 VA	4986 VA						
			TOTAL AMPS:			32 A	32 A	18 A						
			PHASE BALANCE:			0 % A-B	77 % B-C	77 % C-A						

LOAD TYPE		CONNECTED LOAD	DEMAND FACTOR	DEMAND LOAD	PANEL TOTALS	
L	LIGHTING	0 VA	0.00%	0 VA		
R	RECEPTACLE	0 VA	0.00%	0 VA		
M	MOTOR	21606 VA	101.92%	22022 VA	**TOTAL CONNECTED LOAD:**	21606 VA
C	CONTINUOUS	0 VA	0.00%	0 VA	**TOTAL CONNECTED CURRENT:**	26 A
G	GENERAL	0 VA	0.00%	0 VA		
K	KITCHEN	0 VA	0.00%	0 VA	**TOTAL DEMAND LOAD:**	22022 VA
E	EXISTING	0 VA	0.00%	0 VA	**TOTAL DEMAND CURRENT:**	26 A
O	OTHER	0 VA	0.00%	0 VA		

PANEL L2F — EXISTING

LOCATION: | **VOLTAGE:** 120/208 WYE | **A.I.C. RATING:** 10,000
SUPPLY FROM: | **PHASE:** 3 | **MAINS TYPE:** MCB
MOUNTING: SURFACE | **WIRE:** 4 | **BUS RATING:** 100 A
ENCLOSURE: Type 1 | **MCB RATING:** 100 A

NOTES:
1. PROVIDE NEW CIRCUIT BREAKER IN SPACE TO MATCH EXISTING. FIELD VERIFY AVAILABILITY OF THIS CIRCUIT.

NOTE	CKT	LOAD	TYPE	AMP	P	A	B	C	P	AMP	TYPE	LOAD	CKT	NOTE
	1	UNIT HEATER FC1	--	20	1	0 0			1	20	--	DDC	2	
	3	UNIT HEATER FC2	--	20	1		0 0		1	20	--	UNIT HEATER FC17	4	
	5	UNIT HEATER FC3	--	20	1			0 0	1	20	--	UNIT HEATER FC16	6	
	7	UNIT HEATER FC4	--	20	1	0 0			1	20	--	UNIT HEATER FC15	8	
	9	UNIT HEATER FC5	--	20	1		0 0		1	20	--	UNIT HEATER FC14	10	
	11	UNIT HEATER FC6	--	20	1			0 0	1	20	--	UNIT HEATER FC13	12	
	13	UNIT HEATER FC7	--	20	1	0 0			1	20	--	UNIT HEATER FC12	14	
	15	UNIT HEATER FC8	--	20	1		0 0		1	20	--	UNIT HEATER FC11	16	
	17	UNIT HEATER FC9	--	20	1			0 0	1	20	--	RECEPT 1447	18	
	19	TVSS	--	20	1	0 0							20	
	21	TVSS	--	20	1		0 0		3	60	--	SUB PANEL CAFETERIA	22	
	23	TVSS	--	20	1			0 0					24	
1	25	**TERM. BOX CONTROLS -...**	**G**	**20**	**1**	500 --			1	--	--	SPACE	26	
1	27	**TERM. BOX CONTROLS -...**	**G**	**20**	**1**		1000 --		1	--	--	SPACE	28	
1	29	**TERM. BOX CONTROLS -...**	**G**	**20**	**1**			500 --	1	--	--	SPACE	30	
	31					0 0			1	20	--	BRIDGE REC (WTF2)	32	
	33	MAIN CIRCUIT BREAKER	--	100	3		0 0		1	20	--	BRIDGE REC (WTF4)	34	
	35							0 0	1	20	--	BRIDGE REC (WTF6)	36	
			TOTAL LOAD:			500 VA	1000 VA	500 VA						
			TOTAL AMPS:			4 A	8 A	4 A						
			PHASE BALANCE:			100 % A-B	100 % B-C	0 % C-A						

LOAD TYPE		CONNECTED LOAD	DEMAND FACTOR	DEMAND LOAD	PANEL TOTALS	
L	LIGHTING	0 VA	0.00%	0 VA		
R	RECEPTACLE	0 VA	0.00%	0 VA		
M	MOTOR	0 VA	0.00%	0 VA	**TOTAL CONNECTED LOAD:**	2000 VA
C	CONTINUOUS	0 VA	0.00%	0 VA	**TOTAL CONNECTED CURRENT:**	6 A
G	GENERAL	2000 VA	100.00%	2000 VA		
K	KITCHEN	0 VA	0.00%	0 VA	**TOTAL DEMAND LOAD:**	2000 VA
E	EXISTING	0 VA	0.00%	0 VA	**TOTAL DEMAND CURRENT:**	6 A
O	OTHER	0 VA	0.00%	0 VA		

PANEL L2B

LOCATION: | **VOLTAGE:** 120/208 WYE | **A.I.C. RATING:** EXISTING
SUPPLY FROM: T15 | **PHASE:** 3 | **MAINS TYPE:** MLO
MOUNTING: SURFACE | **WIRE:** 4 | **BUS RATING:** 100 A
ENCLOSURE: NEMA 1

NOTES:
1. PROVIDE NEW CIRCUIT BREAKER IN SPACE TO MATCH EXISTING. FIELD VERIFY AVAILABILITY OF THIS CIRCUIT.

NOTE	CKT	LOAD	TYPE	AMP	P	A	B	C	P	AMP	TYPE	LOAD	CKT	NOTE
	1	R-OFFICE AREA TVSS	--	20	1	0 0			1	20	--	R-OFFICE AREA	2	
	3	R-OFFICE AREA TVSS	--	20	1		0 0		1	20	--	R-OFFICE AREA	4	
	5	R-OFFICE AREA TVSS	--	20	1			0 0	1	20	--	R-OFFICE AREA	6	
	7	R-OFFICE AREA	--	20	1	0 0			1	20	--	R-OFFICE AREA 208/209	8	
	9	R-OFFICE AREA 212	--	20	1		0 0		1	20	--	R-OFFICE AREA 206/207	10	
	11	R-OFFICE AREA 211	--	20	1			0 0	1	20	--	R-OFFICE AREA 204/205	12	
	13	R-CLASSROOM 201	--	20	1	0 0			1	20	--	L-CORRIDOR	14	
	15	R-CLASSROOM 202	--	20	1		0 0		1	20	--	L-HALLWAY CANS	16	
	17	R-CLASSROOM 203	--	20	1			0 0	1	20	--	SPARE	18	
	19	R-DEDICATED	--	20	1	0 0			1	20	--	R-OFFICE	20	
	21	R-1692	--	20	1		0 0		1	20	--	1682 COPIER	22	
	23	R-1672	--	20	1			0 0	1	20	--	FA BOOSTER	24	
1	25	**TERM. BOX CONTROLS -...**	**G**	**20**	**1**	**1000** 0			1	20	--	1652+16	26	
	27												28	
	29	SPACE	--	--	1			-- --	1	--	--	SPACE	30	
			TOTAL LOAD:			1000 VA	0 VA	0 VA						
			TOTAL AMPS:			8 A	0 A	0 A						
			PHASE BALANCE:			% A-B	% B-C	% C-A						

LOAD TYPE		CONNECTED LOAD	DEMAND FACTOR	DEMAND LOAD	PANEL TOTALS	
L	LIGHTING	0 VA	0.00%	0 VA		
R	RECEPTACLE	0 VA	0.00%	0 VA		
M	MOTOR	0 VA	0.00%	0 VA	**TOTAL CONNECTED LOAD:**	1000 VA
C	CONTINUOUS	0 VA	0.00%	0 VA	**TOTAL CONNECTED CURRENT:**	3 A
G	GENERAL	1000 VA	100.00%	1000 VA		
K	KITCHEN	0 VA	0.00%	0 VA	**TOTAL DEMAND LOAD:**	1000 VA
E	EXISTING	0 VA	0.00%	0 VA	**TOTAL DEMAND CURRENT:**	3 A
O	OTHER	0 VA	0.00%	0 VA		

PANEL L2E (S1) — EXISTING

LOCATION: | **VOLTAGE:** 120/208 WYE | **A.I.C. RATING:** 10,000
SUPPLY FROM: | **PHASE:** 3 | **MAINS TYPE:** MCB
MOUNTING: SURFACE | **WIRE:** 4 | **BUS RATING:** 200 A
ENCLOSURE: Type 1 | **MCB RATING:** 150 A

NOTES:
1. PROVIDE NEW CIRCUIT BREAKER IN SPACE TO MATCH EXISTING. FIELD VERIFY AVAILABILITY OF THIS CIRCUIT.

NOTE	CKT	LOAD	TYPE	AMP	P	A	B	C	P	AMP	TYPE	LOAD	CKT	NOTE
	1	REFRIGERATOR	--	20	1	0 0			1	20	--	EMERG LIGHTING	2	
	3	DISHWASHER	--	20	1		0 0		1	20	--	STEP LIGHTING	4	
	5	RECEPT	--	20	1			0 0	1	20	--	LIGHTING	6	
	7	DISPOSAL	--	20	1	0 0			1	20	--	RECEPT	8	
	9	ICE MAKER	--	20	1		0 0		1	20	--	RECEPT	10	
	11	RECEPT	--	20	1			0 0	1	20	--	RECEPT	12	
	13	RECEPT	--	20	1	0 0			1	20	--	RECEPT	14	
	15	RECEPT	--	20	1		0 0		1	20	--	RECEPT	16	
	17	RECEPT	--	20	1			0 0	1	20	--	RECEPT	18	
	19	RECEPT	--	20	1	0 0			1	20	--	RECEPT	20	
	21	DROP DOWN SCREEN	--	20	1		0 0		1	20	--	WASHER	22	
	23	RECEPT	--	20	1			0 0	1	20	--	RECEPT	24	
	25	RECEPT	--	20	1	0 0							26	
	27	COOK TOP	--	30	2		0 0		3	20	--	DIMMER CONTROL PANEL	28	
	29							0 0					30	
	31	DRYER	--	50	2	0 0			1	20	--	SPARE	32	
	33						0 500		1	20	**G**	**TERM. BOX CONTROLS**	34	**1**
1	35	**TERM. BOX CONTROLS**	**G**	20	1			500 500	1	20	**G**	**TERM. BOX CONTROLS**	36	**1**
			TOTAL LOAD:			0 VA	500 VA	1000 VA						
			TOTAL AMPS:			0 A	5 A	9 A						
			PHASE BALANCE:			% A-B	87 % B-C	% C-A						

LOAD TYPE		CONNECTED LOAD	DEMAND FACTOR	DEMAND LOAD	PANEL TOTALS	
L	LIGHTING	0 VA	0.00%	0 VA		
R	RECEPTACLE	0 VA	0.00%	0 VA		
M	MOTOR	0 VA	0.00%	0 VA	**TOTAL CONNECTED LOAD:**	1500 VA
C	CONTINUOUS	0 VA	0.00%	0 VA	**TOTAL CONNECTED CURRENT:**	4 A
G	GENERAL	1500 VA	100.00%	1500 VA		
K	KITCHEN	0 VA	0.00%	0 VA	**TOTAL DEMAND LOAD:**	1500 VA
E	EXISTING	0 VA	0.00%	0 VA	**TOTAL DEMAND CURRENT:**	4 A
O	OTHER	0 VA	0.00%	0 VA		

PANEL LVA — EXISTING

LOCATION: | **VOLTAGE:** 120/208 WYE | **A.I.C. RATING:** 10,000
SUPPLY FROM: | **PHASE:** 3 | **MAINS TYPE:** MCB
MOUNTING: SURFACE | **WIRE:** 4 | **BUS RATING:** 400 A
ENCLOSURE: Type 1 | **MCB RATING:** 400 A

NOTES:
1. CONNECT NEW LOAD TO EXISTING SPARE CIRCUIT BREAKER. FIELD VERIFY AVAILABILITY OF THIS CIRCUIT.

