

FIRE ALARM NOTES	ELECTRICAL NOTES	ACRONYMS/ABBREVIATIONS:																																																																																												
1. FIRE ALARM SYSTEM SHALL COMPLY WITH: A. IBC (INTERNATIONAL BUILDING CODE), 2021 B. IFC (INTERNATIONAL FIRE CODE), 2021 C. NFPA 70 (NATIONAL ELECTRIC CODE), 2020 D. NFPA 72 (FIRE ALARM CODE), 2019 E. PROJECT SPECIFICATIONS F. LOCAL AHJ REQUIREMENTS (AMENDMENTS) 2. THESE DRAWINGS REPRESENT ENGINEERED FINALIZED SHOP DRAWINGS READY FOR INSTALLATION. THE CONTRACTOR SHALL PROVIDE RED-LINE FIELD ASBUILTS TO THE FIRE ALARM DESIGNER. THE FIRE ALARM DESIGNER WILL PREPARE AND PROVIDE RECORD DRAWINGS. THE CONTRACTOR IS RESPONSIBLE FOR COMPLETED NFPA 72 INSPECTION & TESTING, RECORD OF COMPLETION FORMS AND AND PROVIDE OPERATION & MAINTENANCE MANUALS TO THE OWNERS REPRESENTATIVE. 3. COORDINATE THE EXACT DEVICE LOCATIONS WITH ELECTRICAL AND MECHANICAL SYSTEM EQUIPMENT AND BUILDING ARCHITECTURAL FEATURES. INSTALLING CONTRACTOR SHALL CONSULT/CONFIRM ANY NECESSARY DEVIATION OF DEVICE BOX PLACEMENT OR CONDUIT/CIRCUIT ROUTING WITH THE DESIGNER OF RECORD PRIOR TO IMPLEMENTING CHANGES IN THE FIELD. 4. ALL FIRE ALARM CABLE AND WIRE TO BE IN CONDUIT. FIRE ALARM CONDUIT SHALL BE 3/4" EMT MINIMUM UNLESS OTHERWISE NOTED. CONCEAL CONDUITS IN WALL AND CEILING SPACES WHEREVER FEASIBLE. MECHANICAL AREAS AND CONCEALED CONDUIT SHALL BE FACTORY FINISHED RED. EXPOSED SURFACE CONDUIT IN FINISHED AREAS SHALL BE PAINTED TO MATCH SURROUNDINGS. 5. ALL FIRE ALARM JUNCTION BOXES AND COVERS ABOVE CEILINGS AND IN MECHANICAL SPACES ARE TO BE PAINTED RED. BOTH SIDES OF COVER PLATES SHALL BE PAINTED RED. JUNCTION BOXES AND COVERS IN EXPOSED LOCATIONS SHALL BE PAINTED TO MATCH EXISTING SURFACES AND IDENTIFIED AS FIRE ALARM WITH PRINTED LABEL. 6. MINIMUM CIRCUIT PERFORMANCE REQUIREMENTS: IDC - INITIATING DEVICE CIRCUIT SHALL BE CLASS B NAC - NOTIFICATION APPLICATION CIRCUIT SHALL BE CLASS B SLC - SIGNALING LINE CIRCUIT SHALL BE CLASS B. NO MORE THAN 12 T-TAPS OR 10% OF EST T-TAPS @ 125. 7. "T" TAPPING: NO MORE THAN 12 T-TAPS OR 10% OF EST T-TAPS @ 125 ON THE SLC. NOT ALLOWED FOR ANY NAC OR IDC CIRCUIT. 8. ALL NOTIFICATION APPLIANCES SHALL OPERATE IN SYNCHRONIZATION AS REQUIRED BY NFPA 72. 9. FIRE ALARM EQUIPMENT CABINETS, BOXES, AND DEVICES SHALL HAVE TAGS PERMANENTLY AFFIXED TO THE FACE. LABEL EACH DEVICE USING SELF-ADHESIVE LASER PRINTED COMMERCIALY AVAILABLE ID TAGS. ADDRESSABLE DEVICES SHALL BE LABELED WITH ADDRESS. NOTIFICATION APPLIANCES SHALL BE LABELED WITH THEIR ASSOCIATED NAC IDENTIFIER MATCHING THAT ON THESE PLANS. LABEL ALL MONITOR AND RELAY MODULES WITH ASSOCIATED FUNCTION. LABEL REMOTE TEST SWITCHES WITH ASSOCIATED DUCT DETECTOR ADDRESS AND AIR HANDLER DESIGNATION. ALL LABELS SHALL BE #24 FONT. 10. DO NOT SPLICE FIRE ALARM CONDUCTORS EXCEPT WHERE INDICATED ON THESE DRAWINGS. ALL FIRE ALARM WIRING SHALL ONLY BE TERMINATED AT A DEVICE OR APPROVED TERMINAL BLOCK LOCATION ONLY. 11. EST4 LCD SHALL HAVE MSU LOGO.	1. THE CONTRACTOR SHALL COMPLY WITH THE CONSTRUCTION PRACTICES AND REQUIREMENTS OF THE REFERENCED EDITION OF THE NATIONAL ELECTRIC CODE (2020 NFPA 70), CURRENT NATIONAL ELECTRICAL SAFETY CODE, AND INSTRUCTIONS OF MANUFACTURERS OF EQUIPMENT AND MATERIALS SUPPLIED FOR THE PROJECT. 2. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL JUNCTION AND PULL BOXES REQUIRED FOR THE INSTALLATION OF ELECTRICAL DEVICES AND EQUIPMENT. WHETHER OR NOT SPECIFICALLY INDICATED ON THE PLANS, SIZING OF THESE BOXES SHALL BE PER THE NATIONAL ELECTRICAL CODE AND/OR MANUFACTURES REQUIREMENTS. 3. ALL PENETRATIONS THROUGH FIRE BARRIERS SHALL BE FIRE STOPPED TO MAINTAIN THE INTEGRITY OF THE FIRE BARRIER. FIRE STOPPING MATERIAL SHALL BE U.L. LISTED. 4. THE CONTRACTOR SHALL OBTAIN APPROVAL FROM THE GENERAL CONTRACTOR QUALITY CONTROL REPRESENTATIVE PRIOR TO MAKING ANY PENETRATIONS THROUGH STRUCTURAL MEMBERS. 5. SHOULD PROJECT CONDITIONS REQUIRE REARRANGEMENT OF WORK, THE CONTRACTOR SHALL MARK SUCH CHANGES ON THE AS-BUILT DRAWINGS. IF THESE CHANGES REQUIRE ALTERNATE METHODS TO THOSE SPECIFIED IN THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL SUBMIT DRAWINGS SHOWING THE PROPOSED ALTERNATE METHODS TO THE GENERAL CONTRACTOR. THE CONTRACTOR SHALL NOT PROCEED UNTIL APPROVAL IS OBTAINED. REARRANGEMENT OF WORK FOR THE PURPOSE OF COORDINATION SHALL NOT BE CONSIDERED AN ITEM FOR EXTRA COST. 6. REPAIR ANY DAMAGE TO EXISTING CONSTRUCTION RESULTING FROM THE INSTALLATION OF ELECTRICAL ITEMS. THE AREAS REPAIRED SHALL MATCH THE ADJACENT SURFACES IN TEXTURE AND COLOR. 7. ALL EXPOSED AND CONCEALED CONDUITS SHALL BE EMT (ELECTRICAL METALLIC TUBING). ALL UNDERGROUND CONDUIT SHALL BE PVC CONDUIT SCHEDULE 40, UNLESS NOTED OTHERWISE. USE FLEXIBLE METAL CONDUIT AND SEAL-TIGHT WHERE APPLICABLE. 8. ALL EQUIPMENT SHALL BE CAPABLE OF FITTING IN THE SPACES LOCATED WHILE MEETING THE MANUFACTURERS' RECOMMENDED ACCESS REQUIREMENTS. REVIEW ALL PLACES WHERE EQUIPMENT IS TO BE INSTALLED PRIOR TO ORDERING OF EQUIPMENT AND NOTIFY THE GENERAL CONTRACTOR OF ANY INADEQUATE CLEARANCES OR CONDITIONS THAT WILL PREVENT THE PROPER INSTALLATION, MAINTENANCE, AND OPERATIONS OF THE EQUIPMENT. 9. PROVIDE ACCESS PANELS TO ALL CONCEALED TRANSFORMERS, DEVICES, JUNCTION BOXES AND EQUIPMENT. COORDINATE THE LOCATION OF ACCESS PANELS TO INSURE THAT THE EQUIPMENT CAN BE MAINTAINED ADEQUATELY. 10. ALL EQUIPMENT AND CABLE SHALL BE PROPERLY RATED FOR THE CONDITIONS IN WHICH IT IS INSTALLED. 11. ALL 120VAC CIRCUIT BREAKERS SERVING FIRE ALARM EQUIPMENT SHALL BE RED AND LOCKABLE. CAMPUS STANDARD IS SPACE AGE ELOCK-FA. 12. ANY PENETRATION OF THE BUILDING VAPOR BARRIER SYSTEM SHALL BE APPROPRIATELY SEALED TO RETAIN THE INTEGRITY OF THE SYSTEM. THIS INCLUDES BUT IS NOT LIMITED TO CONDUITS AND BACKS OF ELECTRICAL BOXES.	1. AFF ABOVE FINISHED FLOOR 2. AC ALTERNATING CURRENT 3. ACT ACOUSTICAL TILE CEILING 4. AWG AMERICAN WIRE GAGE 5. BFC BELOW FINISHED CEILING 6. CD CANDELA 7. CKT CIRCUIT BREAKER 8. C CONDUIT 9. DB DECIBEL 10. DED DEDICATED 11. DC DIRECT CURRENT 12. EMT ELECTRICAL METALLIC TUBING 13. EOL END OF LINE RESISTOR 14. EOLR END OF LINE RELAY 15. EX EXISTING 16. XP EXPLOSION PROOF 17. FA FIRE ALARM 18. FPL FIRE ALARM POWER LIMITED 19. HL HARD LID CEILING TYPE (GYP-BOARD) 20. HVAC HEATING VENTILATING AIR CONDITIONING 21. HZ HERTZ 22. IAW IN ACCORDANCE WITH 23. IDC INITIATING DEVICE CIRCUIT 24. LV LOW VOLTAGE 25. NAC NOTIFICATION APPLIANCE CIRCUIT 26. NEMA NATIONAL ELECTRICAL MANUFACTURER ASSOC. 27. NEC NATIONAL ELECTRIC CODE 28. NIC NOT IN CONTRACT 29. NTS NOT TO SCALE 30. OTS OPEN TO STRUCTURE CEILING 31. RGS RIGID GALVANIZED STEEL CONDUIT 32. SLC SIGNALING LINE CIRCUIT 33. SPDT SINGLE THROW DOUBLE THROW 34. SPST SINGLE THROW SINGLE THROW 35. TSP TWISTED SHIELDED PAIR 36. UTP UNSHIELDED TWISTED PAIR 37. UL UNDERWRITERS LABORATORIES 38. V VOLT 39. WP WEATHERPROOF 40. W/ WITH 41. W/O WITHOUT SHEET INDEX <table><tr><th>SHEET</th><th>DESCRIPTION</th></tr><tr><td>FA0.1</td><td>FIRE ALARM COVER SHEET</td></tr><tr><td>FA0.2</td><td>FIRE ALARM DEVICE LEGEND</td></tr><tr><td>FA0.3</td><td>MAIN LEVEL - OVERALL REFERENCE PLAN</td></tr><tr><td>FA0.4</td><td>CONCOURSE LEVEL - OVERALL REFERENCE PLAN</td></tr><tr><td>FA0.5</td><td>UPPER LEVEL - OVERALL REFERENCE PLAN</td></tr><tr><td>FA0.6</td><td>CATWALK - OVERALL REFERENCE PLAN</td></tr><tr><td>FA1.0</td><td>BASEMENT - FIRE ALARM PLAN</td></tr><tr><td>FA1.1</td><td>MAIN LEVEL NORTH - FIRE ALARM PLAN</td></tr><tr><td>FA1.2</td><td>MAIN LEVEL N.E. & S.E. - FIRE ALARM PLAN</td></tr><tr><td>FA1.3</td><td>MAIN LEVEL EAST & WEST - FIRE ALARM PLAN</td></tr><tr><td>FA1.4</td><td>MAIN LEVEL SOUTH - FIRE ALARM PLAN</td></tr><tr><td>FA1.5</td><td>NORTH CONCOURSE - FIRE ALARM PLAN</td></tr><tr><td>FA1.6</td><td>SOUTH CONCOURSE - FIRE ALARM PLAN</td></tr><tr><td>FA1.7</td><td>UPPER ARENA - FIRE ALARM PLAN</td></tr><tr><td>FA1.8</td><td>NORTH CATWALK - FIRE ALARM PLAN</td></tr><tr><td>FA1.9</td><td>SOUTH CATWALK - FIRE ALARM PLAN</td></tr><tr><td>FA2.0</td><td>BASEMENT - DEMO PLAN</td></tr><tr><td>FA2.1</td><td>MAIN LEVEL NORTH - DEMO PLAN</td></tr><tr><td>FA2.2</td><td>MAIN LEVEL N.E. & S.E. - DEMO PLAN</td></tr><tr><td>FA2.3</td><td>MAIN LEVEL EAST & WEST - DEMO PLAN</td></tr><tr><td>FA2.4</td><td>MAIN LEVEL SOUTH - DEMO PLAN</td></tr><tr><td>FA2.5</td><td>NORTH CONCOURSE - DEMO PLAN</td></tr><tr><td>FA2.6</td><td>SOUTH CONCOURSE - DEMO PLAN</td></tr><tr><td>FA2.7</td><td>UPPER ARENA - DEMO PLAN</td></tr><tr><td>FA2.8</td><td>NORTH CATWALK - DEMO PLAN</td></tr><tr><td>FA2.9</td><td>SOUTH CATWALK - DEMO PLAN</td></tr><tr><td>FA5.1</td><td>HEADEND FACU WIRING DETAIL</td></tr><tr><td>FA5.2</td><td>HEADEND AMP WIRING DETAIL</td></tr><tr><td>FA5.3</td><td>HEADEND NAC WIRING DETAIL</td></tr><tr><td>FA5.4</td><td>HEADEND NAC WIRING DETAIL</td></tr><tr><td>FA5.5</td><td>HEADEND NAC WIRING DETAIL</td></tr><tr><td>FA5.6</td><td>HEADEND NAC WIRING DETAIL</td></tr><tr><td>FA5.7</td><td>DEVICE WIRING DETAILS</td></tr><tr><td>FA6.1</td><td>DEVICE ADDRESSES HEADEND RISER</td></tr><tr><td>FA6.2</td><td>FIRE ALARM SLC RISER DIAGRAM</td></tr><tr><td>FA6.3</td><td>FA HEADEND NOTIFICATION RISER</td></tr><tr><td>FA6.4</td><td>FA APS NOTIFICATION RISER</td></tr><tr><td>FA6.5</td><td>FA APS NOTIFICATION RISER</td></tr><tr><td>FA7.1</td><td>FIRE ALARM NAC CALCS</td></tr><tr><td>FA7.2</td><td>FIRE ALARM NAC CALCS (CONT.)</td></tr><tr><td>FA7.3</td><td>FIRE ALARM NAC CALCS (CONT.)</td></tr><tr><td>FA7.4</td><td>FIRE ALARM BATTERY CALCS</td></tr><tr><td>FA8.1</td><td>FIRE ALARM CALC SUMMARY 1</td></tr><tr><td>FA8.2</td><td>FIRE ALARM CALC SUMMARY 2</td></tr><tr><td>FA8.3</td><td>FIRE ALARM CALC SUMMARY 3</td></tr></table>	SHEET	DESCRIPTION	FA0.1	FIRE ALARM COVER SHEET	FA0.2	FIRE ALARM DEVICE LEGEND	FA0.3	MAIN LEVEL - OVERALL REFERENCE PLAN	FA0.4	CONCOURSE LEVEL - OVERALL REFERENCE PLAN	FA0.5	UPPER LEVEL - OVERALL REFERENCE PLAN	FA0.6	CATWALK - OVERALL REFERENCE PLAN	FA1.0	BASEMENT - FIRE ALARM PLAN	FA1.1	MAIN LEVEL NORTH - FIRE ALARM PLAN	FA1.2	MAIN LEVEL N.E. & S.E. - FIRE ALARM PLAN	FA1.3	MAIN LEVEL EAST & WEST - FIRE ALARM PLAN	FA1.4	MAIN LEVEL SOUTH - FIRE ALARM PLAN	FA1.5	NORTH CONCOURSE - FIRE ALARM PLAN	FA1.6	SOUTH CONCOURSE - FIRE ALARM PLAN	FA1.7	UPPER ARENA - FIRE ALARM PLAN	FA1.8	NORTH CATWALK - FIRE ALARM PLAN	FA1.9	SOUTH CATWALK - FIRE ALARM PLAN	FA2.0	BASEMENT - DEMO PLAN	FA2.1	MAIN LEVEL NORTH - DEMO PLAN	FA2.2	MAIN LEVEL N.E. & S.E. - DEMO PLAN	FA2.3	MAIN LEVEL EAST & WEST - DEMO PLAN	FA2.4	MAIN LEVEL SOUTH - DEMO PLAN	FA2.5	NORTH CONCOURSE - DEMO PLAN	FA2.6	SOUTH CONCOURSE - DEMO PLAN	FA2.7	UPPER ARENA - DEMO PLAN	FA2.8	NORTH CATWALK - DEMO PLAN	FA2.9	SOUTH CATWALK - DEMO PLAN	FA5.1	HEADEND FACU WIRING DETAIL	FA5.2	HEADEND AMP WIRING DETAIL	FA5.3	HEADEND NAC WIRING DETAIL	FA5.4	HEADEND NAC WIRING DETAIL	FA5.5	HEADEND NAC WIRING DETAIL	FA5.6	HEADEND NAC WIRING DETAIL	FA5.7	DEVICE WIRING DETAILS	FA6.1	DEVICE ADDRESSES HEADEND RISER	FA6.2	FIRE ALARM SLC RISER DIAGRAM	FA6.3	FA HEADEND NOTIFICATION RISER	FA6.4	FA APS NOTIFICATION RISER	FA6.5	FA APS NOTIFICATION RISER	FA7.1	FIRE ALARM NAC CALCS	FA7.2	FIRE ALARM NAC CALCS (CONT.)	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1. INSTALL ALL NEW HEADEND EQUIPMENT AND NOTIFICATION APPLIANCES THROUGHOUT THE BUILDING INCLUDING ALL ASSOCIATED RACEWAY. IN THE EVENT THAT THE INSTALLATION OF A NEW NOTIFICATION APPLIANCE CONFLICTS WITH AN EXISTING APPLIANCE, ATTEMPT TO INSTALL ADJACENT TO ONE ANOTHER. IF NOT, REMOVE THE EXISTING APPLIANCE AND RELOCATE IT TEMPORARILY SO THAT IT MAY STILL FUNCTION UNTIL PHASE 4, BUT THE NEW APPLIANCE MAY BE INSTALLED SO IT WILL BE OPERATIONAL IN PHASE 3. 2. INSTALL ALL NEW ADDRESSABLE DEVICES (DETECTION, CONTROLS, MONITORS, ETC.). MOST OF THESE NEW DEVICES WILL REQUIRE UTILIZING THE EXITING DEVICE LOCATION OR CONTROL INTERFACE. WHERE FEASIBLE, INSTALL THE NEW DEVICE ADJACENT TO THE EXISTING DEVICE. OTHERWISE PROVIDE A J-BOX AND SERVICE LOOP FOR COMPLETION IN PHASE 4. I.E. PROVIDE AN SLC SERVICE LOOP TO AN ELEVATOR MECHANICAL ROOM, THEN IN PHASE 4, ALL DEVICES, WIRING, ETC. CAN BE REMOVED ALLOWING FOR THE EXISTING CONDUIT AND BACKBOXES TO BE REUSED WITH THE NEW SYSTEM. 3. AT THIS POINT THE NEW SYSTEM SHOULD BE RUNNING 100% AS FAR NOTIFICATION IS CONCERNED. SOME INPUTS MAYBE FUNCTIONING WHERE THERE ISNT A CONFLICT WITH EXISTING DEVICE OPERATION. A FUNCTIONAL TEST WITH THE AHJ MAY BE REQUIRED TO PROVE FULL NOTIFICATION THROUGH THE NEW SYSTEM. PROVIDE A TEMPORARY ALARM RELAY OUTPUT ON THE EXISTING SYSTEM TO A TEMPORARY ALARM MONITOR FOR THE NEW SYSTEM. DISABLE ALL NOTIFICATION ON THE EXISTING SYSTEM. 4. BEGIN CHANGING OUT EXISTING DEVICES AND CONTROLS (ELEVATORS, DOORS, SPRINKLER, ETC.) IN SMALL QUANTITIES SO THAT "OUT OF SERVICE" TIME CAN MINIMIZED. PROVIDE A FIRE WATCH FOR ANYTIME THE SPRINKLER SYSTEM IS TEMPORARILY OUT OF SERVICE DURING THE TRANSITION FROM EXISTING TO NEW. I.E. ON DAY ONE DO ELEVATOR 1, ON DAY TWO ELEVATOR 2, AND SO ON, AND SUBSEQUENTLY FOR FIRE DOORS WITH DOOR MAGS AND ROLL DOWN DOORS. FINISH TRANSITION WITH SPRINKLER SYSTEM MIGRATION. PROVIDE LOCKOUT/TAGOUT WHEN REQUIRED. INFORM FACILITIES WHEN ANY SYSTEM WILL BE OUT OF OPERATION. DEPROGRAM REMOVED DEVICES FROM THE EXISTING SYSTEM IF FEASIBLE. IT MAYBE ACCEPTABLE TO LEAVE TROUBLES ON THE EXISTING PANEL FOR MISSING DEVICES SO LONG AS IT DOES NOT CAUSE A CONTINUAL DISTURBANCE TO THE OCCUPANTS OF THE BUILDING. PROGRAM (ACCORDING TO THE MATRIX ON THIS SHEET) ALL NEWLY INSTALLED DEVICES INTO THE NEW SYSTEM AS THEY ARE BROUGHT ONLINE. 5. CONDUCT FUNCTIONAL PRE-TEST AND FINAL ACCEPTANCE OF THE NEW SYSTEM. MSU FIRE TECH FOREMAN AND FIRE MARSHAL TO ATTEND. 6. DEMO EXISTING SIMPLEX SYSTEM IN ITS ENTIRETY. REPAIR, PATCH PAINT ANY DISTURBED AREAS AS A RESULT OF DEMO. PAINT ANY NEW CONDUITS NOT YET PAINTED ACCORDING TO THE FIRE ALARM NOTES ON THIS SHEET.	THE EXISTING SIMPLEX SYSTEM WILL BE REMOVED AND REPLACED WITH A NEW EST4 VOICE SYSTEM. THE NEW SYSTEM WILL BE INSTALLED IN ITS ENTIRETY BEFORE DEMO OF EXISTING SYSTEM. INSTALLER SHALL MAINTAIN OPERATION OF EXISTING SYSTEM AND COMPONENTS TO THE FULLEST EXTENT POSSIBLE WHILE INSTALLING THE NEW SYSTEM. THIS BUILDING IS A GROUP 'A' OCCUPANCY OVER 1000 WITH ACCESSORY GROUP 'B'. THE DESIGN WILL FOLLOW IBC 907.2.1 1. A MANUAL ALARM SYSTEM SHALL BE PROVIDED IN ACCORDANCE WITH IBC 907.2.1 2. THE BUILDING IS FULLY SPRINKLERED AND WILL TAKE THE EXCEPTION TO ELIMINATE MANUAL STATIONS. ONE PULL WILL BE PROVIDED AT FACU, THE MAIN RECEPTION OFFICE AND ONE AT THE SPRINKLER RISER. 3. NEW OCCUPANT NOTIFICATION WILL BE PROVIDED THROUGHOUT VIA VOICE EVACUATION. 907.5.2.2 4. SYSTEM WILL BE TOTAL EVACUATION WITH A SINGLE VOICE CHANNEL. 5. SYSTEM WILL HAVE 8 MANUAL PAGING ZONES, BUT WILL NOT COMPLY WITH IBC MINIMUM PAGING ZONES DUE TO EXISTING BUILDING LAYOUT. 6. AUXILIARY SYSTEMS INCLUDE ELEVATOR RECALL, DOOR MAG RELEASE, ROLL-DOWN FIRE DOOR RELEASE, HVAC DETECTION AND SHUTDOWN, KITCHEN HOOD AND SPRINKLER SYSTEM MONITORING. 7. SMOKES AND HEATS FOR CONTROL OF DOOR RELEASE, HVAC AND ELEVATOR RECALL FUNCTIONS WILL BE SUPERVISORY AND OPERATE AS CONTROL DEVICES ONLY TO MINIMIZE FALSE ALARM. 8. PULLS, SMOKES FOR PROTECTION OF EQUIPMENT AND WATERFLOW WILL BE ALARM DEVICES AND ACTIVATE THE EVACUATION MESSAGE. 9. ALL SMOKE DETECTORS CONFIGURED FOR FIRE ALARM SHALL EMPLOY ALARM VERIFICATION PER NFPA 72 2019. 10. PROVIDE NEW CELLULAR COMMUNICATOR WITH NEW SYSTEM. OLD COMMUNICATOR SHALL REMAIN FUNCTIONAL UNTIL EXISTING SYSTEM IS REMOVED.																																																																																													
	* IMPORTANT NOTE * FOR EXISTING DEVICES REMOVED FROM WALLS CONTAINING MURALS OR GRAPHICS, CONTRACTOR SHALL PATCH RESULTING PENETRATIONS. ALL PAINTING OF EXISTING MURALS AND ANY REPAIRS OR REPLACEMENT OF GRAPHICS (INCLUDING WRAPS) WILL BE PERFORMED BY THE OWNER.																																																																																													

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								INITIATING DEVICES				FIRE SPRINK				CONTROL EQUIP											
MANUAL PULL STATION								1.1	X	X			X	X	X												
KITCHEN HOOD								1.2	X	X			X	X	X							X	X				
SMOKE DETECTOR, SPOT PROTECTION (MEDIA BOOTHS)								1.3	X	X			X	X	X							X	X				
SMOKE DETECTOR, EQUIPMENT PROTECTION (CONTROL PANELS)								1.4	X	X			X	X	X							X	X				
SMOKE DETECTOR DOOR MAG / ROLL DOWN DOOR RELEASE								1.5	X		X					X						X			X		
SMOKE DETECTOR (DESIGNATED LEVEL ELEVATOR LOBBY) *								1.6	X		X						X								X		
SMOKE DETECTOR (NON-DESIGNATED LEVEL ELEVATOR LOBBY) *								1.7	X		X							X							X		
SMOKE DETECTOR (ELEVATOR MACHINE ROOM) *								1.8	X		X							X		X					X		
HEAT DETECTION (ELEVATOR MACHINE ROOM, TOP OF SHAFT)								1.9	X		X									X					X		
DUCT SMOKE DETECTION								1.10	X		X									X		X			X		
WATERFLOW								2.1	X	X			X	X	X	X						X	X		X		
VALVE TAMPER								2.2	X		X															X	
FIRE PUMP RUNNING								2.3	X		X														X		
FIRE PUMP LOSS OF AC POWER								2.4	X		X														X		
FIRE PUMP PHASE REVERSAL								2.5	X		X														X		
LOW BATTERY VOLTAGE								3.1	X			X															X
GROUND FAULT / OPEN / SHORT CIRCUIT								3.2	X			X														X	
AC POWER LOSS								3.3	X			X														X	
FIRE DRILL								3.4	X				X	X	X		X										
* NOTE: MAINTAIN EXISTING ELEVATOR RECALL SEQUENCES AS CURRENTLY PROVIDED. FIELD VERIFY EXISTING PROGRAM SEQUENCES AND IMPLEMENT INTO NEW SYSTEM SEQUENCE. PROVIDE SHUNT TRIP FUNCTIONS WHERE AVAILABLE. REDLINE ACCORDINGLY.																											
** NOTE: MAINTAIN EXISTING DAMPER ACTUATION SEQUENCES AS CURRENTLY PROVIDED. FIELD VERIFY EXISTING PROGRAM SEQUENCES AND IMPLEMENT INTO NEW SYSTEM SEQUENCE. REDLINE ACCORDINGLY.																											



