

MONTANA STATE UNIVERSITY

RENNE LIBRARY

DATA CENTER UPS REPLACEMENTS

BOZEMAN, MONTANA

PPA# 24-1182

LEGEND

	EXISTING POWER PANEL
	DISCONNECT SWITCH
	STARTER - COMBINATION MAGNETIC
	VARIABLE FREQUENCY DRIVE
	EMERGENCY POWER OFF BUTTON
	CARD READER
	MOTOR (M - MOTOR, F - FAN, P - PUMP)
	SPECIAL EQUIPMENT CONNECTION
	JUNCTION BOX OR J-BOX

ABBREVIATIONS

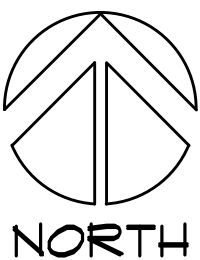
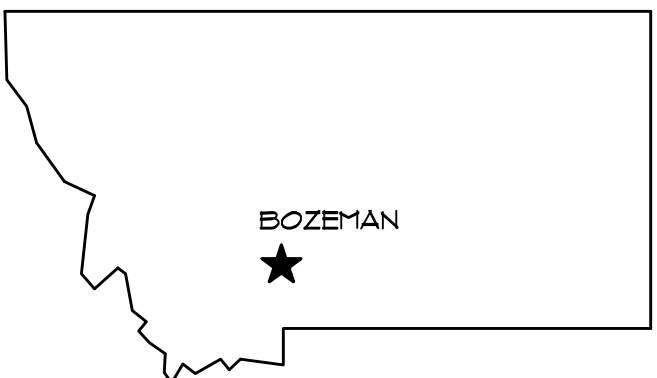
C	CONDUIT
EC	ELECTRICAL CONTRACTOR
EX	EXISTING
G.C.	GENERAL CONTRACTOR
GRD	GROUND
HP	HORSE POWER
M.C.	MECHANICAL CONTRACTOR
TFX,XFMR	TRANSFORMER
VFD	VARIABLE FREQUENCY DRIVE
W\	WITH

GUIDE TO LINEWEIGHTS

—————	ITEMS SHOWN LIGHT ARE EXISTING AND TO REMAIN
—————	ITEMS SHOWN BOLD AND SOLID ARE NEW
- - - - -	ITEMS SHOWN BOLD AND DASHED ARE TO BE REMOVED