NOTE	CKT	LOAD	TYPE	AMP	P	A	B	C	P	AMP	TYPE	LOAD	CKT	NOTE
	1	TVSS	--	20	1	0 0			1	20	--	RM 1408	2	
	3	RM 1408	--	20	1		0 0		1	20	--	SPARE	4	
	5	TVSS	--	20	1			0 0	1	20	--	RM 1408	6	
	7	SPARE	--	20	1	0 0			1	20	--	SPARE	8	
	9	RM 1405	--	20	1		0 0		1	20	--	ACCESS CONTROL	10	
	11	SPARE	--	20	1			0 0	1	20	--	SPARE	12	
	13	RECEPT 1449 / SPARE 1449/1453	--	20	3	0 0			1	20	--	REC RM 1448	14	
	15						0 0		1	20	--	REC RM 1447	16	
	17							0 0	1	20	--	SPARE	18	
	19	SPARE	--	20	1	0 0			1	20	--	SPARE	20	
	21	SPARE	--	20	1		0 0		1	20	--	SPARE	22	
	23	RM 1324	--	20	1			0 0	1	20	--	SPARE	24	
	25	SPARE	--	20	1	0 0			1	20	--	SPARE	26	
	27	RM 1454 WIREMOLD & FURN. FEED	--	20	2		0 0		1	20	--	SPARE	28	
	29							0 0	1	20	--	SPARE	30	
	31	RM 1455, 1457	--	20	1	0 0			1	20	--	SPARE	32	
1	33	**TERM. BOX CONTROLS -...**	**G**	20	1		500 0		1	20	--	SPARE	34	
1	35	**TERM. BOX CONTROLS -...**	**G**	20	1			1000 0	1	20	--	REC RM 1452	36	
1	37	**TERM. BOX CONTROLS -...**	**G**	20	1	500 0			1	20	--	SPARE (RM 1452)	38	
1	39	**TERM. BOX CONTROLS -...**	**G**	20	1		500 0		1	20	--	CRAWL SPACE PWR & LTG	40	
1	41	**TERM. BOX CONTROLS - N....**	**G**	20	1			500 0	1	20	--	SPARE	42	
	43	TRACK LIGHTING	--	20	1	0 0			1	20	--	RM 1330	44	
	45	SPARE	--	20	1		0 0		1	20	--	RM 1324	46	
	47	RM 1320, 1324	--	20	1			0 0	1	20	--	SPARE	48	
	49	RM 1419 FLR BOXES	--	20	1	0 0			1	20	--	SPARE	50	
	51	RM 1419 FLR BOXES	--	20	1		0 0		1	20	--	RM #??	52	
	53	RM 1419 FLR BOXES	--	20	1			0 0	1	20	--	?? FOR DOOR LOGO	54	
	55	RM 1417 EAST WALL	--	20	1	0 0			1	20	--	SPARE	56	
	57	SPARE	--	20	1		0 0		1	20	--	SPARE	58	
	59	RM 1413, 1415	--	20	1			0 0	1	20	--	RM 1417 S. WALL	60	
	61	REC RM 1446 + FLR, 1352 W.	--	20	1	0 0			1	20	--	RM 1450 WIREMOLD	62	
	63	SPARE	--	20	1		0 0		1	20	--	COMPRESSOR MECH RM	64	
	65	RM 1353 FLR BOXES	--	20	1			0 0	1	20	--	RM 1450 WIREMOLD	66	
	67	RM 1405 ORANGE	--	20	1	0 0			1	20	--	SPARE	68	
	69	SPARE	--	20	1		0 0		1	20	--	SPARE	70	
	71	RM 1451, 1455	--	20	1			0 0					72	
	73	RECEPT RM 1450	--	20	1	0 0			2	20	--	SUB PANEL LVA3 - RM 1417	74	
	75	RM 1321	--	20	1		0 0		1	20	--	RM 1353 W. WALL	76	
	77	RM 1450 WIREMOLD	--	20	1			0 0	1	20	--	RM 1405	78	
	79	SPARE	--	20	1	0 0			1	20	--	RM 1417 E WALL	80	
	81	SPARE	--	20	1		0 0		1	20	--	SPARE	82	
	83	SPARE	--	20	1			0 0	1	20	--	RM 1419 E & N WALL	84	
			TOTAL LOAD:			500 VA	1000 VA	1500 VA						
			TOTAL AMPS:			4 A	9 A	13 A						
			PHASE BALANCE:			115 % A-B	46 % B-C	215 % C-A						

LOAD TYPE		CONNECTED LOAD	DEMAND FACTOR	DEMAND LOAD	PANEL TOTALS	
L	LIGHTING	0 VA	0.00%	0 VA		
R	RECEPTACLE	0 VA	0.00%	0 VA		
M	MOTOR	0 VA	0.00%	0 VA	**TOTAL CONNECTED LOAD:**	3000 VA
C	CONTINUOUS	0 VA	0.00%	0 VA	**TOTAL CONNECTED CURRENT:**	8 A
G	GENERAL	3000 VA	100.00%	3000 VA		
K	KITCHEN	0 VA	0.00%	0 VA	**TOTAL DEMAND LOAD:**	3000 VA
E	EXISTING	0 VA	0.00%	0 VA	**TOTAL DEMAND CURRENT:**	8 A
O	OTHER	0 VA	0.00%	0 VA		

PANEL LV1A — EXISTING

LOCATION: | **VOLTAGE:** 120/208 WYE | **A.I.C. RATING:** 10,000
SUPPLY FROM: | **PHASE:** 3 | **MAINS TYPE:** MCB
MOUNTING: SURFACE | **WIRE:** 4 | **BUS RATING:** 250 A
ENCLOSURE: Type 1 | **MCB RATING:** 250 A

NOTES:
1. CONNECT NEW LOAD TO EXISTING SPARE CIRCUIT BREAKER. FIELD VERIFY AVAILABILITY OF THIS CIRCUIT.

NOTE	CKT	LOAD	TYPE	AMP	P	A	B	C	P	AMP	TYPE	LOAD	CKT	NOTE
	1	RECEPTACLES	--	20	1	0 0			1	20	--	RECEPTACLES	2	
	3	RECEPTACLES	--	20	1		0 0		1	20	--	RECEPTACLES	4	
	5	RECEPTACLES	--	20	1			0 0	1	20	--	RECEPTACLES	6	
	7	RECEPTACLES	--	20	1	0 0			1	20	--	RECEPTACLES	8	
	9	RECEPTACLES	--	20	1		0 0		1	20	--	RECEPTACLES	10	
	11	RECEPTACLES	--	20	1			0 0	1	20	--	RECEPTACLES	12	
	13	RECEPTACLES	--	20	1	0 0			1	20	--	RECEPTACLES	14	
	15	RECEPTACLES	--	20	1		0 0		1	20	--	RECEPTACLES	16	
	17	RECEPTACLES	--	20	1			0 0	1	20	--	RECEPTACLES	18	
	19	RECEPTACLES	--	20	1	0 0			1	20	--	RECEPTACLES	20	
	21	RECEPTACLES	--	20	1		0 0		1	20	--	RECEPTACLES	22	
	23	RECEPTACLES	--	20	1			0 0	1	20	--	RECEPTACLES	24	
	25	RECEPTACLES	--	20	1	0 0			1	20	--	RECEPTACLES	26	
	27	RECEPTACLES	--	20	1		0 0		1	20	--	RECEPTACLES	28	
	29	RECEPTACLES	--	20	1			0 0	1	20	--	RECEPTACLES	30	
	31	RECEPTACLES	--	20	1	0 0			1	20	--	RECEPTACLES	32	
	33	LIGHTING	--	20	1		0 0		1	20	--	RECEPTACLES	34	
	35	RECEPTACLES	--	20	1			0 0	1	20	--	ELECTRIC WATER COOLER	36	
	37	LIGHT TRACK	**--**	20	1	0 **1000**			1	**20**	**G**	**TERM. BOX CONTROLS -...**	**38**	**1**
	39	ATM	**--**	20	1		0 **500**		1	**20**	**G**	**TERM. BOX CONTROLS -...**	**40**	**1**
	41	LIGHT TRACK	**--**	20	1			0 **500**	1	**20**	**G**	**TERM. BOX CONTROLS -...**	**42**	**1**
	43	RECEPTACLES	--	20	1	0 0			1	20	--	RECEPTACLES	44	
	45	RECEPTACLES	--	20	1		0 0		1	20	--	RECEPTACLES	46	
	47	RECEPTACLES	--	20	1			0 0	1	20	--	RECEPTACLES	48	
	49	RECEPTACLES	--	20	1	0 0			1	20	--	COPIER	50	
	51	RECEPTACLES	--	20	1		0 0		1	20	--	COPIER	52	
	53	RECEPTACLES	--	20	1			0 0	1	20	--	COPIER	54	
	55	RECEPTACLES	--	20	1	0 0			1	20	--	SPARE	56	
	57	RECEPTACLES	--	20	1		0 0		1	20	--	SPARE	58	
	59	RECEPTACLES	--	20	1			0 0	1	20	--	SPARE	60	
	61	RECEPTACLES	--	20	1	0 --			1	--	--	SPACE	62	
	63	DOOR	--	20	1		0 --		1	--	--	SPACE	64	
	65	DOOR	--	20	1			0 --	1	--	--	SPACE	66	
	67	(2) CH-1	--	20	1	0 --			1	--	--	SPACE	68	
	69	RECEPTACLES, LIGHTING	--	20	1		0 --		1	--	--	SPACE	70	
	71	SPARE	--	20	1			0 --	1	--	--	SPACE	72	
	73	SPACE	--	--	1	-- --			1	--	--	SPACE	74	
	75	SPACE	--	--	1		-- --		1	--	--	SPACE	76	
	77	SPACE	--	--	1			-- --	1	--	--	SPACE	78	
	79	SPACE	--	--	1	-- 0							80	
	81	SPACE	--	--	1		-- 0		3	100	--	PANELBOARD LV1B	82	
	83	SPACE	--	--	1			-- 0					84	
			TOTAL LOAD:			1000 VA	500 VA	500 VA						
			TOTAL AMPS:			8 A	4 A	4 A						
			PHASE BALANCE:			100 % A-B	0 % B-C	100 % C-A						