100% SHOP DRAWING FOR PERMIT/CONSTRUCTION

(BRICK BREEDEN) FIELDHOUSE
FIRE ALARM REPLACEMENT

MONTANA STATE UNIVERSITY
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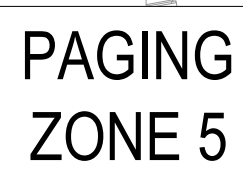
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REVIEWED BY: BSM		
REV.	DESCRIPTION	DATE



PPA#23-0928
AE# 2024-02-04D

PANEL LEGEND								
SYMBOL	QUANTITY	MANUFACTURER	PART NO	DESCRIPTION	SIZE	MOUNTING	TRIM	BOX
FACU	1	EDWARDS	EST4 VOICE PANEL	FACP VOICE PANEL	50"H X 27.34"W X 3.86"D	72" AFF TO THE TOP OF THE CABINET. NO CONDUIT PENETRATION IN BOTTOM.	4-CAB24DR	3-CAB21B
	1	EDWARDS	4-CPU	MAIN CPU		LEFT 3 LRM SPACES ON 3-CHAS7		
	1	EDWARDS	4-LCDLE	DISPLAY MAIN LCD MODULE		ON 4-CPU @ INNER DOOR		
	1	EDWARDS	4-MIC	PAGING MICROPHONE		2 LRM SPACES ON 3-CHAS7		
	1	EDWARDS	4-AUDTELS	AUDIO IO AND TELEPHONE RISER MODULE		LRM SPACE ON 3-CHAS7		
	1	EDWARDS	4-LCDAUDTEL	SEPARATE LCD FOR MIC/FT		ON 4-AUDTELS @ INNER DOOR		
	1	EDWARDS	4-PPSIM	PRIMARY POWER SUPPLY 120V		3-CHAS7		
	1	EDWARDS	3-MODCOM	MODEM COMMUNICATOR AND DIALER		LRM SPACE ON 3-CHAS7		
	1	EDWARDS	3-SSDC2	SIGNATURE SINGLE DRIVER CONTROLLER		LRM SPACE ON 3-CHAS7		
	1	EDWARDS	3-2A20A	20 WATT ZONED AMPLIFIER, CLASS B, 70VRMS		LRM SPACE ON 3-CHAS7		
	1	EDWARDS	3-CAB21B	BACK BOX /W 21 LRM SPACE W/O DOOR		N/A		
	1	EDWARDS	4-CAB24DRL	DOOR ASSEMBLY, RED		3-CAB21B		
	1	EDWARDS	4-24L24S	24 INDICATOR 24 CONTROL DISPLAY MODULE		INNER DOOR		
	3	EDWARDS	3-CHAS7	CHASSIS ASSY FOR 7 LRMS		3-CAB21B		
	2	EDWARDS	4-NET-TP	TWISTED PAIR SFP NETWORK CONTROLLER		ON 4-CPU		
	1	EDWARDS	BC-1	BATTERY BOX FOR 40AH BATTERIES		BELOW OR ADJACENT TO FACU		
FAC	3	EDWARDS	4-6ANN (PAGING)	METALLIC BRONZE ANNUNCIATOR W/4-ANNCPU, MIC	13.2"H X 18.68"W X 2.67"D	72" AFF TO THE TOP OF THE CABINET. NO CONDUIT PENETRATION IN BOTTOM.	4-CAB24DR	3-CAB21B
	3	EDWARDS	4-ANNCPU	ANNUNCIATOR CENTRAL PROCESSOR UNIT		IN 4-6ANNMT		
	3	EDWARDS	4-ANNAUDTEL	AUDIO TELEPHONE INTERFACE MODULE		IN 4-6ANNMT		
	3	EDWARDS	4-LCDLE	DISPLAY MAIN LCD MODULE		ON 4-ANNCPU		
	3	EDWARDS	4-24L24S	24 INDICATOR 24 CONTROL DISPLAY MODULE		IN 4-6ANNMT		
	3	EDWARDS	4-6ANNMT	WALLBOX, SURFACE/FLUSH MOUNTING		N/A		
	3	EDWARDS	4-6ANN SERIES	DOOR ASSEMBLY FOR 4-6ANNMT, BRONZE		ON 4-6ANNMT		
	3	EDWARDS	4-MIC	PAGING MICROPHONE		IN 4-6ANNMT		
CELL	6	EDWARDS	4-NET-TP	TWISTED PAIR SFP NETWORK CONTROLLER		ON 4-ANNCPU		
	1	DMP	DUALCOMNF-LA (24V)	UNIVERSAL FIRE ALARM COMMUNICATOR LTE-A/T&T	4.5"W X 2.75"H X 1.75"D	ADJACENT TO FACU - SURFACE	N/A	INCLUDED
NAC AA30	5	EDWARDS	APS6A	AUXILIARY/BOOSTER POWER SUPPLY, 6A, 120VAC, RED	26"H X 15"W X 5.3"D	72" AFF TO THE TOP OF THE CABINET. NO CONDUIT PENETRATION IN BOTTOM.	N/A	INCLUDED
	5	EDWARDS	SIGA-AA30	30 WATT INTELLIGENT AUDIO AMPLIFIER		MOUNT IN SIDE AT THE TOP OF APS		
NAC AA30x2	1	EDWARDS	APS10A	AUXILIARY/BOOSTER POWER SUPPLY, 10A, 120VAC, RED	26"H X 15"W X 5.3"D	72" AFF TO THE TOP OF THE CABINET. NO CONDUIT PENETRATION IN BOTTOM.	N/A	INCLUDED
	2	EDWARDS	SIGA-AA30	30 WATT INTELLIGENT AUDIO AMPLIFIER		MOUNT IN SIDE AT THE TOP OF APS		
NAC	1	EDWARDS	bPS10A	REMOTE BOOSTER POWER SUPPLY, 10A, 120VAC, RED	17"H X 13"W X 3.375"D	72" AFF TO THE TOP OF THE CABINET. NO CONDUIT PENETRATION IN BOTTOM.	N/A	INCLUDED
AMP	2	EDWARDS	AMPLIFIER(S) FOR HYPERSPIKE SPEAKERS	3-RCC REMOTE CLOSET CABINET WITH (4) 3-ZA95 AMPLIFIERS AND 4-PPS POWER SUPPLIES.	48.375"H X 25"W X 6"D	72" AFF TO THE TOP OF THE CABINET. NO CONDUIT PENETRATION IN BOTTOM.	N/A	3-RCC21
	2	EDWARDS	3-RCC21R	RED REMOTE CHASSIS CABINET /W COVER		N/A		
	2	EDWARDS	4-CPU	MAIN CPU		LEFT 3 LRM SPACES ON 3-CHAS7		
	8	EDWARDS	3-ZA95	95 WATT ZONED AMPLIFIER, CLASS B/A, 25 OR 70VRMS		LRM SPACE ON 3-CHAS7		
	8	EDWARDS	4-PPSIM	PRIMARY POWER SUPPLY 120V		3-CHAS7		
	6	EDWARDS	3-CHAS7	CHASSIS ASSY FOR 7 LRMS		3-RCC21		
	4	EDWARDS	4-NET-TP	TWISTED PAIR SFP NETWORK CONTROLLER		ON 4-CPU		
MFC	3	EDWARDS	MFC-A (ELEV RECALL)	MULTI-FUNCTION CABINET W/ UIO6R AND (4) MCR, (1) MCT2	8"H X 14"W X 3.5"D	SURFACE MOUNT. 48" AFF TO TOP OF BOX. SEE FIRE ALARM PLANS	SIGA-UIO6R	INCLUDED
	3	EDWARDS	SIGA-UIO6R	6 POSITION, RISER SELECTION UIO MB		MOUNTS IN MFC-A		
	12	EDWARDS	SIGA-MCR	CONTROL RELAY MODULE - UIO MOUNT		ON SIGA-UIO6R		
MFC FP	3	EDWARDS	SIGA-MCT2	DUAL INPUT MODULE - UIO MOUNT		ON SIGA-UIO6R		
	1	EDWARDS	MFC-A (FIRE PUMP)	MULTI-FUNCTION CABINET W/ UIO2R AND (2)MCT2'S	8"H X 14"W X 3.5"D	SURFACE MOUNT. 48" AFF TO TOP OF BOX. SEE FIRE ALARM PLANS	SIGA-UIO2R	INCLUDED
	1	EDWARDS	SIGA-UIO2R	6 POSITION, RISER SELECTION UIO MB		MOUNTS IN MFC-A		
MFC FP	1	EDWARDS	SIGA-MCT2	DUAL INPUT MODULE - UIO MOUNT		ON SIGA-UIO2R		
	2	EDWARDS	SIGA-MCT2	DUAL INPUT MODULE - UIO MOUNT		ON SIGA-UIO2R		

DEVICE LEGEND									
SYMBOL	QUANTITY	IS EXISTING	MANUFACTURER	PART NO	DESCRIPTION	SIZE	MOUNTING	TRIM	BOX
IM	8		EDWARDS	SIGA-IM2	ISOLATOR MODULE	2.5"H X 4"W X 1"D	ADJACENT TO THE FACU	SIGA-MP1	4" SQUARE BACK BOX - 2-1/8" DEEP
F	3		EDWARDS	SIGA-278	DOUBLE ACTION FIRE ALARM STATION	6"H X 3.5"W X 1"D	48" TO THE TOP OF THE HANDLE. PULL STATION WITHIN 5' OF THE EXIT	N/A	SINGLE GANG CUT-IN, 278B-RSB SURFACE MOUNT BOX RED
AM	9		EDWARDS	SIGA-CT1	SINGLE INPUT MODULE	2.5"H X 2"W X 1"D	MOUNT WITHIN 3' OF THE DEVICE BEING MONITORED	SIGA-MP2	4" SQUARE BACK BOX - 2-1/8" DEEP, 1-GANG RING
DM	11		EDWARDS	SIGA-CT2	DUAL INPUT MODULE	2.5"H X 2"W X 1"D	MOUNT WITHIN 3' OF THE DEVICE BEING MONITORED	SIGA-MP2	4" SQUARE BACK BOX - 2-1/8" DEEP, 1-GANG RING
CR	7		EDWARDS	SIGA-CR	CONTROL RELAY MODULE	2.5"H X 2"W X 1"D	MOUNT WITHIN 3' OF THE DEVICE BEING CONTROLLED	SIGA-MP2	4" SQUARE BACK BOX - 2-1/8" DEEP, 1-GANG RING
CRH	11		EDWARDS	SIGA-CRH	CONTROL RELAY MODULE (HIGH CURRENT)	4"L x 4"W x 1"D	MOUNT WITHIN 3' OF THE DEVICE BEING CONTROLLED	N/A	4" SQUARE BACK BOX - 2-1/8" DEEP
CC1S	7		EDWARDS	SIGA-CC1S	SIGNATURE SINGLE INPUT SIGNAL SYNCHRONIZATION MODULE	2.5"H X 4"W X 1"D	MOUNT IN APS CABINET	SIGA-MP1	N/A
S	46		EDWARDS	SIGA-OSD W/SIGA-SB4 BASE	INTELLIGENT OPTICAL SMOKE DETECTOR W/ STANDARD BASE	6"Ø X 2.5"D	36" OR GREATER AWAY FROM VENTS OR FLUORESCENT LIGHTS.	SIGA-SB4	4" SQUARE BACK BOX, 1-1/2" DEEP
SB	3		EDWARDS	SIGA-OSD W/SIGA-IB4 BASE	INTELLIGENT OPTICAL SMOKE DETECTOR W/ ISOLATOR BASE	6"Ø X 2.5"D	36" OR GREATER AWAY FROM VENTS OR FLUORESCENT LIGHTS.	SIGA-IB4	4" SQUARE BACK BOX, 1-1/2" DEEP
H	3		EDWARDS	SIGA-HRD W/SIGA-SB4 BASE	INTELLIGENT FIXED TEMPERATURE /RATE-OF-RISE HEAT DETECTOR	6"Ø X 2.5"D	WITHIN 24" OF SPRINKLER HEAD.	SIGA-SB4	4" SQUARE BACK BOX, 1-1/2" DEEP
S/H	6		EDWARDS	SIGA-OSH D W/SIGA-SB4 BASE	MULTISENSOR SMOKE AND HEAT DETECTOR	6"Ø X 2.5"D	WITHIN 24" OF SPRINKLER HEAD.	SIGA-SB4	4" SQUARE BACK BOX, 1-1/2" DEEP
S	13		EDWARDS	SIGA-DDOS	OPTICA INTELLIGENT DUCT SMOKE DETECTOR	8.7L x 5.45"W x 1.9"D	SEE FIRE ALARM PLANS	N/A	4" SQUARE BACK BOX, 1-1/2" DEEP MOUNTED NEXT TO SIGA-SD
	13		EDWARDS	SD-T#	AIR SAMPLE TUBE, FIELD VERIFY		FIELD VERIFY REQUIRED TUBE LENGTH		
TRK	13		EDWARDS	SD-TRK	REMOTE TEST/RESET STATION, KEYED	N/A	COORDINATE FINAL LOCATION WITH MSU FIRE TECH FORMAN	N/A	1-GANG, 2-1/2" DEEP BACK BOX
STROBE	71		EDWARDS	GCSWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	6.8"Ø X 1.82"D	CEILING	GCTW, GRSW-10	4" SQUARE BACKBOX - 2-1/8" DEEP
SPK	44		EDWARDS	GCSWA	SPEAKER, CEILING, WHITE, ALERT	6.8"Ø X 1.82"D	CEILING	GCTW, GRSW-10	4" SQUARE BACKBOX - 2-1/8" DEEP
WALL	102		EDWARDS	G4SWA	SPEAKER/STROBE, WALL, WHITE, ALERT	5.78"H X 4.95"W X 1.62"D	80" TO THE BOTTOM OF THE BACK BOX	GRSW-10	4" SQUARE BACKBOX - 2-1/8" DEEP (FLUSH) OR G4WSB (SURFACE)
WALL	9		EDWARDS	G4SWA	SPEAKER, WALL, WHITE, ALERT	5.78"H X 4.95"W X 1.62"D	80" TO THE BOTTOM OF THE BACK BOX	GRSW-10	4" SQUARE BACKBOX - 2-1/8" DEEP (FLUSH) OR G4WSB (SURFACE)
HS	14		EDWARDS	90215A-801-05-L	TCPA-10 AUDIO SPEAKER, 5 SELECTABLE POWER TAPS, 25V, 70V AND 100 VRMS. RED	10.1"H X 10.1"W X 11.3"D	MOUNT TO CATWALK STRUCTURE SIDE RAILS USING WALL/POLE MOUNT BRACKET	72377B-801	4" SQUARE BACK BOX - 2-1/8" DEEP WITH RED BLANK COVER
HS	8		EDWARDS	90215A-801-05-L	TCPA-10 AUDIO SPEAKER, 5 SELECTABLE POWER TAPS, 25V, 70V AND 100 VRMS. RED	10.1"H X 10.1"W X 11.3"D	WALL MOUNT 8FT AFF TO BOTTOM OF SPEAKER USING WALL MOUNT BRACKET	72377B-801	4" SQUARE BACK BOX - 2-1/8" DEEP WITH RED BLANK COVER
STROBE	33		EDWARDS	G4VWN W/ G4VWA-CVR	WALL STROBE, WHITE, ALERT COVER	5.78"H X 4.95"W X 1.62"D	80" TO THE BOTTOM OF THE BACK BOX	G4TW, GP-10 & G4VWA-CVR	4" SQUARE BACKBOX - 2-1/8" DEEP (FLUSH) OR G4WSB (SURFACE)
STROBE	4		EDWARDS	GCVWN W/ GCVWA-CVR	STROBE, CEILING, WHITE, ALERT COVER	6.8"Ø X 1.82"D	CEILING	GCTW, GP-10 & GCVWA-CVR	4" SQUARE BACKBOX - 2-1/8" DEEP
HC	16		EDWARDS	GCVHWA	STROBE, CEILING, WHITE, ALERT, HI CANDELA	6.8"Ø X 1.82"D	CEILING	GCTW, GP-10 & GCVWA-CVR	4" SQUARE BACKBOX - 2-1/8" DEEP
WP	1		EDWARDS	WG4RF-HVMC	OUTDOOR RATED HORN-STROBE, RED WITH FIRE MARKING, CLEAR LENS	5.6"W X 8.5"H X 1.4"D	MOUNT ABOVE OR ADJACENT TO FDC. 6'-10' ABOVE GRADE	N/A	742347U (RED)
JB	28		GENERIC	N/A	JUNCTION BOX WALL	N/A	N/A	N/A	4" SQUARE BACK BOX - 2-1/8" DEEP WITH RED BLANK COVER
JB	22		GENERIC	N/A	JUNCTION BOX CEILING	N/A	N/A	N/A	4" SQUARE BACK BOX - 2-1/8" DEEP WITH RED BLANK COVER
FD	6		GENERIC	N/A	ROLL DOWN FIRE DOOR (MCCABE LINK)	N/A	EXISTING HARDWARE	N/A	N/A
DOC	1		SPACE AGE ELECTRONICS	SSU00685	FIRE ALARM DOCUMENT CABINET W/8GB USB DRIVE (ACE-11), RED WITH CUSTOM LOGO	N/A	EXISTING HARDWARE	N/A	N/A
PC	1		GENERIC	N/A	FIRE PUMP CONTROLLER	N/A	EXISTING CONTROLS	N/A	N/A
WS	7		GENERIC	N/A	WATERFLOW SWITCH	N/A	EXISTING SWITCH	N/A	N/A
VS	14		GENERIC	N/A	VALVE TAMPER SUPERVISORY SWITCH	N/A	EXISTING SWITCH	N/A	N/A
VF	2		GENERIC	N/A	BACKFLOW VALVE	N/A	EXISTING SWITCH	N/A	N/A
24V	28		GENERIC	N/A	24VAC/DC	N/A	EXISTING HARDWARE	N/A	N/A



APS:4
APS:5
APS:6

PAGING
ZONE 4

PAGING
ZONE 2

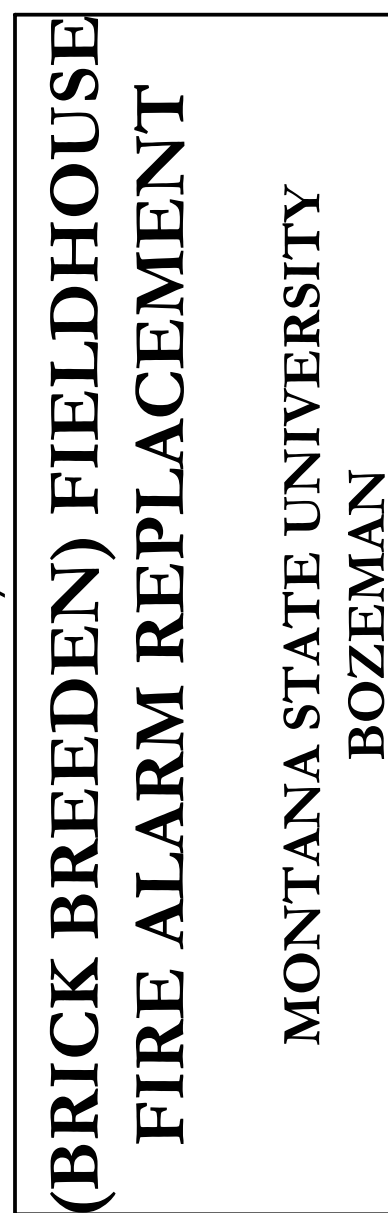
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ZONE 1

PAGING
ZONE 3

APS:

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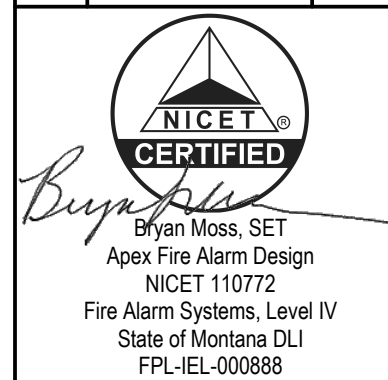
MAIN LEVEL - OVERALL REFERENCE PLAN

$$\frac{3}{64}'' = 1'-0''$$


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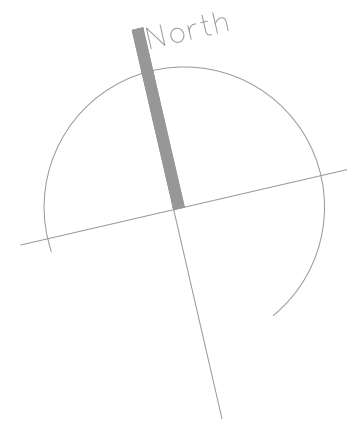
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SHEET TITLE
MAIN LEVEL - OVERALL REF. PLAN

SHEET
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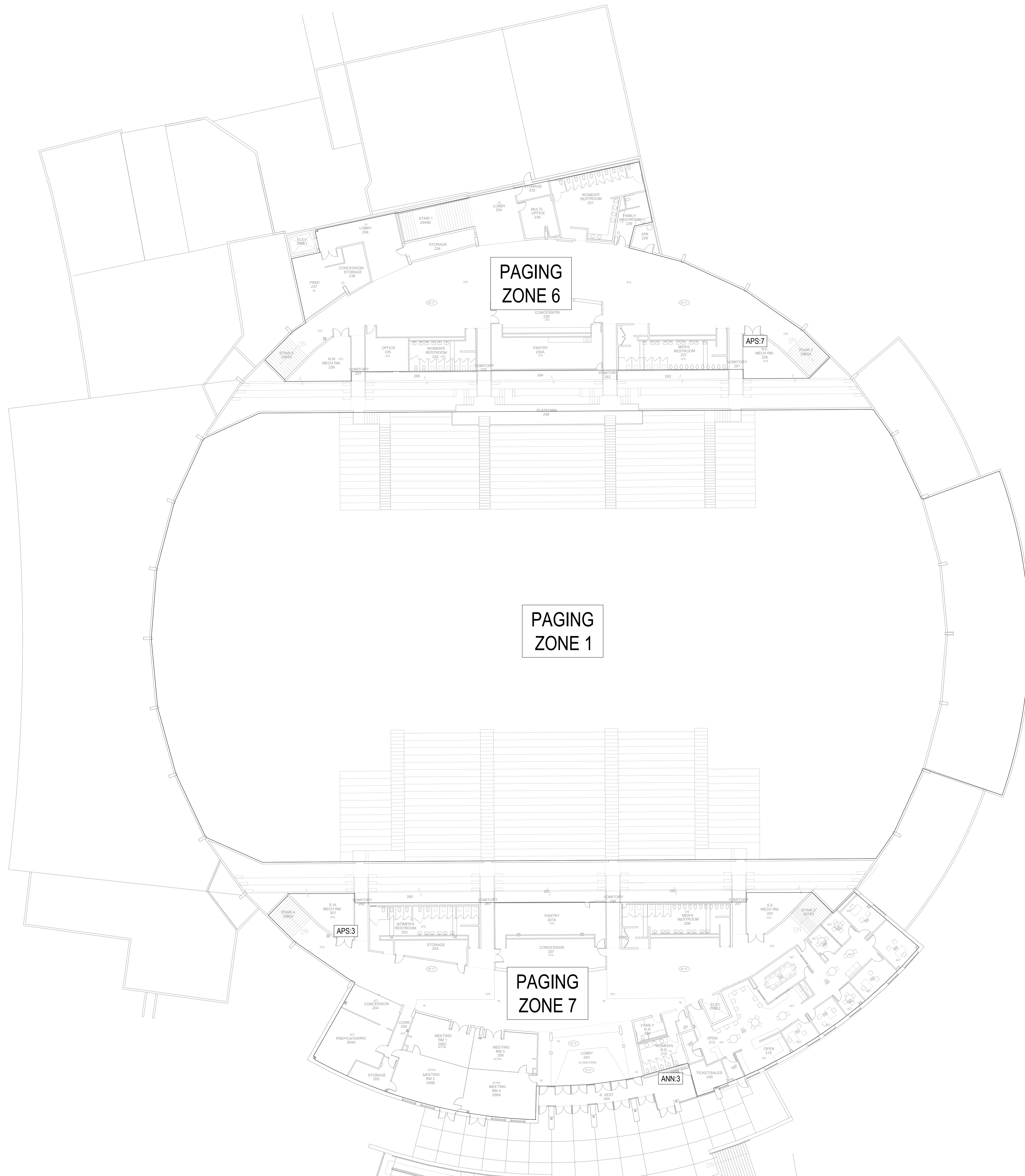
DATE
10/22/2025





Exterior Gross Area
47063

Interior Gross Area
46217



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(BRICK BREEDEN) FIELDHOUSE
FIRE ALARM REPLACEMENT

MONTANA STATE UNIVERSITY
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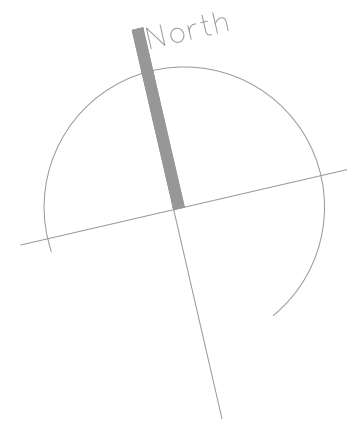