PROJECT LOCATION

STATE OF MONTANA MAP

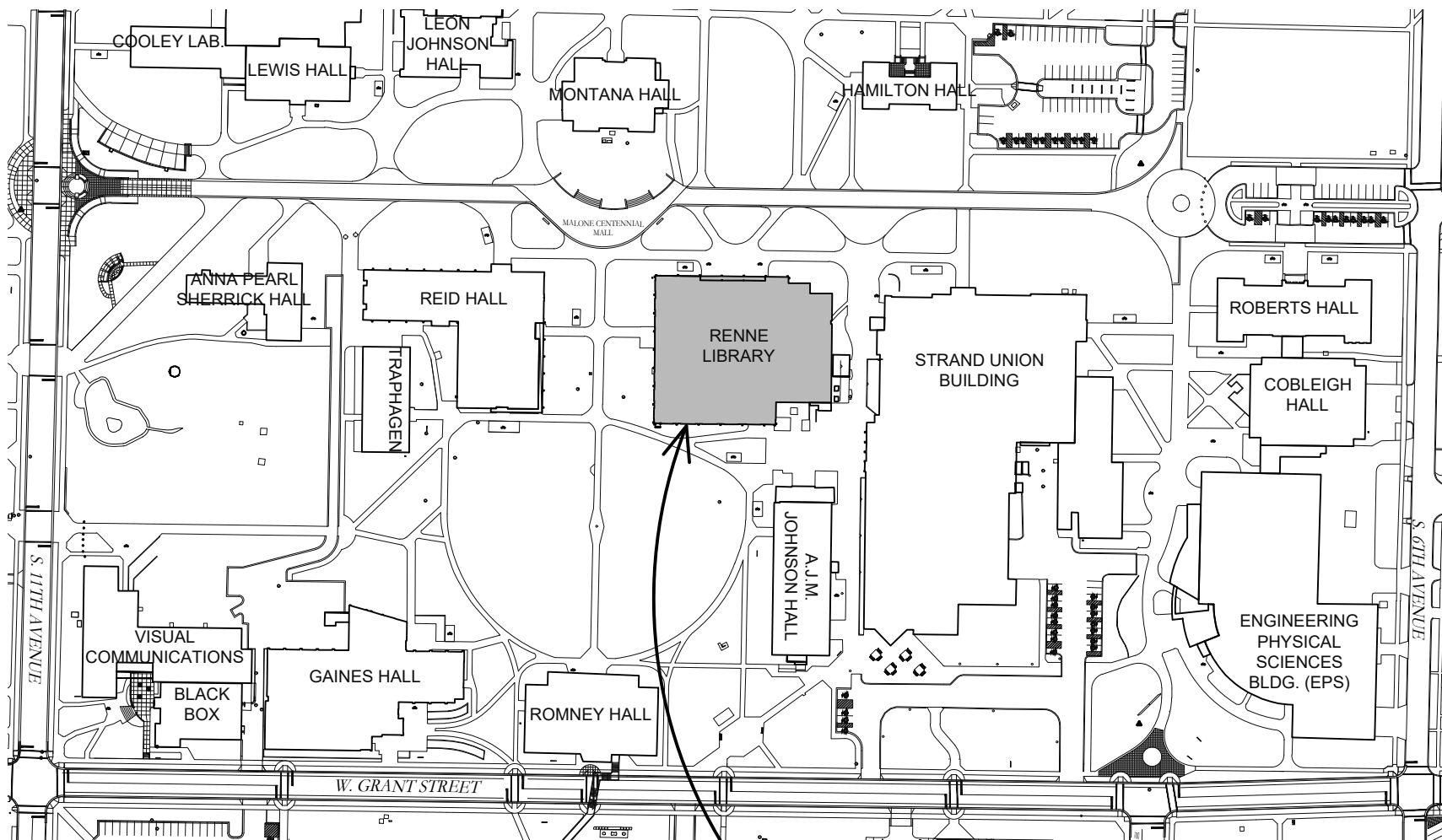


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PROJECT ADDRESS
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PARTIAL CAMPUS MAP



PROJECT LOCATION

DRAWING INDEX

ELECTRICAL	
E1	ELECTRICAL COVER SHEET
E2	ELECTRICAL PLAN
E3	RISER DIAGRAM - EXISTING
E4	RISER DIAGRAM - PHASE 1
E5	RISER DIAGRAM - PHASE 2
E6	RISER DIAGRAM - PHASE 3

APPLICABLE BUILDING CODES

2021 INTERNATIONAL BUILDING CODE (IBC)
2020 NATIONAL ELECTRICAL CODE (NEC)

PROJECT SCOPE OF WORK

THIS PROJECT INCLUDES THE DEMOLITION OF (5) EXISTING UNINTERRUPTIBLE POWER SUPPLIES (UPS's) AND THE INSTALLATION OF (2) NEW UPS's. ADDITIONAL ELECTRICAL WORK WILL INCLUDE THE DISCONNECTING AND RECONNECTING OF MULTIPLE PANELBOARDS FROM THE OLD UPS's TO THE NEW UPS's.



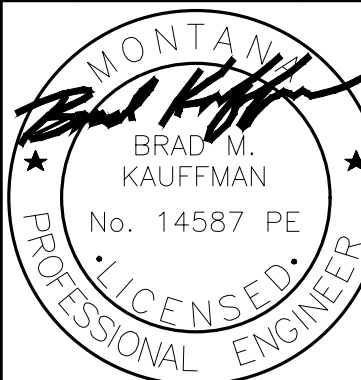
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SHEET TITLE

