

# GEOLOGICAL SURVEY - REPLACEMENT OF HVAC AND UPGRADE LIGHTING BUEHLER & ANNEX BUILDINGS ROLLA, MISSOURI

MECH / ELEC ENGINEER:



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Missouri Certificate of Authority Number:  
2018019632



Wayne A. Strobe

The Engineer, whose signature appears on the mechanical, plumbing, & electrical drawings, assumes responsibility only for what appears on the drawings, and disclaims (pursuant to Section 327.11 RSMo) any responsibility for all other plans, specifications, estimates, reports, or other documents or instruments not sealed by the above Engineer relating to, or intended to be used for, any part or parts of the project to which these drawings refer.

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ENGINEER: MID MO ENGINEERING ALLIANCE

PROJECT NUMBER: W2401-01

SITE NUMBER: 5001  
ASSET NUMBER: 7815001007  
ASSET NUMBER: 7815001008



OWNER: STATE OF MISSOURI  
MIKE KEHOE, GOVERNOR  
DEPARTMENT OF  
NATURAL RESOURCES

PROJECT  
MANAGEMENT: OFFICE OF ADMINISTRATION DIVISION  
OF FACILITIES MANAGEMENT, DESIGN AND  
CONSTRUCTION





CONSTRUCTION  
DOCUMENTS



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GEOLOGICAL SURVEY -  
REPLACEMENT OF HVAC AND  
UPGRADE LIGHTING  
BUEHLER & ANNEX BUILDINGS

ROLLA, MISSOURI

PROJECT: W2401-01  
SITE: 5001  
ASSET: 7815001007

REVISION	DATE

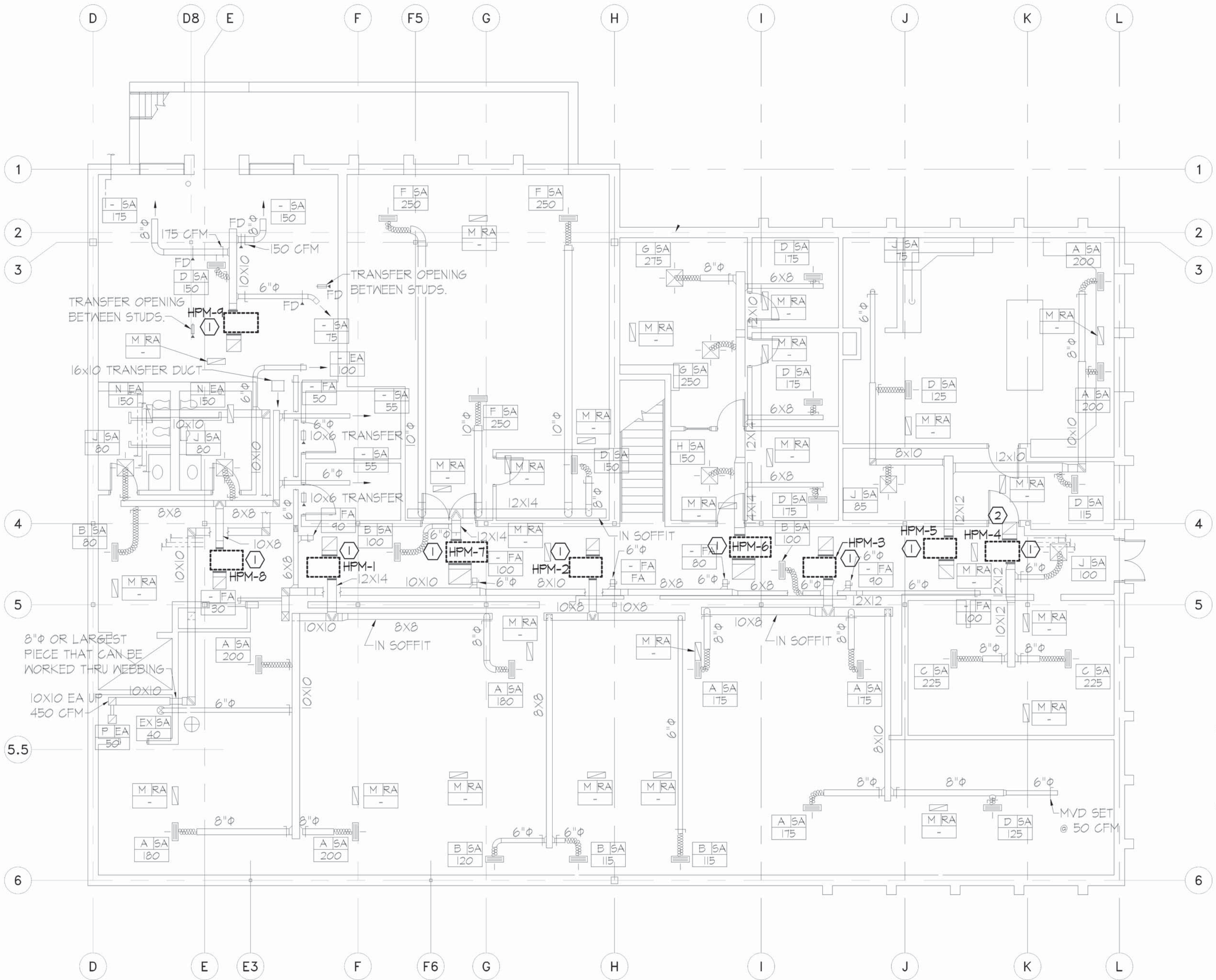
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DRAWN BY: JS  
CHECKED BY: WS  
DESIGNED BY: WS

SHEET TITLE:  
BASEMENT  
HVAC / POWER  
DEMOLITION

SHEET NUMBER:

ME-101

SHEET 2 OF 16  
ISSUE DATE: AUGUST 14, 2025



GENERAL NOTES:

1. DRAWINGS (PLANS, DETAILS AND SCHEMATICS ARE DIAGRAMMATIC IN NATURE AND INDICATE GENERAL LOCATION AND ARRANGEMENT OF NEW AND EXISTING MAJOR EQUIPMENT AND PIPING SYSTEMS. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING EXACT LOCATIONS AND DIMENSIONS OF ALL EQUIPMENT, PIPING AND PIPING COMPONENTS. CONTRACTOR IS ALSO RESPONSIBLE FOR FINAL TIE-IN POINT LOCATIONS BETWEEN NEW AND EXISTING PIPING SYSTEMS EQUIPMENT AND UTILITIES.

2. UNLESS OTHERWISE NOTED EXISTING SHOWN IN FADE-AWAY PEN. NEW, RELOCATED OR DEMOLITION ITEMS SHOWN IN DARK HEAVY PEN.

3. MATERIAL EXPOSED WITHIN THE RETURN AIR PLENUM SHALL BE NONCOMBUSTIBLE OR SHALL HAVE A FLAME SPREAD INDEX OF NOT MORE THAN 25 AND A SMOKE DEVELOPMENT INDEX OF NOT MORE THAN 50 WHEN TESTED IN ACCORDANCE WITH ASTM E84.

4. REMOVE AND REINSTALL EXISTING GRID AS REQUIRED FOR HP AND LIGHT INSTALLATION. SEE UNIT PRICE SPEC FOR FURTHER INFORMATION.

NOTES:

- ① REMOVE AND REPLACE EXISTING HEAT PUMP. EXISTING DUCTWORK, CONDENSER WATER, AND POWER CONNECTIONS TO REMAIN FOR REUSE
- ② THIS HEATPUMP HAS BEEN REPLACED ONCE. TURN THIS UNIT OVER TO THE OWNER FOR REUSE..

MECHANICAL / ELECTRICAL DEMOLITION  
MAIN BASEMENT FLOOR PLAN  
SCALE: 1/8" = 1'-0"



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

JOB# M-DP-01 PLTD 8/14/2025



GENERAL NOTES:

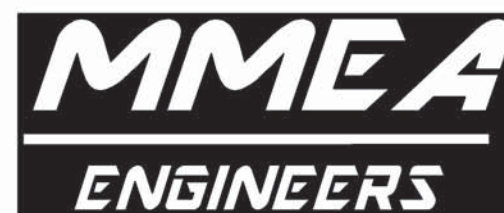
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STATE OF MISSOURI  
MIKE KEHOE,  
GOVERNOR



EXPIRES: 12-31-25

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NATURAL RESOURCES

GEOLOGICAL SURVEY -  
REPLACEMENT OF HVAC AND  
UPGRADE LIGHTING  
BUEHLER & ANNEX BUILDINGS

ROLLA, MISSOURI

PROJECT: W2401-01  
SITE: 5001  
ASSET: 7815001007

REVISION	DATE

CAD DWG FILE: 24005  
DRAWN BY: JS  
CHECKED BY: WS  
DESIGNED BY: WS

SHEET TITLE:  
1ST FLOOR  
HVAC / POWER  
DEMOLITION

SHEET NUMBER:

ME-102

SHEET 3 OF 16  
ISSUE DATE: AUGUST 14, 2025



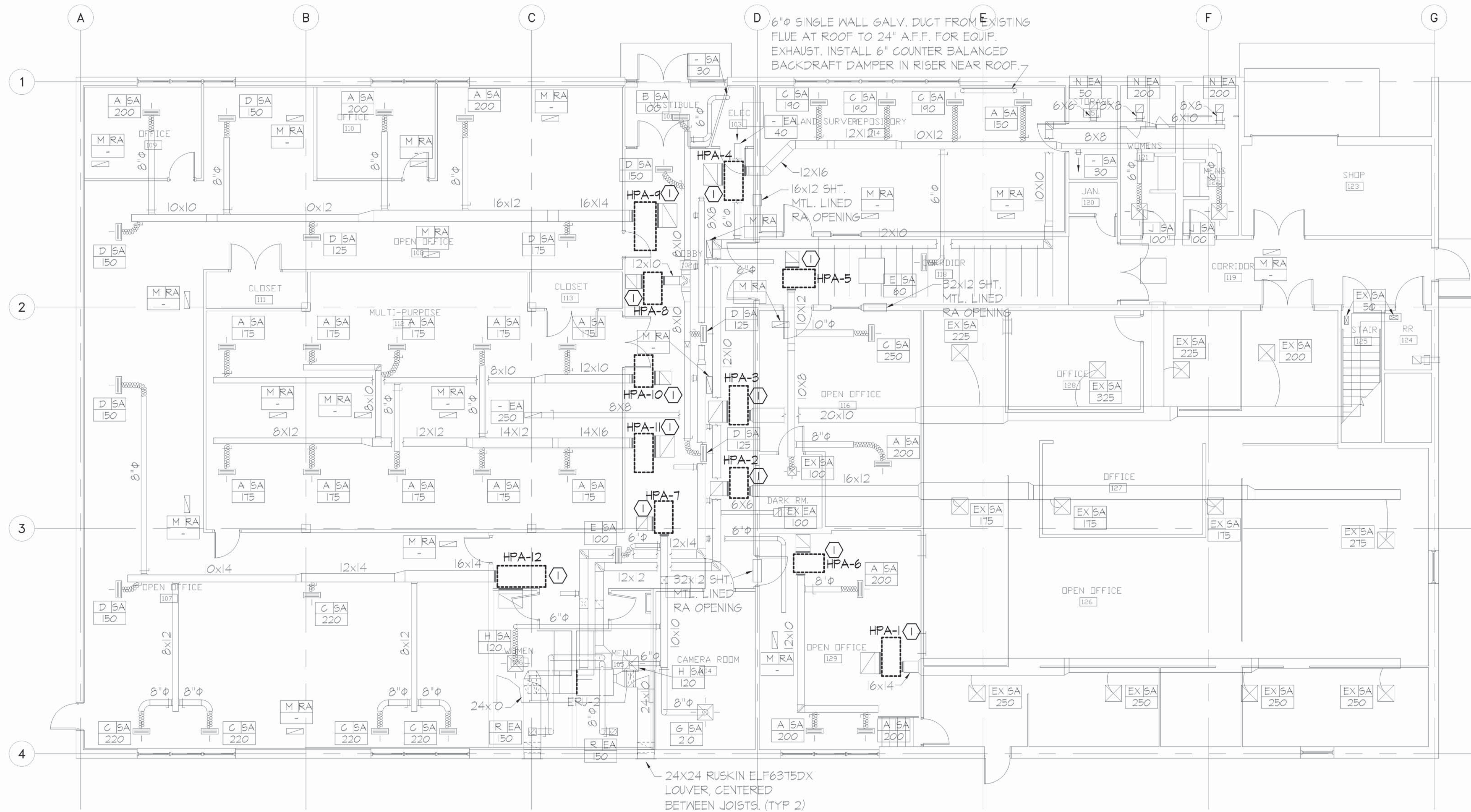
MECHANICAL / ELECTRICAL DEMOLITION  
MAIN 1ST FLOOR PLAN  
SCALE: 1/8" = 1'-0"