LOAD TYPE		CONNECTED LOAD	DEMAND FACTOR	DEMAND LOAD	PANEL TOTALS	
L	LIGHTING	0 VA	0.00%	0 VA		
R	RECEPTACLE	0 VA	0.00%	0 VA		
M	MOTOR	0 VA	0.00%	0 VA	**TOTAL CONNECTED LOAD:**	2000 VA
C	CONTINUOUS	0 VA	0.00%	0 VA	**TOTAL CONNECTED CURRENT:**	6 A
G	GENERAL	2000 VA	100.00%	2000 VA		
K	KITCHEN	0 VA	0.00%	0 VA	**TOTAL DEMAND LOAD:**	2000 VA
E	EXISTING	0 VA	0.00%	0 VA	**TOTAL DEMAND CURRENT:**	6 A
O	OTHER	0 VA	0.00%	0 VA		

PANEL LVE — EXISTING

LOCATION: | **VOLTAGE:** 120/208 WYE | **A.I.C. RATING:** 10,000
SUPPLY FROM: | **PHASE:** 3 | **MAINS TYPE:** MCB
MOUNTING: SURFACE | **WIRE:** 4 | **BUS RATING:** 100 A
ENCLOSURE: Type 1 | **MCB RATING:** 100 A

NOTES:
1. CONNECT NEW LOAD TO EXISTING SPARE CIRCUIT BREAKER. FIELD VERIFY AVAILABILITY OF THIS CIRCUIT.

NOTE	CKT	LOAD	TYPE	AMP	P	A	B	C	P	AMP	TYPE	LOAD	CKT	NOTE
	1	F-22 ATT VIDEO COMP	--	20	1	0 0			1	20	--	800W F-7 & MOTOR SCRN	2	
	3	1200W RECEPT & F-22	--	20	1		0 0		1	20	--	1400W RECEPT	4	
	5	800W RECEPT & F-22	--	20	1			0 0	1	20	--	1100W RECEPT	6	
	7	1100W RECEPT & F-22	--	20	1	0 0			1	20	--	1300W RECEPT 0165	8	
	9	1200W RECEPT & F-22	--	20	1		0 0		1	20	--	1700W RECEPT	10	
	11	1000W RECEPT & F-22	--	20	1			0 0	1	20	--	1200W REC, RR EF-7	12	
	13	1100W REC, F-22, CAB. UH	--	20	1	0 0			1	20	--	1200W RECEPT	14	
	15	800W RECEPT & F-22	--	20	1		0 0		1	20	--	1200W RECEPT	16	
	17	1300W REC, F-22, RM 1154 S.	--	20	1			0 0	1	20	--	1300W RECEPT	18	
	19	1200W REC & F-22	--	20	1	0 0			1	20	--	1150W MOTOR SCRN F-17 &...	20	
	21	RECEPTACLE	--	20	2		0 0		1	20	--	1500W RECEPT, RM 1081 HTR	22	
	23							0 0	1	20	--	400W TELEPHONE EQUIP	24	
	25	SPARE	**--**	20	1	0 0							26	
	27	WASHER	--	40	2		0 0		2	50	--	11KW RANGE	28	
	29							0 0					30	
	31	PLAY RM RECEPT	--	20	1	0 0			1	20	--	SPARE	30	
	33	FRONT DESK/OFFICE RECEPT	--	20	1		0 0		1	20	--	1100W RECEPT, ROOF EF-6	32	
	35	REFRIG	--	20	1			0 0	1	20	--	600W RECEPT	34	
	37	220V RECEPT	--	20	1	0 0			2	20	--	EXISTING LOAD	36	
	39	220V RECEPT	--	20	1		0 0					220V RECEPT	38	
1	41	**TERM. BOX CONTROLS - EAST**	**G**	20	1			1000 0	1	20	--	SPARE	40	
1	43	**TERM. BOX CONTROLS - EAST**	**G**	20	1	500 0			1

PANEL L3A — EXISTING

LOCATION:
SUPPLY FROM:
MOUNTING: RECESSED
ENCLOSURE: Type 1

VOLTAGE: 120/208 WYE
PHASE: 3
WIRE: 4

A.I.C. RATING: 10,000
MAINS TYPE: MLO
BUS RATING: 225 A

NOTES:
1. NEW LOAD CONNECTED TO EXISTING SPARE CIRCUIT BREAKER. FIELD VERIFY AVAILABILITY OF THIS CIRCUIT.

NOTE	CKT	LOAD	TYPE	AMP	P	A		B		C		P	AMP	TYPE	LOAD	CKT	NOTE
	1	RECEPT CLASSRM 307	--	20	1	0	0					1	20	--	COPIER 2143 / TVSS	2	
	3	RECEPT CLASSRM 306	--	20	1			0	0			1	20	--	RECEPT LAB AND SEM....	4	
	5	RECEPT CLASSRM 305	--	20	1					0	0	1	20	--	RM 2600, 2602	6	
	7	RECEPT SEMINAR 302	--	20	1	0	0					1	20	--	RECEPT SEMINAR 301	8	
	9	RM 2534	--	20	1			0	0			1	20	--	RECEPT OFFICE AREA 317	10	
	11	RECEPT OFFICE AREA 303	--	20	1					0	0	1	20	--	RECEPT SEMINAR 318	12	
	13	RECEPT OFFICE AREA 303	--	20	1	0	0					1	20	--	SPARE	14	
	15	RECEPT CUBES 313-316	--	20	1			0	0			1	20	--	RECEPT CLASSRM 330	16	
	17	COMP SW RM 2617	--	20	1					0	0	1	20	--	RECEPT RESTRM & LOUNGE	18	
	19	COMP SW RM 2617	--	20	1	0	0					1	20	--	SPARE (TO DISPLAY CTR)	20	
	21	SPARE	--	20	1			0	0			1	20	--	RECEPT MAT'L CTR	22	
	23	DRINKING FOUNTAIN	--	20	1					0	0	1	20	--	RECEPT MAT'L CTR	24	
	25	RECEPT TELE RM & EWC	--	20	1	0	0					1	20	--	FACULTY OFFICES	26	
	27	**TERM. BOX CONTROLS**	**G**	20	1			500	0			1	20	--	FACULTY OFFICES 2633, 2635	28	
	29	2650 FURN FEED	--	20	1					0	0	1	20	--	FACULT OFFICES	30	
	31	SPARE (2650 CEILING)	--	20	1	0	0					1	20	--	RECEPT IN WALL NEAR 2630	32	
	33	RECEPT IN WALL NEAR 2630	--	20	1			0	0			1	20	--	RM 2650 FURN FEED	34	
	35	RM 2532, 2534	--	20	1					0	500	1	20	**G**	**TERM. BOX CONTROLS**	36	
	37	RM 2650	--	20	1	0	0					1	20	--	RECEPT RM 2925 (QTY 3)	38	
	39	SPARE (DWN STAIRS AT ELEV)	--	20	1			0	500			1	20	**G**	**TERM. BOX CONTROLS**	40	
	41	1524 COMPANY SWITCH	--	20	1					0	0	1	20	--	RM 1528	42	
				TOTAL LOAD:		0 VA		1000 VA		500 VA							
				TOTAL AMPS:		0 A		9 A		5 A							
				PHASE BALANCE:		% A-B		87 % B-C		% C-A							

LOAD TYPE		CONNECTED LOAD	DEMAND FACTOR	DEMAND LOAD	PANEL TOTALS	
L	LIGHTING	0 VA	0.00%	0 VA		
R	RECEPTACLE	0 VA	0.00%	0 VA		
M	MOTOR	0 VA	0.00%	0 VA	**TOTAL CONNECTED LOAD:**	1500 VA
C	CONTINUOUS	0 VA	0.00%	0 VA	**TOTAL CONNECTED CURRENT:**	4 A
G	GENERAL	1500 VA	100.00%	1500 VA		
K	KITCHEN	0 VA	0.00%	0 VA	**TOTAL DEMAND LOAD:**	1500 VA
E	EXISTING	0 VA	0.00%	0 VA	**TOTAL DEMAND CURRENT:**	4 A
O	OTHER	0 VA	0.00%	0 VA		

PANEL L3B — EXISTING

LOCATION:
SUPPLY FROM:
MOUNTING: SURFACE
ENCLOSURE: Type 1

VOLTAGE: 120/208 WYE
PHASE: 3
WIRE: 4

A.I.C. RATING: 10,000
MAINS TYPE: MLO
BUS RATING: 225 A

NOTES:
1. NEW LOAD CONNECTED TO EXISTING SPARE CIRCUIT BREAKER. FIELD VERIFY AVAILABILITY OF THIS CIRCUIT.

NOTE	CKT	LOAD	TYPE	AMP	P	A		B		C		P	AMP	TYPE	LOAD	CKT	NOTE
	1	RECEPS	--	20	1	0	0					1	20	--	RECEPS	2	
	3	RECEPS	--	20	1			0	0			1	20	--	RM 2565 RECEPS	4	
	5	RECEPS	--	20	1					0	0	1	20	--	RECEPS	6	
	7	RECEPS	--	20	1	0	0					1	20	--	RM 2563 RECEPS	8	
	9	RECEPS	--	20	1			0	0			1	20	--	RECEPTS	10	
	11	RECEPS	--	20	1					0	0	1	20	--	RM 2553 RECEPS	12	
	13	OFF. 1182/2540/2543/2541 REC	--	20	1	0	0					1	20	--	TASK LIGHTS	14	
	15	RECEPS	--	20	1			0	0			1	20	--	RM 2553 RECEPS	16	
	17	OFFICE 2541/2557 RECEPS	--	20	1					0	0	1	20	--	FIRE ALARM	18	
	19	OFFICE 2557 RECEPS	--	20	1	0	0					1	20	--	LIGHTS RM 1550, 1557	20	
	21	OFFICE 2559/2558 RECEPS	--	20	1			0	0			1	20	--	SPOT & TRACK LIGHTS	22	
	23	SECURITY CKT	--	20	1					0	0	1	20	--	DOOR MAG	24	
1	25	**TERM. BOX CONTROLS**	**G**	20	1	500	0					1	20	--	OFF. 2547/2545/2543 RECEPS	26	
1	27	**TERM. BOX CONTROLS**	**G**	20	1			500	0			1	20	--	OFF. 2546/2547/2545/2544 REC.	28	
1	29	**TERM. BOX CONTROLS**	**G**	20	1					500	0	1	20	--	DEDICATED COPIER RECEP	30	
1	31	**TERM. BOX CONTROLS**	**G**	20	1	1500	0					1	20	--	SODA MACHINE GFI DED.	32	
1	33	**TERM. BOX CONTROLS**	**G**	20	1			1000	0			1	20	--	SODA MACHINE GFI DED.	34	
1	35	**TERM. BOX CONTROLS**	**G**	20	1					1000	0	1	20	--	SODA MACHINE GFI DED.	36	
				TOTAL LOAD:		2000 VA		1500 VA		1500 VA							
				TOTAL AMPS:		17 A		13 A		13 A							
				PHASE BALANCE:		33 % A-B		0 % B-C		33 % C-A							