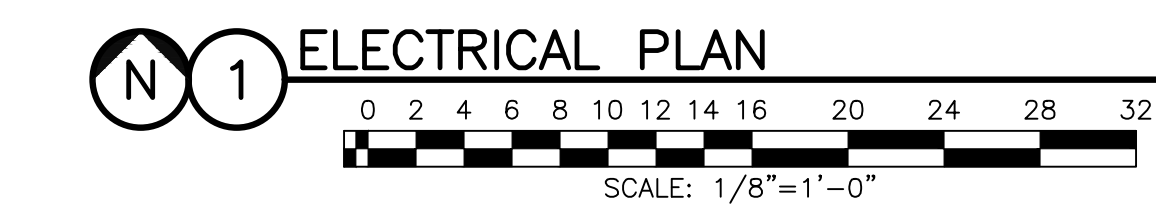
ELECTRICAL
COVER SHEET

SHEET

E1

DATE

10-27-25



- A. ALL ELECTRICAL OUTAGES SHALL BE SCHEDULED WITH MSU UIT AND FACILITY SERVICES A MINIMUM OF 2-WEEKS IN ADVANCE AND NEEDS TO OCCUR DURING WINTER BREAK, SPRING BREAK, OR DURING SUMMER SESSION (MAY 11 THROUGH AUGUST 21, 2026) UNLESS COORDINATED OTHERWISE WITH UIT STAFF.
- B. ALL CONDUITS SHALL BE INSTALLED BELOW RAISED FLOOR IN FLEXIBLE METALLIC CONDUIT. THE ONLY EXCEPTION WILL BE THE FEEDER TO NEW UPS-A, WHICH WILL BE IN EMT CONDUIT INSTALLED ABOVE THE SUSPENDED CEILING GRID.
- C. BASIS OF DESIGN FOR UPS IS Eaton (SEE SPECIFICATIONS). UPS HAS 225 AMP OVERCURRENT PROTECTION BUILT INTO INTERNAL MAINLINE FUSIBLE SWITCH ON INCOMING AND OUTGOING BREAKERS. ANY DEVIATION FROM THIS OVERCURRENT PROTECTION SIZING CAUSED BY A SUBSTITUTION, RESULTING IN A NEED FOR NEW CIRCUIT BREAKERS IN PANEL 'Z' OR 'BE1'L SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR.
- D. REFER TO ELECTRICAL RISER DIAGRAMS, SHEETS E3 THROUGH E6, FOR CIRCUITING REQUIREMENTS BETWEEN UPS'S AND PANELBOARDS.

- ① DISCONNECT EXISTING EPS SWITCHES FROM EXISTING UPS-A AND SAVE FOR REUSE. EXTEND TO NEW UPS-A AND UPS-B VIA 5#12 AND #12G IN 3/4" CONDUIT (COORDINATE EXACT WIRING REQUIREMENTS WITH UPS VENDOR).
- ② AVOID INSTALLING UPS'S DIRECTLY UNDERNEATH EXISTING WATER PIPING IN THIS LOCATION.
- ③ REMOVE EXISTING SURFACE MOUNTED WIREMOLD, BOXES, AND DEVICES ON WALL DIRECTLY BEHIND NEW UPS LOCATIONS.
- ④ ALL WORK ASSOCIATED WITH THE INSTALLATION OF UPS-B AND THE REMOVAL OF UPS-S4 SHALL BE ALTERNATE BID ITEM #1. SEE SHEET E6 FOR ADDITIONAL INFORMATION.

1. PLEASE REFER TO IH REPORT IN PROJECT MANUAL APPENDIX.
2. NO DRILLING THROUGH TEXTURED CONCRETE WALLS IN HALLWAYS BELOW CEILING LEVEL IS ALLOWED. DRILLING THROUGH OTHER WALL TYPES IS ACCEPTABLE.
3. DO NOT DRILL OR CUT ANY NEW HOLES IN DATA CENTER RAISED FLOOR TILES. FOR ANY NEW PENETRATIONS THROUGH FLOOR TILE SYSTEM, UTILIZE SPARE FLOOR TILES WITH EXISTING OPENINGS.



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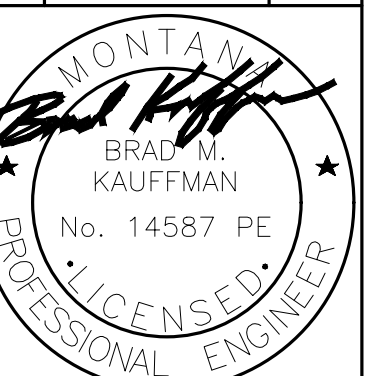
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SHEET TITLE	
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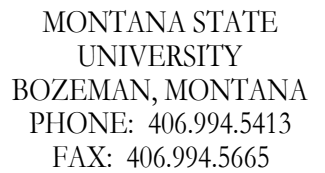
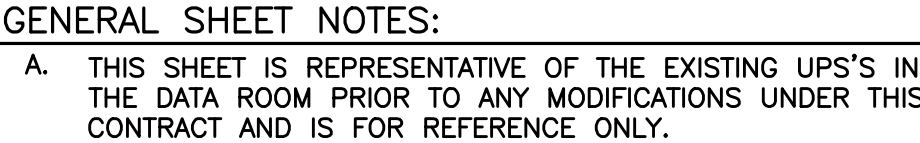
ELECTRICAL PLAN