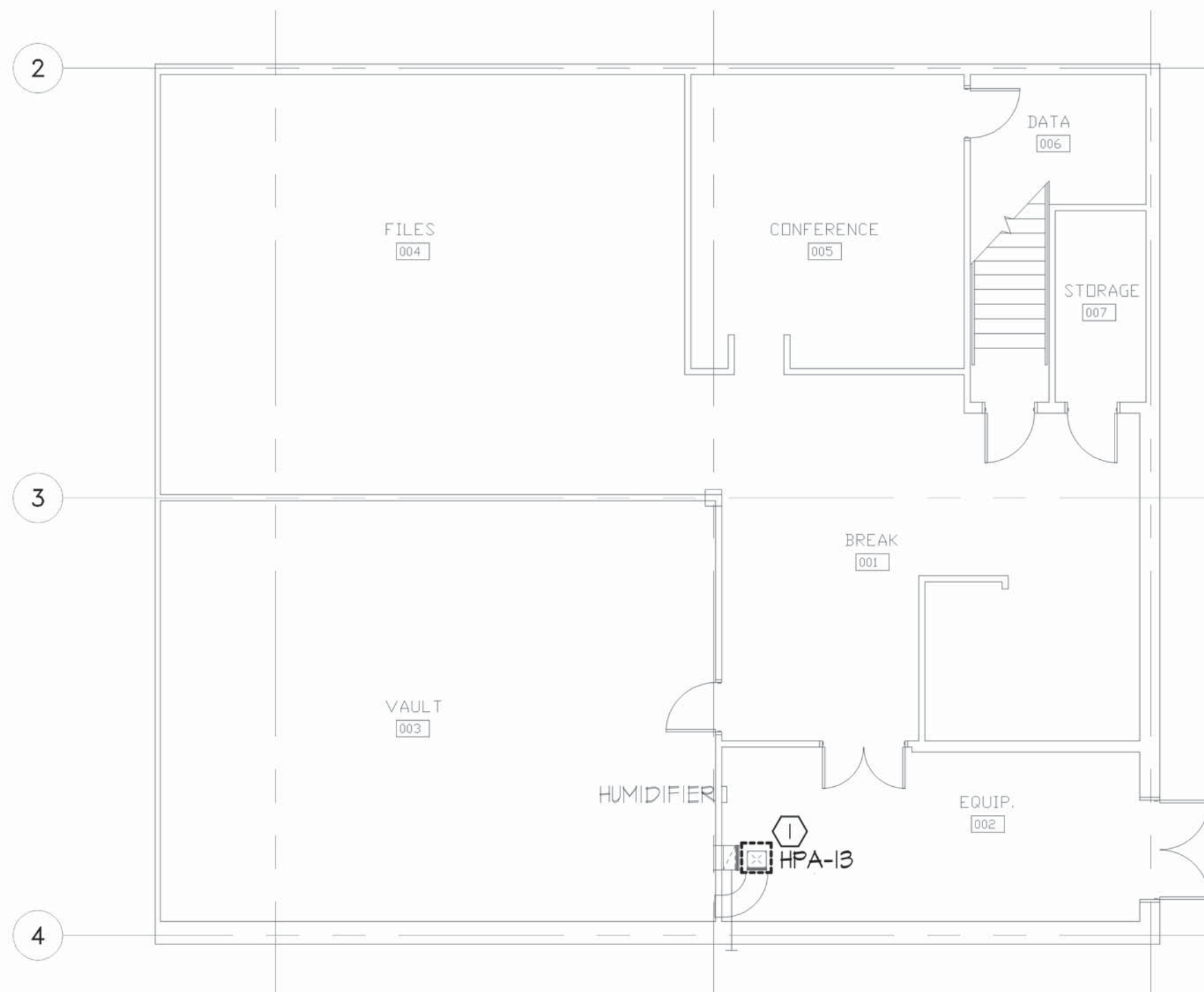
SCALE: 1/8" = 1'-0"

JOB# M-DP-02 PLTD 8/14/2025





MECHANICAL / ELECTRICAL DEMOLITION  
ANNEX 1ST FLOOR PLAN  
SCALE: 1/8"=1'-0"



MECHANICAL / ELECTRICAL DEMOLITION  
ANNEX BASEMENT FLOOR PLAN  
SCALE: 1/8"=1'-0"

GENERAL NOTES:

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4. REMOVE AND REINSTALL EXISTING GRID AS REQUIRED FOR HP AND LIGHT INSTALLATION. SEE UNIT PRICE SPEC FOR FURTHER INFORMATION.

NOTES:

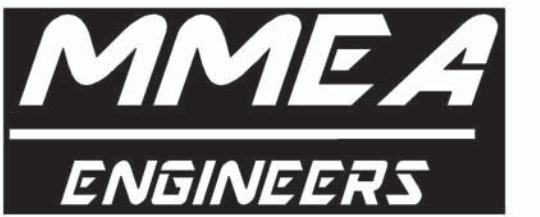
- ① REMOVE AND REPLACE EXISTING HEAT PUMP, EXISTING DUCTWORK, CONDENSER WATER, AND POWER CONNECTIONS TO REMAIN FOR REUSE.

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BUEHLER & ANNEX BUILDINGS

ROLLA, MISSOURI

PROJECT: W2401-01  
SITE: 5001  
ASSET: 7815001008

REVISION	DATE

CAD DWG FILE: 24005  
DRAWN BY: JS  
CHECKED BY: WS  
DESIGNED BY: WS

SHEET TITLE:  
ANNEX  
HVAC / POWER  
DEMOLITION

SHEET NUMBER:

ME-103

SHEET 4 OF 16  
ISSUE DATE: AUGUST 14, 2025

0 4' 8' 16' 32'  
SCALE: 1/8" = 1'-0"

JOB# M-DP-03 PLTD 8/14/2025





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ROLLA, MISSOURI

PROJECT: W2401-01  
SITE: 5001  
ASSET: 7815001007

REVISION	DATE

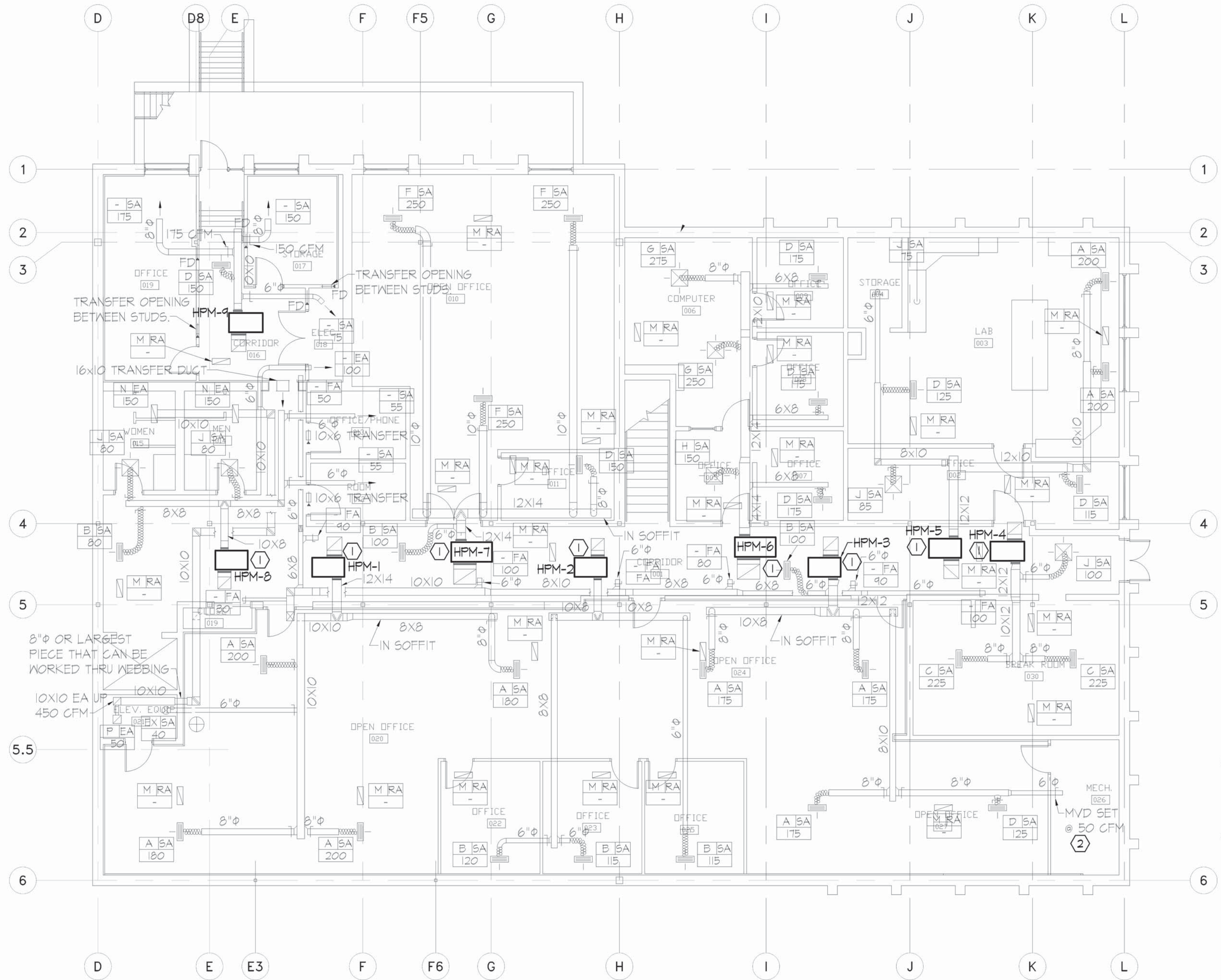
CAD DWG FILE: 24005  
DRAWN BY: JS  
CHECKED BY: WS  
DESIGNED BY: WS

SHEET TITLE:  
BASEMENT  
HVAC / POWER  
RENOVATION

SHEET NUMBER:

ME-104

SHEET 5 OF 16  
ISSUE DATE: AUGUST 14, 2025



MECHANICAL RENOVATION  
MAIN BASEMENT FLOOR PLAN  
SCALE: 1/8" = 1'-0"

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4. REMOVE AND REINSTALL EXISTING GRID AS REQUIRED FOR HP AND LIGHT INSTALLATION. SEE UNIT PRICE SPEC FOR FURTHER INFORMATION.

NOTES:

- CONNECT NEW HEAT PUMP TO EXISTING DUCTWORK, CONDENSER WATER, AND POWER. MODIFY EXISTING DUCTWORK AS NEEDED.
- REPLACE EXISTING 2" PRESSURE MAINTAINING BALL CONTROL VALVE W/ A NEW 2" CHARACTERIZED BALL CONTROL VALVE TO MAINTAIN PRESSURE ON OUTLET SIDE OF HEAT EXCHANGER @ 10 PSI. ON WELL SIDE OF HX.