PPA#23-0928
AE# 2024-02-04D

SHEET TITLE
CONCOURSE LEVEL-
OVERALL REF. PLAN

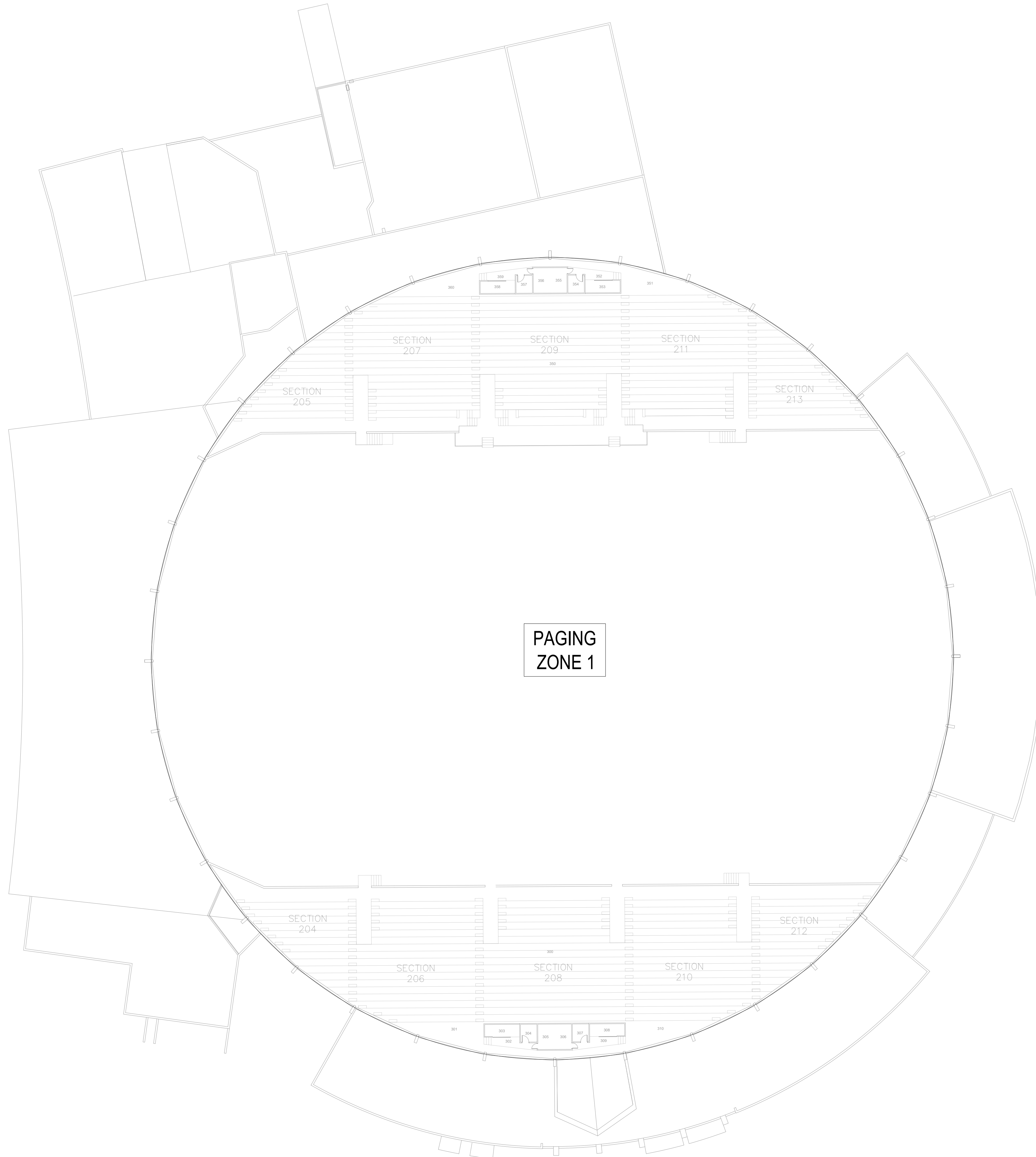
SHEET
FA0.4

DATE
10/22/2025



Exterior Gross Area
23216

Interior Gross Area
22754



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**(BRICK BREEDEN) FIELDHOUSE
FIRE ALARM REPLACEMENT**

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REV.	DESCRIPTION	DATE

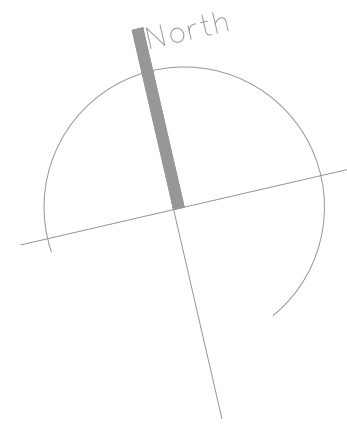


PPA#23-0928
AE# 2024-02-04D

SHEET TITLE
UPPER LEVEL -
OVERALL REF. PLAN

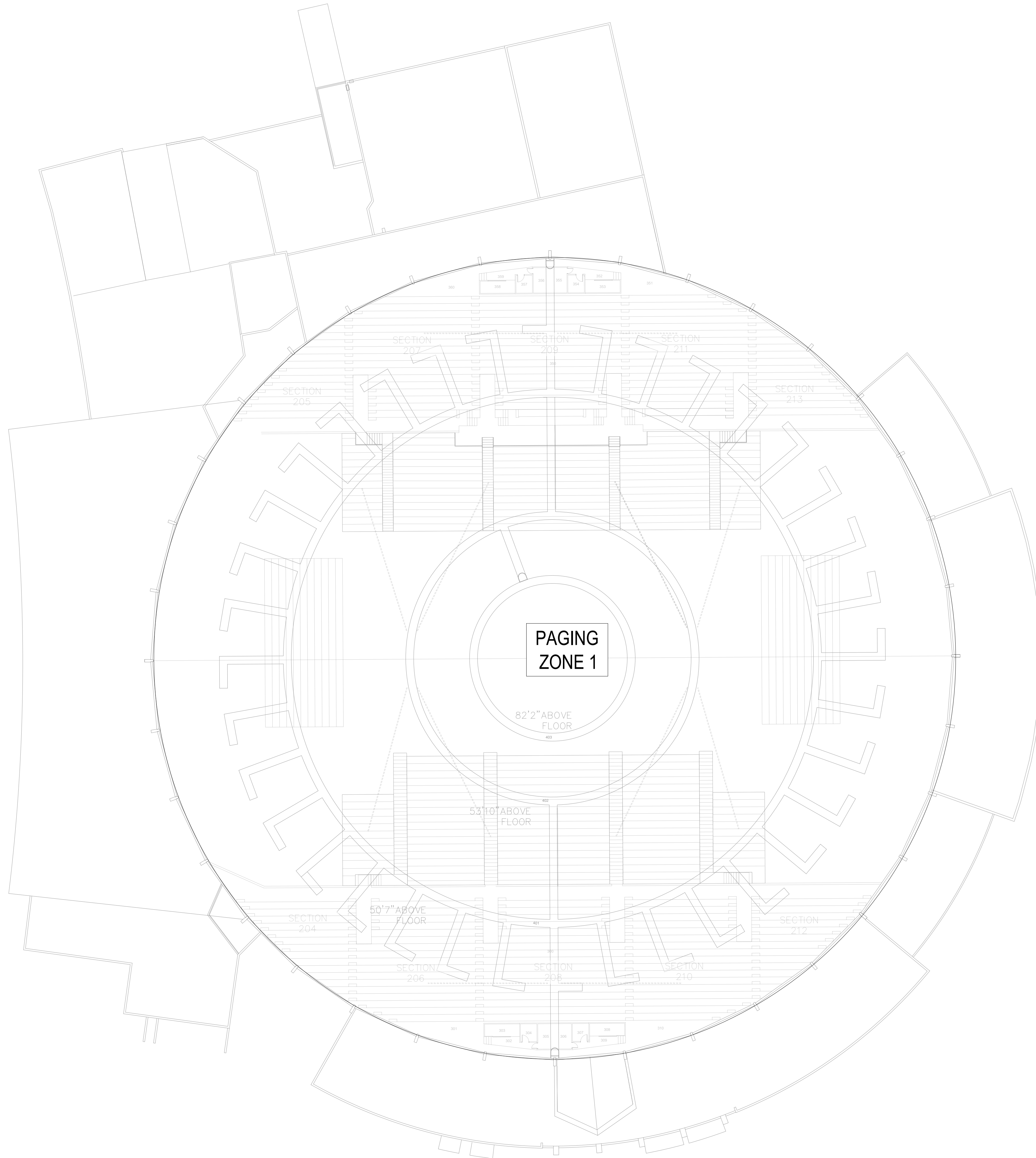
SHEET
FA0.5

DATE
10/22/2025



Exterior Gross Area
5692

Interior Gross Area
5692



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**(BRICK BREEDEN) FIELDHOUSE
FIRE ALARM REPLACEMENT**

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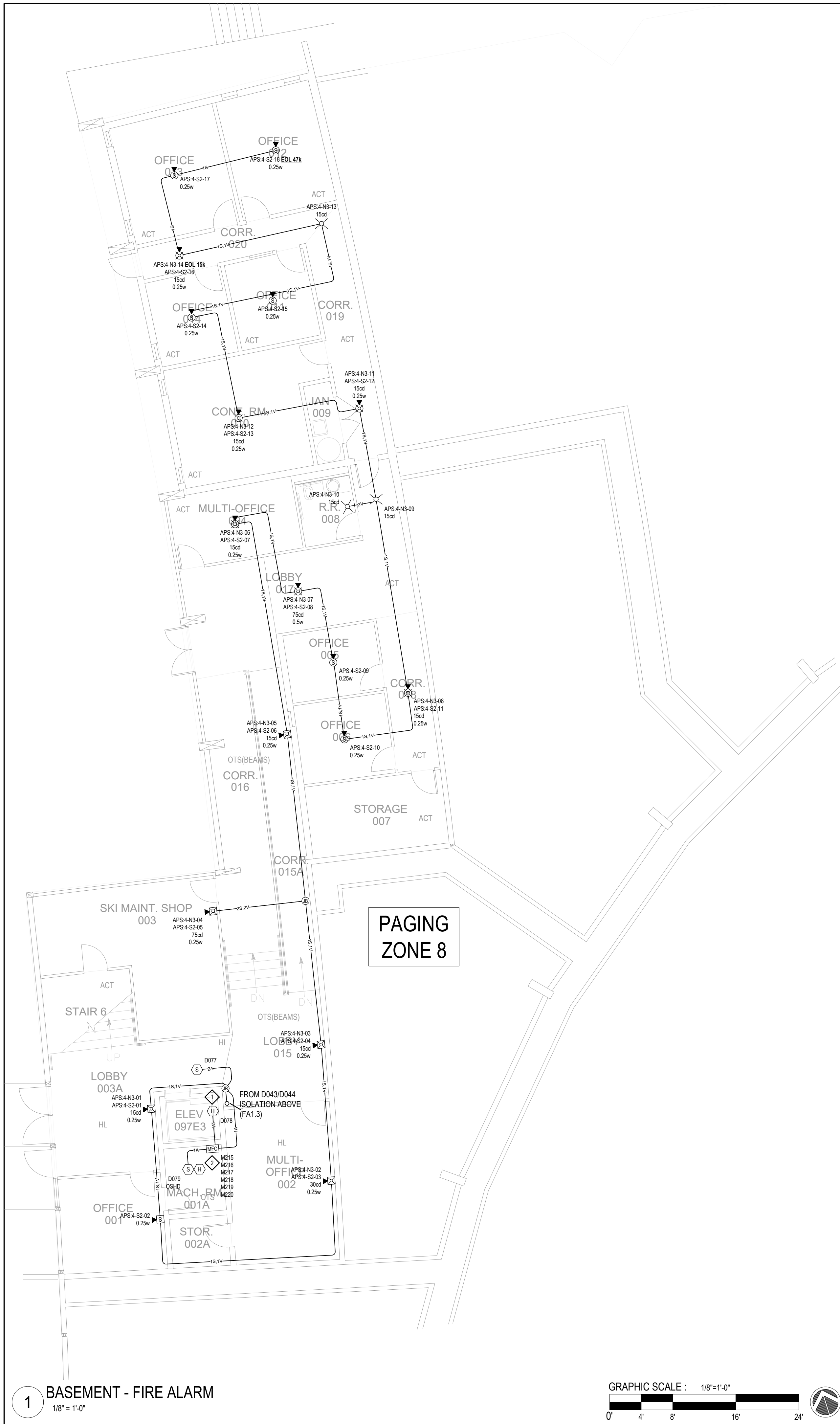


PPA#23-0928
AE# 2024-02-04D

SHEET TITLE
CATWALK -
OVERALL REF. PLAN

SHEET
FA0.6

DATE
10/22/2025



KEY NOTES:

- PROVIDE HEAT DETECTOR IN THE ELEVATOR SHAFT PIT. USE EXISTING DEVICE LOCATION (BLANKED OFF, REMOVED FROM SERVICE).
- PROVIDE HEAT DETECTOR IN THE ELEVATOR MACHINE ROOM. USE EXISTING DEVICE LOCATION (BLANKED OFF, REMOVED FROM SERVICE).



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(BRICK BREEDEN) FIELDHOUSE
FIRE ALARM REPLACEMENT
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REV.	DESCRIPTION



PPA#23-0928
AE# 2024-02-04D

SHEET TITLE
BASEMENT
FIRE ALARM

SHEET
FA1.0

DATE
10/22/2025

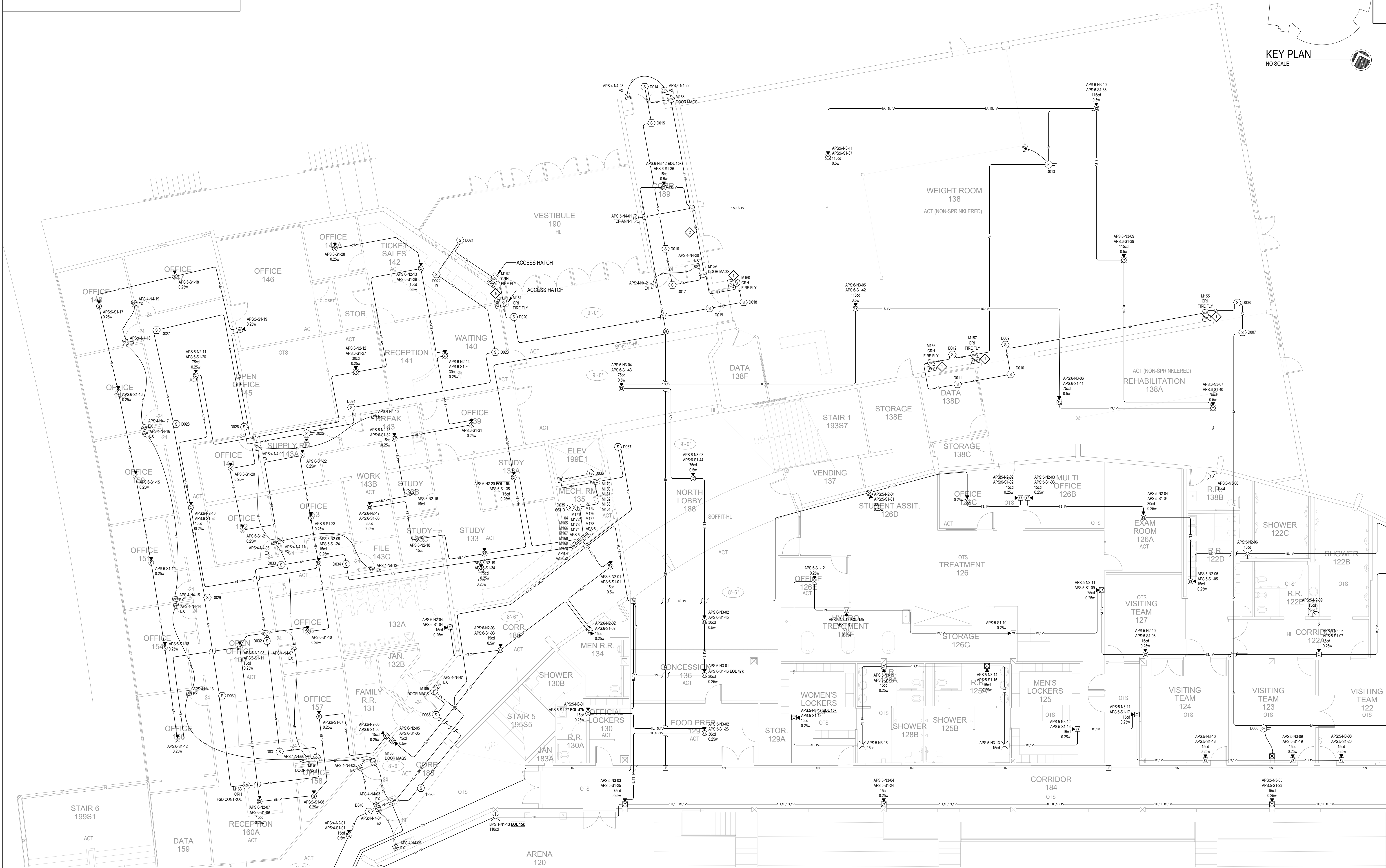
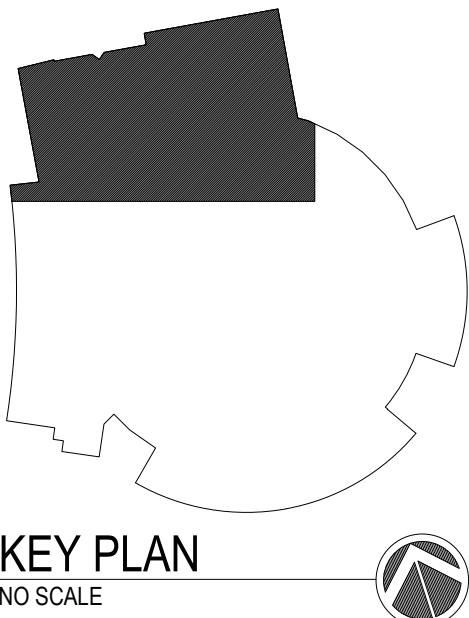
KEY NOTES:

◇

INTERFACE WITH EXISTING ROLL DOWN DOOR HARDWARE (MCCABE LINK). DOOR CONTROLS LOCATED ABOVE CEILING. ACCESS VIA DROP TILE OR ACCESS HATCH.

◇

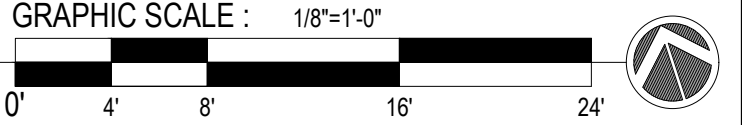
EXISTING EST MANUAL STATION. APPEARS TO BE PART OF THE WELLNESS/SHROVER GYM SYSTEM. THIS SHOULD BE REMOVED OR RELOCATED SO AS TO NOT CONFUSE OCCUPANTS OF THE BBFH, AS THE BBFH ONLY HAS MANUAL STATIONS IN SELECT AREAS AS SHOWN IN THESE DRAWINGS.



1

MAIN LEVEL - NORTH FIRE ALARM

1/8" = 1'-0"





MONTANA
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(BRICK BREEDEN) FIELDHOUSE

FIRE ALARM REPLACEMENT

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APEX

FIRE ALARM DESIGN, LLC

DRAWN BY: BSM

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REV.

DESCRIPTION

DATE



Bryan Moss, SET

Apex Fire Alarm Design

NICET 110772

Fire Alarm Systems, Level IV

State of Montana DLI

FPL-IEL-000888

PPA#23-0928

AE# 2024-02-04D

SHEET TITLE

MAIN LEVEL NORTH

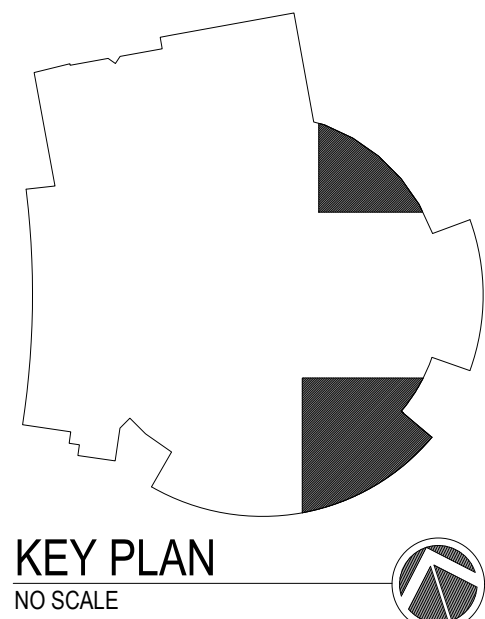
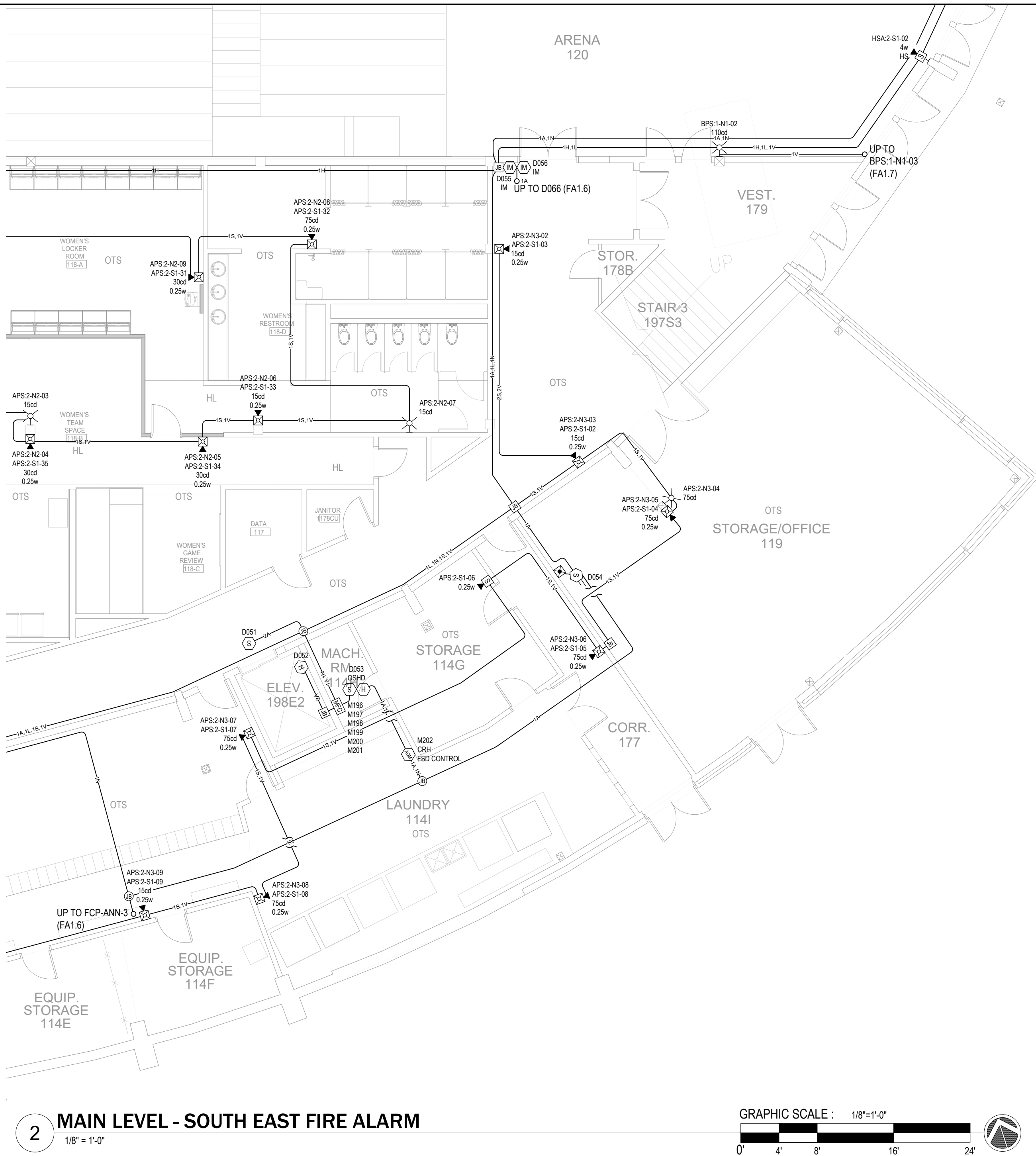
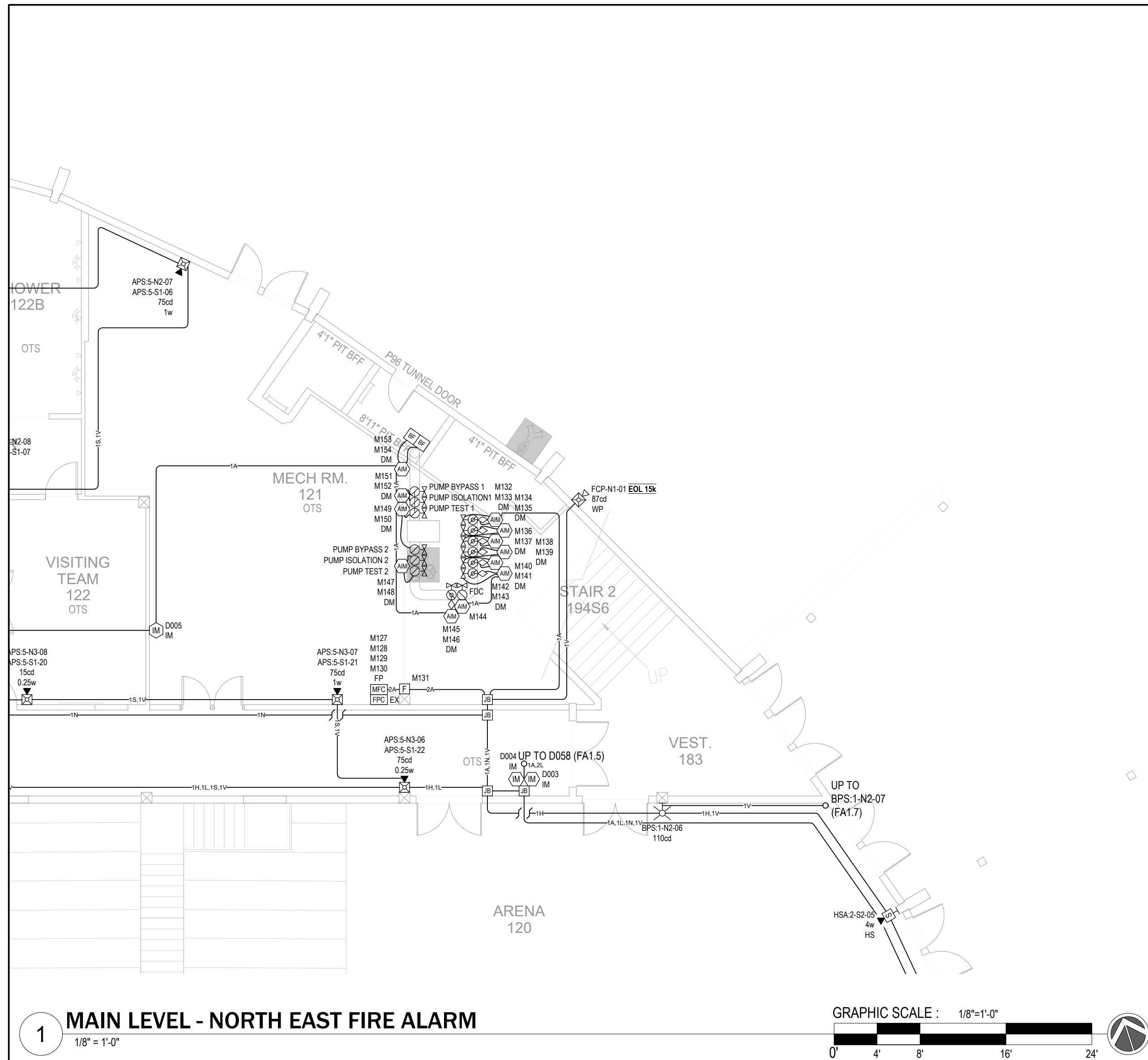
FIRE ALARM

SHEET

FA1.1

DATE

10/22/2025



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(BRICK BREEDEN) FIELDHOUSE
FIRE ALARM REPLACEMENT

MONTANA STATE UNIVERSITY
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DRAWN BY: BSM		
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REV.	DESCRIPTION	DATE



Bryan Moss, SET
Apex Fire Alarm Design
NICET 110772
Fire Alarm Systems, Level IV
State of Montana DLI
FPL-IEL-000888