LOAD TYPE		CONNECTED LOAD	DEMAND FACTOR	DEMAND LOAD	PANEL TOTALS	
L	LIGHTING	0 VA	0.00%	0 VA		
R	RECEPTACLE	0 VA	0.00%	0 VA		
M	MOTOR	0 VA	0.00%	0 VA	**TOTAL CONNECTED LOAD:**	5000 VA
C	CONTINUOUS	0 VA	0.00%	0 VA	**TOTAL CONNECTED CURRENT:**	14 A
G	GENERAL	5000 VA	100.00%	5000 VA		
K	KITCHEN	0 VA	0.00%	0 VA	**TOTAL DEMAND LOAD:**	5000 VA
E	EXISTING	0 VA	0.00%	0 VA	**TOTAL DEMAND CURRENT:**	14 A
O	OTHER	0 VA	0.00%	0 VA		

PANEL LVF — EXISTING

LOCATION:
SUPPLY FROM: DLVA
MOUNTING: SURFACE
ENCLOSURE: NEMA 1

VOLTAGE: 120/208 WYE
PHASE: 3
WIRE: 4

A.I.C. RATING: 10,000
MAINS TYPE: MLO
BUS RATING: 225 A

NOTES:
1. RELOCATE EXISTING LOAD FROM CIRCUIT 9.
2. REPLACE EXISTING CIRCUIT BREAKERS WITH 3P CIRCUIT BREAKER TO MATCH EXISTING.

NOTE	CKT	LOAD	TYPE	AMP	P	A		B		C		P	AMP	TYPE	LOAD	CKT	NOTE
	1	0450 PHONE RM AC	--	20	1	0	0					1	20	--	0450	2	
	3	1449 CHILLER RM	--	20	1			0	0			1	20	--	0450 TWIST LOCK	4	
1	5	**MAIN LOBBY MONITOR**	**--**	**20**	**1**					0	0	1	20	--	0452	6	
	7	0452 AIR DRYER	--	20	1	0	0					1	20	--	0453 W. WALL	8	
	9							2005	0			1	20	--	BUDERUS BOILERS 120V	10	
2	11	**AIR COMPRESSOR (AC-1)**	**M**	**30**	**3**					2005	0	1	20	--	DED. BY ELEV RM	12	
	13					2005	0					1	20	--	"GAS HOUSE" POWER	14	
	15	0453 BOILER RM	--	20	1			0	0			1	20	--	MAIN ENTRANCE RECEPTION	16	
	17	1449 CHILLER RM WTR HTR	--	20	1					0	0	1	20	--	0450	18	
	19	1451 DISPATCH	--	20	1	0	0					2	20	--	SPARE	20	
	21	1353 LOW WALL W/COUNTER	--	20	1			0	0							22	
	23	SPARE	--	20	1					0	0	1	20	--	1453	24	
	25	0450 UPS	--	20	1	0	0					1	20	--	1453	26	
	27	1449 CONTROLS RM	--	20	1			0	0			1	20	--	ELEVATOR #1 SHUNT TRIP	28	
	29	SPARE	--	20	1					0	0	2	20	--	OUTSIDE SE CORNER	30	
	31	1453, 1449	--	20	1	0	0								DISCONNECT	32	
	33	1449 CHILLER RM	--	20	1			0	0			2	20	--	0452 CLOTHES DRYER	34	
	35	SPARE	--	20	1					0	0					36	
	37	POLICE AREA	--	20	1	0	0					1	20	--	SPARE	38	
	39	SPARE	--	20	1			0	0			2	20	--	1453	40	
	41	ELEVATOR CAR LIGHTS	--	20	1					0	0					42	
				TOTAL LOAD:		2005 VA		2005 VA		2005 VA							
				TOTAL AMPS:		17 A		17 A		17 A							
				PHASE BALANCE:		0 % A-B		0 % B-C		0 % C-A							

LOAD TYPE		CONNECTED LOAD	DEMAND FACTOR	DEMAND LOAD	PANEL TOTALS	
L	LIGHTING	0 VA	0.00%	0 VA		
R	RECEPTACLE	0 VA	0.00%	0 VA		
M	MOTOR	6016 VA	125.00%	7521 VA	**TOTAL CONNECTED LOAD:**	6016 VA
C	CONTINUOUS	0 VA	0.00%	0 VA	**TOTAL CONNECTED CURRENT:**	17 A
G	GENERAL	0 VA	0.00%	0 VA		
K	KITCHEN	0 VA	0.00%	0 VA	**TOTAL DEMAND LOAD:**	7521 VA
E	EXISTING	0 VA	0.00%	0 VA	**TOTAL DEMAND CURRENT:**	21 A
O	OTHER	0 VA	0.00%	0 VA		

PANEL LVH — NEW

LOCATION:
SUPPLY FROM:
MOUNTING: SURFACE
ENCLOSURE: NEMA 1

VOLTAGE: 120/208 WYE
PHASE: 3
WIRE: 4

A.I.C. RATING: 10,000
MAINS TYPE: MCB
BUS RATING: 200 A
MCB RATING: 200 A

NOTES:
1. RECONNECT EXISTING BRANCH CIRCUIT.

NOTE	CKT	LOAD	TYPE	AMP	P	A		B		C		P	AMP	TYPE	LOAD	CKT	NOTE
1	1	RM 1111 - OFFICE	--	20	1	0	0					1	20	--	RM 1109 W	2	1
1	3	RM 1103 - HALL	--	20	1			0	0			1	20	--	RM 1109 W	4	1
1	5	RM 1105	--	20	1					0	0	1	20	--	RM 1103	6	1
1	7	RM 1103	--	20	1	0	0					1	20	--	RM 1103	8	1
1	9	RM 1103	--	20	1			0	0			1	20	--	FLR 1109	10	1
1	11	RM 1107 - NORTH	--	20	1					0	0	1	20	--	FLR 1109	12	1
1	13	RM 1109 S	--	20	1	0	0					1	20	--	FLR 1109	14	1
1	15	RM 1109 E	--	20	1			0	0			1	20	--	FLR 1113	16	1
1	17	RM 1109 N	--	20	1					0	0	1	20	--	RM 1107 N	18	1
1	19	RM 1113 S	--	20	1	0	0					2	20	--	W WALL 208V	20	1
1	21	RM 1103 - HALL	--	20	1			0	0							22	
1	23	RM 1113 E	--	20	1					0	0	1	20	--	EXISTING LOAD	24	1
1	25	RM 1107 N	--	20	1	0	--					1	--	--	SPACE	26	
1	27	RM 1117	--	20	1			0	0			1	20	--	RM 1109	28	1
1	29	RM 1107	--	20	1					0	0	1	20	--	SPARE	30	
1	31	RM 1117	--	30	2	0	0					2	20	--	R-1115 CLASSROOM	32	1
	33							0	0							34	
1	35	1101, 07, 09, 1113 CEILING	--	20	2					0	0	1	20	--	R-ELEC RM	36	1
	37					0	0					1	20	--	N/S FIRE SMOKE DAMPERS	38	1
	39	TERM. BOX CONTROLS	G	20	1			1000	0			1	20	--	SW CORNER MAG DOOR HOLD	40	1
	41	TERM. BOX CONTROLS	G	20	1					1000	0	1	20	--	SPARE	42	
	43	TERM. BOX CONTR - LWR LVL	G	20	1	500	0					1	20	--	SPARE	44	
	45	TERM. BOX CONTR - LWR LVL	G	20	1			500	0			1	20	--	SPARE	46	
	47	SPARE	--	20	1					0	0	1	20	--	SPARE	48	
	49	SPARE	--	20	1	0	0					1	20	--	SPARE	50	
	51	SPARE	--	20	1			0	0			1	20	--	SPARE	52	
	53	SPARE	--	20	1					0	0	1	20	--	SPARE	54	
	55	SPARE	--	20	1	0	0					1	20	--	SPARE	56	
	57	SPARE	--	20	1			0	0			1	20	--	SPARE	58	
	59	SPARE	--	20	1					0	0	1	20	--	SPARE	60	
				TOTAL LOAD:		500 VA		1500 VA		1000 VA							
				TOTAL AMPS:		4 A		13 A		9 A							
				PHASE BALANCE:		215 % A-B		46 % B-C		115 % C-A							

LOAD TYPE		CONNECTED LOAD	DEMAND FACTOR	DEMAND LOAD	PANEL TOTALS	
L	LIGHTING	0 VA	0.00%	0 VA		
R	RECEPTACLE	0 VA	0.00%	0 VA		
M	MOTOR	0 VA	0.00%	0 VA	**TOTAL CONNECTED LOAD:**	3000 VA
C	CONTINUOUS	0 VA	0.00%	0 VA	**TOTAL CONNECTED CURRENT:**	8 A
G	GENERAL	3000 VA	100.00%	3000 VA		
K	KITCHEN	0 VA	0.00%	0 VA	**TOTAL DEMAND LOAD:**	3000 VA
E	EXISTING	0 VA	0.00%	0 VA	**TOTAL DEMAND CURRENT:**	8 A
O	OTHER	0 VA	0.00%	0 VA		

PANEL L2A — EXISTING

LOCATION:
SUPPLY FROM:
MOUNTING: RECESSED
ENCLOSURE: Type 1

VOLTAGE: 120/208 WYE
PHASE: 3
WIRE: 4

A.I.C. RATING: 10,000
MAINS TYPE: MLO
BUS RATING: 225 A

NOTES:
1. NEW LOAD CONNECTED TO EXISTING SPARE CIRCUIT BREAKER FIELD VERIFY AVAILABILITY OF THIS CIRCUIT.