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

JOB# M-FP-01 PLTD 8/14/2025



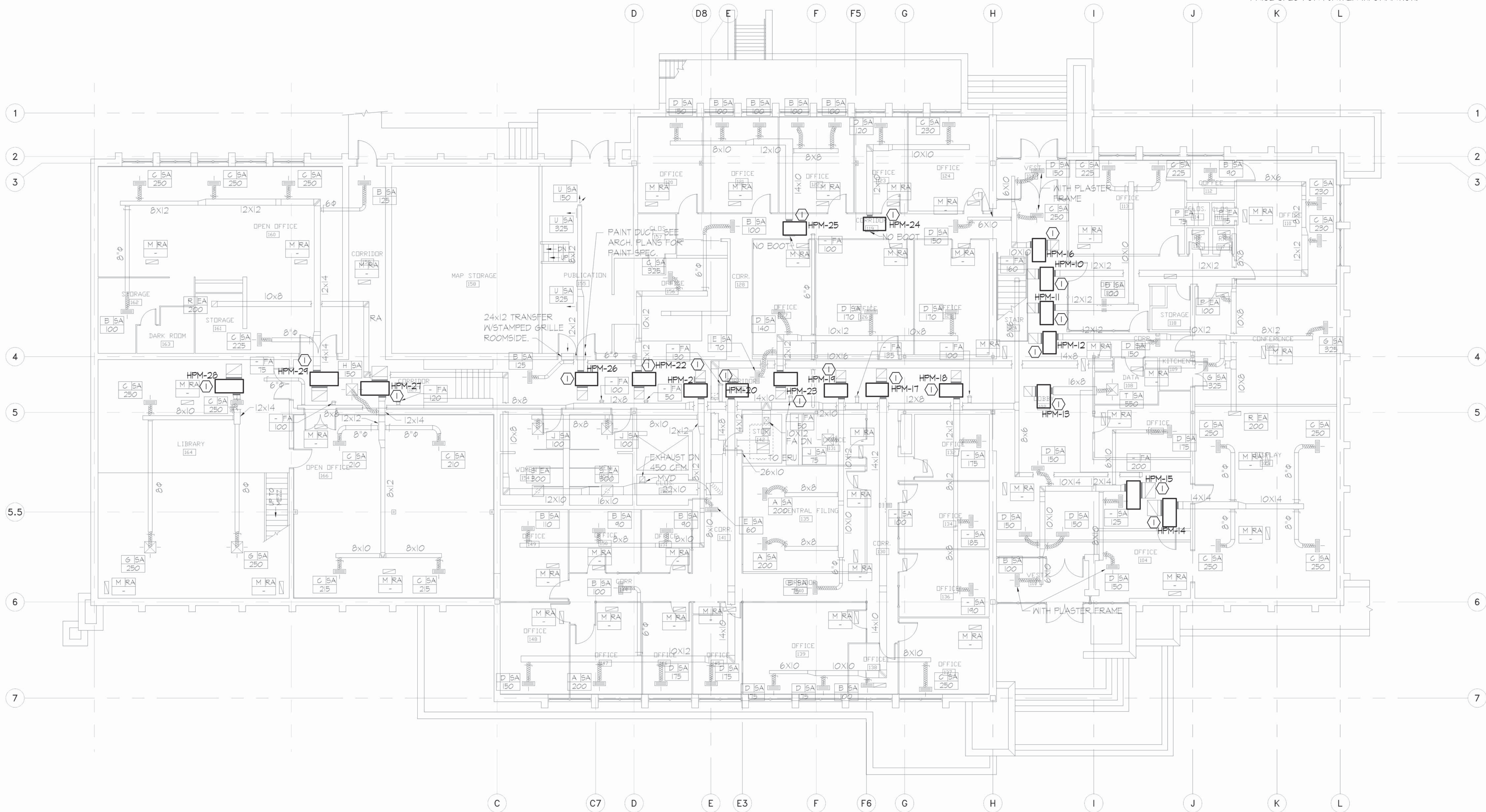
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NOTES:

- 1

CONNECT NEW HEAT PUMP TO EXISTING DUCTWORK, CONDENSER WATER, AND POWER. MODIFY EXISTING DUCTWORK AS NEEDED.



MECHANICAL / ELECTRICAL RENOVATION  
MAIN 1ST FLOOR PLAN  
SCALE: 1/8"=1'-0"



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

STATE OF MISSOURI  
MIKE KEHOE,  
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EXPRES: 12-31-25

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ROLLA, MISSOURI

PROJECT: W2401-01  
SITE: 5001  
ASSET: 7815001007

REVISION	DATE

CAD DWG FILE: 24005  
DRAWN BY: JS  
CHECKED BY: WS  
DESIGNED BY: WS

SHEET TITLE:  
1ST FLOOR  
HVAC / POWER  
RENOVATION

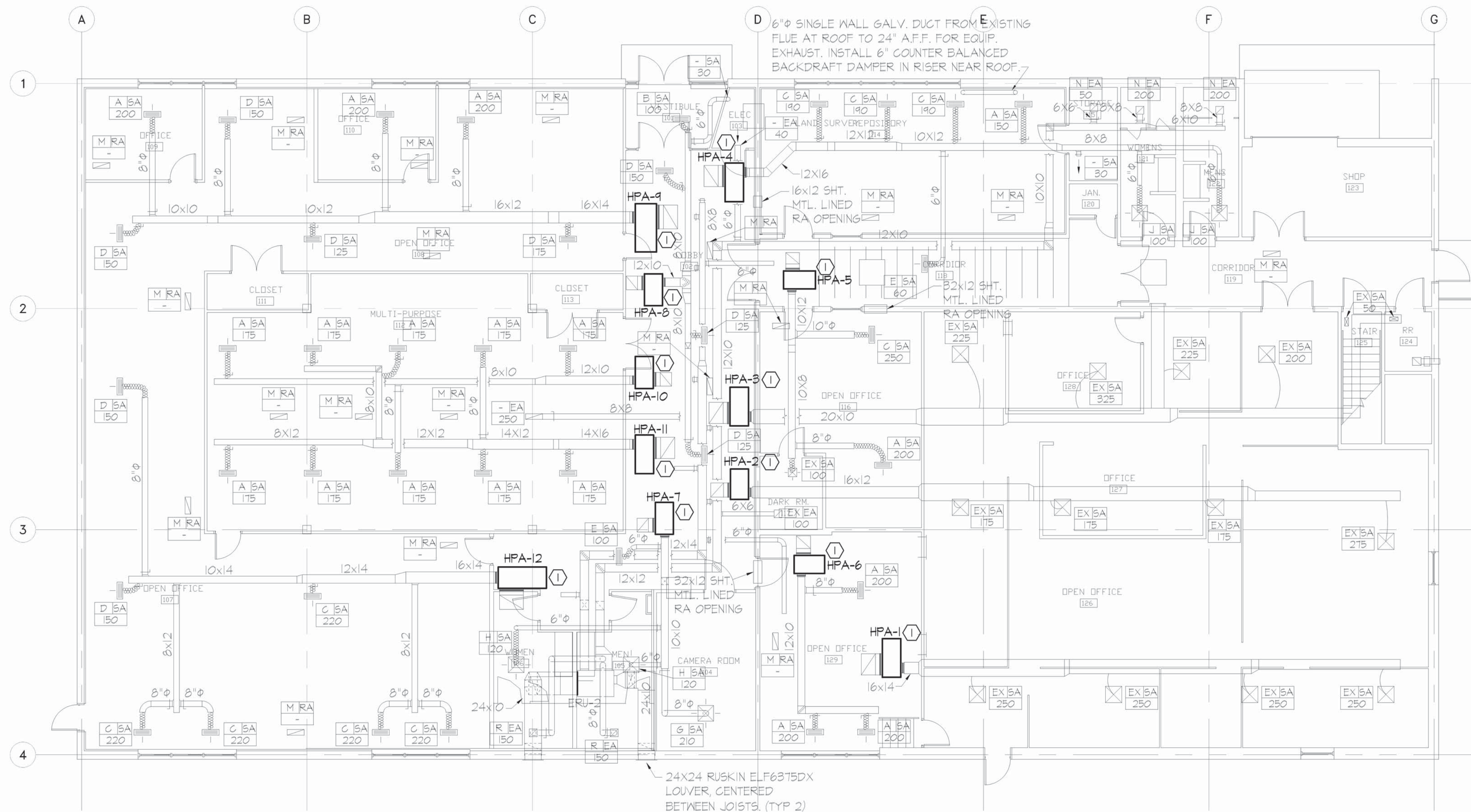
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ME-105

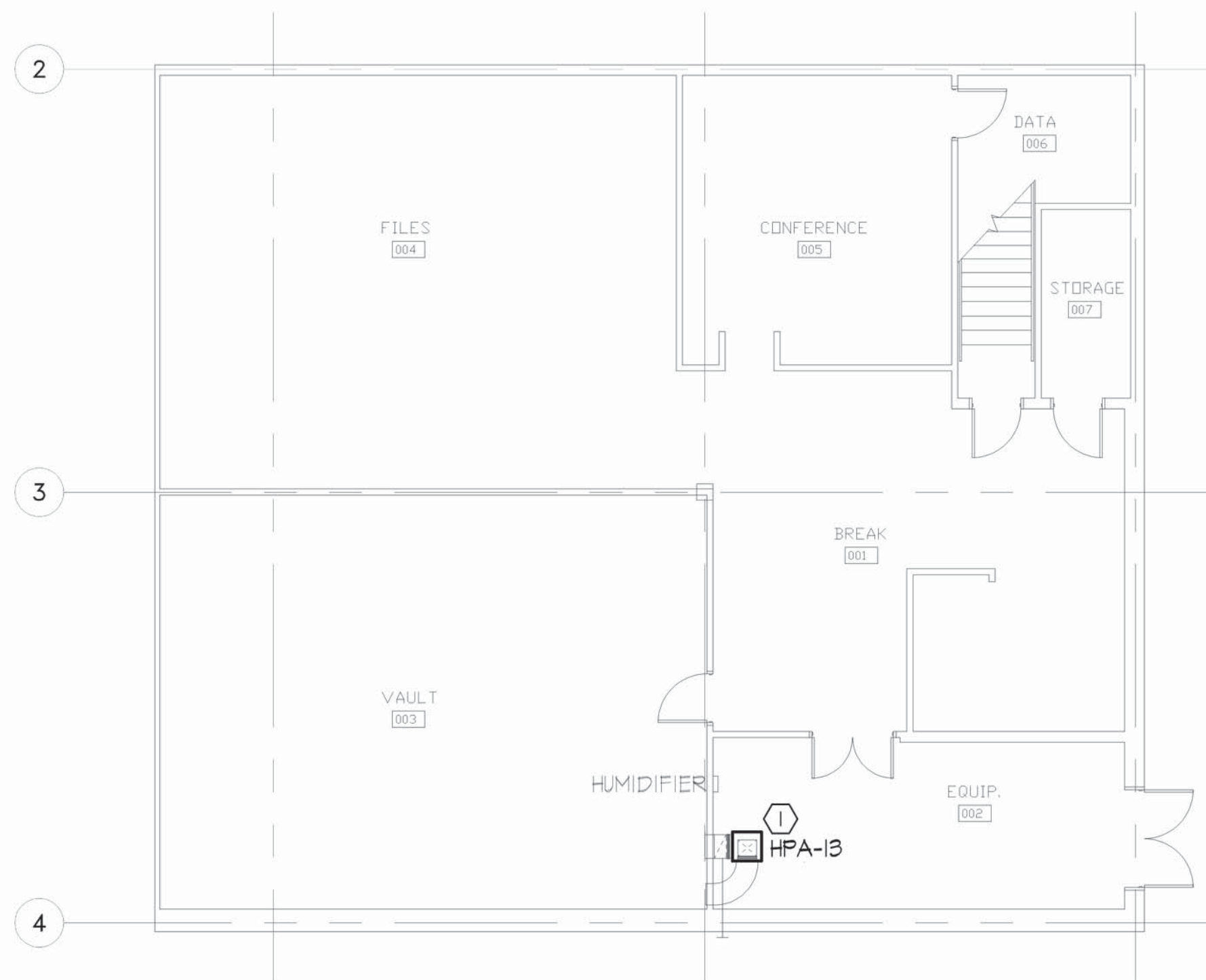
SHEET 6 OF 16  
ISSUE DATE: AUGUST 14, 2025

JOB# M-FP-02 PLTD 8/14/2025





**MECHANICAL / ELECTRICAL RENOVATION  
ANNEX 1ST FLOOR PLAN**  
SCALE: 1/8"=1'-0"



**MECHANICAL / ELECTRICAL RENOVATION  
ANNEX BASEMENT FLOOR PLAN**  
SCALE: 1/8"=1'-0"

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- REMOVE AND REINSTALL EXISTING GRID AS REQUIRED FOR HP AND LIGHT INSTALLATION. SEE UNIT PRICE SPEC FOR FURTHER INFORMATION.

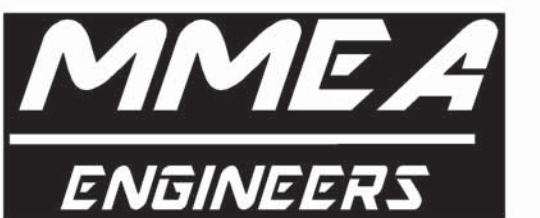
**NOTES:**

- ① CONNECT NEW HEAT PUMP TO EXISTING DUCTWORK, CONDENSER WATER, AND POWER. MODIFY EXISTING DUCTWORK AS NEEDED.