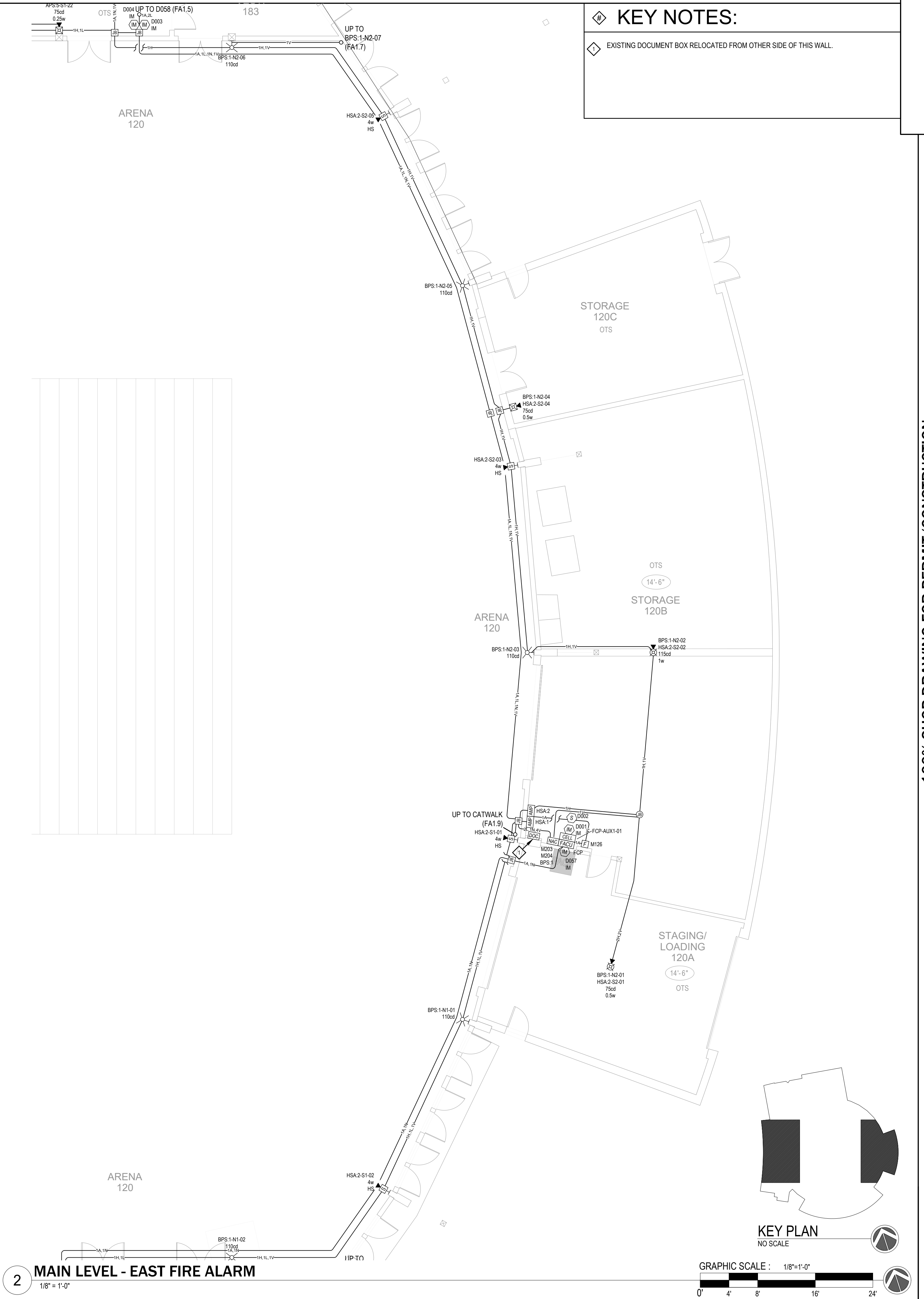
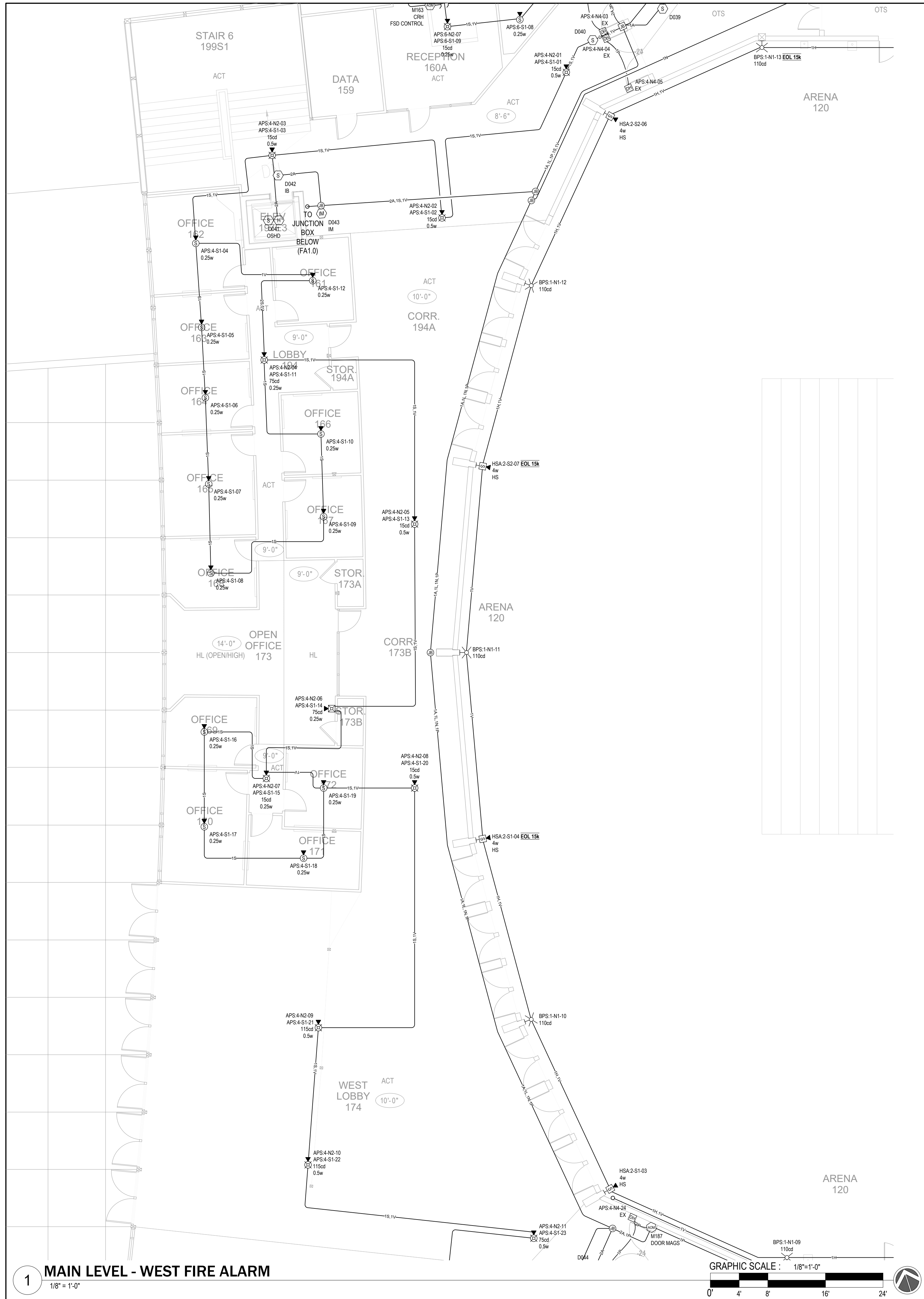
PPA#23-0928

AE# 2024-02-04D

SHEET TITLE
MAIN LEVEL N.E. &
S.E. FIRE ALARM

SHEET
FA1.2

DATE
10/22/2025



KEY NOTES:

EXISTING DOCUMENT BOX RELOCATED FROM OTHER SIDE OF THIS WALL.



100% SHOP DRAWING FOR PERMIT/CONSTRUCTION

(BRICK BREEDEN) FIELDHOUSE

FIRE ALARM REPLACEMENT

MONTANA STATE UNIVERSITY
BOZEMAN



DRAWN BY: BSM		
REVIEWED BY: BSM		
REV.	DESCRIPTION	DATE



PPA#23-0928

AE# 2024-02-04D

SHEET TITLE

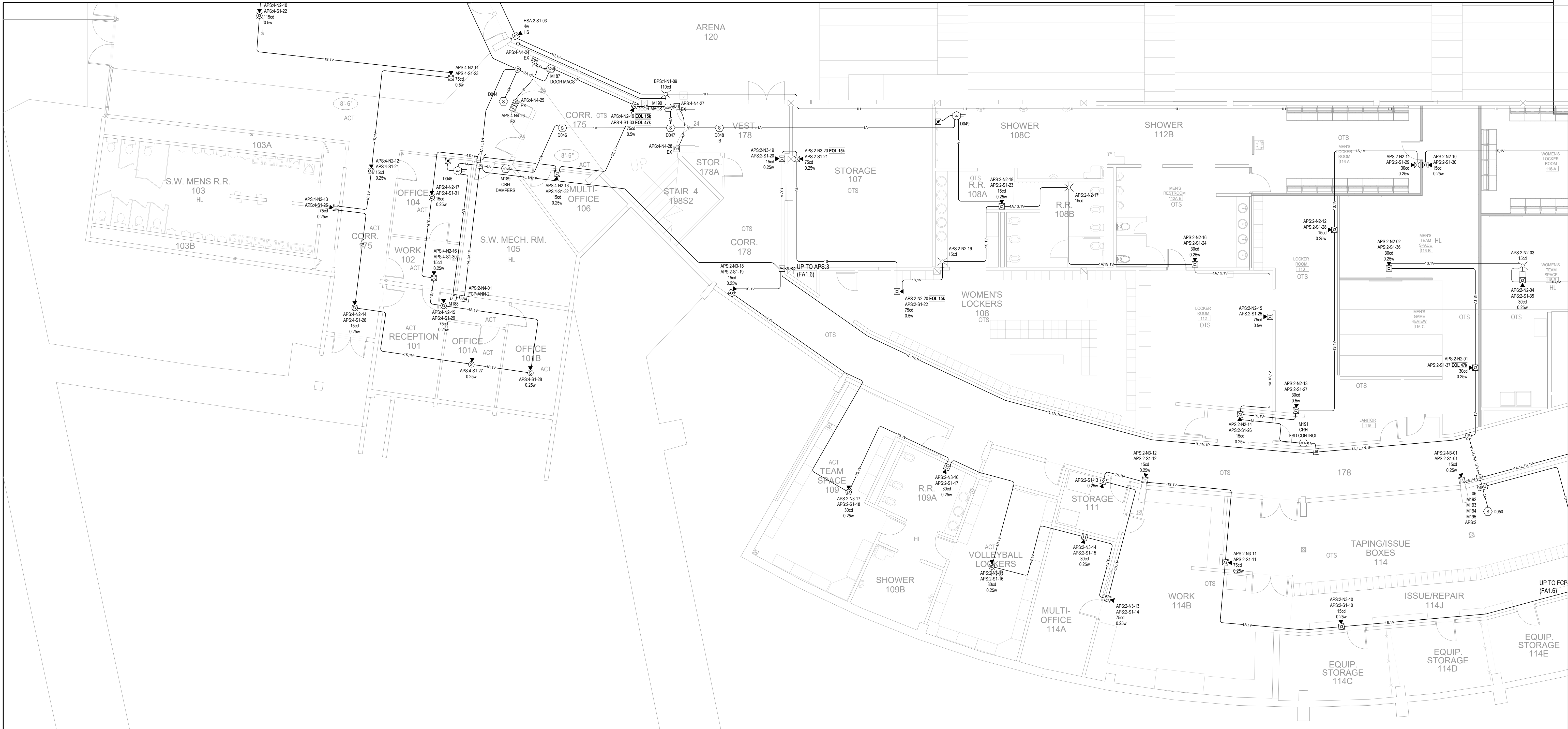
MAIN LEVEL EAST & WEST FIRE ALARM

SHEET

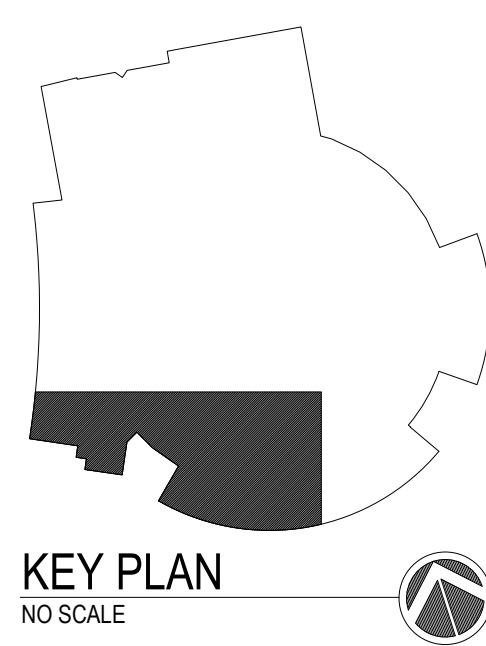
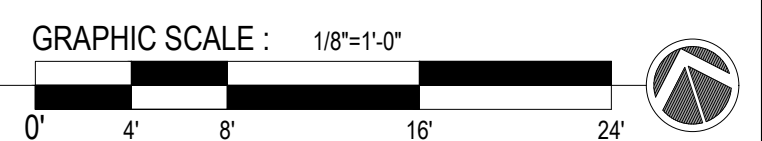
FA1.3

DATE

10/22/2025



1 MAIN LEVEL - SOUTH FIRE ALARM
1/8" = 1'-0"



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(BRICK BREEDEN) FIELDHOUSE
FIRE ALARM REPLACEMENT
MONTANA STATE UNIVERSITY
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REV.	DESCRIPTION	DATE

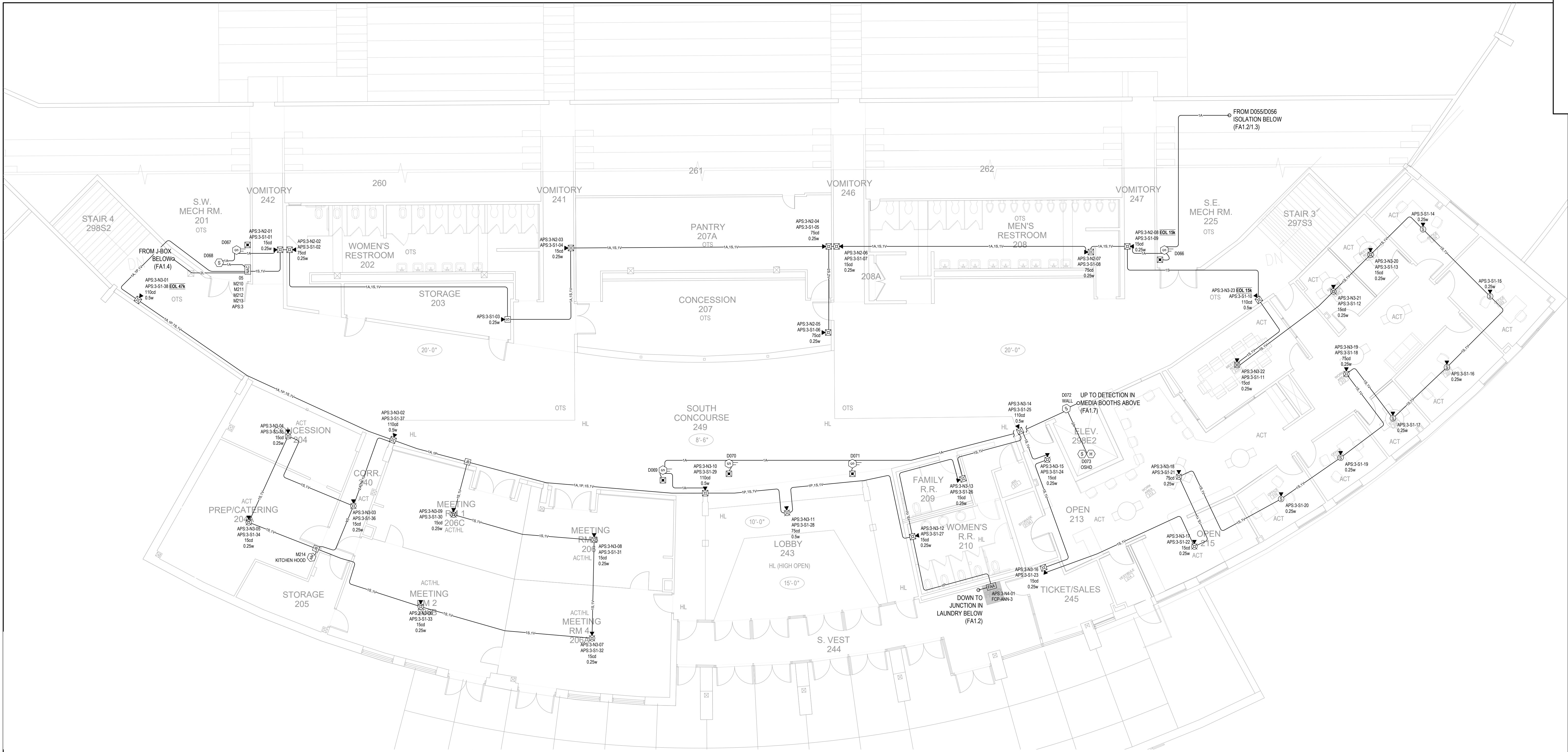


PPA#23-0928
AE# 2024-02-04D

SHEET TITLE
MAIN LEVEL SOUTH
FIRE ALARM

SHEET
FA1.4

DATE
10/22/2025



1

SOUTH CONCOURSE - FIRE ALARM
1/8" = 1'-0"

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

0'4'8'16'24'

KEY PLAN
NO SCALE

MONTANA
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(BRICK BREEDEN) FIELDHOUSE
FIRE ALARM REPLACEMENT

MONTANA STATE UNIVERSITY
BOZEMAN

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APEX
FIRE ALARM DESIGN, LLC

DRAWN BY: **BSM**
REVIEWED BY: **BSM**

REV.	DESCRIPTION	DATE

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CERTIFIED

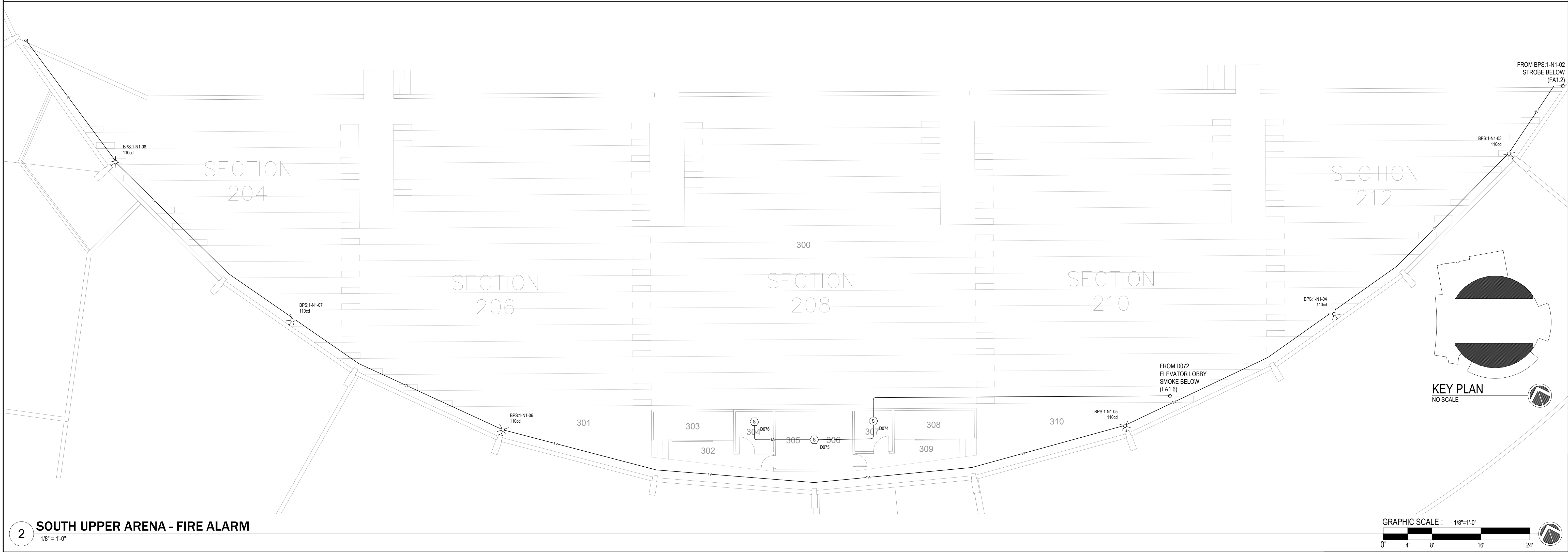
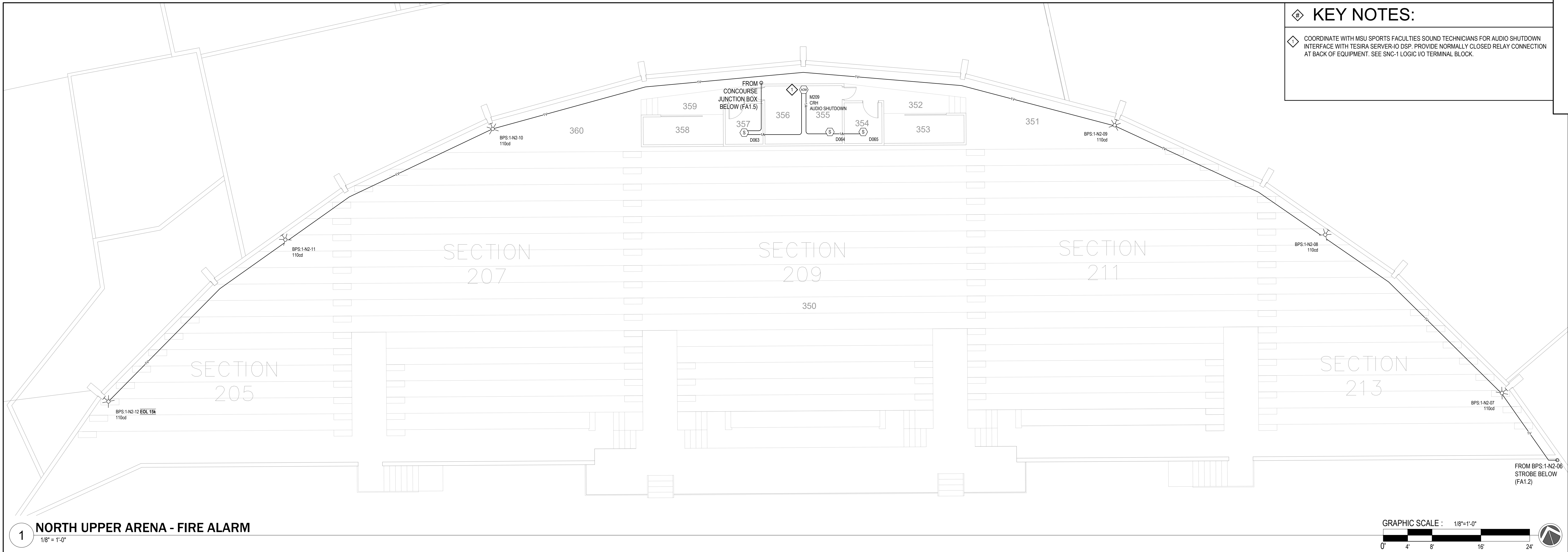
Bryan Moss, SET
Apex Fire Alarm Design
NICET 110772
Fire Alarm Systems, Level IV
State of Montana DLI
FPL-IEL-000888

PPA#23-0928
AE# 2024-02-04D

SHEET TITLE
SOUTH CONCOURSE
FIRE ALARM

SHEET
FA1.6

DATE
10/22/2025



KEY NOTES:

COORDINATE WITH MSU SPORTS FACILITIES SOUND TECHNICIANS FOR AUDIO SHUTDOWN INTERFACE WITH TESIRA SERVER-IO DSP. PROVIDE NORMALLY CLOSED RELAY CONNECTION AT BACK OF EQUIPMENT. SEE SNC-1 LOGIC I/O TERMINAL BLOCK.



(BRICK BREEDEN) FIELDHOUSE
FIRE ALARM REPLACEMENT

MONTANA STATE UNIVERSITY
BOZEMAN



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REVIEWED BY: BSM		
REV.	DESCRIPTION	DATE



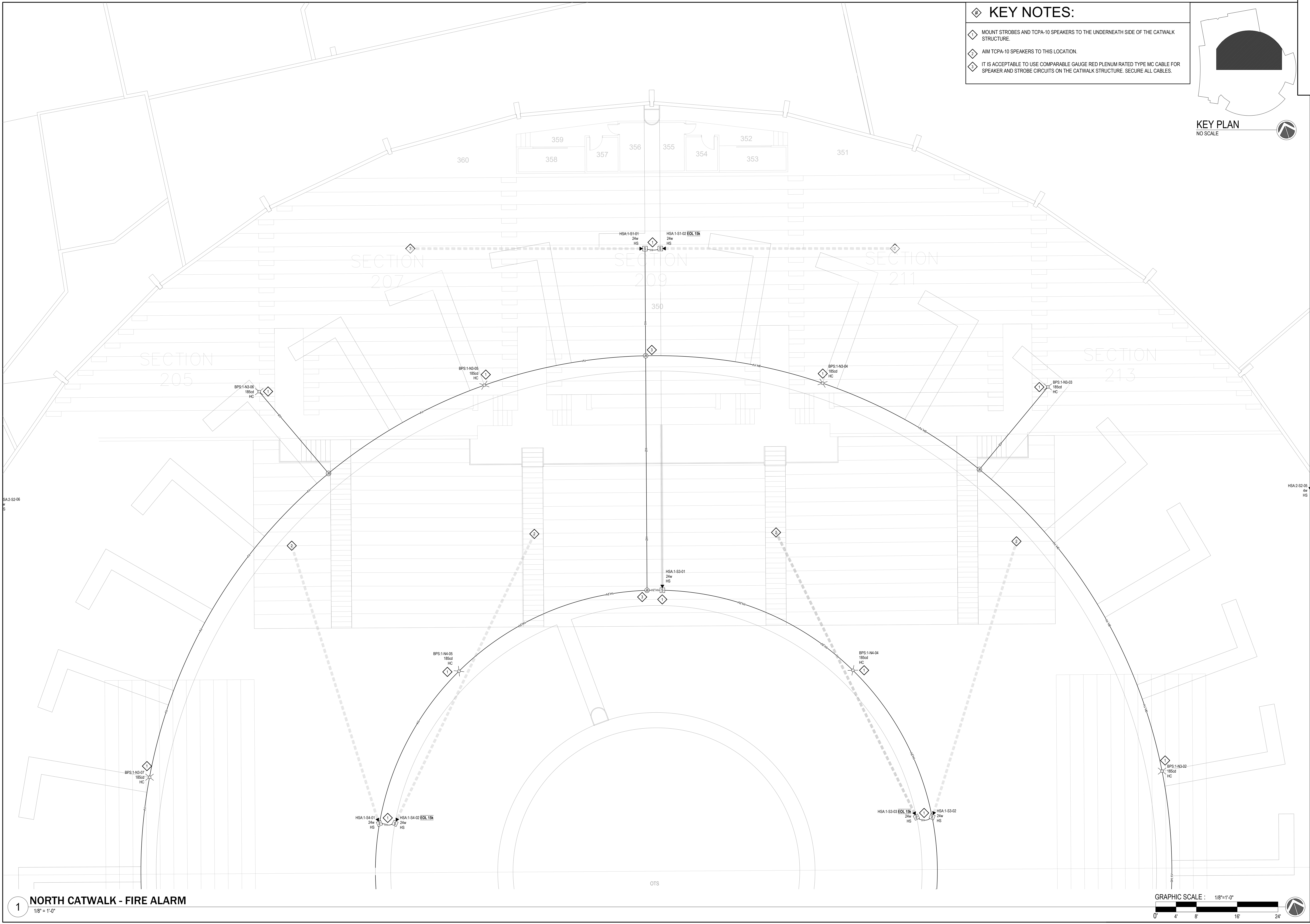
PPA#23-0928
AE# 2024-02-04D

SHEET TITLE
UPPER ARENA
FIRE ALARM

SHEET
FA1.7

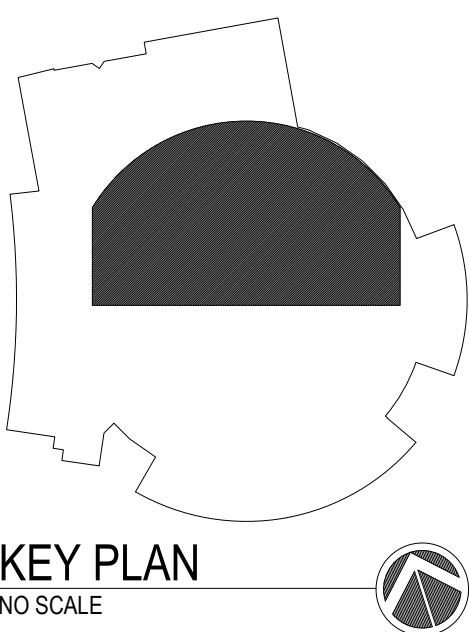
DATE
10/22/2025

100% SHOP DRAWING FOR PERMIT/CONSTRUCTION



KEY NOTES:

- ◇ MOUNT STROBES AND TCPA-10 SPEAKERS TO THE UNDERNEATH SIDE OF THE CATWALK STRUCTURE.
- ◇ AIM TCPA-10 SPEAKERS TO THIS LOCATION.
- ◇ IT IS ACCEPTABLE TO USE COMPARABLE GAUGE RED PLENUM RATED TYPE MC CABLE FOR SPEAKER AND STROBE CIRCUITS ON THE CATWALK STRUCTURE. SECURE ALL CABLES.