SHEET

E2

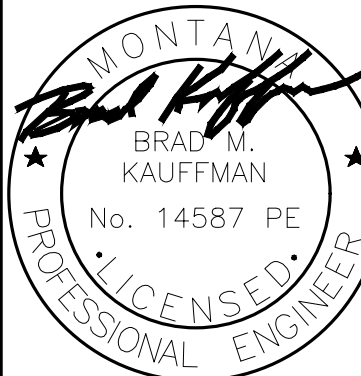
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SHEET TITLE
RISER DIAGRAM
EXISTING

E3

DATE
10-27-25



- SPECIFIC SHEET NOTES:**

- ① DISCONNECT PANEL 'BE3L' AND REMOVE APPROXIMATELY 2 FEET OF CONDUIT AND INSTALL 18X18 JUNCTION BOX ABOVE PANELBOARD.
- ② PLACE PANEL IN UPS BYPASS MODE UTILIZING EXISTING WALL MOUNTED BYPASS SWITCH. THEN REMOVE ASSOCIATED UPS AND ALL ASSOCIATED CONDUCTORS BETWEEN UPS AND BYPASS SWITCH. REMOVE AND DISPOSE OF UPS.
- ③ PROVIDE TEMPORARY FEED TO 3-PHASE UPS FROM PANEL #BE3 AND #6 GROUND IN 1-1/4" CONDUIT. UTILIZE EXISTING 100A-3P CIRCUIT BREAKER SITTING LOOSE ON TOP OF PANELBOARD. RE-ARRANGE EXISTING CIRCUIT BREAKERS AS REQUIRED TO FREE UP SPACE FOR NEW CIRCUIT BREAKER.
- ④ DISCONNECT UPS FROM PANEL 'BE3L' ONCE NEW FEED FROM PANEL 'X' IS INSTALLED.
- ⑤ MOVE EXISTING LIGHTING CIRCUIT FROM PANEL BE3L TO PANEL 'X', EXTENDING CONDUIT AND WIRE AS REQUIRED. NOTE THAT PANEL 'BE3L' AND PANEL 'X' ARE ADJACENT TO EACH OTHER. DO NOT MIX OR SPLICE CIRCUITS WITHIN PANELBOARDS. UTILIZE EXISTING SPARE 20A-1P CIRCUIT BREAKER IN PANEL 'X' AND CONNECT VIA #212 AND #12 IN 1/2" CONDUIT.
- ⑥ REMOVE EXISTING CONDUCTORS AND MAINTAIN CONDUIT FOR REUSE.



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Professional Engineer Seal for Brad M. Kauffman, State of Montana, License No. 14587 PE.