STATE OF MISSOURI  
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GEOLOGICAL SURVEY -  
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ROLLA, MISSOURI

PROJECT: W2401-01  
SITE: 5001  
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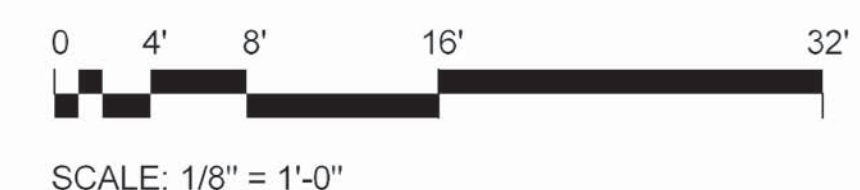
CAD DWG FILE: 24005  
DRAWN BY: JS  
CHECKED BY: WS  
DESIGNED BY: WS

SHEET TITLE:  
**ANNEX  
HVAC / POWER  
RENOVATION**

SHEET NUMBER:

**ME-106**

SHEET 7 OF 16  
ISSUE DATE: AUGUST 14, 2025



JOB# M-FP-03 PLTD 8/14/2025





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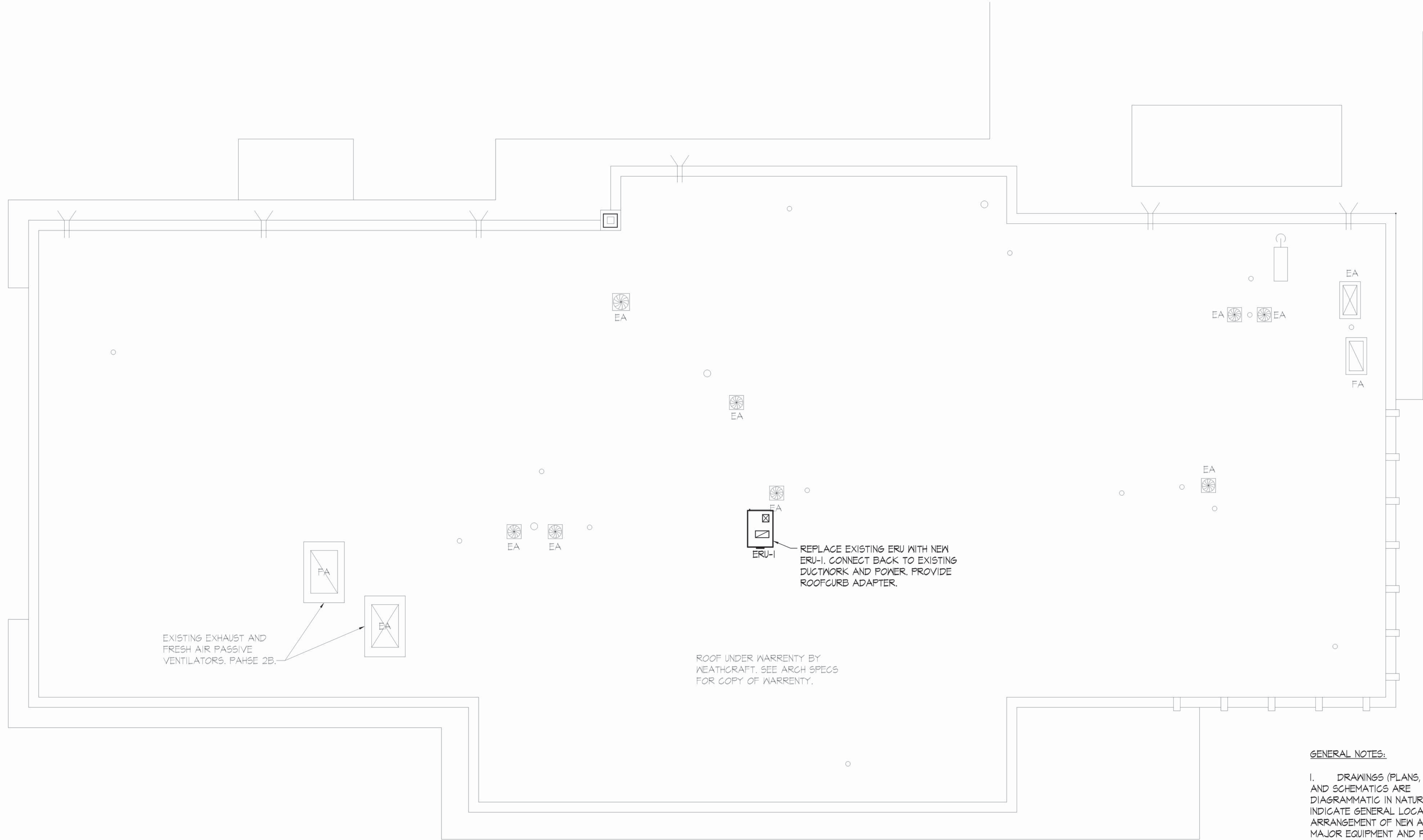
CAD DWG FILE: 24005  
DRAWN BY: JS  
CHECKED BY: WS  
DESIGNED BY: WS

SHEET TITLE:  
HVAC / POWER  
ROOF  
RENOVATION /  
DEMOLITION

SHEET NUMBER:

ME-107

SHEET 8 OF 16  
ISSUE DATE: AUGUST 14, 2025



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MECHANICAL / ELECTRICAL  
RENOVATION / DEMOLITION ROOF PLAN  
SCALE: 1/8"=1'-0"



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

JOB# M-FP-04 PLTD 8/14/2025





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REVISION	DATE

CAD DWG FILE: 24005  
DRAWN BY: JS  
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DESIGNED BY: WS

SHEET TITLE:  
HVAC SCHEDULES

SHEET NUMBER:

M-201

SHEET 9 OF 16  
ISSUE DATE: AUGUST 14, 2025

HEAT PUMP UNIT SCHEDULE

MARK	MANUFACTURER	MODEL NUMBER	CFM	ESP IN W.C.	CONFIGURATION ORIEN. / RETURN	ELECTRONIC FILTER SIZE	COOLING								HEATING						GPM	WPD FT H2O	WATER PIPING SIZE	B&G PUMP MODEL	MIN F.A. CFM	ELECTRICAL			MAX FUSE	OPTIONS
							CAPACITY (MBH)		HEAT REJECTION	EAT (°F)		EWT (° F)	LWT (° F)	EER	CAP. TOTAL (MBH)	HEAT OF ABSORPTION	EAT DB (°F)	EWT DB (°F)	LWT	COP						VOLTS	φ	MCA AMPS		
							TOTAL	SENSIBLE		DB	WB																			
HPM-1	WATERFURNACE	V5AHO24	800	0.30	HORZ. / L.H.	20x20xl	23,715	18,787	28,959	78	64	73	85.1	15.4	24,322	18,143	70	50	42.4	3.9	4.8	3.1	3/4"	N/A	90	208	1	14.7	20	
HPM-2	WATERFURNACE	V5AHO09	350	0.59	HORZ. / L.H.	20x20xl	10,590	8,552	12,750	78	64	73	85.8	16.7	9,950	7,418	70	50	42.6	3.9	2.0	3.7	3/4"	N/A	45	208	1	6.6	15	
HPM-3	WATERFURNACE	V5AHO24	800	0.30	HORZ. / L.H.	20x20xl	23,715	18,787	28,959	78	64	73	85.1	15.4	24,322	18,143	70	50	42.4	3.9	4.8	3.1	3/4"	N/A	90	208	1	14.7	20	DE-SUPER HEATER (HR002) 5,700 BTH
HPM-4	WATERFURNACE	V5AHO18	550	0.41	HORZ. / L.H.	20x20xl	16,592	13,234	19,694	78	64	73	83.9	18.3	14,951	11,532	70	50	43.6	4.4	3.6	4.1	1"	N/A	50	208	1	9.2	15	
HPM-5	WATERFURNACE	V5AHO24	800	0.30	HORZ. / R.H.	20x20xl	23,715	18,787	28,959	78	64	73	85.1	15.4	24,322	18,143	70	50	42.4	3.9	4.8	3.1	3/4"	N/A	50	208	1	14.7	20	
HPM-6	WATERFURNACE	V5AHO36	1,200	0.43	HORZ. / L.H.	TWO 18x20xl	33,373	26,951	40,634	78	64	73	84.3	15.7	32,699	24,930	70	50	43.1	4.2	7.2	6.3	1"	N/A	80	208	3	15.2	20	DE-SUPER HEATER (HR002) 8,575 BTH
HPM-7	WATERFURNACE	V5AHO30	1,000	0.48	HORZ. / L.H.	TWO 18x20xl	27,246	22,004	32,787	78	64	73	83.9	16.8	26,215	20,473	70	50	43.2	4.6	6.0	4.6	1"	N/A	100	208	1	14.7	20	
HPM-8	WATERFURNACE	V5AHO09	350	0.59	HORZ. / L.H.	20x20xl	10,590	8,552	12,750	78	64	73	85.8	16.7	9,950	7,418	70	50	42.6	3.9	2.0	3.7	3/4"	N/A	30	208	1	14.7	15	
HPM-9	WATERFURNACE	V5AHO18	550	0.41	HORZ. / L.H.	20x20xl	16,592	13,234	19,694	78	64	73	83.9	18.3	14,951	11,532	70	50	43.6	4.4	3.6	4.1	1"	N/A	50	208	1	9.2	15	
HPM-10	WATERFURNACE	V5AHO18	550	0.41	HORZ. / L.H.	20x20xl	16,592	13,234	19,694	78	64	73	83.9	18.3	14,951	11,532	70	50	43.6	4.4	3.6	4.1	1"	N/A	20	208	1	9.2	15	
HPM-11	WATERFURNACE	V5AHO18	550	0.41	HORZ. / L.H.	20x20xl	16,592	13,234	19,694	78	64	73	83.9	18.3	14,951	11,532	70	50	43.6	4.4	3.6	4.1	1"	N/A	20	208	1	9.2	15	
HPM-12	WATERFURNACE	V5AHO24	800	0.30	HORZ. / L.H.	20x20xl	23,715	18,787	28,959	78	64	73	85.1	15.4	24,322	18,143	70	50	42.4	3.9	4.8	3.1	3/4"	N/A	120	208	1	14.7	20	
HPM-13	WATERFURNACE	V5AHO18	550	0.41	HORZ. / L.H.	20x20xl	16,592	13,234	19,694	78	64	73	83.9	18.3	14,951	11,532	70	50	43.6	4.4	3.6	4.1	1"	N/A	0	208	1	9.2	15	
HPM-14	WATERFURNACE	V5AHO30	1,000	0.48	HORZ. / L.H.	TWO 18x20xl	27,246	22,004	32,787	78	64	73	83.9	16.8	26,215	20,473	70	50	43.2	4.6	6.0	4.6	1"	N/A	160	208	1	14.7	20	
HPM-15	WATERFURNACE	V5AHO30	1,000	0.48	HORZ. / R.H.	TWO 18x20xl	27,246	22,004	32,787	78	64	73	83.9	16.8	26,215	20,473	70	50	43.2	4.6	6.0	4.6	1"	N/A	40	208	1	14.7	20	
HPM-16	WATERFURNACE	V5AHO18	550	0.41	HORZ. / R.H.	20x20xl	16,592	13,234	19,694	78	64	73	83.9	18.3	14,951	11,532	70	50	43.6	4.4	3.6	4.1	1"	N/A	0	208	1	9.2	15	
HPM-17	WATERFURNACE	V5AHO24	800	0.30	HORZ. / L.H.	20x20xl	23,715	18,787	28,959	78	64	73	85.1	15.4	24,322	18,143	70	50	42.4	3.9	4.8	3.1	3/4"	N/A	100	208	1	14.7	20	
HPM-18	WATERFURNACE	V5AHO18	550	0.41	HORZ. / L.H.	20x20xl	16,592	13,234	19,694	78	64	73	83.9	18.3	14,951	11,532	70	50	43.6	4.4	3.6	4.1	1"	N/A	100	208	1	9.2	15	
HPM-19	WATERFURNACE	V5AHO18	550	0.41	HORZ. / L.H.	20x20xl	16,592	13,234	19,694	78	64	73	83.9	18.3	14,951	11,532	70	50	43.6	4.4	3.6	4.1	1"	N/A	35	208	1	9.2	15	
HPM-20	WATERFURNACE	V5AHO24	800	0.30	HORZ. / R.H.	20x20xl	23,715	18,787	28,959	78	64	73	85.1	15.4	24,322	18,143	70	50	42.4	3.9	4.8	3.1	3/4"	N/A	70	208	1	14.7	20	
HPM-21	WATERFURNACE	V5AHO18	550	0.41	HORZ. / L.H.	20x20xl	16,592	13,234	19,694	78	64	73	83.9	18.3	14,951	11,532	70	50	43.6	4.4	3.6	4.1	1"	N/A	60	208	1	9.2	15	
HPM-22	WATERFURNACE	V5AHO18	550	0.41	HORZ. / L.H.	20x20xl	16,592	13,234	19,694	78	64	73	83.9	18.3	14,951	11,532	70	50	43.6	4.4	3.6	4.1	1"	N/A	50	208	1	9.2	15	
HPM-23	WATERFURNACE	V5AHO18	550	0.41	HORZ. / L.H.	20x20xl	16,592	13,234	19,694	78	64	73	83.9	18.3	14,951	11,532	70	50	43.6	4.4	3.6	4.1	1"	N/A	50	208	1	9.2	15	
HPM-24	WATERFURNACE	V5AHO09	350	0.59	HORZ. / L.H.	20x20xl	10,590	8,552	12,750	78	64	73	85.8	16.7	9,950	7,418	70	50	42.6	3.9	2.0	3.7	3/4"	N/A	40	208	1	14.7	15	
HPM-25	WATERFURNACE	V5AHO18	550	0.41	HORZ. / L.H.	20x20xl	16,592	13,234	19,694	78	64	73	83.9	18.3	14,951	11,532	70	50	43.6	4.4	3.6	4.1	1"	N/A	60	208	1	9.2	15	
HPM-26	WATERFURNACE	V5AHO24	800	0.30	HORZ. / L.H.	20x20xl	23,715	18,787	28,959	78	64	73	85.1	15.4	24,322	18,143	70	50	42.4	3.9	4.8	3.1	3/4"	N/A	100	208	1	14.7	20	
HPM-27	WATERFURNACE	V5AHO30	1,000	0.48	HORZ. / L.H.	TWO 18x20xl	27,246	22,004	32,787	78	64	73	83.9	16.8	26,215	20,473	70	50	43.2	4.6	6.0	4.6	1"	N/A	120	208	1	14.7	20	
HPM-28	WATERFURNACE	V5AHO30	1,000	0.48	HORZ. / L.H.	TWO 18x20xl	27,246	22,004	32,787	78	64	73	83.9	16.8	26,215	20,473	70	50	43.2	4.6	6.0	4.6	1"	N/A	75	208	1	14.7	20	
HPM-29	WATERFURNACE	V5AHO36	1,200	0.43	HORZ. / L.H.	TWO 18x20xl	33,373	26,951	40,634	78	64	73	84.3	15.7	32,699	24,930	70	50	43.1	4.2	7.2	6.3	1"	N/A	100	208	3	15.2	20	
HPA-1	WATERFURNACE	V5AHO30	1,000	0.48	HORZ. / R.H.	TWO 18x20xl	26,194	20,976	32,339	78	64	85	95.0	14.5	24,870	19,203	70	46	40.1	4.4	6.5	5.3	1"	PL-36	100	208	1	16.5	20	
HPA-2	WATERFURNACE	V5AHO24	800	0.30	HORZ. / R.H.	20x20xl	23,255	17,994	28,960	78	64	85	94.7	13.9	23,613	17,488	70	46	40.2	3.9	6.0	4.6	1"	PL-36	110	208	1	16.5	20	
HPA-3	WATERFURNACE	V5AHO36	1,200	0.43	HORZ. / R.H.	TWO 18x20xl	32,486	25,779	40,446	78	64	85	94.5	13.9	31,466	23,745	70	46	40.4	4.1	8.5	8.4	1"	PL-36	100	208	1	22.5	30	DE-SUPER HEATER (HR002) 8,575 BTH
HPA-4	WATERFURNACE	V5AHO30	1,000	0.48	HORZ. / L.H.	TWO 18x20xl	26,194	20,976	32,339	78	64	85	95.0	14.5	24,870	19,203	70	46	40.1	4.4	6.5	5.3	1"	PL-36	120	208	1	16.5	20	
HPA-5	WATERFURNACE	V5AHO18	550	0.41	HORZ. / R.H.	20x20xl	15,413	12,158	18,880	78	64	85	94.4	15.2	14,332	10,951	70	46	40.5	4.2	4.0	4.9	1"	PL-36	100	208	1	11.0	15	DE-SUPER HEATER (HR001) 4,280 BTH
HPA-6	WATERFURNACE	V5AHO24	800	0.30	HORZ. / R.H.	20x20xl	23,255	17,994	28,960	78	64	85	94.7	13.9	23,613	17,488	70	46	40.2	3.9	6.0	4.6	1"	PL-36	100	208	1	16.5	20	
HPA-7	WATERFURNACE	V5AHO18	550	0.41	HORZ. / R.H.	20x20xl	15,413	12,158	18,880	78	64	85	94.4	15.2	14,332	10,951	70	46	40.5	4.2	4.0	4.9	1"	PL-36	120	208	1	11.0	15	
HPA-8	WATERFURNACE	V5AHO18	550	0.41	HORZ. / L.H.	20x20xl	15,413	12,158	18,880	78	64	85	94.4	15.2	14,332	10,951	70	46	40.5	4.2	4.0	4.9	1"	PL-36	120	208	1	11.0	15	
HPA-9	WATERFURNACE	V5AHO36	1,200	0.43	HORZ. / R.H.	TWO 18x20xl	32,486	25,779	40,446	78	64	85	94.5	13.9	31,466	23,745	70	46	40.4	4.1	8.5	8.4	1"	PL-36	100	208	1	22.5	30	
HPA-10	WATERFURNACE	V5AHO18	550	0.41	HORZ. / L.H.	20x20xl	15,413	12,158	18,880	78	64	85	94.4	15.2	14,332	10,951	70	46	40.5	4.2	4.0	4.9	1"	PL-36	100	208	1	11.0	15	
HPA-11	WATERFURNACE	V5AHO36	1,200	0.43	HORZ. / R.H.	TWO 18x20xl	32,546	25,795	40,499	78	64																			