1 NORTH CATWALK - FIRE ALARM
1/8" = 1'-0"

GRAPHIC SCALE : 1/8" = 1'-0"
0' 4' 8' 16' 24'



100% SHOP DRAWING FOR PERMIT/CONSTRUCTION
(BRICK BREEDEN) FIELDHOUSE
FIRE ALARM REPLACEMENT
MONTANA STATE UNIVERSITY
BOZEMAN



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REVIEWED BY: BSM		
REV.	DESCRIPTION	DATE

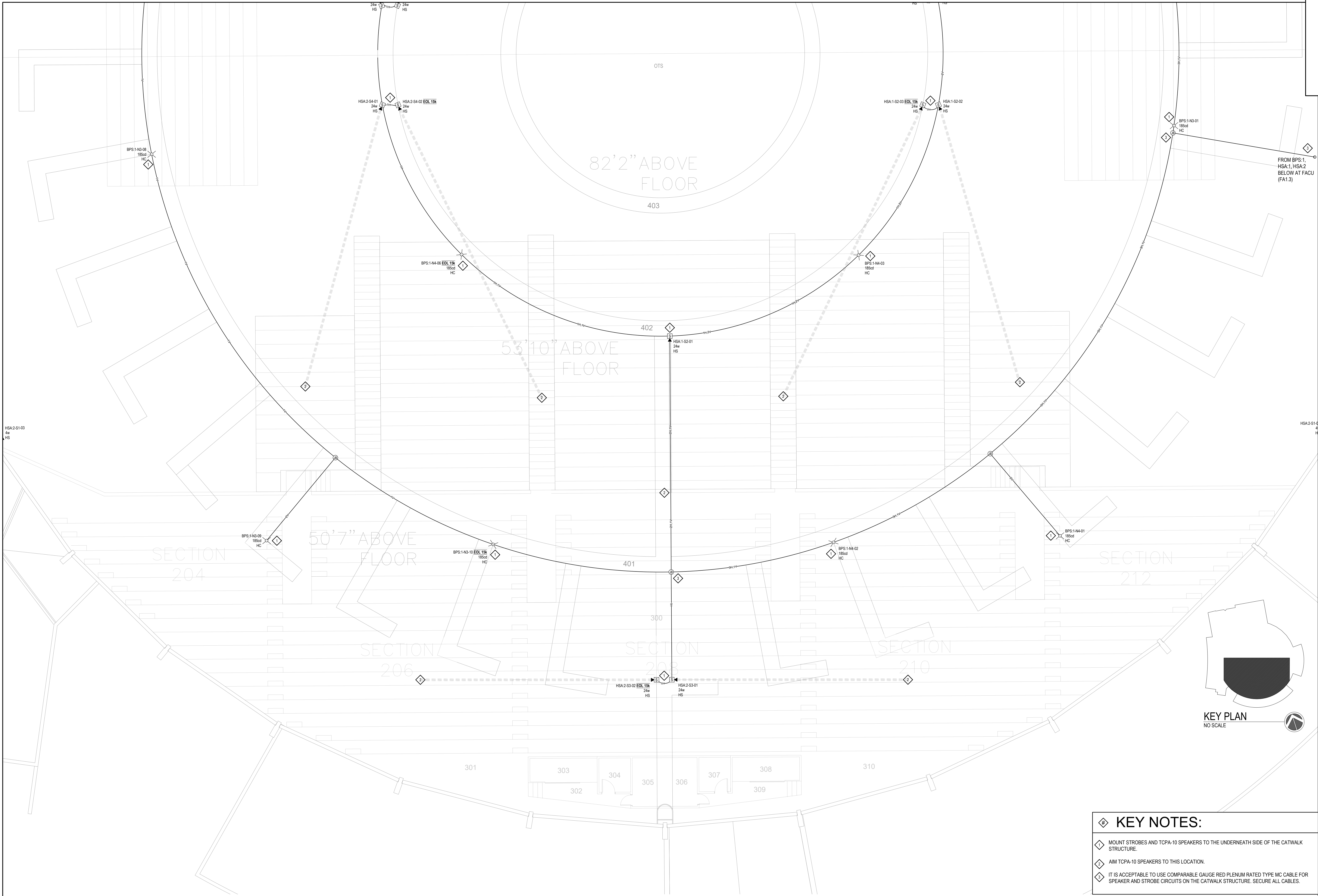


PPA#23-0928
AE# 2024-02-04D

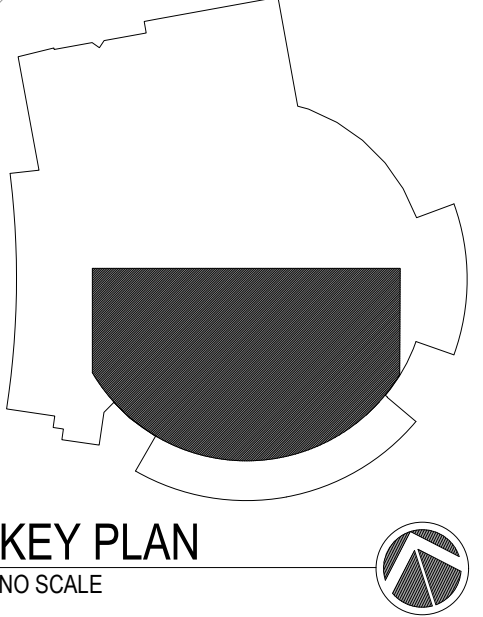
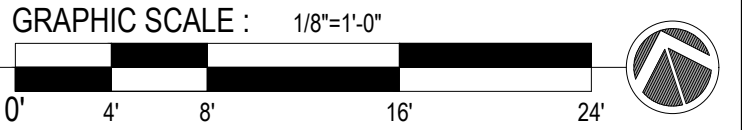
SHEET TITLE
NORTH CATWALK
FIRE ALARM

SHEET
FA1.8

DATE
10/22/2025



- KEY NOTES:**
- ◆ MOUNT STROBES AND TCPA-10 SPEAKERS TO THE UNDERNEATH SIDE OF THE CATWALK STRUCTURE.
 - ◆ AIM TCPA-10 SPEAKERS TO THIS LOCATION.
 - ◆ IT IS ACCEPTABLE TO USE COMPARABLE GAUGE RED PLENUM RATED TYPE MC CABLE FOR SPEAKER AND STROBE CIRCUITS ON THE CATWALK STRUCTURE. SECURE ALL CABLES.



**(BRICK BREEDEN) FIELDHOUSE
FIRE ALARM REPLACEMENT**

MONTANA STATE UNIVERSITY
BOZEMAN



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REVIEWED BY: BSM		
REV.	DESCRIPTION	DATE



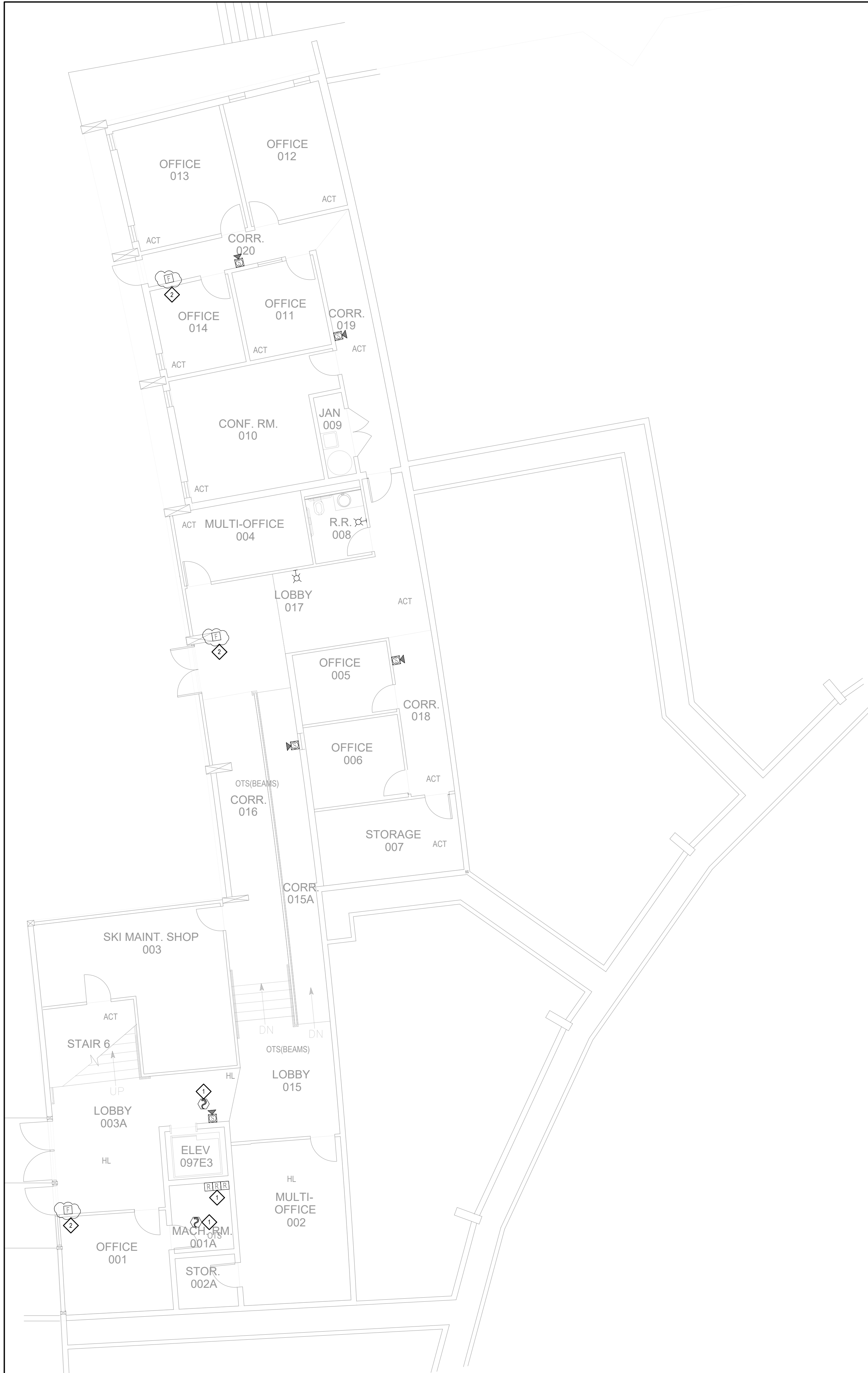
PPA#23-0928
AE# 2024-02-04D

SHEET TITLE
SOUTH CATWALK
FIRE ALARM

SHEET
FA1.9

DATE
10/22/2025

100% SHOP DRAWING FOR PERMIT/CONSTRUCTION



1 BASEMENT - DEMO
1/8" = 1'-0"

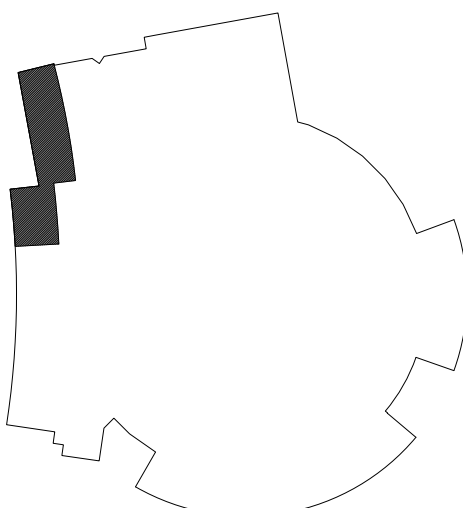


FIRE ALARM SHEET NOTES:

1. ALL DEVICES AND APPLIANCES SHOWN ARE TO BE DEMOLISHED AFTER THE NEW SYSTEM IS INSTALLED. EXCEPTION: HVAC, DOOR AND ELEVATOR CONTROLS. SEE APPLICABLE KEYNOTE THIS SHEET.
2. REMOVE ALL CONDUIT, BACKBOXES AND WIRE TO THE EXTENT FEASIBLE. PATCH AND REPAIR ANY SURFACES AFFECTED BY DEVICE DEMO. PAINT TO MATCH SURROUNDINGS.

KEY NOTES:

- ◇ DEMO ELEVATOR CONTROL INTERFACE AND OR DETECTION DEVICE(S) ACCORDING TO THE PHASE PLAN PROVIDED ON THE COVER SHEET FA0.1
- ◇ MANUAL STATION PREVIOUSLY REMOVED AND BLANKED OFF. REMOVE BACKBOX, CONDUIT & WIRED AS NOTED IN THE SHEET NOTE ABOVE.



KEY PLAN
NO SCALE



100% SHOP DRAWING FOR PERMIT/CONSTRUCTION
(BRICK BREEDEN) FIELDHOUSE
FIRE ALARM REPLACEMENT
MONTANA STATE UNIVERSITY
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REVIEWED BY: BSM		
REV.	DESCRIPTION	DATE



PPA#23-0928
AE# 2024-02-04D

SHEET TITLE
BASEMENT
DEMO

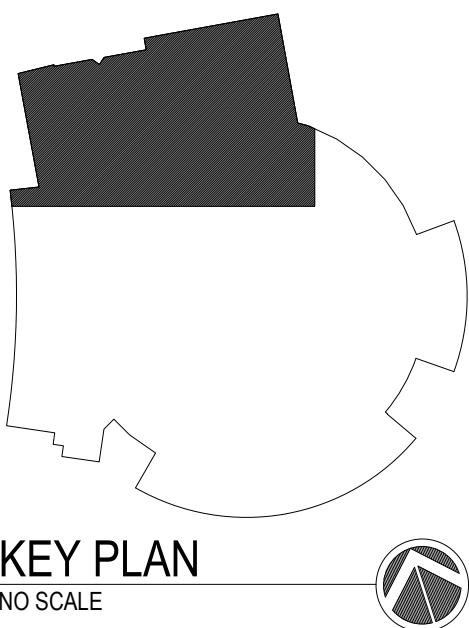
SHEET
FA2.0

DATE
10/22/2025

1. ALL DEVICES AND APPLIANCES SHOWN ARE TO BE DEMOLISHED AFTER THE NEW SYSTEM IS INSTALLED. EXCEPTION: HVAC, DOOR AND ELEVATOR CONTROLS. SEE APPLICABLE KEYNOTE THIS SHEET.
2. REMOVE ALL CONDUIT, BACKBOXES AND WIRE TO THE EXTENT FEASIBLE. PATCH AND REPAIR ANY SURFACES AFFECTED BY DEVICE DEMO. PAINT TO MATCH SURROUNDINGS.
3. EXISTING ELECTROMAGNETIC DOOR HOLDERS AND ROLL-DOWN DOORS/MCCB LINKS (NOT SHOWN ON THESE DEMO SHEETS) ARE TO REMAIN AND BE REUSED WITH THE NEW FIRE ALARM SYSTEM.

◆ KEY NOTES:

- ◆ DEMO ELEVATOR CONTROL INTERFACE AND OR DETECTION DEVICE(S) ACCORDING TO THE PHASE PLAN PROVIDED ON THE COVER SHEET FA0.1
- ◆ DEMO DUCT SMOKE DETECTOR ACCORDING TO THE PHASE PLAN PROVIDED ON THE COVER SHEET FA0.1.
- ◆ DEMO ROLL DOWN DOOR CONTROL RELAY AND NON-FUNCTIONING FIRE-FLY DOOR EQUIPMENT ACCORDING TO THE PHASE PLAN PROVIDED ON THE COVER SHEET FA0.1. EXISTING MCCABE LINK AND ASSOCIATED AND POWER SUPPLY TO REMAIN.
- ◆ MANUAL STATION PREVIOUSLY REMOVED AND BLANKED OFF. REMOVE BACKBOX, CONDUIT & WIRED AS NOTED IN THE SHEET NOTE ABOVE.

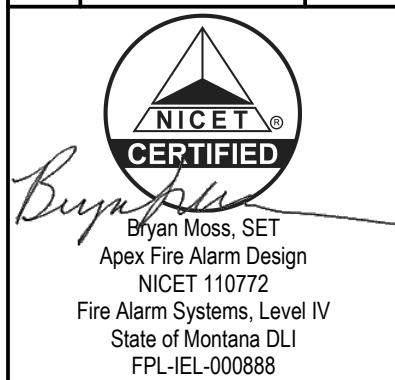


TOP DRAWING FOR PERMIT/CONSTRUCTION
(BRICK BREEDEN) FIELDHOUSE
FIRE ALARM REPLACEMENT

MONTANA STATE UNIVERSITY
BOZEMAN



DRAWN BY: BSM		
REVIEWED BY: BSM		
REV.	DESCRIPTION	DATE

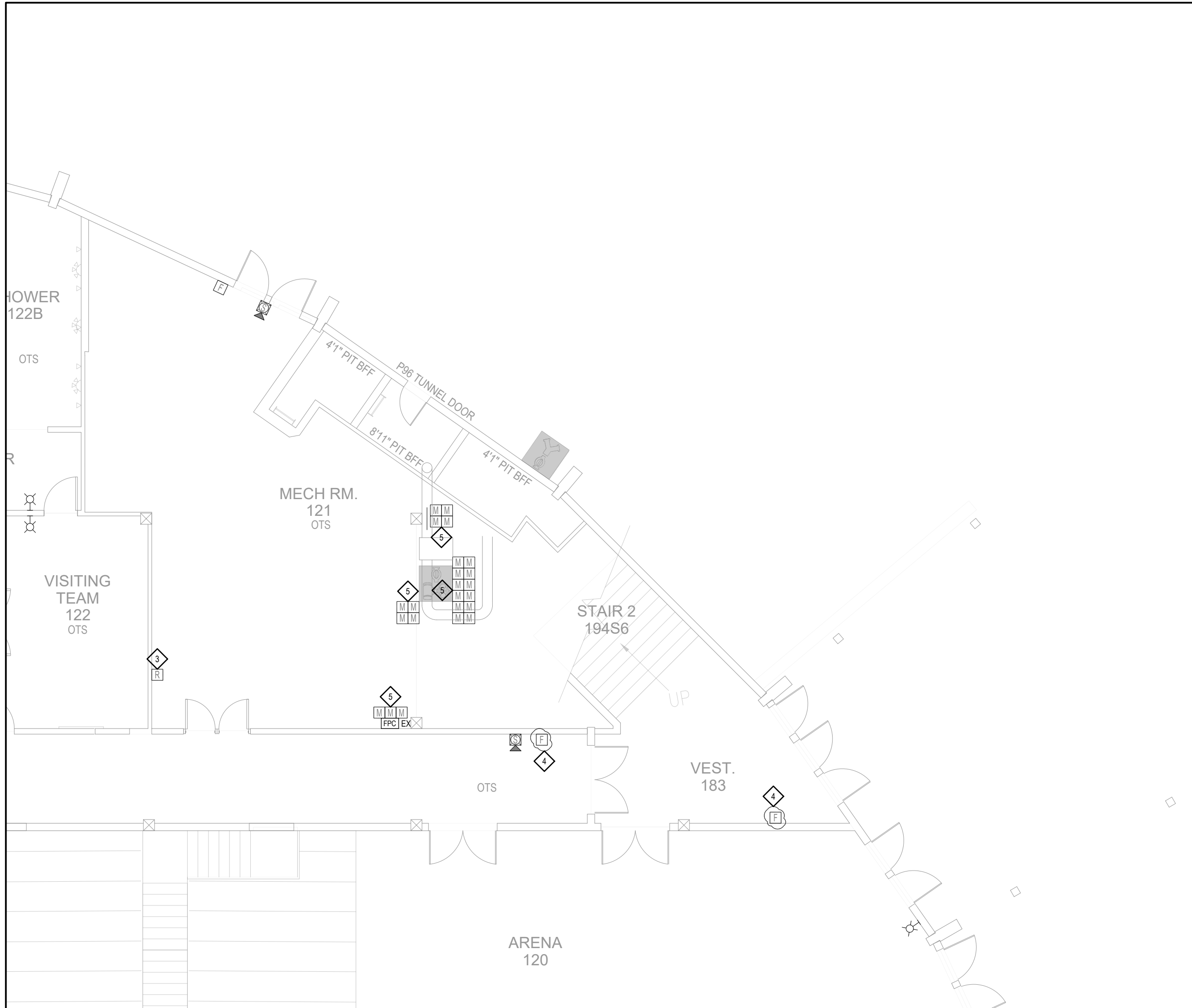


PPA#23-0928
AE# 2024-02-04D

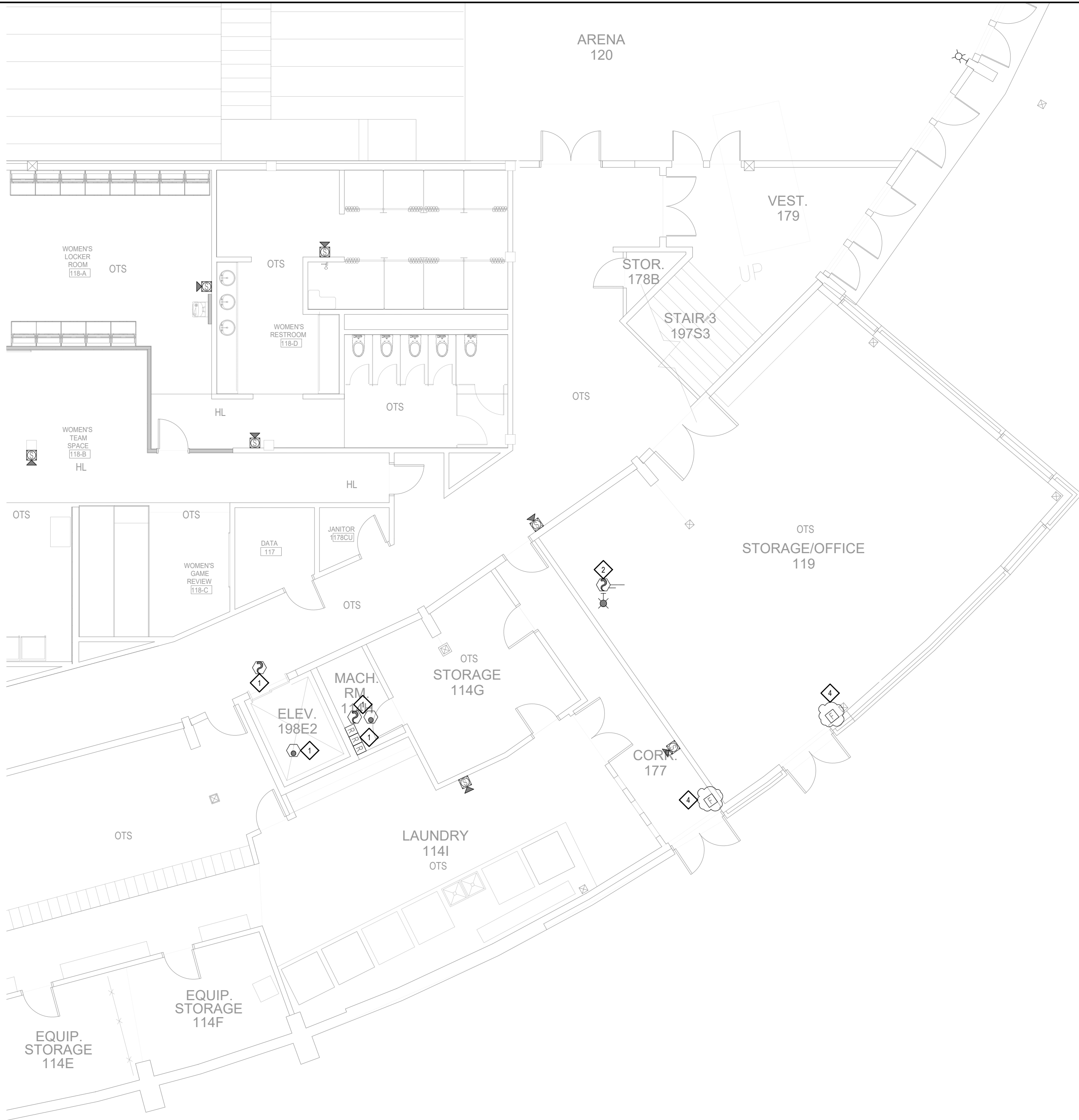
SHEET TITLE
MAIN LEVEL NORTH
DEMO

SHEET
FA2.1

DATE
10/22/2025



1 MAIN LEVEL - NORTH EAST DEMO
1/8" = 1'-0"



2 MAIN LEVEL - SOUTH EAST DEMO
1/8" = 1'-0"

FIRE ALARM SHEET NOTES:

1. ALL DEVICES AND APPLIANCES SHOWN ARE TO BE DEMOLISHED AFTER THE NEW SYSTEM IS INSTALLED. EXCEPTION: HVAC, DOOR AND ELEVATOR CONTROLS AND SPRINKLER SWITCH MONITOR MODULES. SEE APPLICABLE KEYNOTE THIS SHEET.

2. REMOVE ALL CONDUIT, BACKBOXES AND WIRE TO THE EXTENT FEASIBLE. PATCH AND REPAIR ANY SURFACES AFFECTED BY DEVICE DEMO. PAINT TO MATCH SURROUNDINGS.

◆ KEY NOTES:

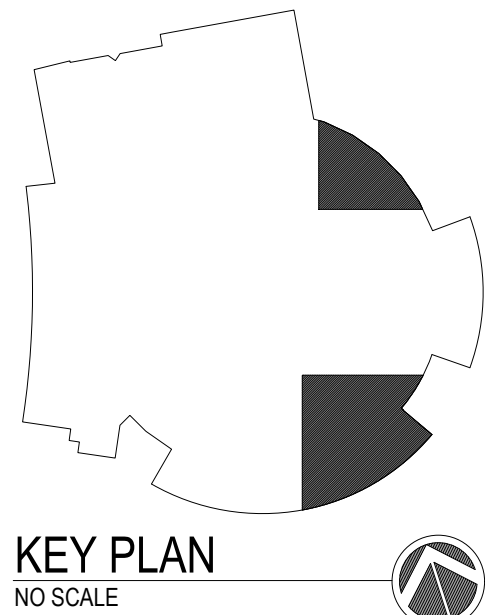
◆ DEMO ELEVATOR CONTROL INTERFACE AND OR DETECTION DEVICE(S) ACCORDING TO THE PHASE PLAN PROVIDED ON THE COVER SHEET FA0.1

◆ DEMO DUCT SMOKE DETECTOR ACCORDING TO THE PHASE PLAN PROVIDED ON THE COVER SHEET FA0.1.

◆ DEMO HVAC FAN CONTROL RELAY ACCORDING TO THE PHASE PLAN PROVIDED ON THE COVER SHEET FA0.1.

◆ MANUAL STATION PREVIOUSLY REMOVED AND BLANKED OFF. REMOVE BACKBOX, CONDUIT & WIRED AS NOTED IN THE SHEET NOTE ABOVE.