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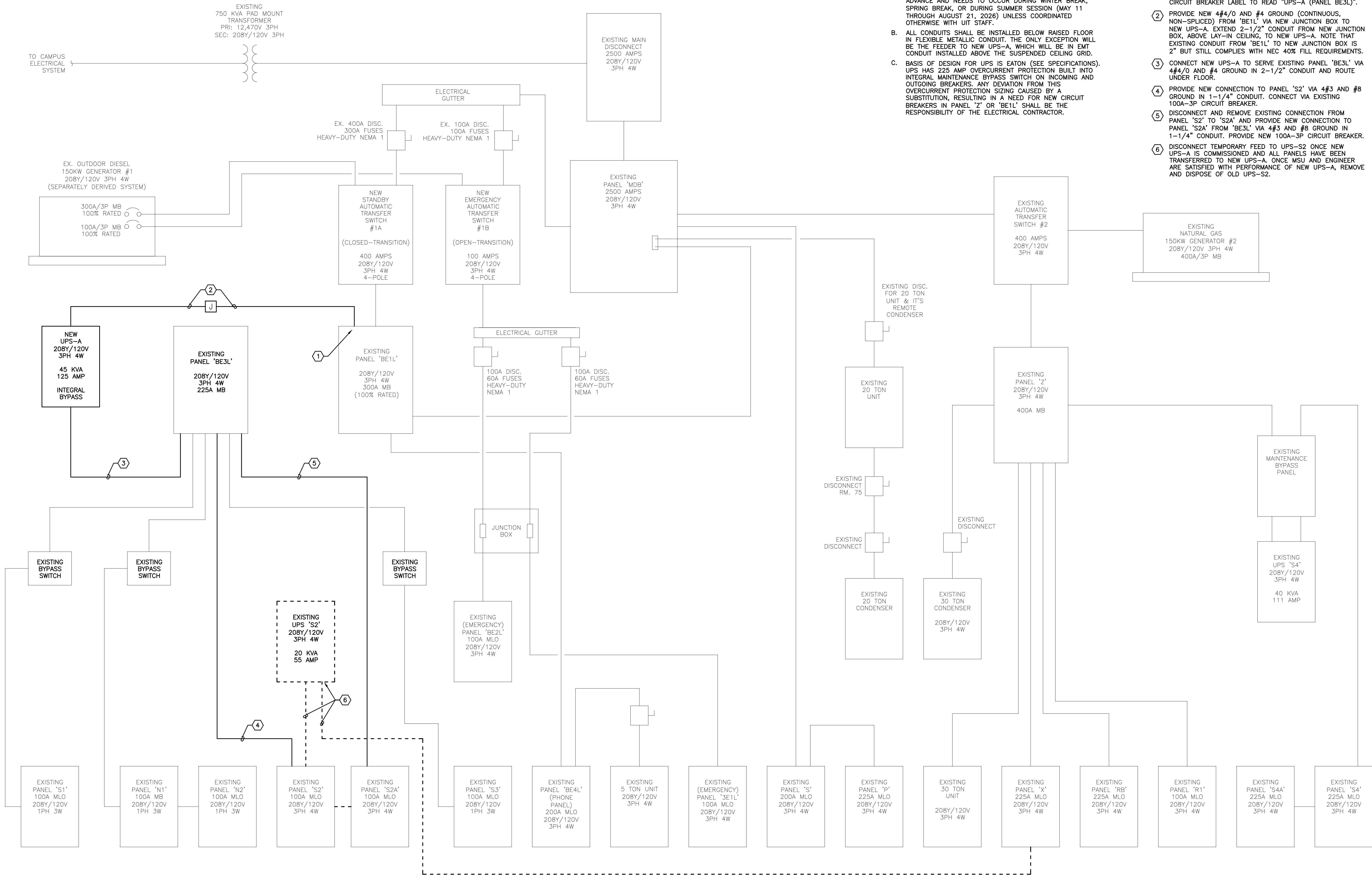
SHEET TITLE
RISER DIAGRAM
PHASE 1

SHEET

E4

DATE
10-27-25

1 PARTIAL ELECTRICAL RISER DIAGRAM – PHASE 1
SCALE: NONE



GENERAL SHEET NOTES:

- A. ALL ELECTRICAL OUTAGES SHALL BE SCHEDULED WITH MSU UIT AND FACILITY SERVICES A MINIMUM OF 2-WEEKS IN ADVANCE AND NEEDS TO OCCUR DURING WINTER BREAK, SPRING BREAK, OR DURING SUMMER SESSION (MAY 11 THROUGH AUGUST 21, 2026) UNLESS COORDINATED OTHERWISE WITH UIT STAFF.
- B. ALL CONDUITS SHALL BE INSTALLED BELOW RAISED FLOOR IN FLEXIBLE METALLIC CONDUIT. THE ONLY EXCEPTION WILL BE THE FEEDER TO NEW UPS-A, WHICH WILL BE IN EMT CONDUIT INSTALLED ABOVE THE SUSPENDED CEILING GRID.
- C. BASIS OF DESIGN FOR UPS IS EATON (SEE SPECIFICATIONS). UPS HAS 225 AMP OVERCURRENT PROTECTION BUILT INTO INTEGRAL MAINTENANCE BYPASS SWITCH ON INCOMING AND OUTGOING BREAKERS. ANY DEVIATION FROM THIS OVERCURRENT PROTECTION SIZING CAUSED BY A SUBSTITUTION, RESULTING IN A NEED FOR NEW CIRCUIT BREAKERS IN PANEL 'Z' OR 'BE1L' SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR.