NOTE	CKT	LOAD	TYPE	AMP	P	A		B		C		P	AMP	TYPE	LOAD	CKT	NOTE
	1	EXISTING LOAD	--	20	1	0	0					1	20	--	EXISTING LOAD	2	
	3	EXISTING LOAD	--	20	1			0	0			1	20	--	EXISTING LOAD	4	
	5	EXISTING LOAD	--	20	1					0	0	1	20	--	EXISTING LOAD	6	
	7	EXISTING LOAD	--	20	1	0	0					1	20	--	EXISTING LOAD	8	
	9	EXISTING LOAD	--	20	1			0	0			1	20	--	EXISTING LOAD	10	
	11	EXISTING LOAD	--	20	1					0	0	1	20	--	EXISTING LOAD	12	
	13	EXISTING LOAD	--	20	1	0	0					1	20	--	EXISTING LOAD	14	
	15	EXISTING LOAD	--	20	1			0	0			1	20	--	EXISTING LOAD	16	
	17	EXISTING LOAD	--	20	1					0	0	1	20	--	EXISTING LOAD	18	
1	19	**TERM. BOX CONTROLS -...**	**G**	20	1	500	0					1	20	--	EXISTING LOAD	20	
1	21	**TERM. BOX CONTROLS -...**	**G**	20	1			1000	0			1	20	--	EXISTING LOAD	22	
	23	SPARE (OFF)	--	20	1					0	0	1	20	--	EXISTING LOAD	24	
	25	EXISTING LOAD	--	20	1	0	0					1	20	--	EXISTING LOAD	26	
	27	EXISTING LOAD	--	20	1			0	0			1	20	--	EXISTING LOAD	28	
	29	EXISTING LOAD	--	20	1					0	0	1	20	--	EXISTING LOAD	30	
	31	EXISTING LOAD	--	20	1	0	0					1	20	--	EXISTING LOAD	32	
	33	EXISTING LOAD	--	20	1			0	0			1	20	--	EXISTING LOAD	34	
	35	EXISTING LOAD	--	20	1					0	0	1	20	--	EXISTING LOAD	36	
	37	EXISTING LOAD	--	20	1	0	0					1	20	--	EXISTING LOAD	38	
	39	EXISTING LOAD	--	20	1			0	0			1	20	--	EXISTING LOAD	40	
	41	EXISTING LOAD	--	20	1					0	0	1	20	--	EXISTING LOAD	42	
				TOTAL LOAD:		500 VA		1000 VA		0 VA							
				TOTAL AMPS:		5 A		9 A		0 A							
				PHASE BALANCE:		87 % A-B		% B-C		% C-A							

LOAD TYPE		CONNECTED LOAD	DEMAND FACTOR	DEMAND LOAD	PANEL TOTALS	
L	LIGHTING	0 VA	0.00%	0 VA		
R	RECEPTACLE	0 VA	0.00%	0 VA		
M	MOTOR	0 VA	0.00%	0 VA	**TOTAL CONNECTED LOAD:**	1500 VA
C	CONTINUOUS	0 VA	0.00%	0 VA	**TOTAL CONNECTED CURRENT:**	4 A
G	GENERAL	1500 VA	100.00%	1500 VA		
K	KITCHEN	0 VA	0.00%	0 VA	**TOTAL DEMAND LOAD:**	1500 VA
E	EXISTING	0 VA	0.00%	0 VA	**TOTAL DEMAND CURRENT:**	4 A
O	OTHER	0 VA	0.00%	0 VA		

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TITLE

Red Rocks Community College - Controls Upgrades
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DRAWING TITLE

ELECTRICAL PANELBOARD SCHEDULES

REVISIONS:

100% CD

Date: 11/03/2026
DRAWN BY: JAH
CHECKED BY: JAH
JOB NO: 2025-477

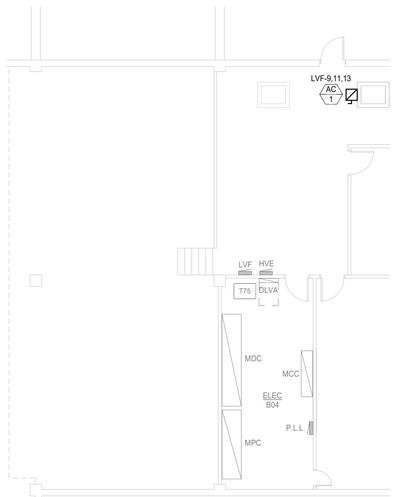
SHEET NO.

E-005

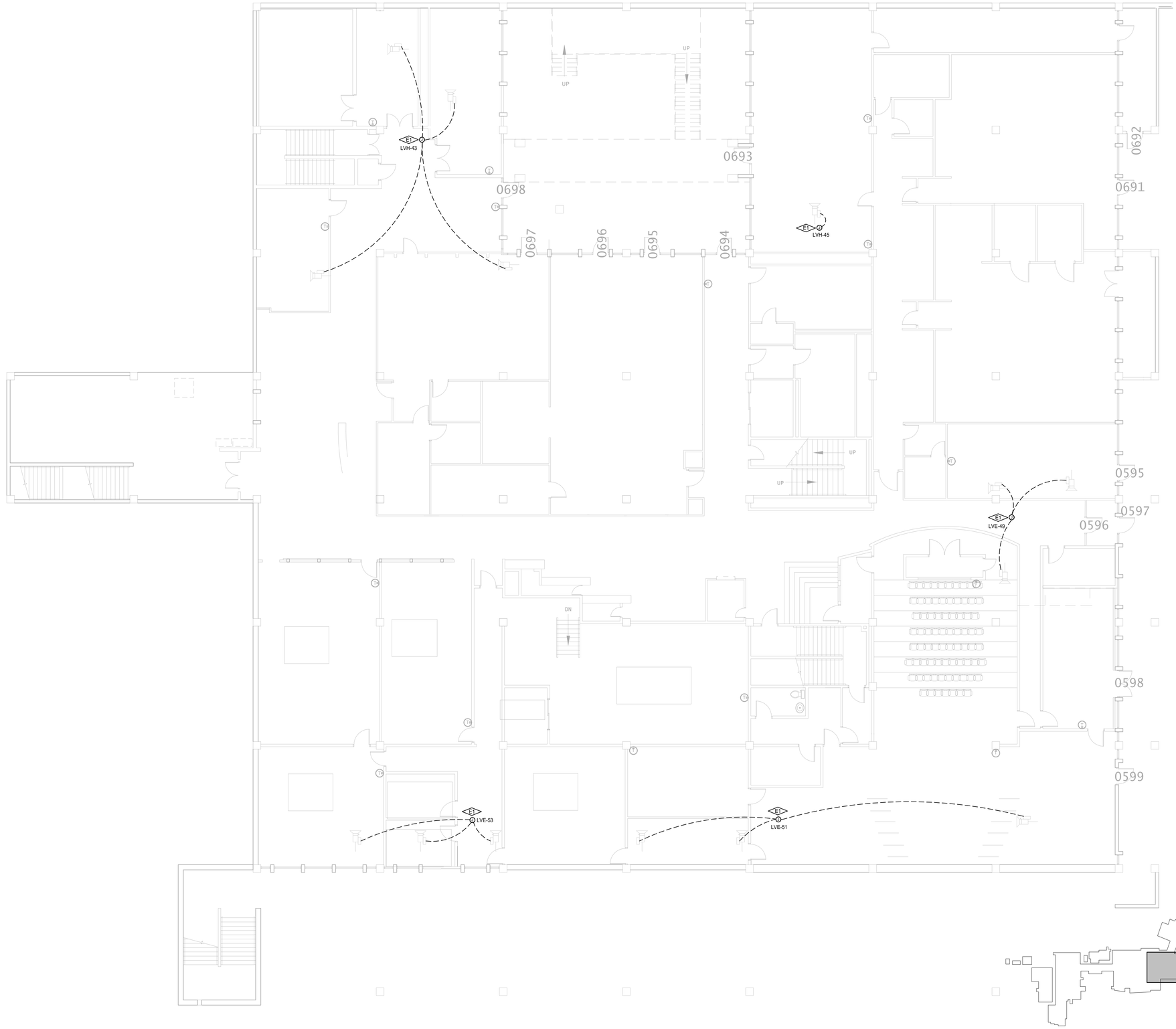
10/20/2026 7:12:27 AM INSERT FILE PATH

KEYNOTES

E1	PROVIDE JUNCTION BOX AND 120V CIRCUIT ABOVE THE ACCESSIBLE CEILING FOR TERMINAL BOX CONTROLS. VERIFY EXACT LOCATION WITH THE MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN AND ADJUST LOCATION AS REQUIRED.



BASEMENT LEVEL POWER PLAN
SCALE: 1/8" = 1'-0"



BASEMENT LEVEL POWER PLAN
SCALE: 1/8" = 1'-0"

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DRAWING TITLE

LOWER LEVEL POWER PLAN

REVISIONS:

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Date:	11/03/2026
DRAWN BY:	JAH
CHECKED BY:	JAH
JOB NO:	2025-477

SHEET NO.

E-10.00

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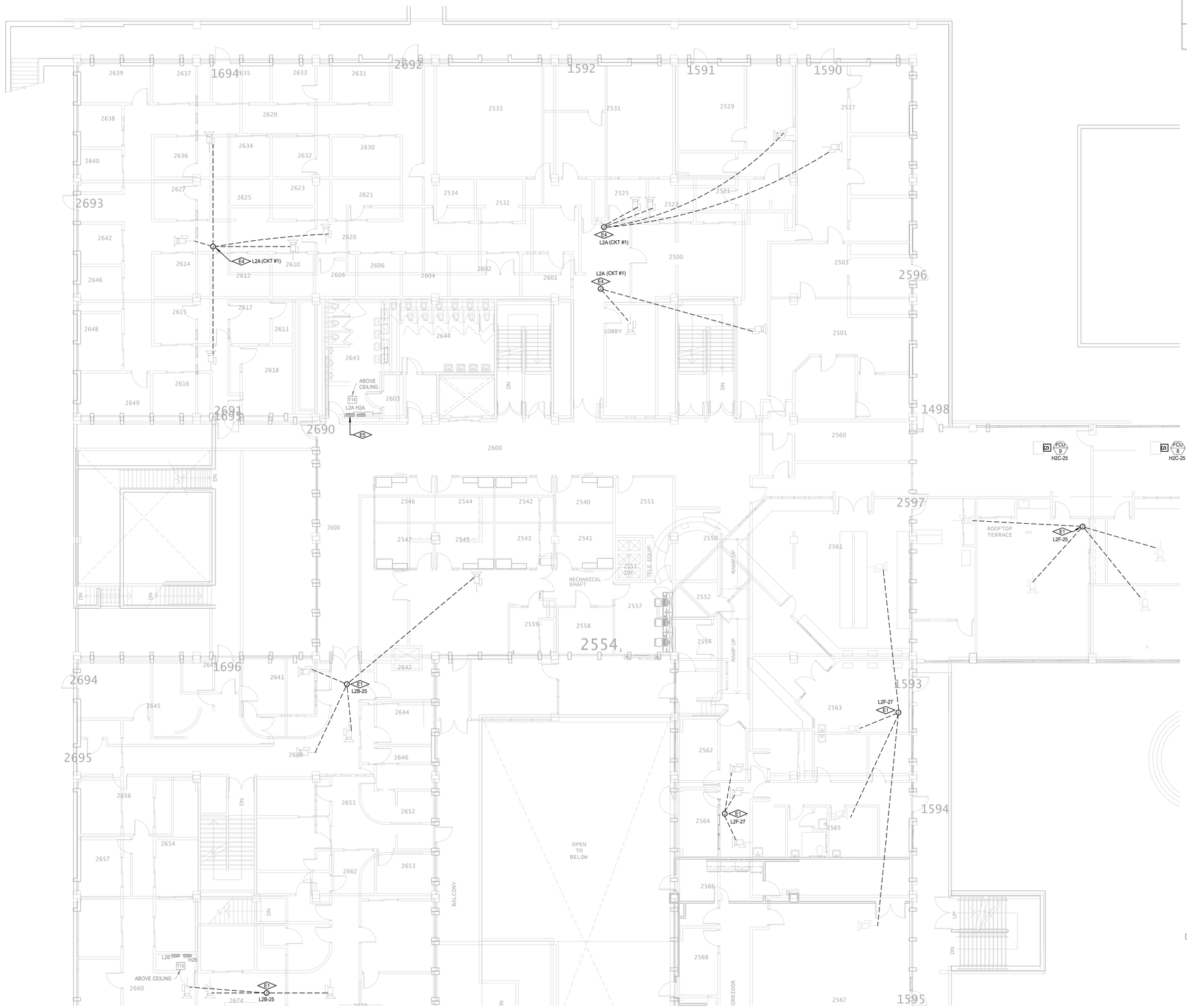
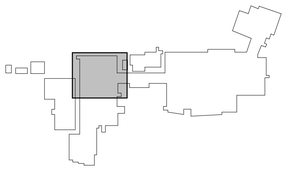
KEYNOTES