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NATURAL RESOURCES

GEOLOGICAL SURVEY -  
REPLACEMENT OF HVAC AND  
UPGRADE LIGHTING  
BUEHLER & ANNEX BUILDINGS

ROLLA, MISSOURI

PROJECT: W2401-01  
SITE: 5001  
ASSET: 7815001007

REVISION	DATE

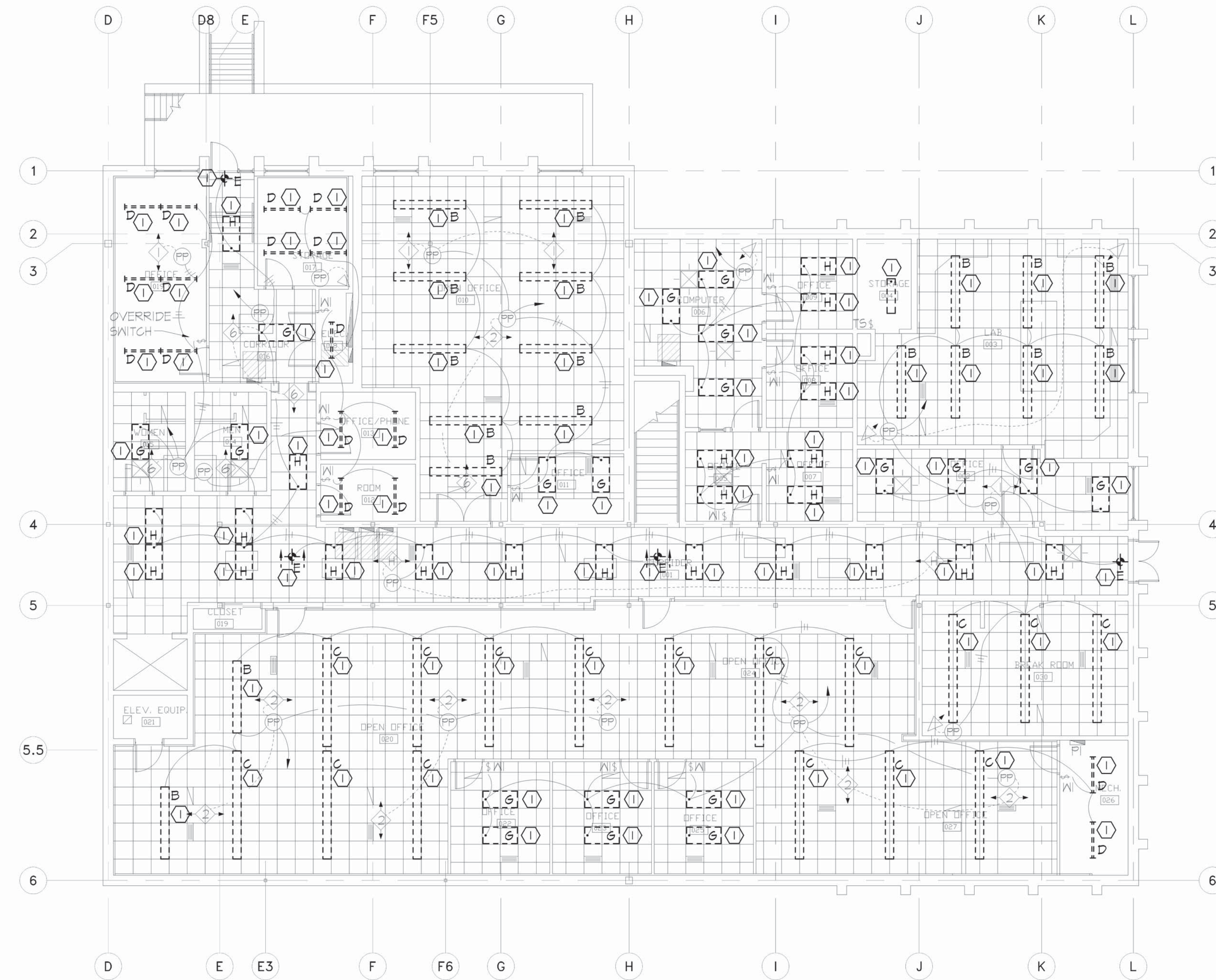
CAD DWG FILE: 24005  
DRAWN BY: JS  
CHECKED BY: WS  
DESIGNED BY: WS

SHEET TITLE:  
BASEMENT  
LIGHTING  
DEMOLITION

SHEET NUMBER:

E-101

SHEET 10 OF 16  
ISSUE DATE: AUGUST 14, 2025



GENERAL NOTES:

1. DRAWINGS (PLANS, DETAILS AND SCHEMATICS ARE DIAGRAMMATIC IN NATURE AND INDICATE GENERAL LOCATION AND ARRANGEMENT OF NEW AND EXISTING MAJOR EQUIPMENT AND PIPING SYSTEMS. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING EXACT LOCATIONS AND DIMENSIONS OF ALL EQUIPMENT, PIPING AND PIPING COMPONENTS. CONTRACTOR IS ALSO RESPONSIBLE FOR FINAL TIE-IN POINT LOCATIONS BETWEEN NEW AND EXISTING PIPING SYSTEMS EQUIPMENT AND UTILITIES.

2. UNLESS OTHERWISE NOTED EXISTING SHOWN IN FADE-AWAY PEN. NEW, RELOCATED OR DEMOLITION ITEMS SHOWN IN DARK HEAVY PEN.

3. MATERIAL EXPOSED WITHIN THE RETURN AIR PLENUM SHALL BE NONCOMBUSTIBLE OR SHALL HAVE A FLAME SPREAD INDEX OF NOT MORE THAN 25 AND A SMOKE DEVELOPMENT INDEX OF NOT MORE THAN 50 WHEN TESTED IN ACCORDANCE WITH ASTM E84.

NOTES:

① REMOVE AND REPLACE EXISTING LIGHT FIXTURE. EXISTING CIRCUIT AND SWITCHING TO REMAIN.

OCCUPANCY/CONTROLS SENSOR SCHEDULE			
\$WS WS-120/2T1	⬢	WT-600	
\$WA WA-100	⬢	WT-1100	
\$WI WI-200	⬢	WT-2205	
\$TS TS-SERIES	⬢	WT-2250	
* LS-100X/LS-30	⬢	HONEYWELL T100E STAT W/O T100E SUBBASE	
◁ DT-200	⬢		
◁ CX-100 SERIES	⬢	CURRENT TRANS. RELAY	
PP POWER PACK	⬢		
SP SLAVE PACK	⬢	HUMIDITY SCHEDULE	
* ALL OCCUPANCY SENSORS MODEL #15 BASED ON WATTSTOPPER			

NOTE: ALL SENSORS SHALL BE SET FOR 30 MINUTES.

01 LIGHTING DEMOLITION  
MAIN BASEMENT FLOOR PLAN  
SCALE: 1/8"=1'-0"



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

JOB# E-DP-01 PLTD 8/14/2025





CONSTRUCTION  
DOCUMENTS



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Missouri Certificate of Authority Number:  
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MANAGEMENT, DESIGN  
AND CONSTRUCTION  
DEPARTMENT OF  
NATURAL RESOURCES

GEOLOGICAL SURVEY -  
REPLACEMENT OF HVAC AND  
UPGRADE LIGHTING  
BUEHLER & ANNEX BUILDINGS

ROLLA, MISSOURI

PROJECT: W2401-01  
SITE: 5001  
ASSET: 7815001007

REVISION	DATE

CAD DWG FILE: 24005  
DRAWN BY: JS  
CHECKED BY: WS  
DESIGNED BY: WS

SHEET TITLE:  
1ST FLOOR  
LIGHTING  
DEMOLITION

SHEET NUMBER:

E-102

SHEET 11 OF 16  
ISSUE DATE: AUGUST 14, 2025

GENERAL NOTES:

- DRAWINGS (PLANS, DETAILS AND SCHEMATICS ARE DIAGRAMMATIC IN NATURE AND INDICATE GENERAL LOCATION AND ARRANGEMENT OF NEW AND EXISTING MAJOR EQUIPMENT AND PIPING SYSTEMS. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING EXACT LOCATIONS AND DIMENSIONS OF ALL EQUIPMENT, PIPING AND PIPING COMPONENTS. CONTRACTOR IS ALSO RESPONSIBLE FOR FINAL TIE-IN POINT LOCATIONS BETWEEN NEW AND EXISTING PIPING SYSTEMS EQUIPMENT AND UTILITIES.
- UNLESS OTHERWISE NOTED EXISTING SHOWN IN FADE-AWAY PEN, NEW, RELOCATED OR DEMOLITION ITEMS SHOWN IN DARK HEAVY PEN.
- MATERIAL EXPOSED WITHIN THE RETURN AIR PLENUM SHALL BE NONCOMBUSTIBLE OR SHALL HAVE A FLAME SPREAD INDEX OF NOT MORE THAN 25 AND A SMOKE DEVELOPMENT INDEX OF NOT MORE THAN 50 WHEN TESTED IN ACCORDANCE WITH ASTM E84.