◆ DEMO SPRINKLER FIRE PUMP, TAMPER AND FLOW SWITCH MONITOR CONNECTIONS ACCORDING TO THE PHASE PLAN PROVIDED ON THE COVER SHEET FA0.1



100% SHOP DRAWING FOR PERMIT/CONSTRUCTION

(BRICK BREEDEN) FIELDHOUSE
FIRE ALARM REPLACEMENT

MONTANA STATE UNIVERSITY
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REV.	DESCRIPTION	DATE

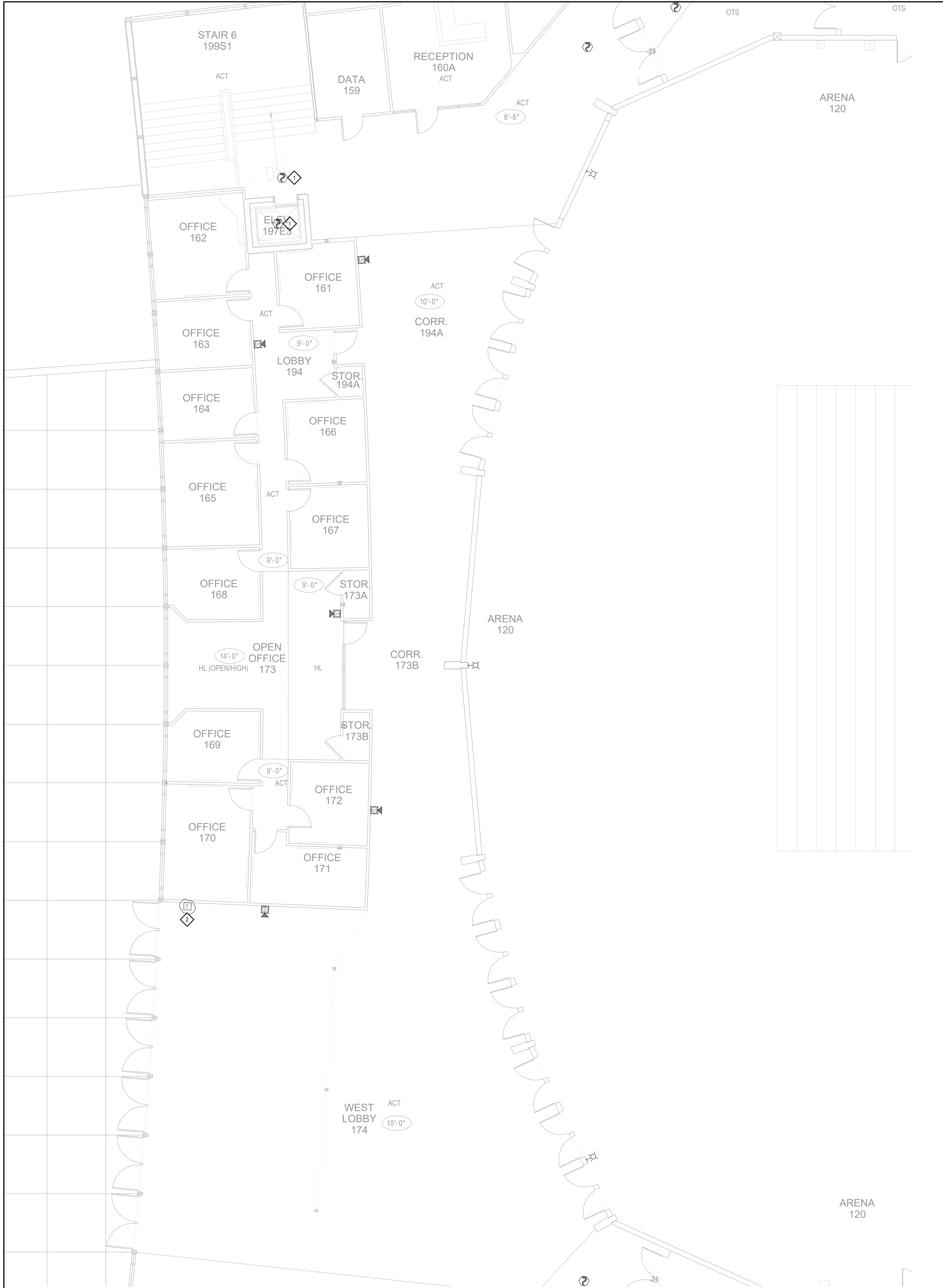

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Apex Fire Alarm Design
NICET 110772
Fire Alarm Systems, Level IV
State of Montana DLI
FPL-IEL-000888

PPA#23-0928
AE# 2024-02-04D

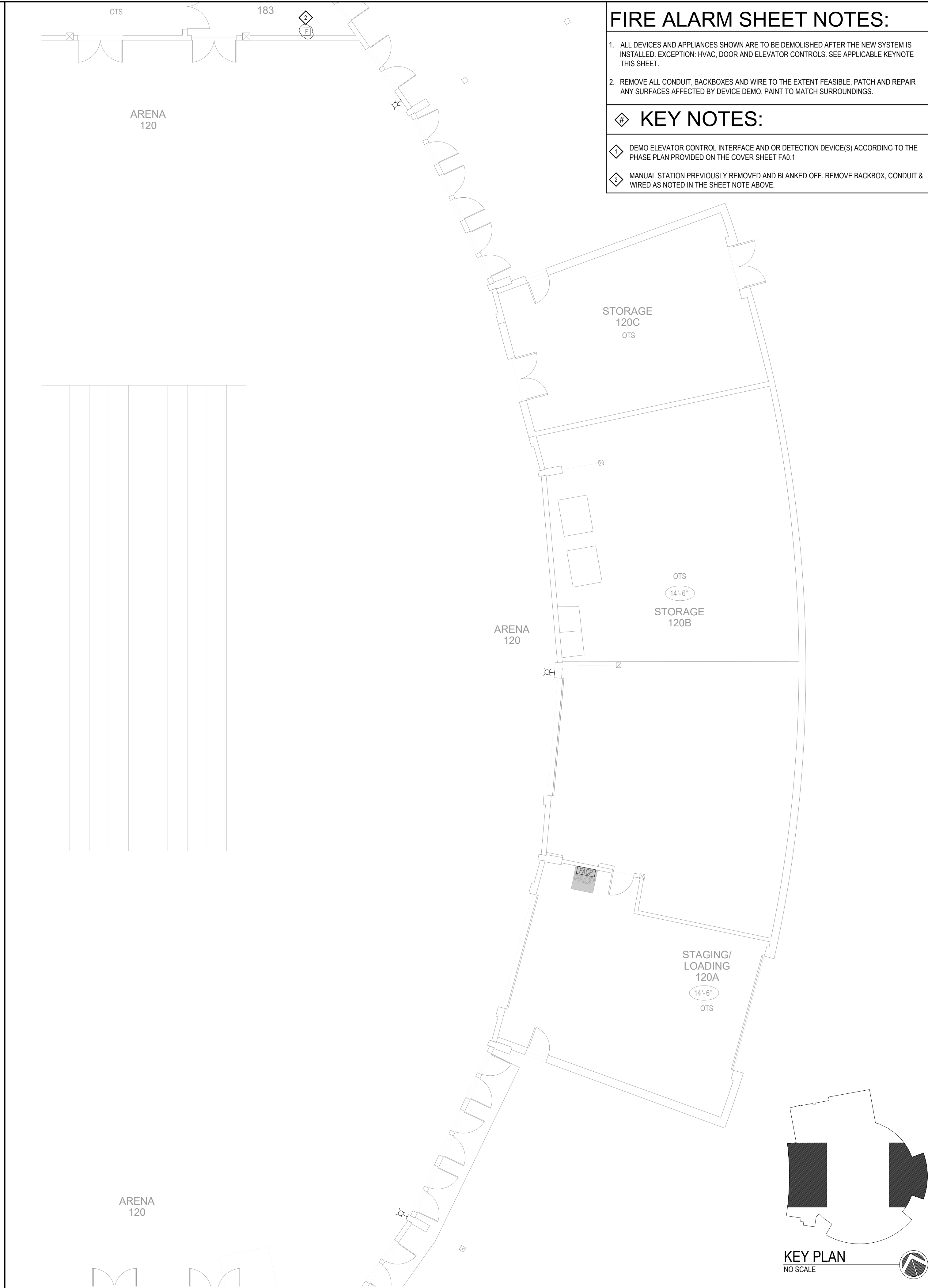
SHEET TITLE
MAIN LEVEL N.E.
& S.E. DEMO

SHEET
FA2.2

DATE
10/22/2025



1 MAIN LEVEL - WEST DEMO
1/8" = 1'-0"



2 MAIN LEVEL - EAST DEMO
1/8" = 1'-0"

FIRE ALARM SHEET NOTES:

- ALL DEVICES AND APPLIANCES SHOWN ARE TO BE DEMOLISHED AFTER THE NEW SYSTEM IS INSTALLED. EXCEPTION: HVAC, DOOR AND ELEVATOR CONTROLS. SEE APPLICABLE KEYNOTE THIS SHEET.
- REMOVE ALL CONDUIT, BACKBOXES AND WIRE TO THE EXTENT FEASIBLE. PATCH AND REPAIR ANY SURFACES AFFECTED BY DEVICE DEMO. PAINT TO MATCH SURROUNDINGS.

KEY NOTES:

- DEMO ELEVATOR CONTROL INTERFACE AND OR DETECTION DEVICE(S) ACCORDING TO THE PHASE PLAN PROVIDED ON THE COVER SHEET FA0.1
- MANUAL STATION PREVIOUSLY REMOVED AND BLANKED OFF. REMOVE BACKBOX, CONDUIT & WIRED AS NOTED IN THE SHEET NOTE ABOVE.



100% SHOP DRAWING FOR PERMIT/CONSTRUCTION
(BRICK BREEDEN) FIELDHOUSE
FIRE ALARM REPLACEMENT
MONTANA STATE UNIVERSITY
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REVIEWED BY: BSM		
REV.	DESCRIPTION	DATE



PPA#23-0928
AE# 2024-02-04D

SHEET TITLE
MAIN LEVEL EAST
& WEST DEMO

SHEET
FA2.3

DATE
10/22/2025



1 MAIN LEVEL - SOUTH DEMO
1/8" = 1'-0"

FIRE ALARM SHEET NOTES:

1. ALL DEVICES AND APPLIANCES SHOWN ARE TO BE DEMOLISHED AFTER THE NEW SYSTEM IS INSTALLED. EXCEPTION: HVAC, DOOR AND ELEVATOR CONTROLS. SEE APPLICABLE KEYNOTE THIS SHEET.

2. REMOVE ALL CONDUIT, BACKBOXES AND WIRE TO THE EXTENT FEASIBLE. PATCH AND REPAIR ANY SURFACES AFFECTED BY DEVICE DEMO. PAINT TO MATCH SURROUNDINGS.

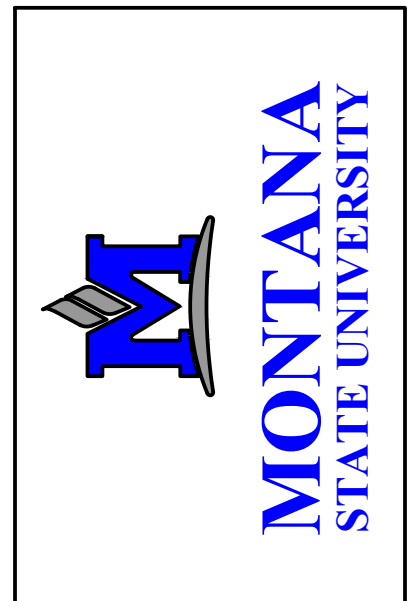
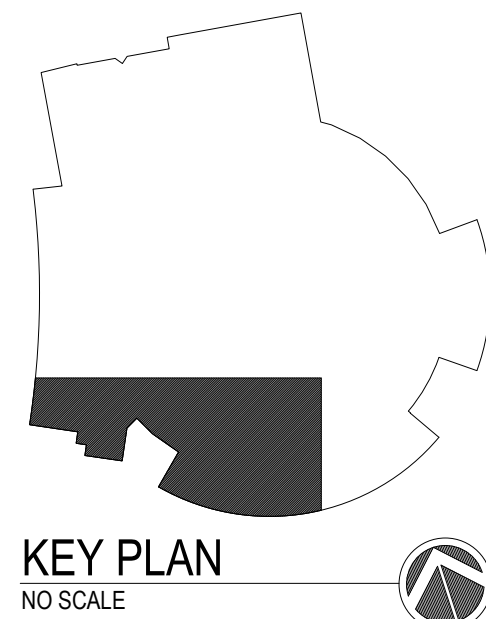
3. EXISTING ELECTROMAGNETIC DOOR HOLDERS AND ROLL-DOWN DOORS (NOT SHOWN ON THESE DEMO SHEETS) ARE TO REMAIN AND BE REUSED WITH THE NEW FIRE ALARM SYSTEM.

KEY NOTES:

DEMO DUCT SMOKE DETECTOR ACCORDING TO THE PHASE PLAN PROVIDED ON THE COVER SHEET FA0.1.

DEMO HVAC DAMPER CONTROL RELAY ACCORDING TO THE PHASE PLAN PROVIDED ON THE COVER SHEET FA0.1.

MANUAL STATION PREVIOUSLY REMOVED AND BLANKED OFF. REMOVE BACKBOX, CONDUIT & WIRED AS NOTED IN THE SHEET NOTE ABOVE.



100% SHOP DRAWING FOR PERMIT/CONSTRUCTION

(BRICK BREEDEN) FIELDHOUSE
FIRE ALARM REPLACEMENT

MONTANA STATE UNIVERSITY
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REV.	DESCRIPTION	DATE

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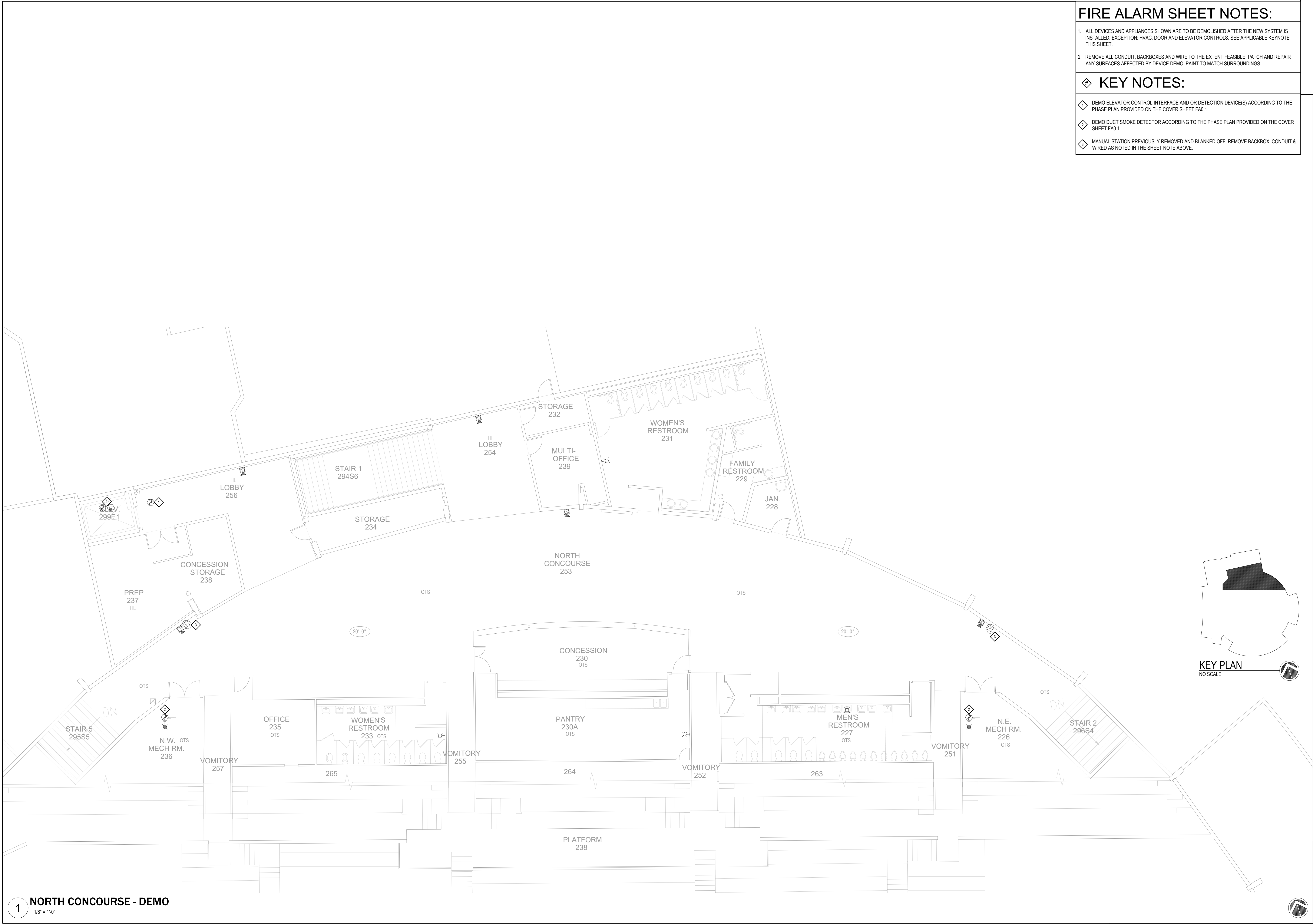
Bryan Moss, SET
Apex Fire Alarm Design
NICET 110772
Fire Alarm Systems, Level IV
State of Montana DLI
FPL-IEL-000888

PPA#23-0928
AE# 2024-02-04D

SHEET TITLE
MAIN LEVEL SOUTH
DEMO

SHEET
FA2.4

DATE
10/22/2025



- FIRE ALARM SHEET NOTES:
1.

ALL DEVICES AND APPLIANCES SHOWN ARE TO BE DEMOLISHED AFTER THE NEW SYSTEM IS INSTALLED. EXCEPTION: HVAC, DOOR AND ELEVATOR CONTROLS. SEE APPLICABLE KEYNOTE THIS SHEET.
2.

REMOVE ALL CONDUIT, BACKBOXES AND WIRE TO THE EXTENT FEASIBLE. PATCH AND REPAIR ANY SURFACES AFFECTED BY DEVICE DEMO. PAINT TO MATCH SURROUNDINGS.
- KEY NOTES:
- ◇

DEMO ELEVATOR CONTROL INTERFACE AND OR DETECTION DEVICE(S) ACCORDING TO THE PHASE PLAN PROVIDED ON THE COVER SHEET FA0.1
- ◇

DEMO DUCT SMOKE DETECTOR ACCORDING TO THE PHASE PLAN PROVIDED ON THE COVER SHEET FA0.1.
- ◇

MANUAL STATION PREVIOUSLY REMOVED AND BLANKED OFF. REMOVE BACKBOX, CONDUIT & WIRED AS NOTED IN THE SHEET NOTE ABOVE.



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100% SHOP DRAWING FOR PERMIT/CONSTRUCTION

(BRICK BREEDEN) FIELDHOUSE
FIRE ALARM REPLACEMENT

MONTANA STATE UNIVERSITY
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APEX
FIRE ALARM DESIGN, LLC

DRAWN BY: BSM

REVIEWED BY: BSM

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Apex Fire Alarm Design
NICET 110772
Fire Alarm Systems, Level IV
State of Montana DLI
FPL-IEL-000888

PPA#23-0928

AE# 2024-02-04D

SHEET TITLE
NORTH CONCOURSE
DEMO

SHEET
FA2.5

DATE
10/22/2025



1 SOUTH CONCOURSE - DEMO
1/8" = 1'-0"

FIRE ALARM SHEET NOTES:

1. ALL DEVICES AND APPLIANCES SHOWN ARE TO BE DEMOLISHED AFTER THE NEW SYSTEM IS INSTALLED. EXCEPTION: HVAC, DOOR AND ELEVATOR CONTROLS. SEE APPLICABLE KEYNOTE THIS SHEET.

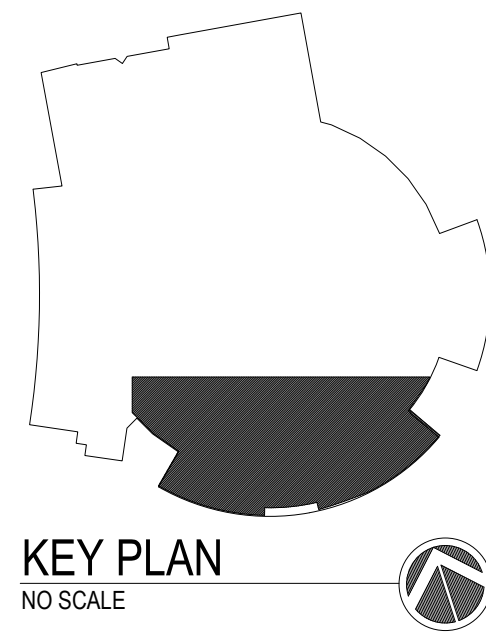
2. REMOVE ALL CONDUIT, BACKBOXES AND WIRE TO THE EXTENT FEASIBLE. PATCH AND REPAIR ANY SURFACES AFFECTED BY DEVICE DEMO. PAINT TO MATCH SURROUNDINGS.

KEY NOTES:

1. DEMO ELEVATOR CONTROL INTERFACE AND OR DETECTION DEVICE(S) ACCORDING TO THE PHASE PLAN PROVIDED ON THE COVER SHEET FA0.1

2. DEMO DUCT SMOKE DETECTOR ACCORDING TO THE PHASE PLAN PROVIDED ON THE COVER SHEET FA0.1.

3. MANUAL STATION PREVIOUSLY REMOVED AND BLANKED OFF. REMOVE BACKBOX, CONDUIT & WIRED AS NOTED IN THE SHEET NOTE ABOVE.



100% SHOP DRAWING FOR PERMIT/CONSTRUCTION

(BRICK BREEDEN) FIELDHOUSE
FIRE ALARM REPLACEMENT

MONTANA STATE UNIVERSITY
BOZEMAN



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REVIEWED BY: BSM		
REV.	DESCRIPTION	DATE

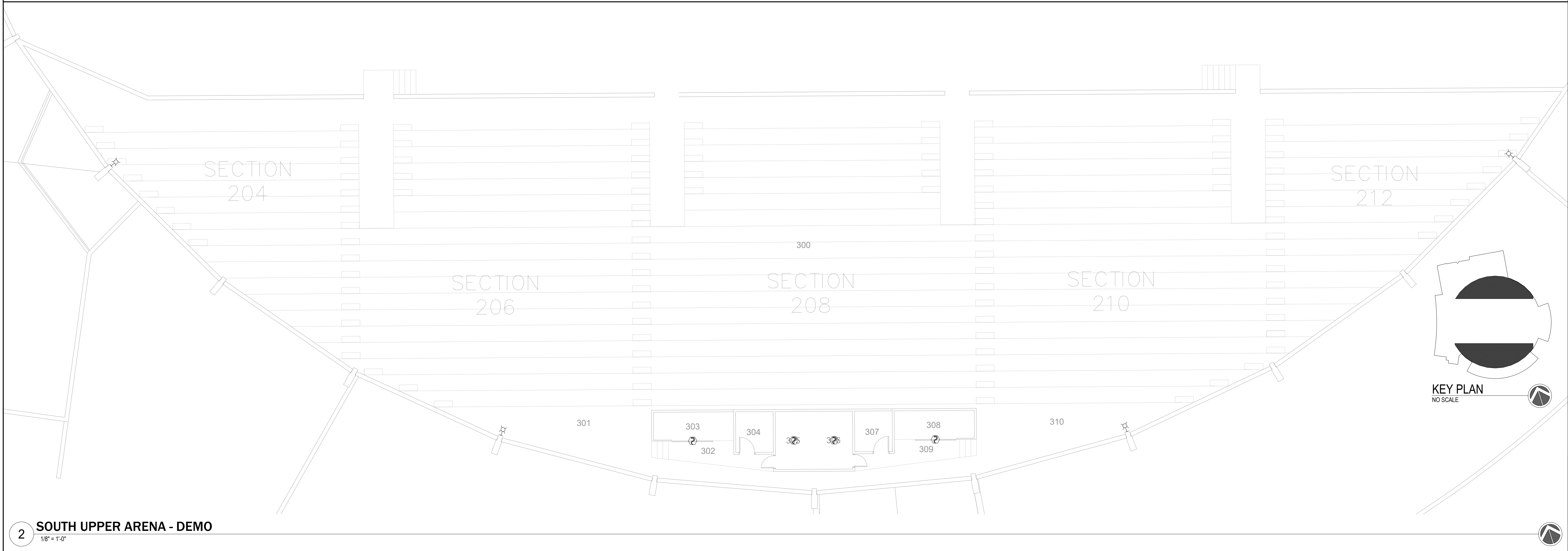
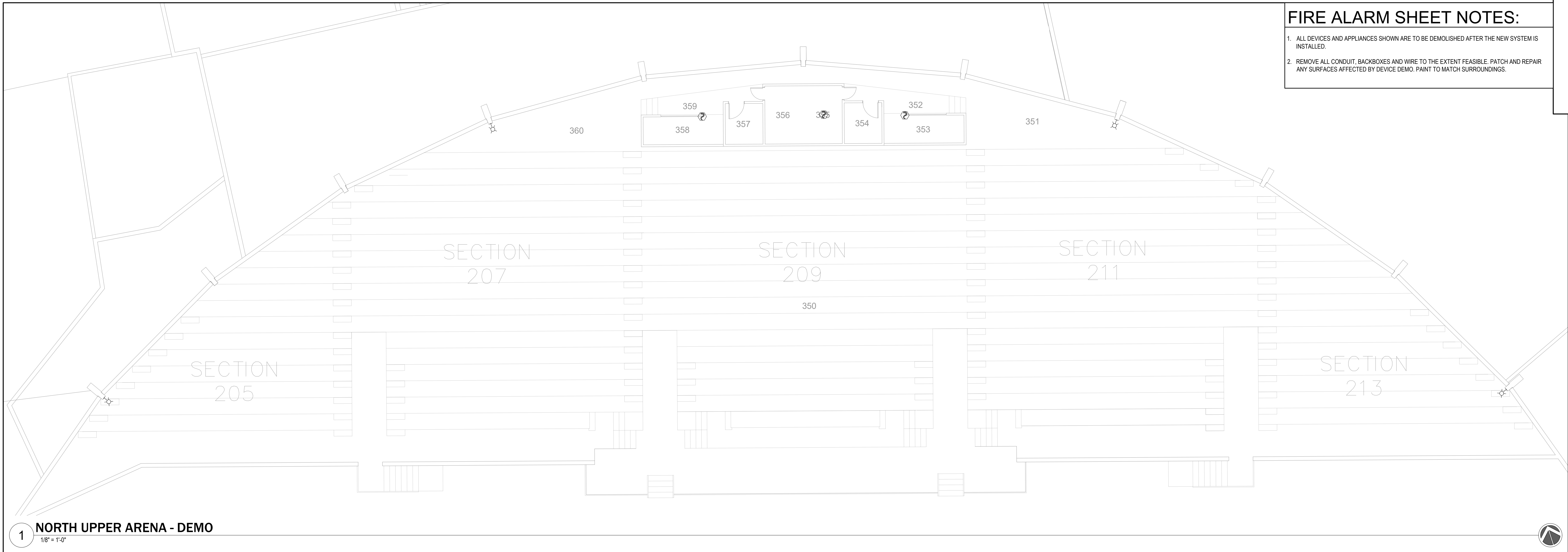

Bryan Moss, SET
Apex Fire Alarm Design
NICET 110772
Fire Alarm Systems, Level IV
State of Montana DLI
FPL-IEL-000888

PPA#23-0928
AE# 2024-02-04D

SHEET TITLE
SOUTH CONCOURSE
DEMO

SHEET
FA2.6

DATE
10/22/2025



- FIRE ALARM SHEET NOTES:**
1. ALL DEVICES AND APPLIANCES SHOWN ARE TO BE DEMOLISHED AFTER THE NEW SYSTEM IS INSTALLED.
 2. REMOVE ALL CONDUIT, BACKBOXES AND WIRE TO THE EXTENT FEASIBLE. PATCH AND REPAIR ANY SURFACES AFFECTED BY DEVICE DEMO. PAINT TO MATCH SURROUNDINGS.