E1	PROVIDE JUNCTION BOX AND 120V CIRCUIT ABOVE THE ACCESSIBLE CEILING FOR TERMINAL BOX CONTROLS. VERIFY EXACT LOCATION WITH THE MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN AND ADJUST LOCATION AS REQUIRED.
E4	PROVIDE JUNCTION BOX AND 120V CIRCUIT ABOVE THE ACCESSIBLE CEILING FOR TERMINAL BOX CONTROLS. CONNECT TO AN AVAILABLE "SPARE/SPACE" IN PANELBOARD INDICATED. PROVIDE CIRCUIT BREAKER AS REQUIRED. VERIFY EXACT LOCATION WITH THE MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN AND ADJUST LOCATION AS REQUIRED.
E5	CONTRACTOR SHALL FIELD VERIFY EXISTING CIRCUITING AND AVAILABLE SPARES/SPACES IN THIS PANELBOARD. PROVIDE UPDATED, TYPE WRITTEN PANELBOARD DIRECTORY. PROVIDE RESULTS OF THE EXISTING CIRCUITING INVESTIGATION TO THE ENGINEER OF RECORD.





LEVEL 1 POWER PLAN

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

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TITLE

Red Rocks Community College - Controls Upgrades

13300 W. 6th Ave, Lakewood, CO. 80228

DRAWING TITLE

FIRST FLOOR POWER PLAN - WEST WING NORTH

REVISIONS:

100% CD

Date:	11/03/2026
DRAWN BY:	JAH
CHECKED BY:	JAH
JOB NO:	2025-477

SHEET NO.

E-11.00

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LEVEL 1 POWER PLAN

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

KEYNOTES

E1	PROVIDE JUNCTION BOX AND 120V CIRCUIT ABOVE THE ACCESSIBLE CEILING FOR TERMINAL BOX CONTROLS. VERIFY EXACT LOCATION WITH THE MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN AND ADJUST LOCATION AS REQUIRED.

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TITLE

Red Rocks Community College - Controls Upgrades

13300 W. 6th Ave, Lakewood, CO. 80228

DRAWING TITLE

FIRST FLOOR POWER PLAN - WEST WING SOUTH

REVISIONS:

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Date:	11/03/2026
DRAWN BY:	JAH
CHECKED BY:	JAH
JOB NO:	2025-477

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E-11.01

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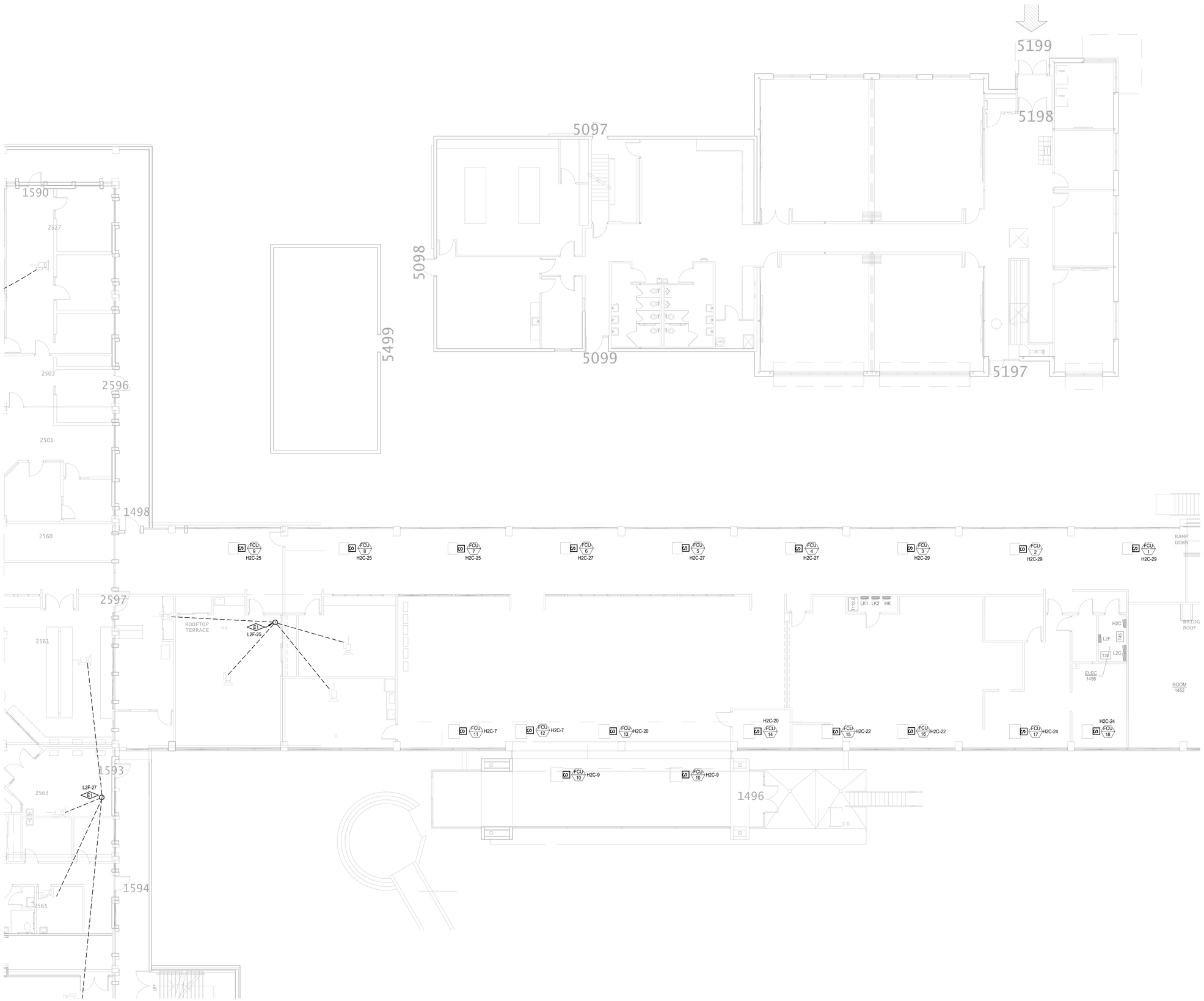
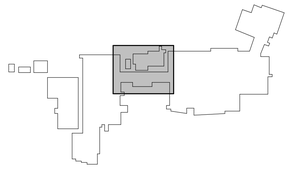
KEYNOTES

E1	PROVIDE JUNCTION BOX AND 120V CIRCUIT ABOVE THE ACCESSIBLE CEILING FOR TERMINAL BOX CONTROLS. VERIFY EXACT LOCATION WITH THE MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN AND ADJUST LOCATION AS REQUIRED.





LEVEL 1 POWER PLAN

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

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11/03/2026
Electrical

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TITLE

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DRAWING TITLE

FIRST FLOOR POWER PLAN - BRIDGE

REVISIONS:

100% CD

Date:	11/03/2026
DRAWN BY:	JAH
CHECKED BY:	JAH
JOB NO:	2025-477

SHEET NO.

E-11.03

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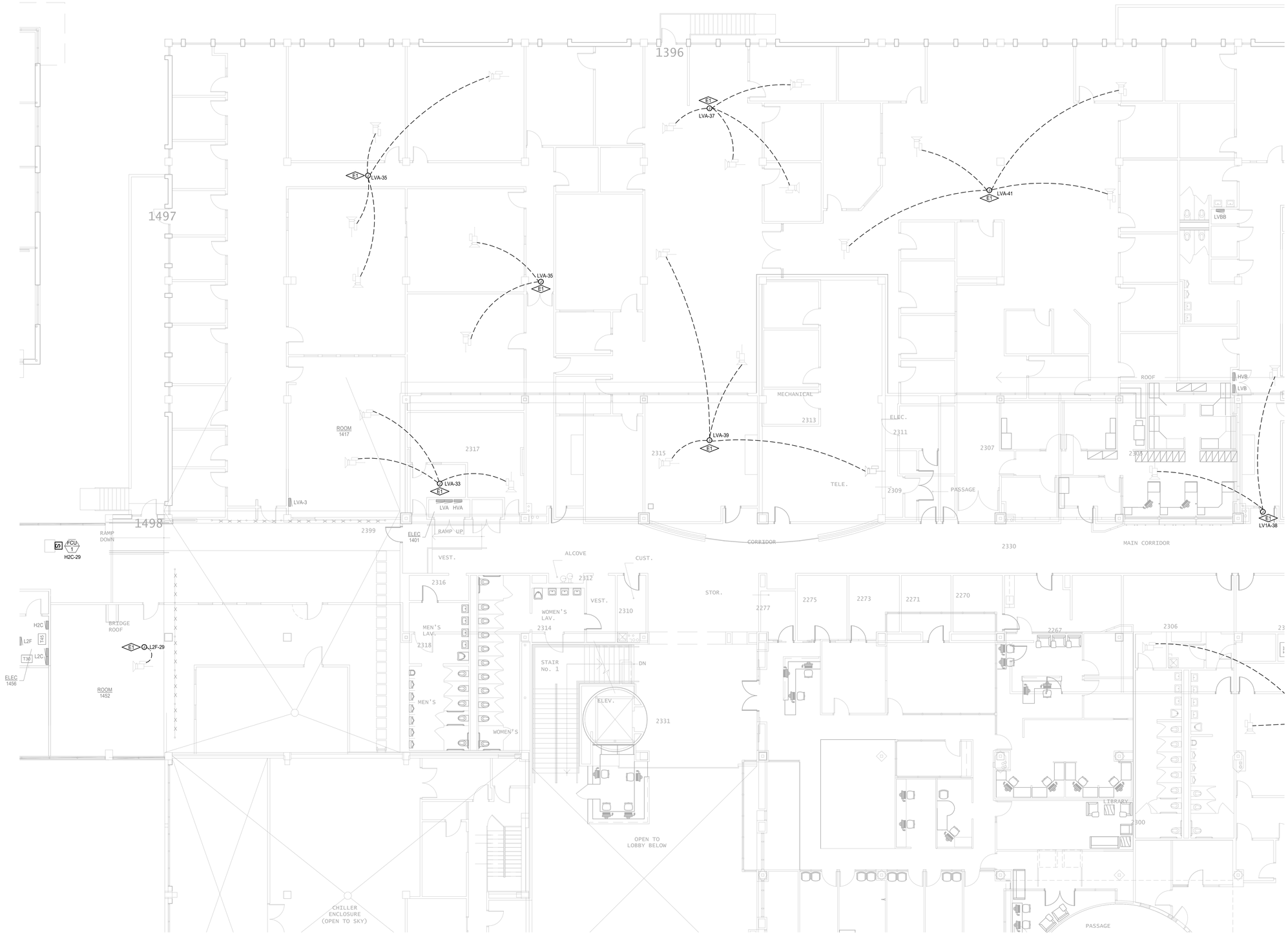
KEYNOTES