NOTES:

- ① REMOVE AND REPLACE EXISTING LIGHT FIXTURE. EXISTING CIRCUIT AND SWITCHING TO REMAIN.



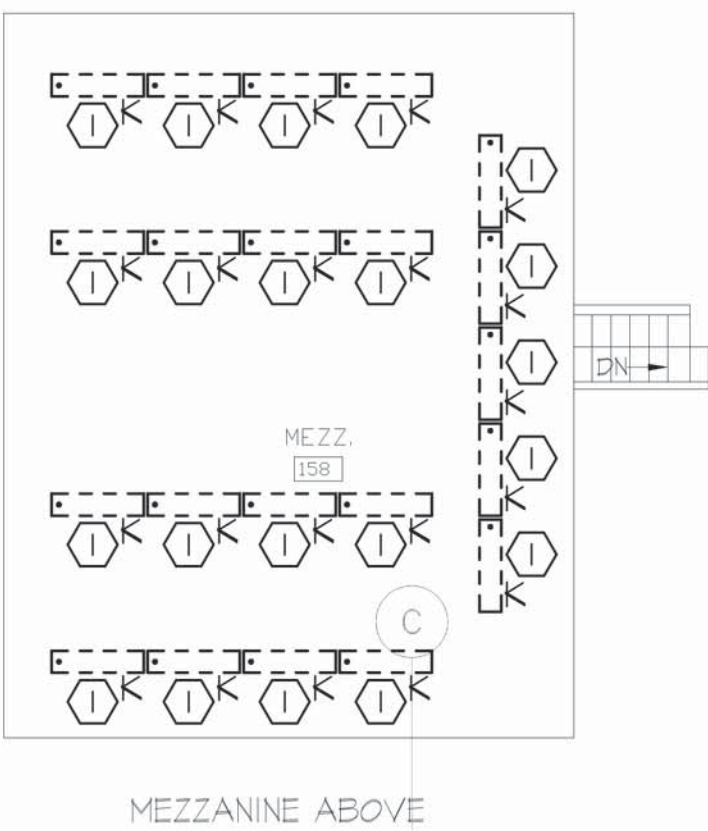
SCALE: 1/8" = 1'-0"

JOB# E-DP-02 PLD 8/14/2025

OCCUPANCY/CONTROLS SENSOR SCHEDULE

- \$WS WS-120/271  
\$WA WA-100  
\$WI WI-200  
\$TS TS-SERIES  
LS-100X/LS-30  
DT-200  
CX-100 SERIES  
PP POWER PACK  
SP SLAVE PACK  
\* ALL OCCUPANCY SENSORS MODEL #5 BASED ON WATTSTOPPER
- WT-600  
WT-1100  
WT-2205  
WT-2250  
HONEYWELL T1100E STAT W/7100E SUBBASE  
CURRENT TRANS. RELAY  
HUMIDITY SCHEDULE

NOTE: ALL SENSORS SHALL BE SET FOR 30 MINUTES.



SEE ALTERNATE #1  
(03/E-102)

02 LIGHTING DEMOLITION MAIN MEZZANINE  
SCALE: 1/8"=1'-0"

01 LIGHTING DEMOLITION MAIN 1ST FLOOR PLAN  
SCALE: 1/8"=1'-0"



**MMEA**  
**ENGINEERS**

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2018019632

GEOLOGICAL SURVEY -  
REPLACEMENT OF HVAC AND  
UPGRADE LIGHTING  
BUEHLER & ANNEX BUILDINGS

PROJECT: W2401-01  
SITE: 5001  
ASSET: 7815001008

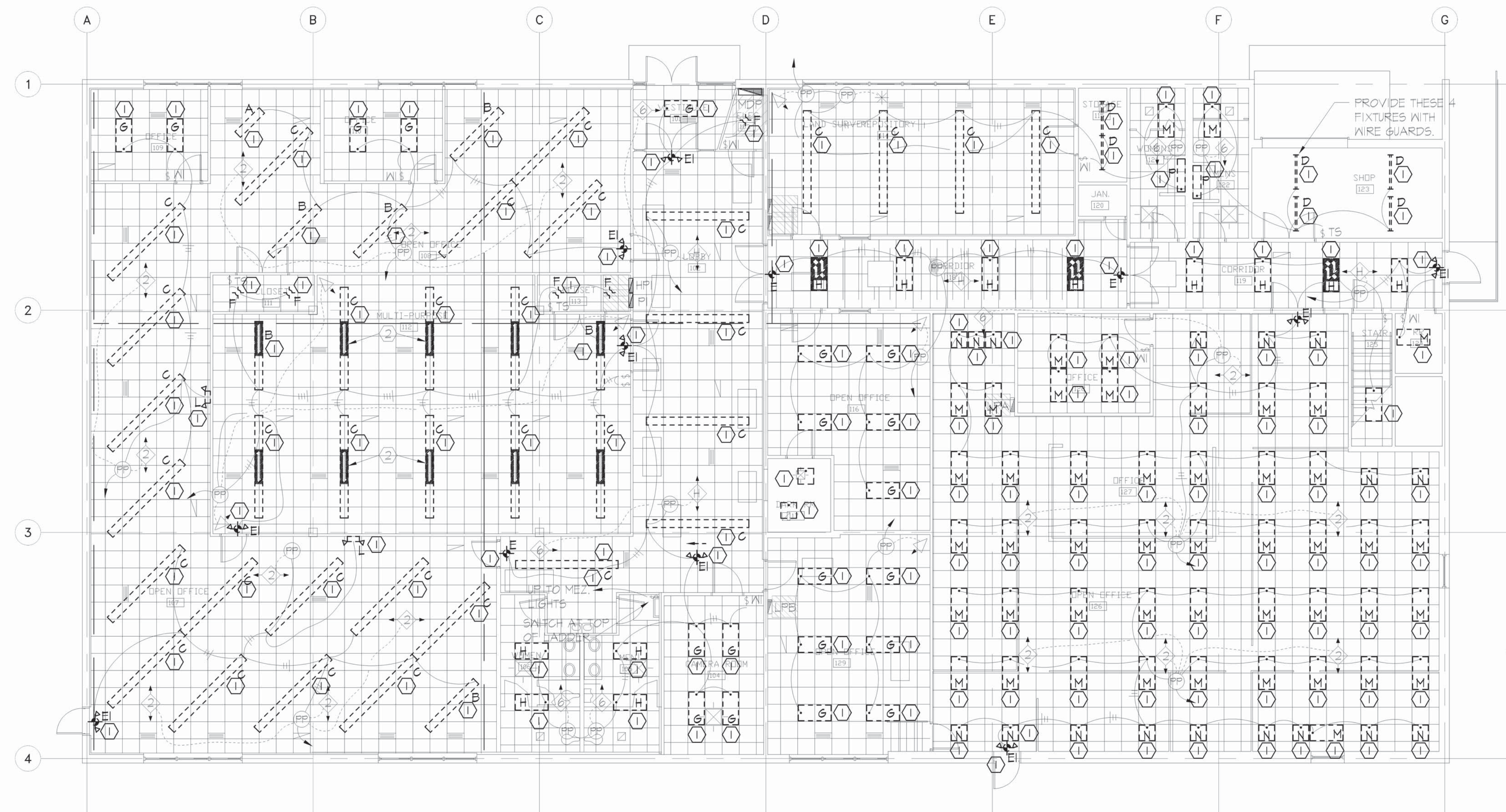
REVISION	DATE

CAD DWG FILE: 24005  
DRAWN BY: JS  
CHECKED BY: WS  
DESIGNED BY: WS

SHEET NUMBER:

E-103

SHEET 12 OF 16  
ISSUE DATE: AUGUST 14, 2025



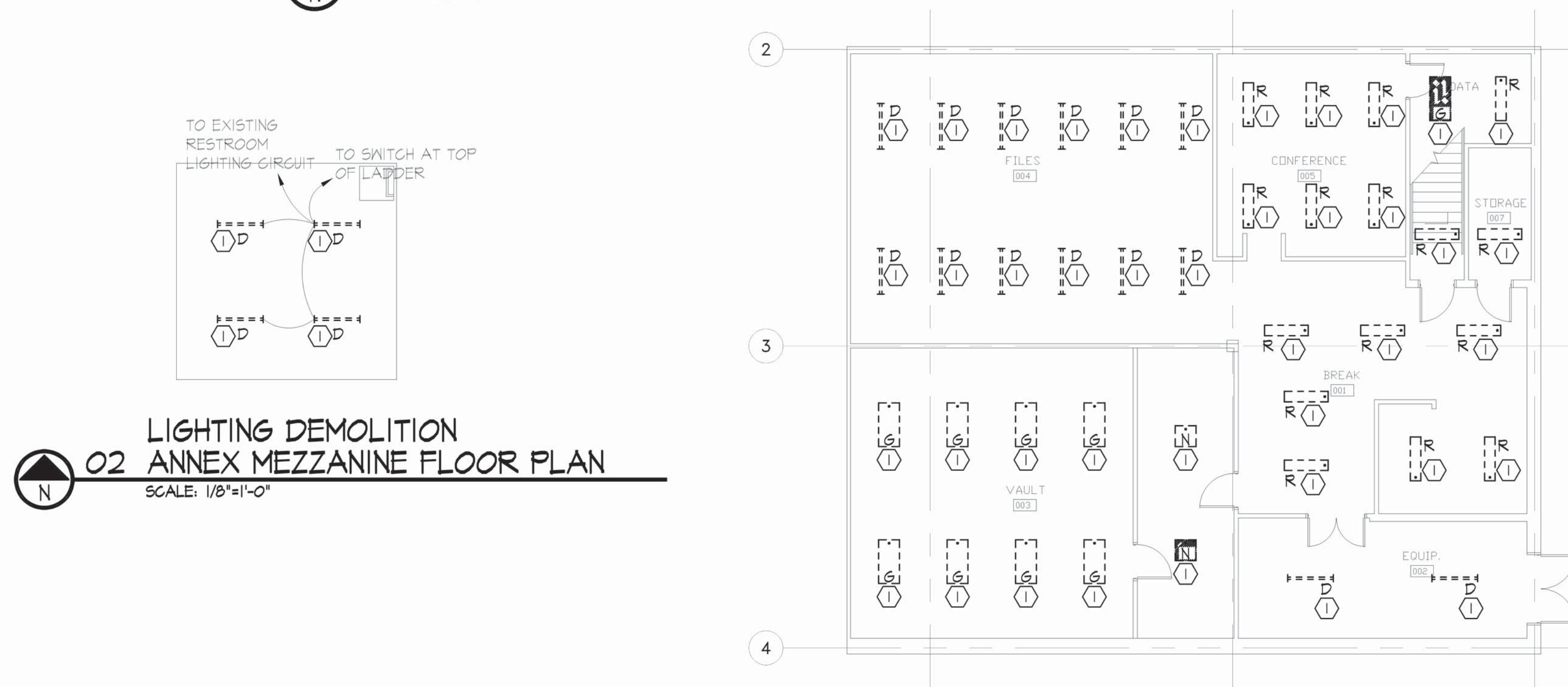
1. DRAWINGS (PLANS, DETAILS AND SCHEMATICS) ARE DIAGRAMMATIC IN NATURE AND INDICATE GENERAL LOCATION AND ARRANGEMENT OF NEW AND EXISTING MAJOR EQUIPMENT AND PIPING SYSTEMS. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING EXACT LOCATIONS AND DIMENSIONS OF ALL EQUIPMENT, PIPING AND PIPING COMPONENTS. CONTRACTOR IS ALSO RESPONSIBLE FOR FINAL TIE-IN POINT LOCATIONS BETWEEN NEW AND EXISTING PIPING SYSTEMS EQUIPMENT AND UTILITIES.