SPECIFIC SHEET NOTES:

- 1 NEW UPS SHALL BE FED FROM EXISTING 225A-3P CIRCUIT BREAKER THAT PREVIOUSLY FED PANEL 'BE3L'. UPDATE CIRCUIT BREAKER LABEL TO READ "UPS-A (PANEL BE3L)".
- 2 PROVIDE NEW 4#4/0 AND #4 GROUND (CONTINUOUS, NON-SPLICED) FROM 'BE1L' VIA NEW JUNCTION BOX TO NEW UPS-A. EXTEND 2-1/2" CONDUIT FROM NEW JUNCTION BOX, ABOVE LAY-IN CEILING, TO NEW UPS-A. NOTE THAT EXISTING CONDUIT FROM 'BE1L' TO NEW JUNCTION BOX IS 2" BUT STILL COMPLIES WITH NEC 40% FILL REQUIREMENTS.
- 3 CONNECT NEW UPS-A TO SERVE EXISTING PANEL 'BE3L' VIA 4#4/0 AND #4 GROUND IN 2-1/2" CONDUIT AND ROUTE UNDER FLOOR.
- 4 PROVIDE NEW CONNECTION TO PANEL 'S2' VIA 4#3 AND #8 GROUND IN 1-1/4" CONDUIT. CONNECT VIA EXISTING 100A-3P CIRCUIT BREAKER.
- 5 DISCONNECT AND REMOVE EXISTING CONNECTION FROM PANEL 'S2' TO 'S2A' AND PROVIDE NEW CONNECTION TO PANEL 'S2A' FROM 'BE3L' VIA 4#3 AND #8 GROUND IN 1-1/4" CONDUIT. PROVIDE NEW 100A-3P CIRCUIT BREAKER.
- 6 DISCONNECT TEMPORARY FEED TO UPS-S2 ONCE NEW UPS-A IS COMMISSIONED AND ALL PANELS HAVE BEEN TRANSFERRED TO NEW UPS-A. ONCE MSU AND ENGINEER ARE SATISFIED WITH PERFORMANCE OF NEW UPS-A, REMOVE AND DISPOSE OF OLD UPS-S2.

1 PARTIAL ELECTRICAL RISER DIAGRAM - PHASE 2
SCALE: NONE



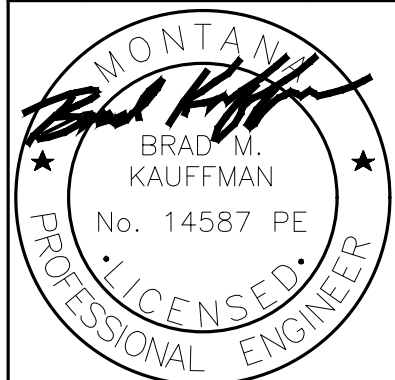
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SHEET TITLE
RISER DIAGRAM
PHASE 2

SHEET
E5

DATE
10-27-25



- SPECIFIC SHEET NOTES:**

- ① CONNECT NEW 'UPS-B' TO 225A-3P CIRCUIT BREAKER THAT PREVIOUSLY SERVED UPS PANEL 'RB'. UPDATE CIRCUIT BREAKER LABELING.
- ② CONNECT EXISTING PANEL 'RB' TO 175A-3P CIRCUIT BREAKER THAT PREVIOUSLY SERVED UPS-S4 (ONCE UPS-S4 IS READY FOR REMOVAL). UPDATE CIRCUIT BREAKER LABELING.
- ③ PROVIDE NEW FEEDER FROM EXISTING PANEL 'Z' TO UPS-B AND FROM UPS-B TO EXISTING PANEL 'S4'. FEEDERS SHALL BE ROUTED UNDER FLOOR AND BE SIZED AT 4#4/0 AND #4 DISCONNECT IN 2-1/2" CONDUIT.
- ④ DISCONNECT FEED TO UPS-S4 ONCE NEW UPS-B IS COMMISSIONED AND PANELS S4 AND S4A HAVE BEEN TRANSFERRED TO NEW UPS-B. ONCE MSU AND ENGINEER ARE SATISFIED WITH PERFORMANCE OF NEW UPS-B, REMOVE AND DISPOSE OF OLD UPS-S4. REMOVE AND DISPOSE OF WALL MOUNTED MAINTENANCE BYPASS PANEL AS WELL.



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SHEET TITLE

RISER DIAGRAM

PHASE 3

SHEET
E6

DATE
10-27-25