E1	PROVIDE JUNCTION BOX AND 120V CIRCUIT ABOVE THE ACCESSIBLE CEILING FOR TERMINAL BOX CONTROLS. VERIFY EXACT LOCATION WITH THE MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN AND ADJUST LOCATION AS REQUIRED.



LEVEL 1 POWER PLAN

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

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11/03/2026
Electrical

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TITLE

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DRAWING TITLE

FIRST FLOOR POWER PLAN - MAIN BUILDING A

REVISIONS:

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Date:	11/03/2026
DRAWN BY:	JAH
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JOB NO:	2025-477

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E-11.04

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KEYNOTES

E1	PROVIDE JUNCTION BOX AND 120V CIRCUIT ABOVE THE ACCESSIBLE CEILING FOR TERMINAL BOX CONTROLS. VERIFY EXACT LOCATION WITH THE MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN AND ADJUST LOCATION AS REQUIRED.
E2	DISCONNECT EXISTING PANELBOARD FOR REMOVAL AND REPLACMENT. PROVIDE NEW 2-SECTION PANELBOARD. RECONNECT EXISTING FEEDER AND BRANCH CIRCUITS.

LEVEL 1 POWER PLAN

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

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TITLE

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DRAWING TITLE

FIRST FLOOR POWER PLAN - MAIN BUILDING B

REVISIONS:

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Date:	11/03/2026
DRAWN BY:	JAH
CHECKED BY:	JAH
JOB NO:	2025-477

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E-11.05

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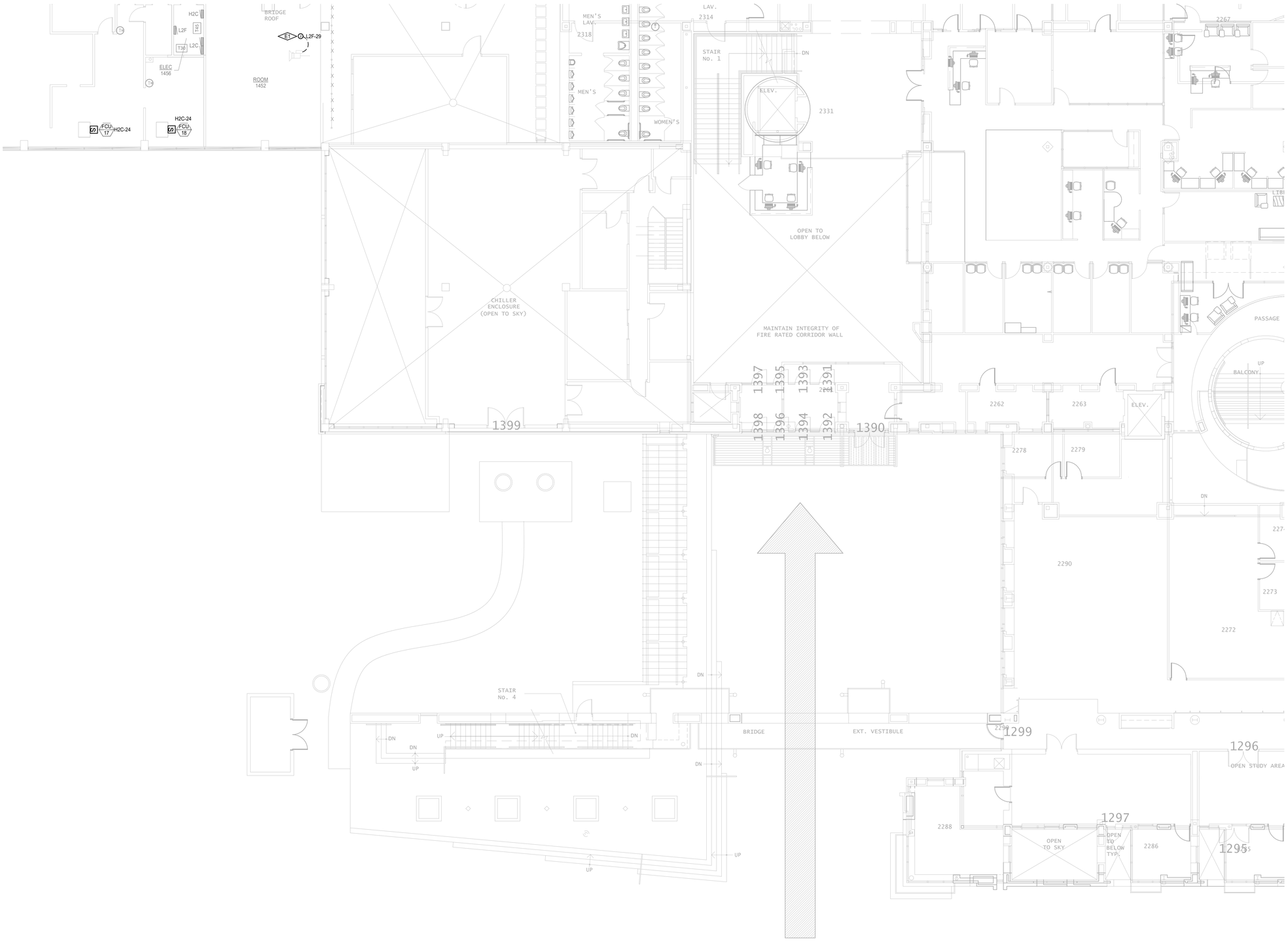
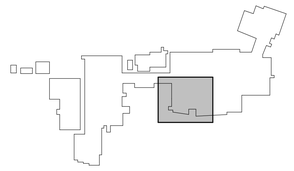


KEYNOTES

E1	PROVIDE JUNCTION BOX AND 120V CIRCUIT ABOVE THE ACCESSIBLE CEILING FOR TERMINAL BOX CONTROLS. VERIFY EXACT LOCATION WITH THE MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN AND ADJUST LOCATION AS REQUIRED.

LEVEL 1 POWER PLAN

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



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DRAWING TITLE

FIRST FLOOR POWER PLAN - MAIN BUILDING C

REVISIONS:

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Date:	11/03/2026
DRAWN BY:	JAH
CHECKED BY:	JAH
JOB NO:	2025-477

SHEET NO.

E-11.06

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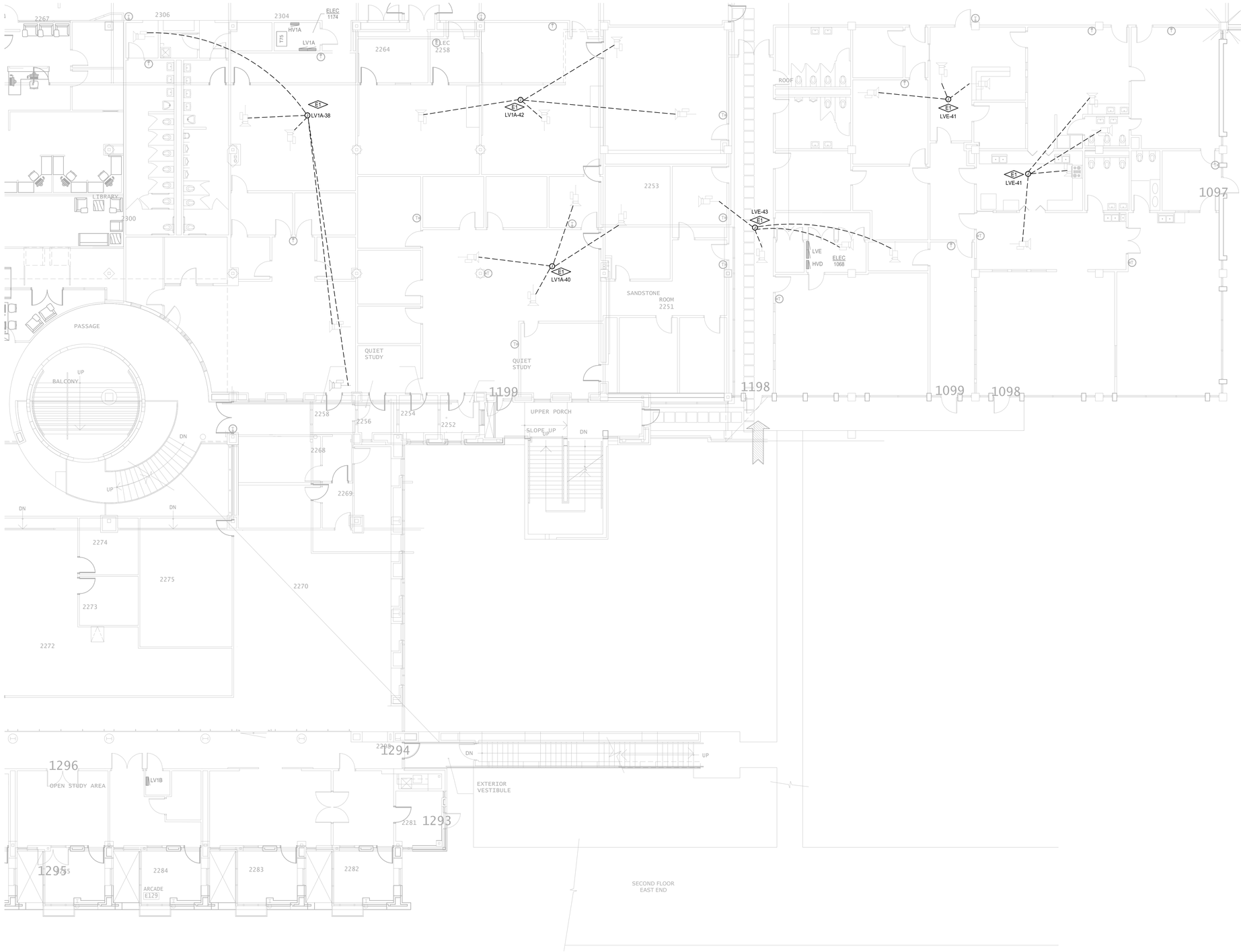

KEYNOTES

E1	PROVIDE JUNCTION BOX AND 120V CIRCUIT ABOVE THE ACCESSIBLE CEILING FOR TERMINAL BOX CONTROLS. VERIFY EXACT LOCATION WITH THE MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN AND ADJUST LOCATION AS REQUIRED.