2. UNLESS OTHERWISE NOTED  
EXISTING SHOWN IN FADE-AWAY PEN.  
NEW, RELOCATED OR DEMOLITION  
ITEMS SHOWN IN DARK HEAVY PEN.

3. MATERIAL EXPOSED WITHIN THE RETURN AIR PLENUM SHALL BE NONCOMBUSTIBLE OR SHALL HAVE A FLAME SPREAD INDEX OF NOT MORE THAN 25 AND A SMOKE DEVELOPMENT INDEX OF NOT MORE THAN 50 WHEN TESTED IN ACCORDANCE WITH ASTM E84.

① REMOVE AND REPLACE EXISTING LIGHT FIXTURE. EXISTING CIRCUIT AND SWITCHING TO REMAIN.

01 LIGHTING DEMOLITION ANNEX 1ST FLOOR PLAN  
SCALE: 1/8"=1'-0"



02 LIGHTING DEMOLITION  
ANNEX MEZZANINE FLOOR PLAN  
SCALE: 1/8"=1'-0"

03 LIGHTING DEMOLITION  
ANNEX BASEMENT FLOOR PLAN  
SCALE: 1/8"=1'-0"



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





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NATURAL RESOURCES

GEOLOGICAL SURVEY -  
REPLACEMENT OF HVAC AND  
UPGRADE LIGHTING  
BUEHLER & ANNEX BUILDINGS

ROLLA, MISSOURI

PROJECT: W2401-01  
SITE: 5001  
ASSET: 7815001007

REVISION	DATE

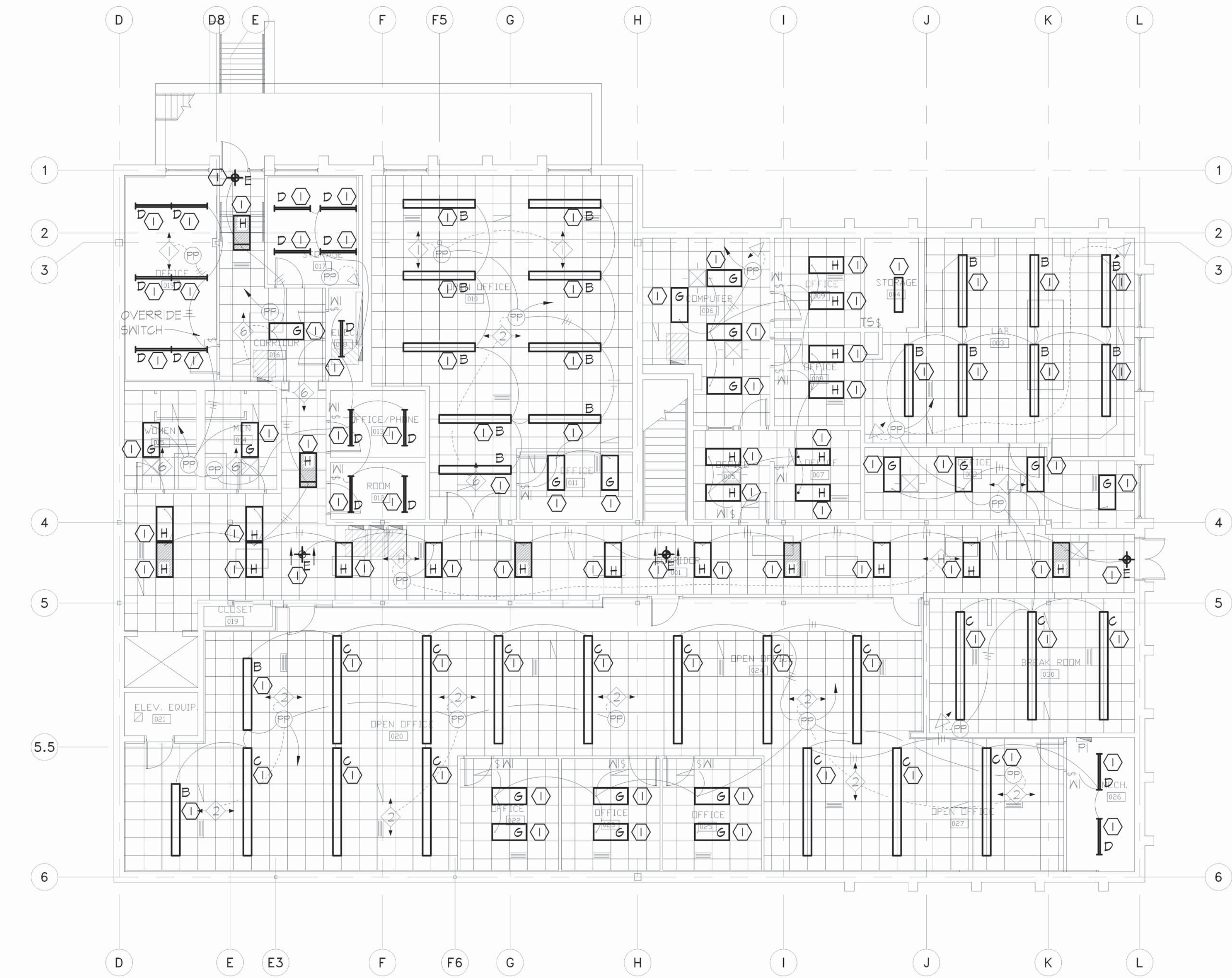
CAD DWG FILE: 24005  
DRAWN BY: JS  
CHECKED BY: WS  
DESIGNED BY: WS

SHEET TITLE:  
BASEMENT  
LIGHTING  
RENOVATION

SHEET NUMBER:

E-104

SHEET 13 OF 16  
ISSUE DATE: AUGUST 14, 2025



GENERAL NOTES:

- DRAWINGS (PLANS, DETAILS AND SCHEMATICS ARE DIAGRAMMATIC IN NATURE AND INDICATE GENERAL LOCATION AND ARRANGEMENT OF NEW AND EXISTING MAJOR EQUIPMENT AND PIPING SYSTEMS. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING EXACT LOCATIONS AND DIMENSIONS OF ALL EQUIPMENT, PIPING AND PIPING COMPONENTS. CONTRACTOR IS ALSO RESPONSIBLE FOR FINAL TIE-IN POINT LOCATIONS BETWEEN NEW AND EXISTING PIPING SYSTEMS EQUIPMENT AND UTILITIES.
- UNLESS OTHERWISE NOTED EXISTING SHOWN IN FADE-AWAY PEN. NEW, RELOCATED OR DEMOLITION ITEMS SHOWN IN DARK HEAVY PEN.
- MATERIAL EXPOSED WITHIN THE RETURN AIR PLENUM SHALL BE NONCOMBUSTIBLE OR SHALL HAVE A FLAME SPREAD INDEX OF NOT MORE THAN 25 AND A SMOKE DEVELOPMENT INDEX OF NOT MORE THAN 50 WHEN TESTED IN ACCORDANCE WITH ASTM E84.

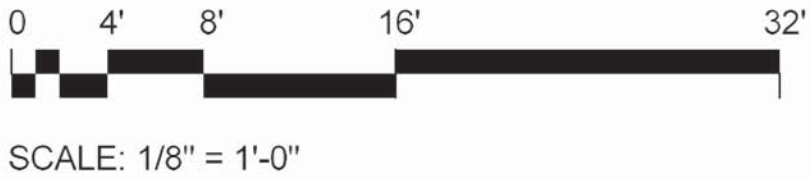
NOTES:

- ① REPLACEMENT LIGHT FIXTURE TO BE CONNECTED BACK TO EXISTING CIRCUITING AND SWITCHING.

OCCUPANCY/CONTROLS SENSOR SCHEDULE	
WS WS-120/271	WT-600
WA WA-100	WT-1100
WI WI-200	WT-2205
TS TS-SERIES	WT-2250
LS-100X/LS-30	HONEYWELL T100E STAT W/OT100E SUBBASE
DT-200	CT CURRENT TRANS. RELAY
CX-100 SERIES	PP POWER PACK
SP SLAVE PACK	HS HUMIDITY SCHEDULE
* ALL OCCUPANCY SENSORS MODEL #S BASED ON WATTSTOPPER	

NOTE: ALL SENSORS SHALL BE SET FOR 30 MINUTES.

01 LIGHTING RENOVATION  
MAIN BASEMENT FLOOR PLAN  
SCALE: 1/8"=1'-0"



JOB# E-UP-01 PLTD 8/14/2025





CONSTRUCTION  
DOCUMENTS



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GEOLOGICAL SURVEY -  
REPLACEMENT OF HVAC AND  
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BUEHLER & ANNEX BUILDINGS

ROLLA, MISSOURI

PROJECT: W2401-01  
SITE: 5001  
ASSET: 7815001007

REVISION	DATE

CAD DWG FILE: 24005  
DRAWN BY: JS  
CHECKED BY: WS  
DESIGNED BY: WS

SHEET TITLE:  
1ST FLOOR  
LIGHTING  
RENOVATION

SHEET NUMBER:

E-105

SHEET 14 OF 16  
ISSUE DATE: AUGUST 14, 2025

JOB# E-UP-02 PLTD 8/14/2025

GENERAL NOTES:

1. DRAWINGS (PLANS, DETAILS AND SCHEMATICS ARE DIAGRAMMATIC IN NATURE AND INDICATE GENERAL LOCATION AND ARRANGEMENT OF NEW AND EXISTING MAJOR EQUIPMENT AND PIPING SYSTEMS. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING EXACT LOCATIONS AND DIMENSIONS OF ALL EQUIPMENT, PIPING AND PIPING COMPONENTS. CONTRACTOR IS ALSO RESPONSIBLE FOR FINAL TIE-IN POINT LOCATIONS BETWEEN NEW AND EXISTING PIPING SYSTEMS EQUIPMENT AND UTILITIES.

2. UNLESS OTHERWISE NOTED EXISTING SHOWN IN FADE-AWAY PEN. NEW, RELOCATED OR DEMOLITION ITEMS SHOWN IN DARK HEAVY PEN.

3. MATERIAL EXPOSED WITHIN THE RETURN AIR PLENUM SHALL BE NONCOMBUSTIBLE OR SHALL HAVE A FLAME SPREAD INDEX OF NOT MORE THAN 25 AND A SMOKE DEVELOPMENT INDEX OF NOT MORE THAN 50 WHEN TESTED IN ACCORDANCE WITH ASTM E84.

NEW EXTERIOR LIGHT MOUNTED ON CANOPY (TYP OF 3)

OCCUPANCY/CONTROLS SENSOR SCHEDULE

\$WS WS-120/217  
\$WA WA-100  
\$WI WI-200  
\$TS TS-SERIES  
\* LS-100X/LS-30  
△ DT-200  
△ CX-100 SERIES  
PP POWER PACK  
SP SLAVE PACK  
\* ALL OCCUPANCY SENSORS MODEL #S BASED ON WATTSTOPPER

NT-600  
NT-1100  
NT-2205  
NT-2250  
HONEYWELL T100E STAT W/100E SUBBASE  
CURRENT TRANS. RELAY  
HUMIDITY SCHEDULE

NOTE: ALL SENSORS SHALL BE SET FOR 30 MINUTES.

MEZZANINE ABOVE

SEE ALTERNATE #1  
(03/E-102)

02 LIGHTING RENOVATION MAIN MEZZANINE  
SCALE: 1/8"=1'-0"

01 LIGHTING RENOVATION MAIN 1ST FLOOR PLAN  
SCALE: 1/8"=1'-0"

NOTES:

① REPLACEMENT LIGHT FIXTURE TO BE CONNECTED BACK TO EXISTING CIRCUITING AND SWITCHING.

② 2 #12 THIN, #12 CU GRD, 3/4" C BACK TO A NEW 20A / 1P BRKR N NEAREST 120/208V PANEL.