**(BRICK BREEDEN) FIELDHOUSE
FIRE ALARM REPLACEMENT**

MONTANA STATE UNIVERSITY
BOZEMAN



DRAWN BY: BSM		
REVIEWED BY: BSM		
REV.	DESCRIPTION	DATE



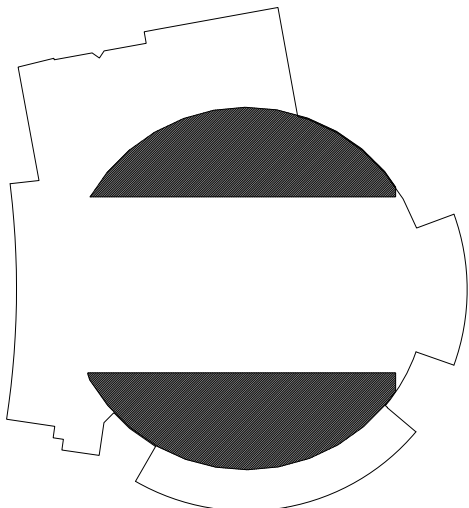
PPA#23-0928
AE# 2024-02-04D

SHEET TITLE
UPPER ARENA
DEMO

SHEET
FA2.7

DATE
10/22/2025

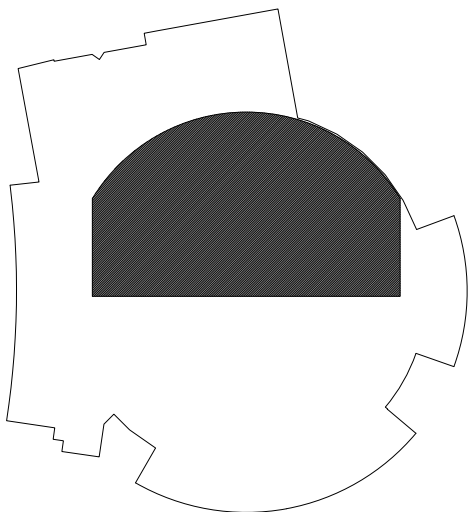
100% SHOP DRAWING FOR PERMIT/CONSTRUCTION



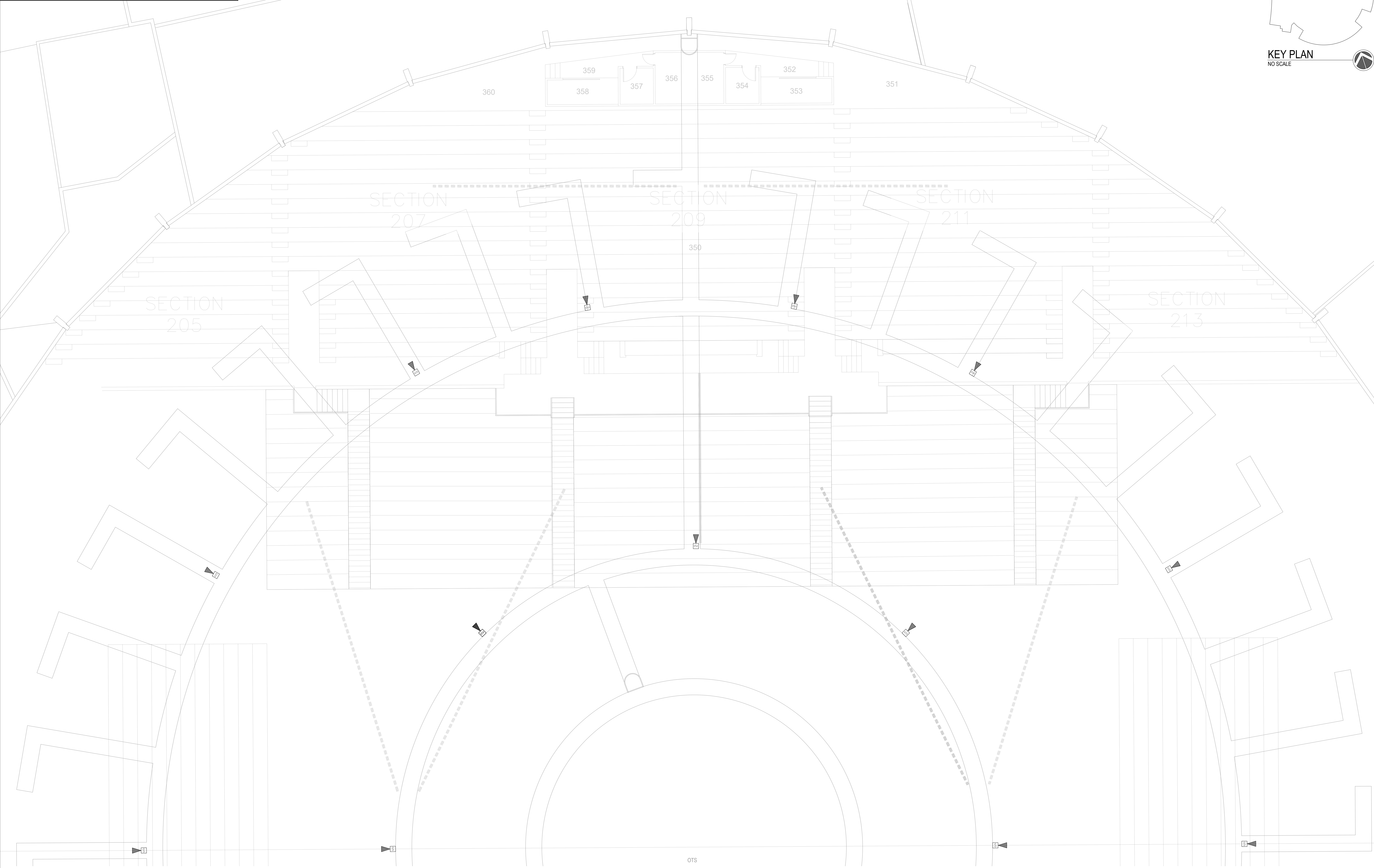
KEY PLAN
NO SCALE

FIRE ALARM SHEET NOTES:

1. ALL DEVICES AND APPLIANCES SHOWN ARE TO BE DEMOLISHED AFTER THE NEW SYSTEM IS INSTALLED.
2. REMOVE ALL CONDUIT, BACKBOXES AND WIRE TO THE EXTENT FEASIBLE. PATCH AND REPAIR ANY SURFACES AFFECTED BY DEVICE DEMO. PAINT TO MATCH SURROUNDINGS.



KEY PLAN
NO SCALE



1 NORTH CATWALK - DEMO
1/8" = 1'-0"



100% SHOP DRAWING FOR PERMIT/CONSTRUCTION

**(BRICK BREEDEN) FIELDHOUSE
FIRE ALARM REPLACEMENT**

MONTANA STATE UNIVERSITY
BOZEMAN



DRAWN BY: BSM		
REVIEWED BY: BSM		
REV.	DESCRIPTION	DATE

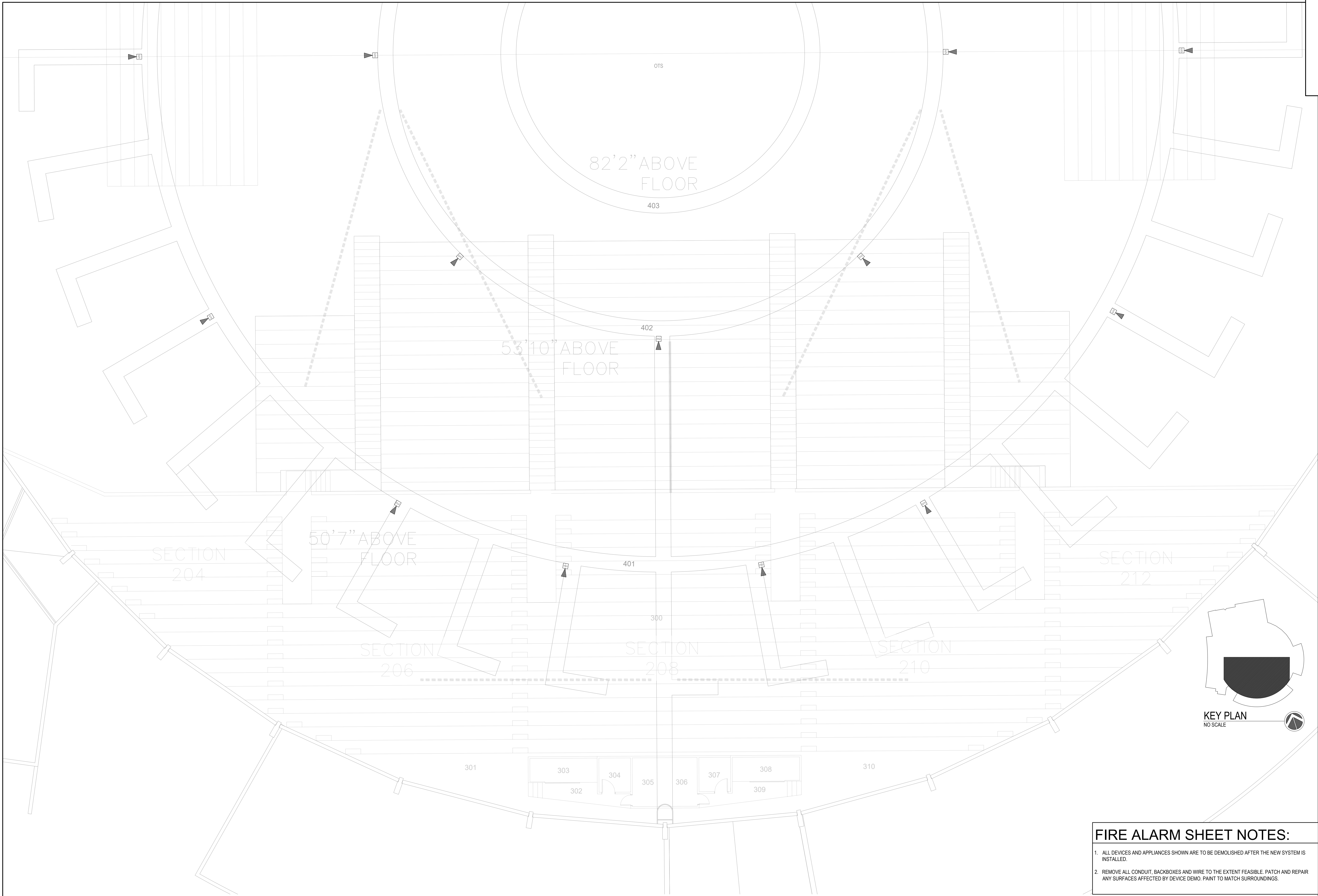


PPA#23-0928
AE# 2024-02-04D

SHEET TITLE
NORTH CATWALK
DEMO

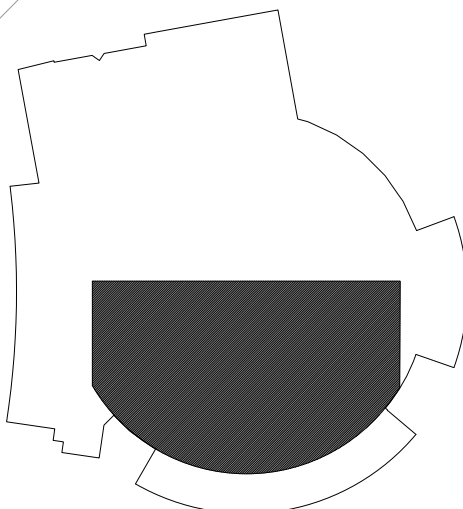
SHEET
FA2.8

DATE
10/22/2025



FIRE ALARM SHEET NOTES:

1. ALL DEVICES AND APPLIANCES SHOWN ARE TO BE DEMOLISHED AFTER THE NEW SYSTEM IS INSTALLED.
2. REMOVE ALL CONDUIT, BACKBOXES AND WIRE TO THE EXTENT FEASIBLE. PATCH AND REPAIR ANY SURFACES AFFECTED BY DEVICE DEMO. PAINT TO MATCH SURROUNDINGS.



KEY PLAN
NO SCALE

100% SHOP DRAWING FOR PERMIT/CONSTRUCTION

(BRICK BREEDEN) FIELDHOUSE
FIRE ALARM REPLACEMENT



DRAWN BY: BSM		
REVIEWED BY: BSM		
REV.	DESCRIPTION	DATE

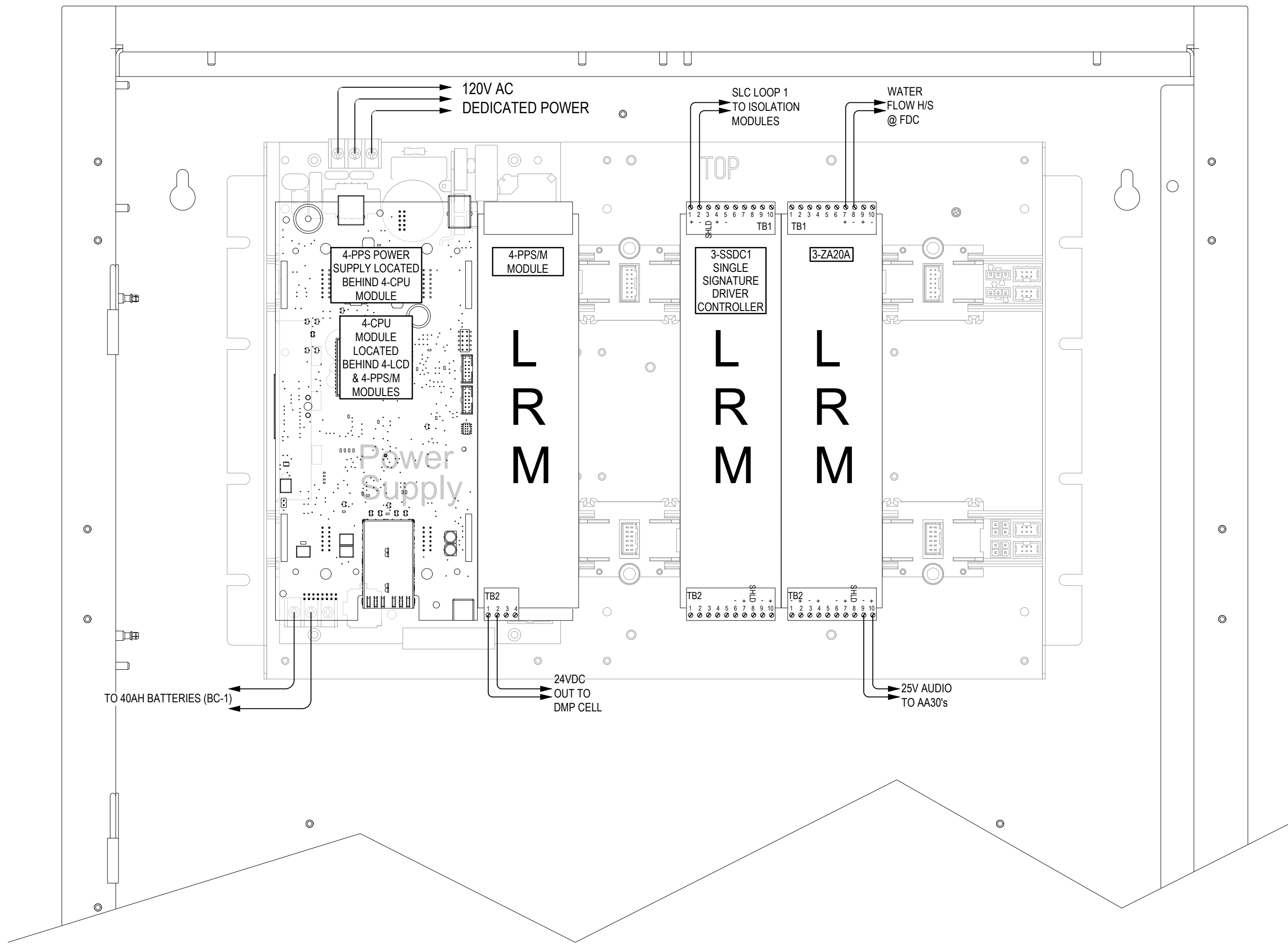


PPA#23-0928
AE# 2024-02-04D

SHEET TITLE
SOUTH CATWALK
DEMO

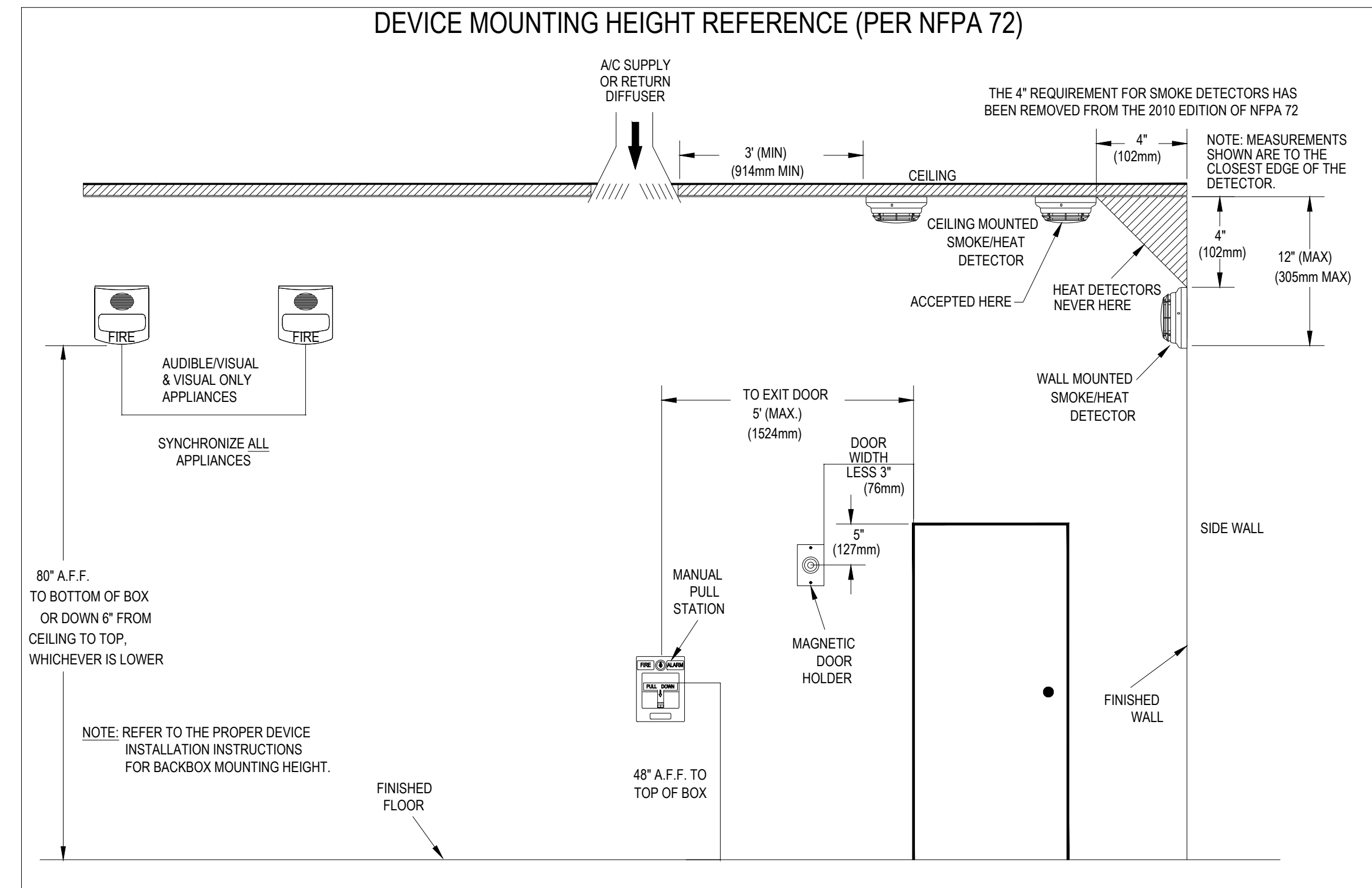
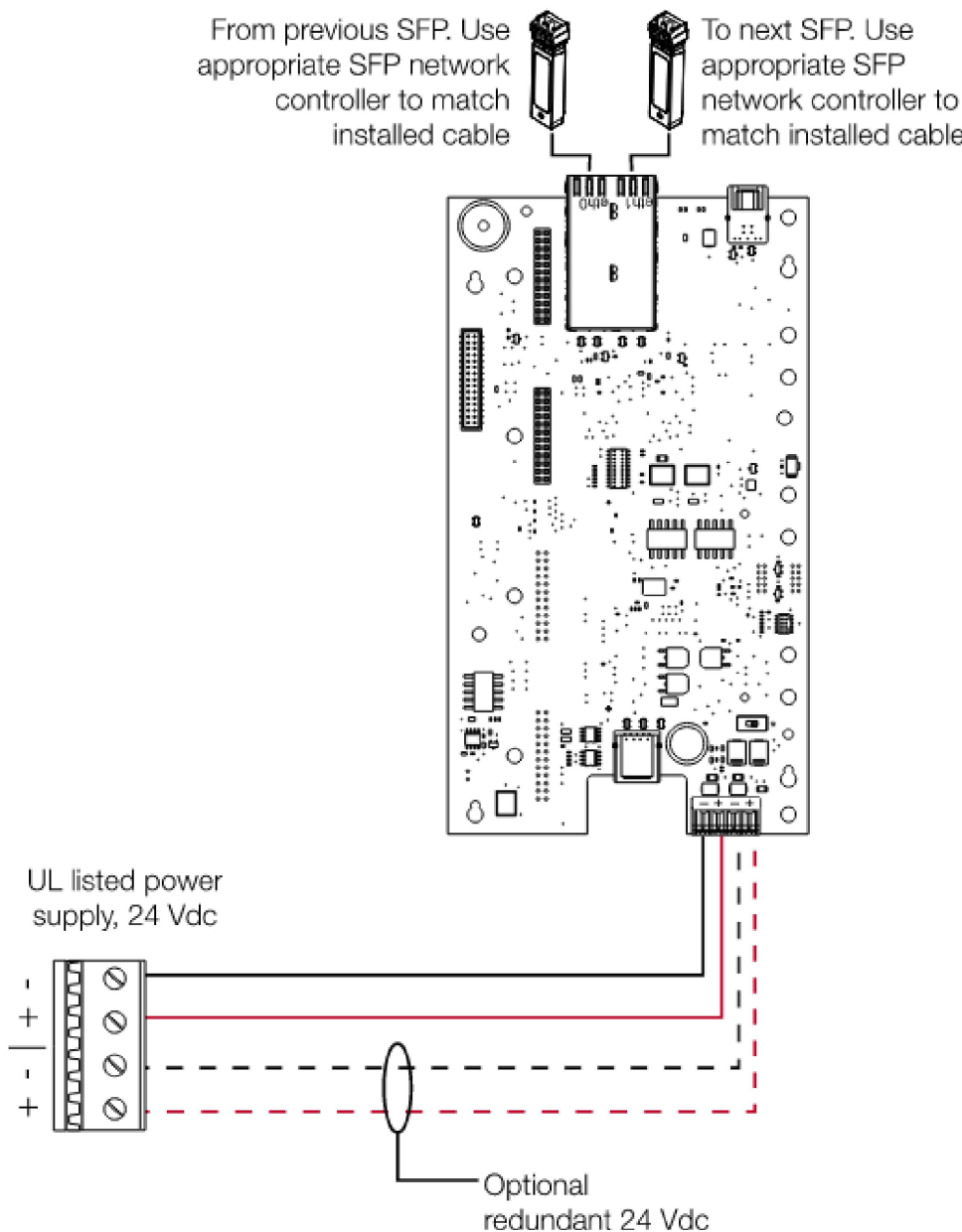
SHEET
FA2.9

DATE
10/22/2025



1 FACU - EST4 (PARTIAL)
FA5.1 N.T.S

1 FAA - 4-6ANN ANNUNCIATOR WITH MIC
FA5.1 N.T.S



3 TYPICAL DEVICE MOUNTING HEIGHTS
FA5.1 N.T.S

OPTIONAL ACCESSORY LIST		
ITEM	PART NUMBER	DESCRIPTION
1	72377B-801	WALL MOUNT BRACKET
2	72378B-801	DUAL UNIT MOUNTING ADAPTER

2.1. Single Mount

The TCPA-10 is intended to be hung from the mounting bracket. A typical mount will use a wall bracket. A double mounting bracket is available for hanging two speakers together for 180° of broadcast coverage (see section 2.2).

- 1) To mount a single TCPA-10, attach the mounting bracket to the wall bracket (optional accessory or customer supplied) with three 1/4-20 bolts (Figure 4).

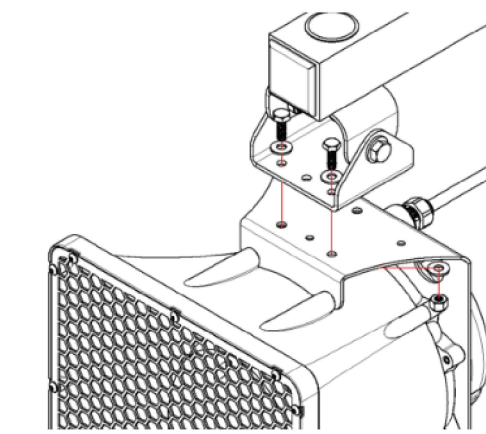
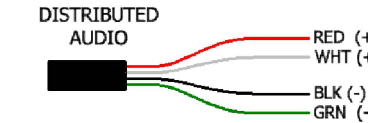


Figure 4: Attaching Wall Mounting Bracket

- 2) Attach the mounting bracket to the wall or pole with appropriate hardware according to local codes and safety practices.

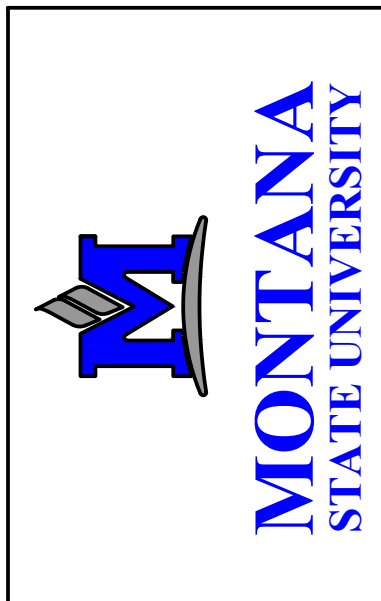
CABLE ROUTING ALL TCPA-10 SYSTEMS UTILIZE AN OUTDOOR RATED SJ100W CABLE FOR ELECTRICAL CONNECTIONS. TO CONNECT THE TCPA-10 SPEAKER TO AN AMPLIFIER, ROUTE THE CABLE TO AN APPROPRIATE JUNCTION BOX. FOR EASE OF INSTALLATION INTO A JUNCTION BOX, A STRAIN-RELIEF CORD CONNECTOR IS INCLUDED. DISTRIBUTED AUDIO SYSTEMS HAVE FOUR LEAD WIRES. THE DUPLICATE WIRES ON THE DISTRIBUTED AUDIO IS FOR PLACING MULTIPLE UNITS IN SERIES (I.E. MULTIPLE TCPA-10S ON THE SAME DISTRIBUTED AUDIO LINE).