LEVEL 1 POWER PLAN

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

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11/03/2026
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TITLE

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DRAWING TITLE

FIRST FLOOR POWER PLAN - MAIN BUILDING D

REVISIONS:

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Date:	11/03/2026
DRAWN BY:	JAH
CHECKED BY:	JAH
JOB NO:	2025-477

SHEET NO.

E-11.07

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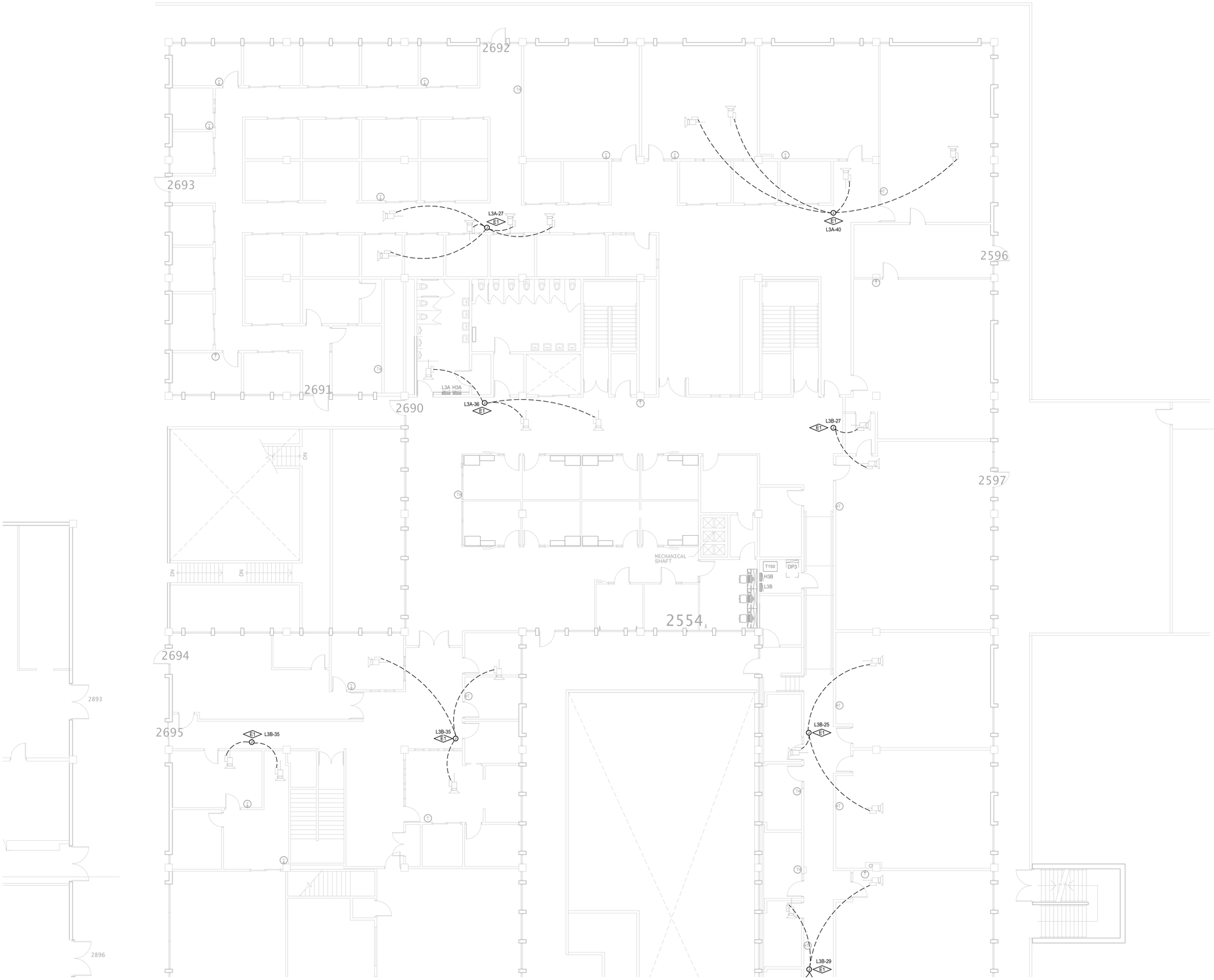
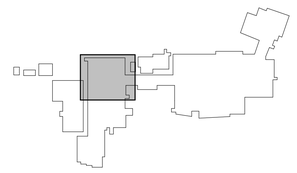
KEYNOTES

E1	PROVIDE JUNCTION BOX AND 120V CIRCUIT ABOVE THE ACCESSIBLE CEILING FOR TERMINAL BOX CONTROLS. VERIFY EXACT LOCATION WITH THE MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN AND ADJUST LOCATION AS REQUIRED.



LEVEL 2 POWER PLAN
SCALE: 1/8" = 1'-0"



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11/03/2026
Electrical

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DRAWING TITLE

SECOND FLOOR POWER PLAN - CONSTRUCTION
TECHNOLOGY NORTH

REVISIONS:

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Date:	11/03/2026
DRAWN BY:	JAH
CHECKED BY:	JAH
JOB NO:	2025-477

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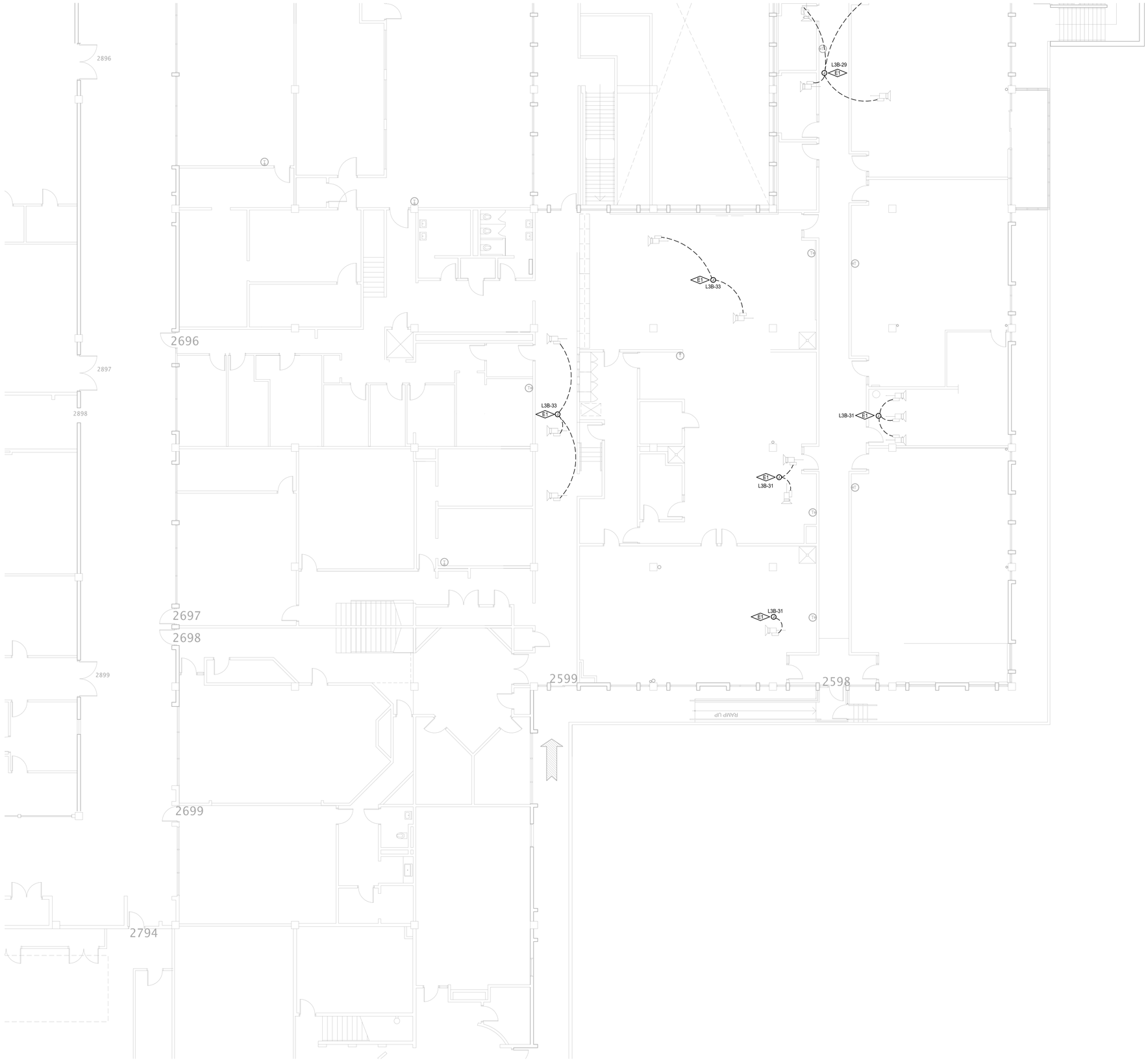
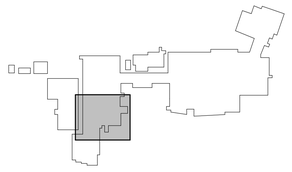


KEYNOTES

E1	PROVIDE JUNCTION BOX AND 120V CIRCUIT ABOVE THE ACCESSIBLE CEILING FOR TERMINAL BOX CONTROLS. VERIFY EXACT LOCATION WITH THE MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN AND ADJUST LOCATION AS REQUIRED.



LEVEL 2 POWER PLAN

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

COLORADO LICENSED PROFESSIONAL ENGINEER
0040442
11/03/2026
Electrical

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TITLE

Red Rocks Community College - Controls Upgrades

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DRAWING TITLE

SECOND FLOOR POWER PLAN - CONSTRUCTION
TECHNOLOGY CENTRAL

REVISIONS:

100% CD

Date:	11/03/2026
DRAWN BY:	JAH
CHECKED BY:	JAH
JOB NO:	2025-477

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