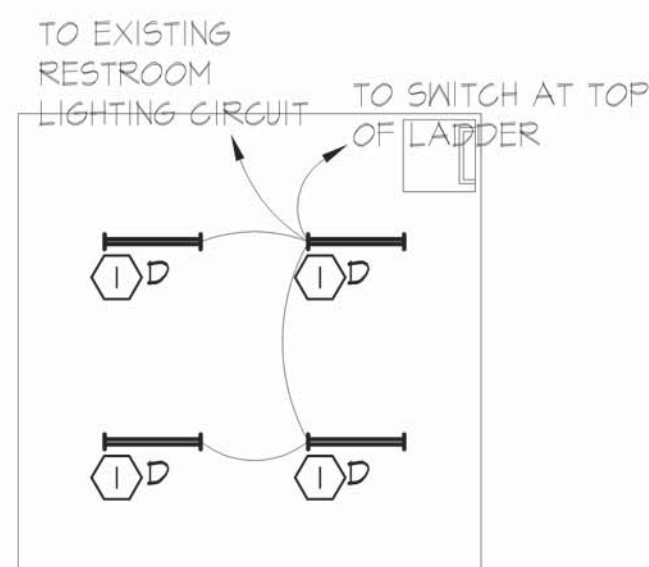


SCALE: 1/8" = 1'-0"

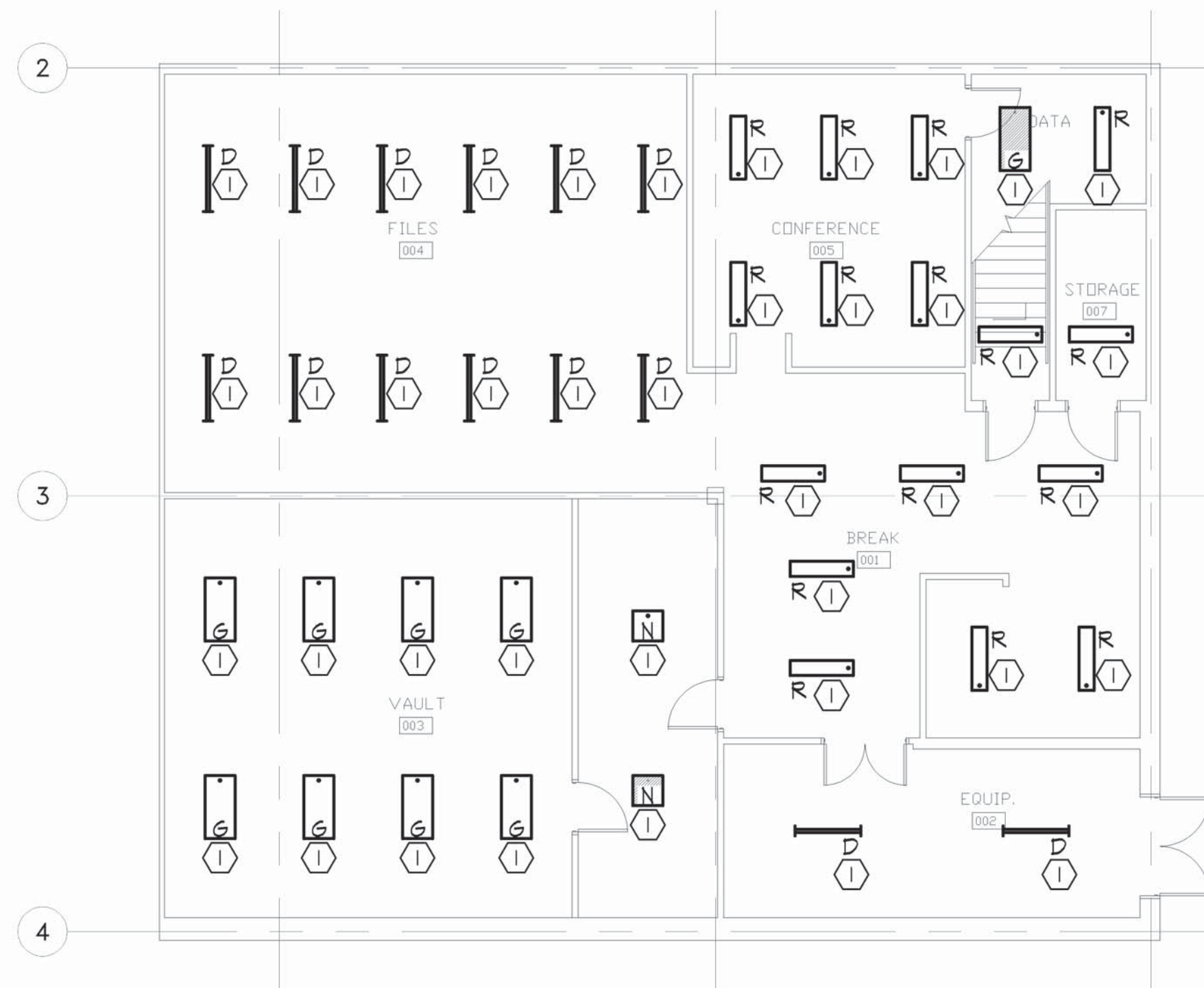




01 LIGHTING RENOVATION ANNEX 1ST FLOOR PLAN  
SCALE: 1/8"=1'-0"



02 LIGHTING RENOVATION ANNEX MEZZANINE FLOOR PLAN  
SCALE: 1/8"=1'-0"



03 LIGHTING RENOVATION ANNEX BASEMENT FLOOR PLAN  
SCALE: 1/8"=1'-0"

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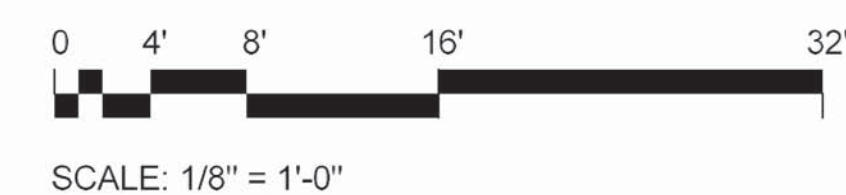
NOTES:

- ① REPLACEMENT LIGHT FIXTURE TO BE CONNECTED BACK TO EXISTING CIRCUITING AND SWITCHING.

OCCUPANCY/CONTROLS SENSOR SCHEDULE

\$WS WS-120/277	⑥ WT-600
\$WA WA-100	④ WT-1100
\$WI WI-200	② WT-2205
\$TS TS-SERIES	④ WT-2250
* LS-100X/LS-30	① HONEYWELL T100E STAT W/0100E SUBBASE
④ DT-200	④ CX-100 SERIES
④ POWER PACK	④ CURRENT TRANS. RELAY
④ SLAVE PACK	④ HUMIDITY SCHEDULE
* ALL OCCUPANCY SENSORS MODEL #S BASED ON WATTSTOPPER	

NOTE: ALL SENSORS SHALL BE SET FOR 30 MINUTES.



CONSTRUCTION  
DOCUMENTS



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2018019632

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MANAGEMENT, DESIGN  
AND CONSTRUCTION  
DEPARTMENT OF  
NATURAL RESOURCES

GEOLOGICAL SURVEY -  
REPLACEMENT OF HVAC AND  
UPGRADE LIGHTING  
BUEHLER & ANNEX BUILDINGS

ROLLA, MISSOURI

PROJECT: W2401-01  
SITE: 5001  
ASSET: 7815001008

REVISION	DATE

CAD DWG FILE: 24005  
DRAWN BY: JS  
CHECKED BY: WS  
DESIGNED BY: WS

SHEET TITLE:  
ANNEX  
LIGHTING  
RENOVATION

SHEET NUMBER:

E-106

SHEET 15 OF 16  
ISSUE DATE: AUGUST 14, 2025



ELECTRICAL SYMBOL SCHEDULE	
ALL SYMBOLS SHOWN ARE NOT NECESSARILY USED ON THE DRAWINGS	
	HOME RUN CIRCUIT TO PANEL PI, BREAKER SPACES 1,2,4
	EACH ARROW INDICATES ONE CIRCUIT
	SHORT HATCH MARKS INDICATE # OF PHASE CONDUCTORS
	LONG HATCH MARKS INDICATE # OF NEUTRAL CONDUCTORS
	NO HATCH MARKS INDICATE TWO CONDUCTORS
	ADDITIONALLY, EVERY CIRCUIT TO INCLUDE CODE SIZED GROUND
	TIE TO EXISTING
	RECEPTACLE OUTLET (DUPLEX - QUADRUPLEX)
	FLOOR DUPLEX RECEPTACLE - FLOOR QUADRUPLEX RECEPTACLE
	SPECIAL POWER
	GROUND FAULT CIRCUIT INTERRUPT - WEATHER PROOF
	JUNCTION BOX - FULL BOX - JUNCTION BOX ABOVE CEILING
	CONTACTOR - DISCONNECT - STARTER - FUSED DISCONNECT
	ELECTRIC MOTOR
	ELECTRIC PANEL
	**WALL SWITCH SINGLE POLE (THREE POLE - TIMER SWITCH - DIMMER SWITCH)
	LIGHT FIXTURE (CEILING MOUNTED - WALL MOUNTED)
	FLUORESCENT LIGHT FIXTURE (ENCLOSED - STRIP)
	BATTERY PACK WITH EMERGENCY LIGHTS - EMERGENCY EXIT SIGN
	EMERGENCY EXIT WITH DUAL EMERGENCY LIGHTS
	LIGHT FIXTURES WITH EMERGENCY BATTERY PACK
	*J-BOX WITH BLANK FACE PLATE
	*COMPUTER DATA - FLOOR RECESSED COMPUTER DATA - DATA & COMMUNICATION
	FLOW SWITCH
	AUDIO VISUAL ALARM - VISUAL ALARM - AUDIO ALARM
	MANUAL PULL STATION
	TAMPER SWITCH
	DUCT MOUNTED SMOKE DETECTOR - HEAT DETECTOR - SMOKE DETECTOR
	FIRE ALARM CONTROL PANEL - TELEPHONE DIALER
	WATER FLOW INDICATOR
	INTERLOCK RELAY
* MINIMUM 3/4" CONDUIT WITH JUNCTION BOX AND PULL STRING.	
**SEE OCCUPANCY SCHEDULE ON REOVATION PLANS.	

LIGHT FIXTURE SCHEDULE						
MARK	MANUFACTURER & MODEL NUMBER	TYPE	LAMPS		MOUNTING	REMARKS
			#			
A	HEW MX4UD-4'00-L12/B40U/L12/B40D-S-A/F-ACFS/D96-S9658/W-DIM-UNV	LED	-	NOTE 1	PENDANT	
B	HEW MX4UD-8'00-L12/B40U/L12/B40D-S-A/F-ACFS/D96-S9658/W-DIM-UNV	LED		NOTE 1	PENDANT	
C	HEW MX4UD-12'00-L12/B40U/L12/B40D-S-A/F-ACFS/D96-S9658/W-DIM-UNV	LED		NOTE 1	PENDANT	
D	HEW T5R-4-L50/B40(2)/VBY-2/FNU-DIM-UNV	LED		NOTE 1	PENDANT	
E	HEW EXIT-R-EM-WHT-D	LED			SURFACE	
E1	HEW EXIT/EM/LED-R-WHT-D	LED			SURFACE	
F	HEW 6DR-TL-L20/B40-DIMI-UNV-OM-OF-CS-N-F1	LED		NOTE 1	CAN	
G	HEW BP-24-L5/BOS-W5-DIM-UNV	LED		NOTE 1	RECESSED	
G2	HEW BP-24-L5/BOS-W5-DIM-UNV			NOTE 1	RECESSED	
H	HEW BP-24-L5/BOS-W5-DIM-UNV	LED		NOTE 1	RECESSED	
J	HEW BP-24-L5/BOS-W5-DIM-UNV	LED		NOTE 1	RECESSED	
J2	HEW BP-24-L5/BOS-W5-DIM-UNV	LED		NOTE 1	RECESSED	
K	HEW ASM-4-L46/B40-S-5-S-DIM-UNV	LED		NOTE 1	SURFACE	
L	HEW EMER/LED-WHT-D	LED			SURFACE	
M	HEW LT-24-L52/B40-AF-(4)EQ CLIPS-DIM-UNV			NOTE 1	RECESSED	
N	HEW BP-22-L5/BOS-W5-DIM-UNV	LED		NOTE 1	RECESSED	
P	HEW WMAUD-4-L40/B40U/L40/B40D-AF-DIMU/DIMD-UNV	LED		NOTE 1		
Q	HEW BP-24-L5/BOS-W5-DIM-UNV	LED		NOTE 1	WALL	
R	HEW 11-4-L52-B40-F-AF12125-DIM-UNV	LED		NOTE 1	SURFACE	

- NOTES:
- COLOR TEMPERATURE ON ALL FIXTURES TO BE SET AT 4000K.
  - SHADED FIXTURES ON DRAWINGS TO BE PROVIDED WITH EMERGENCY BATTERY BACKUP. CIRCUIT TO UNSWITCHED HOT.

STATE OF MISSOURI  
MIKE KEHOE,  
GOVERNOR



CONSTRUCTION  
DOCUMENTS

**MMEA**  
**ENGINEERS**

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BUEHLER & ANNEX BUILDINGS

ROLLA, MISSOURI

PROJECT: W2401-01  
SITE: 5001  
ASSET: 7815001007  
ASSET: 7815001008

REVISION	DATE

CAD DWG FILE: 24005  
DRAWN BY: JS  
CHECKED BY: WS  
DESIGNED BY: WS

SHEET TITLE:  
ELECTRICAL  
SCHEDULES

SHEET NUMBER:

E-201

SHEET 16 OF 16  
ISSUE DATE: AUGUST 14, 2025



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

JOB# E-SH-01 PLTD 8/14/2025