2 HYPERSPIKE TCPA-10 MOUNTING AND WIRING
FA5.1 N.T.S

100% SHOP DRAWING FOR PERMIT/CONSTRUCTION

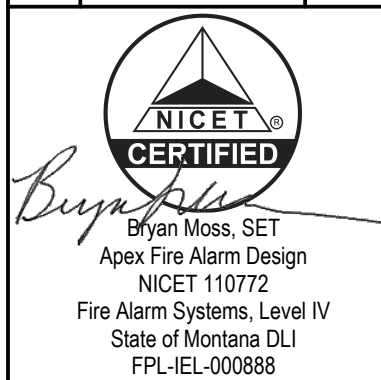
(BRICK BREEDEN) FIELDHOUSE
FIRE ALARM REPLACEMENT



MONTANA STATE UNIVERSITY
BOZEMAN



DRAWN BY: BSM		
REVIEWED BY: BSM		
REV.	DESCRIPTION	DATE

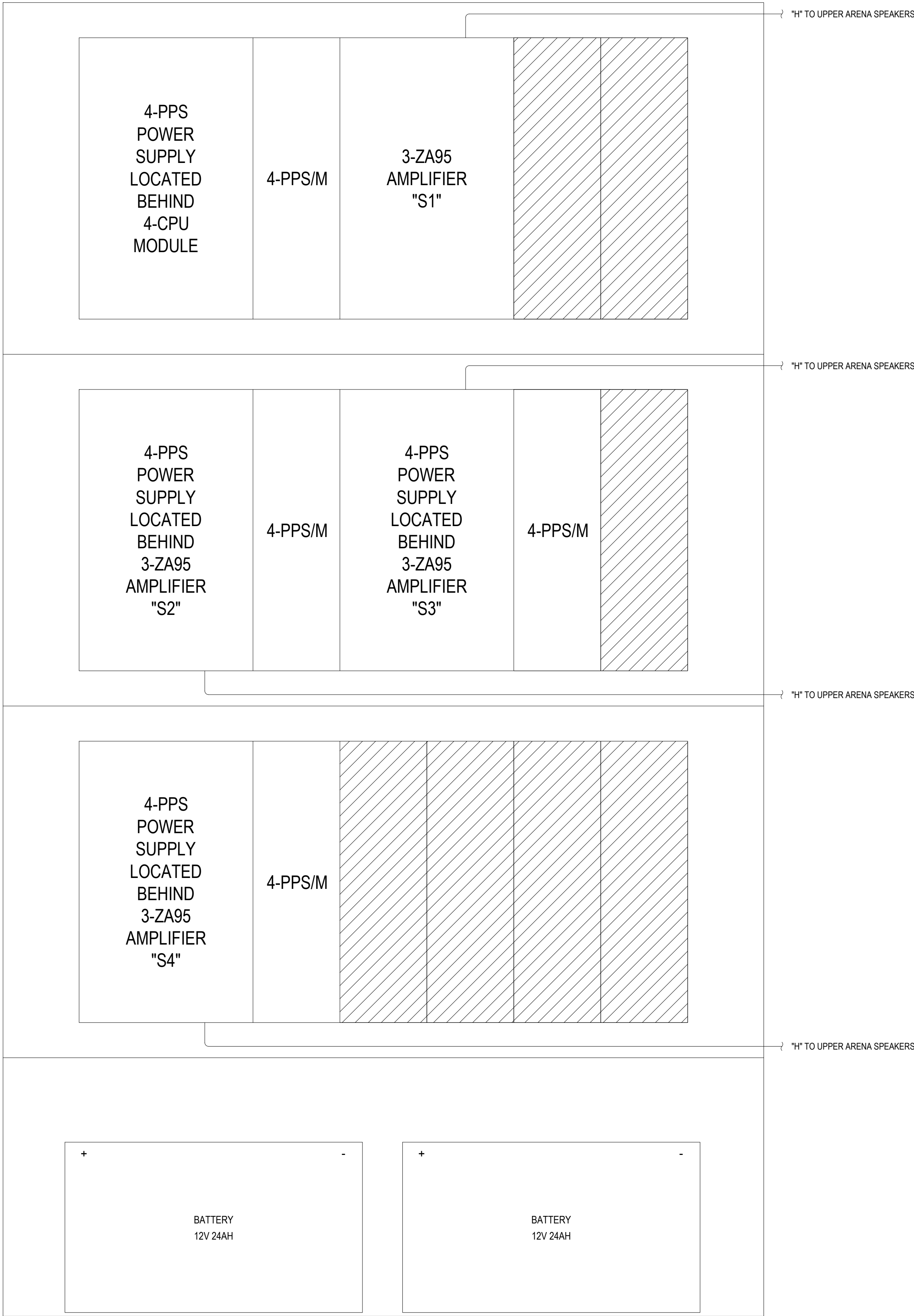


PPA#23-0928
AE# 2024-02-04D

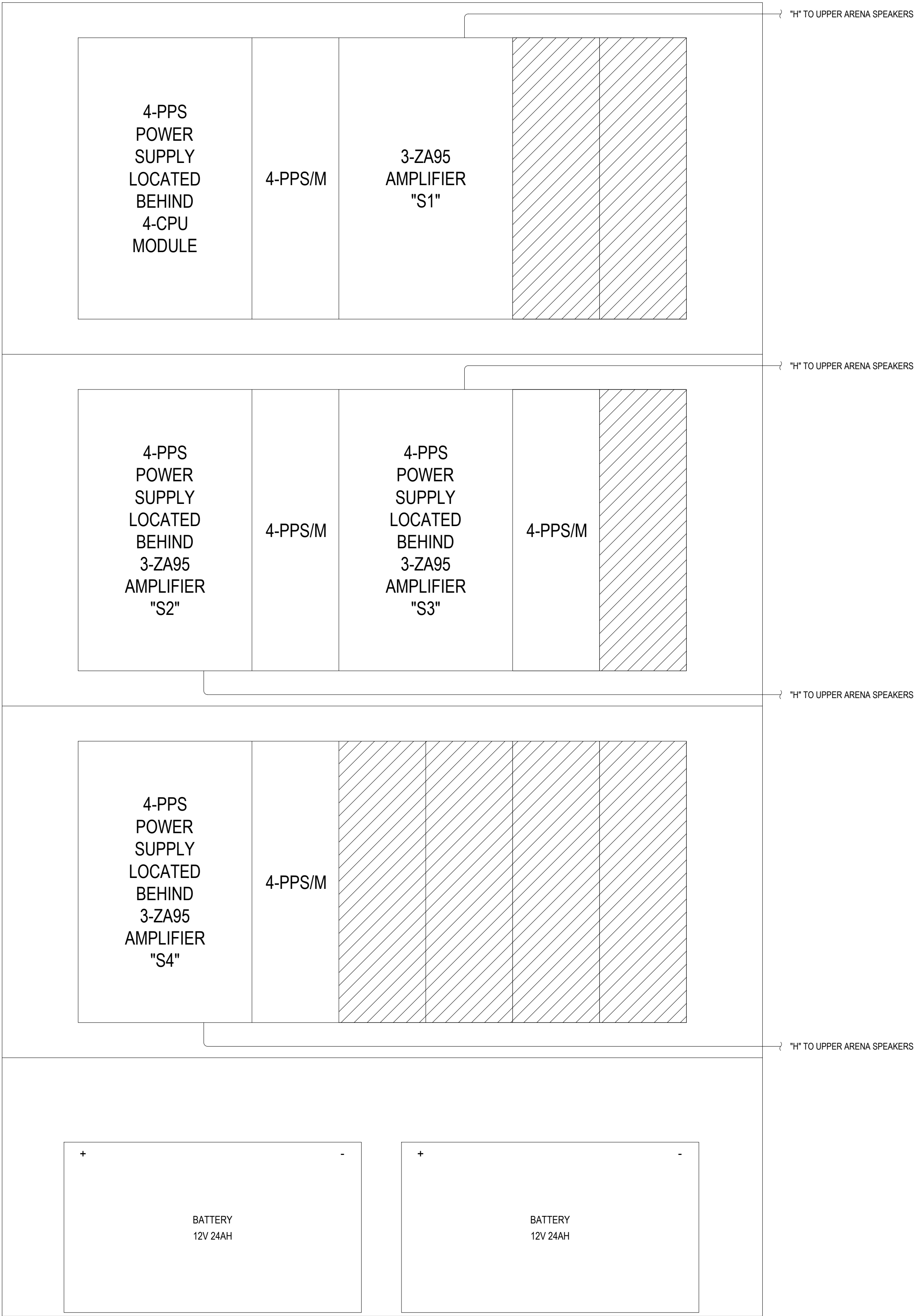
SHEET TITLE
HEADEND FACU
WIRING DETAIL

SHEET
FA5.1

DATE
10/22/2025



1 HSA:1 HYPERSPIKE SPEAKER AMPLIFIER ASSEMBLY
FA5.2 N.T.S



2 HSA:2 HYPERSPIKE SPEAKER AMPLIFIER ASSEMBLY
FA5.2 N.T.S



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FIRE ALARM REPLACEMENT
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REVIEWED BY: BSM		
REV.	DESCRIPTION	DATE

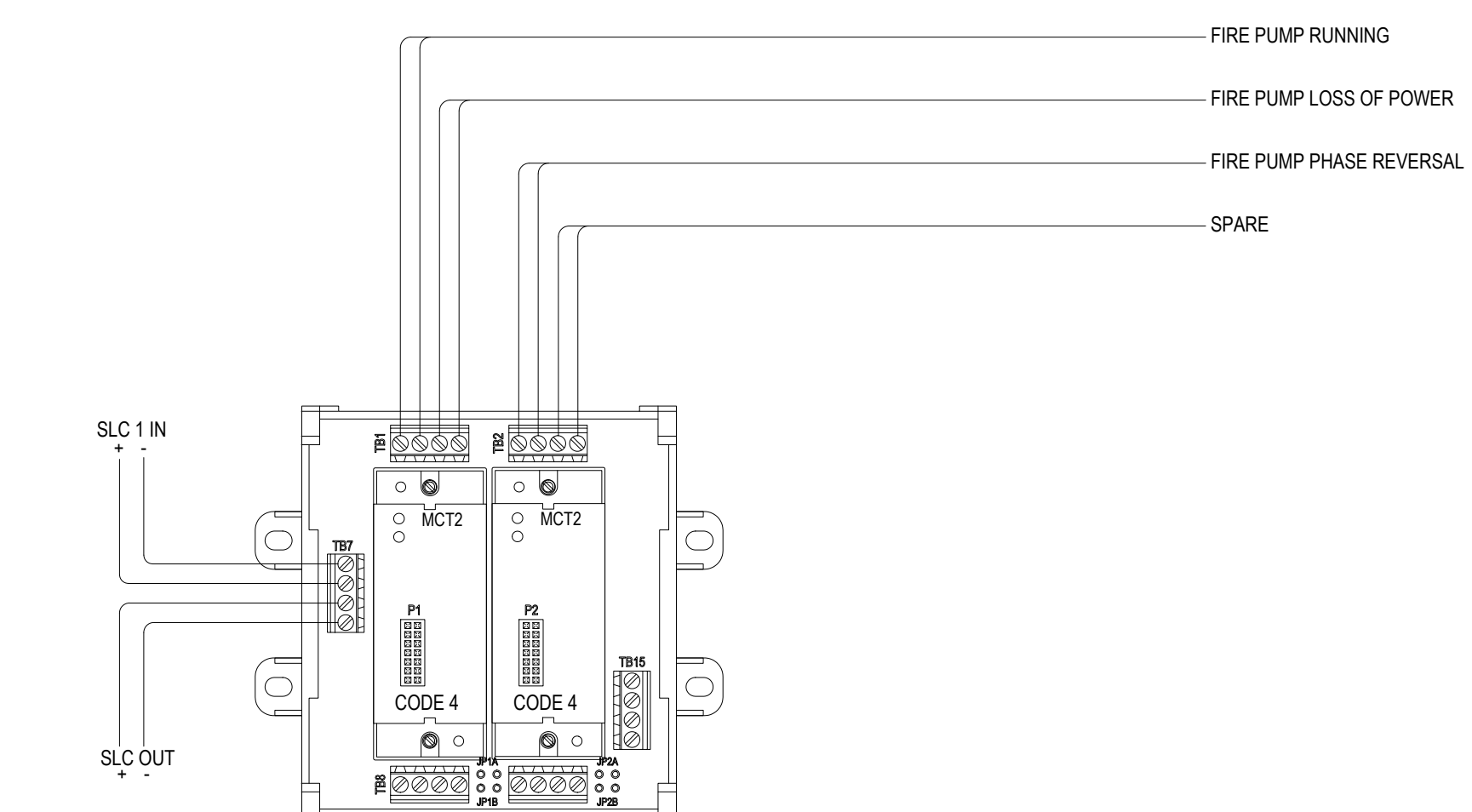
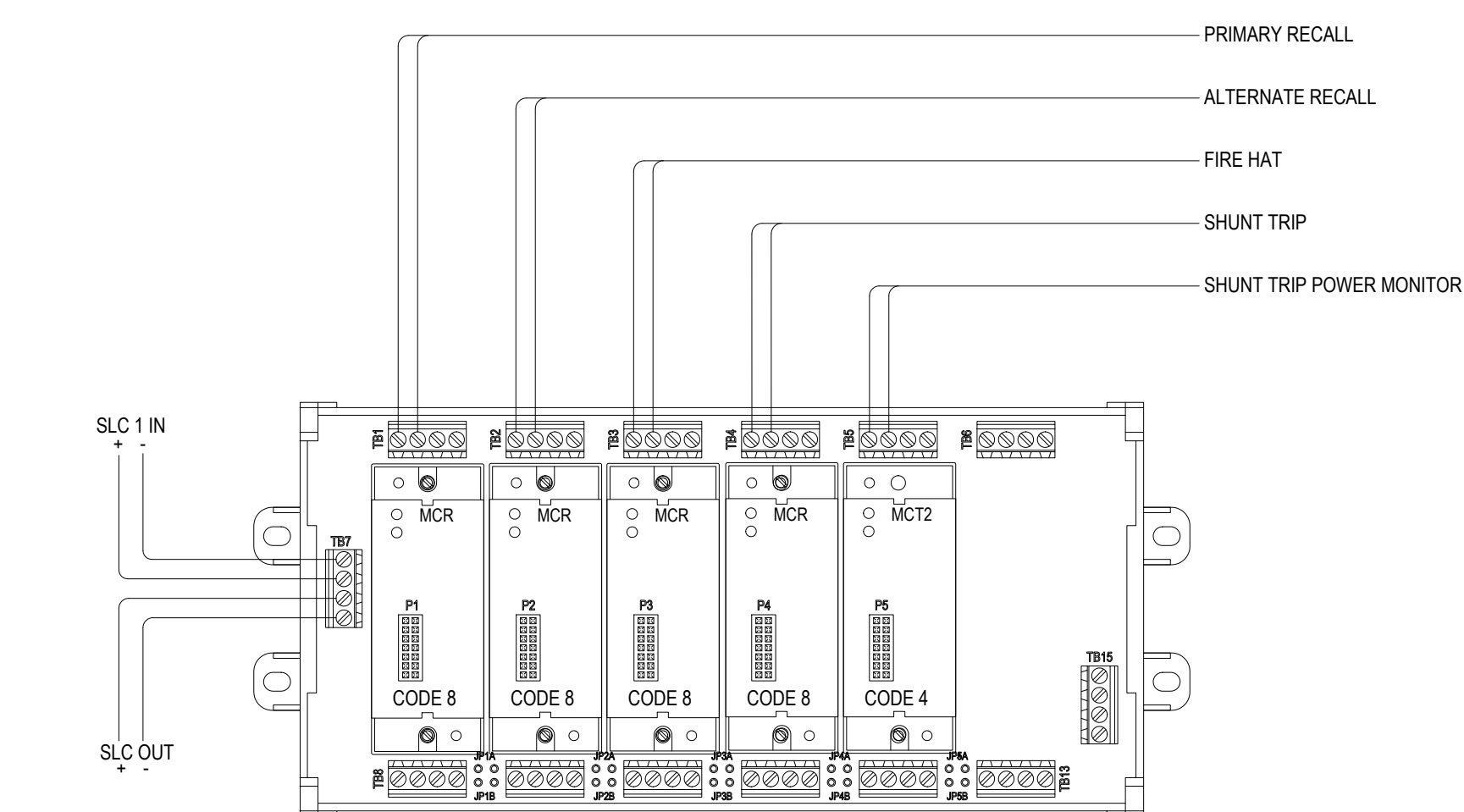
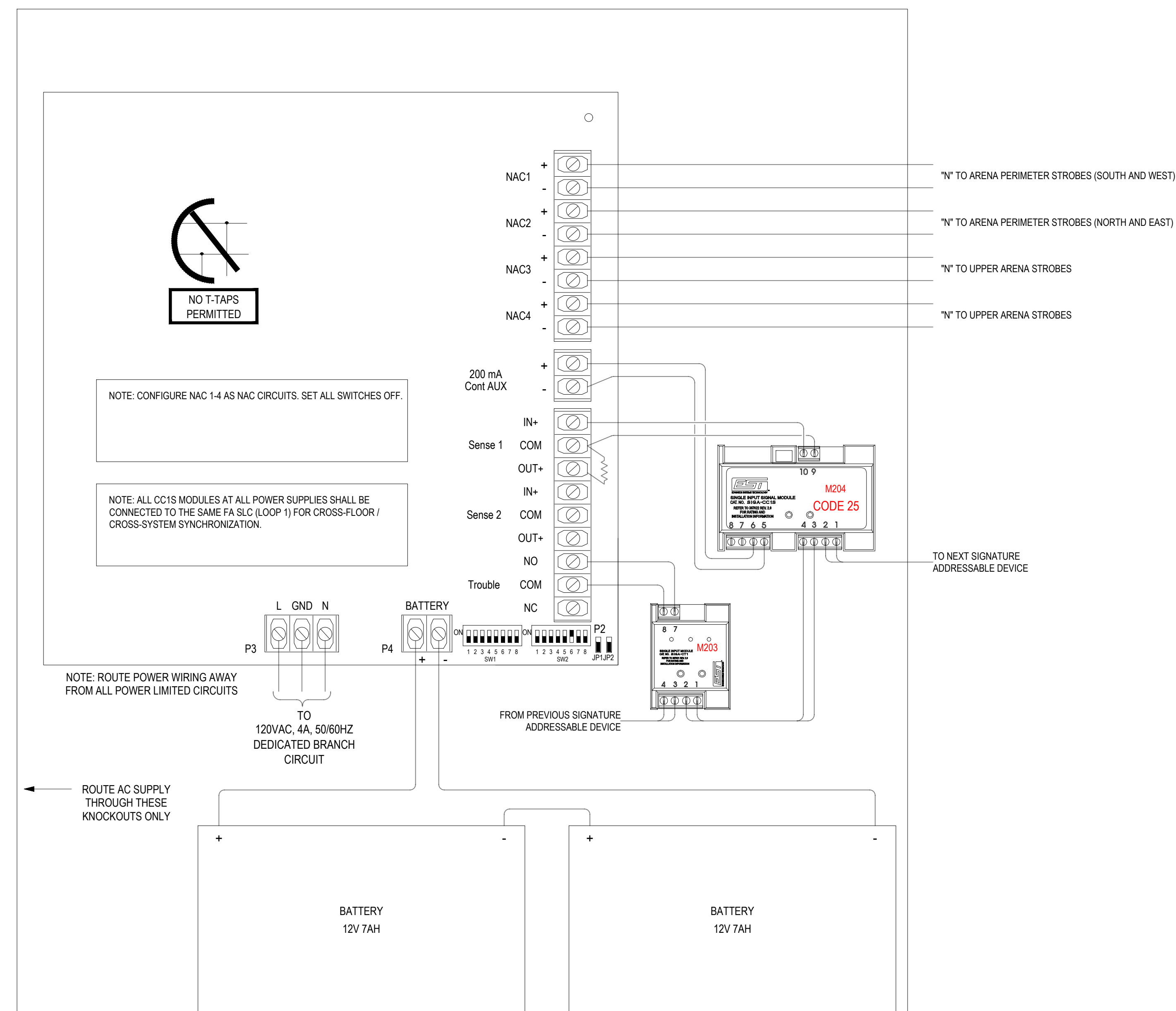


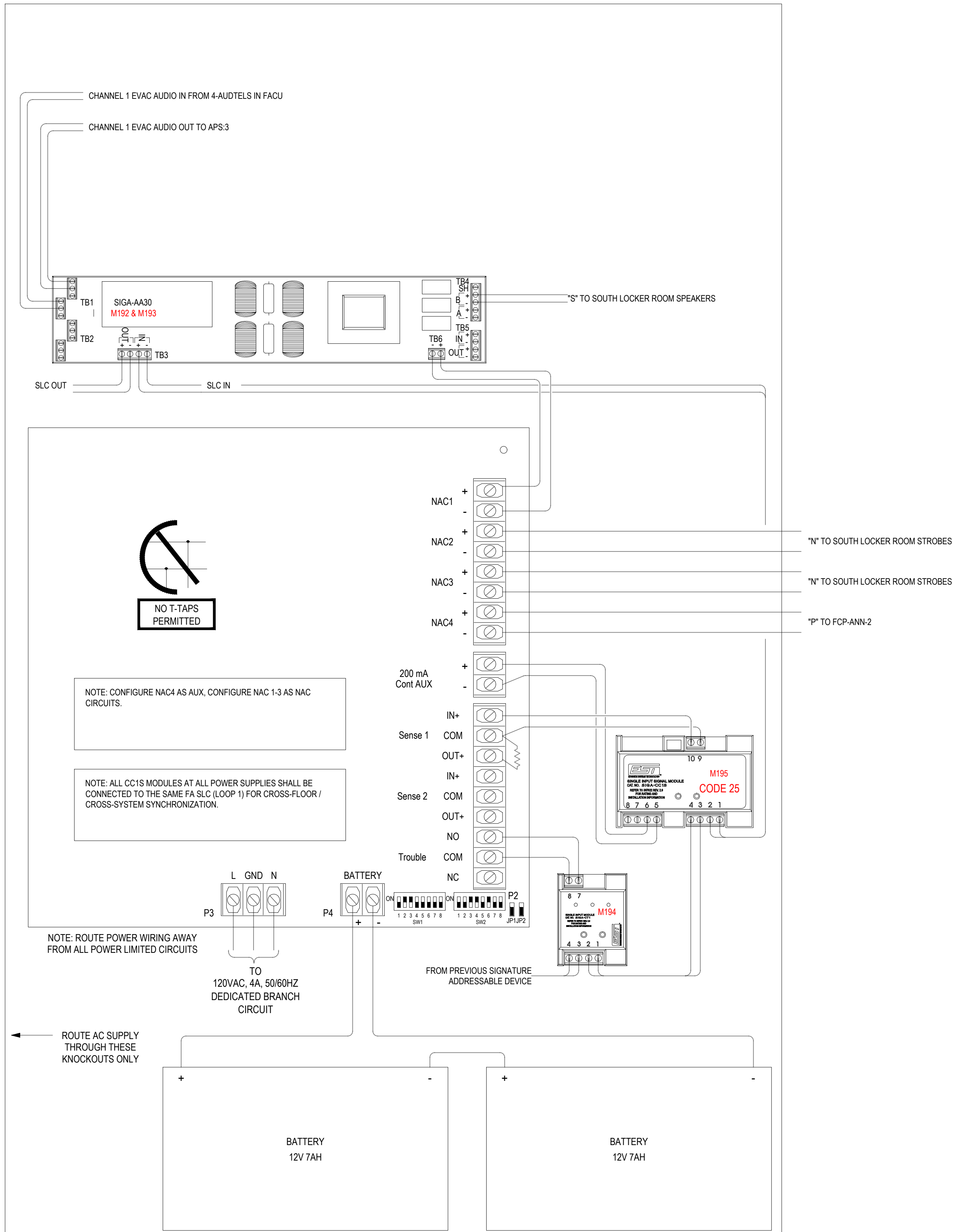
PPA#23-0928
AE# 2024-02-04D

SHEET TITLE
HEADEND AMP
WIRING DETAIL

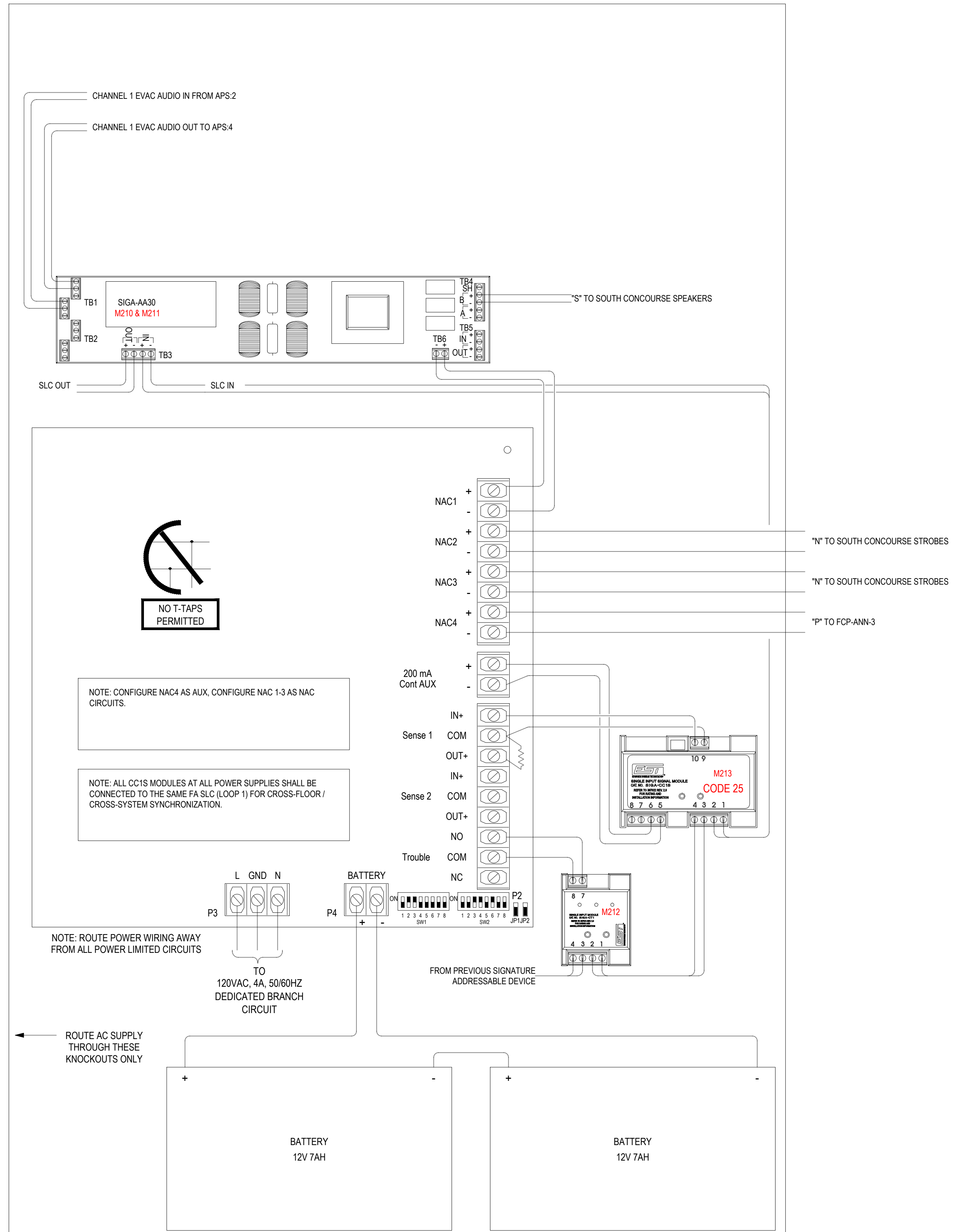
SHEET
FA5.2

DATE
10/22/2025





1 APS:2 WIRING AND DIP SWITCH CONFIGURATION
FA5.4 N.T.S



2 APS:3 WIRING AND DIP SWITCH CONFIGURATION
FA5.4 N.T.S



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REVIEWED BY: BSM		
REV.	DESCRIPTION	DATE

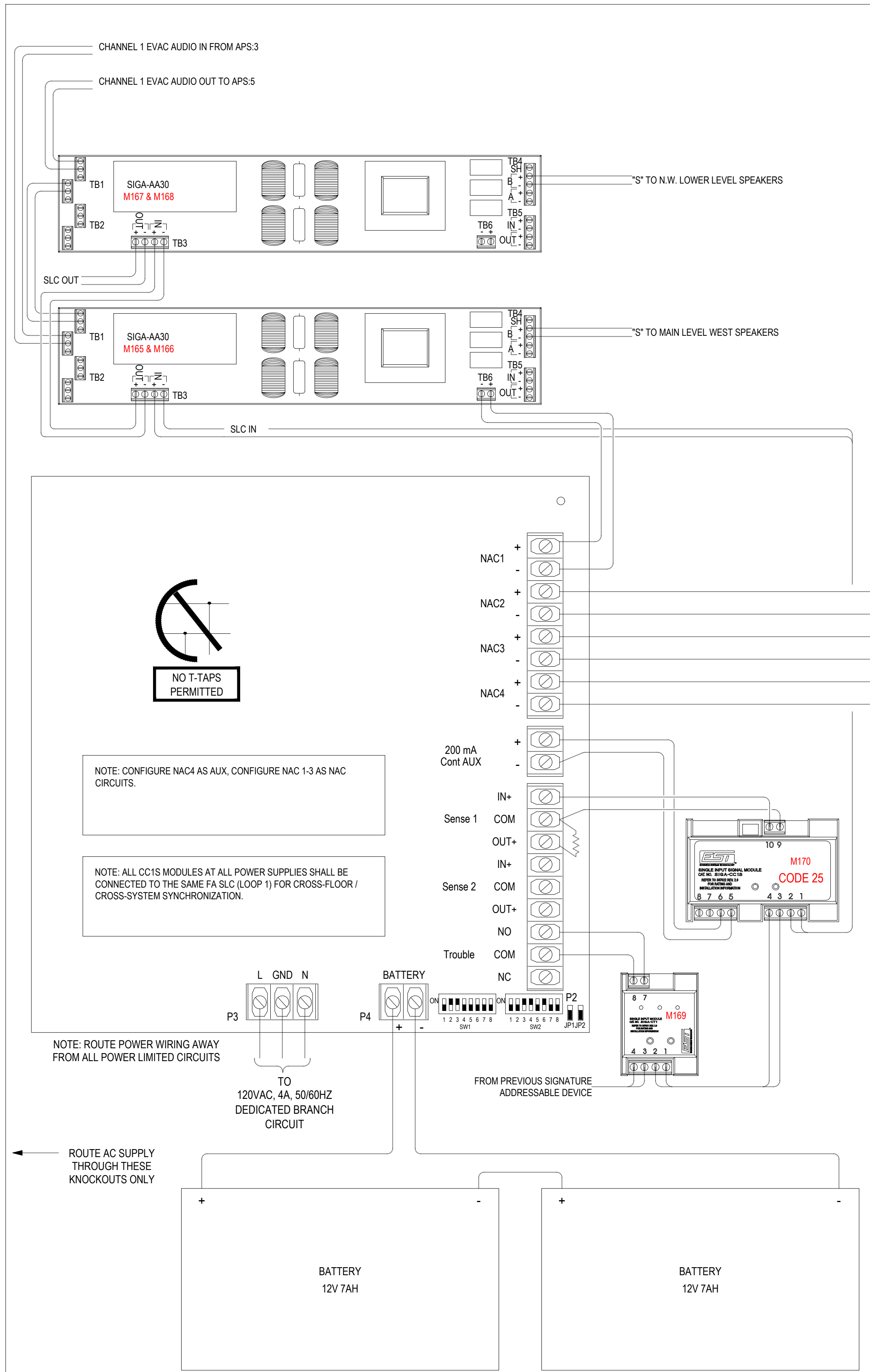


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AE# 2024-02-04D

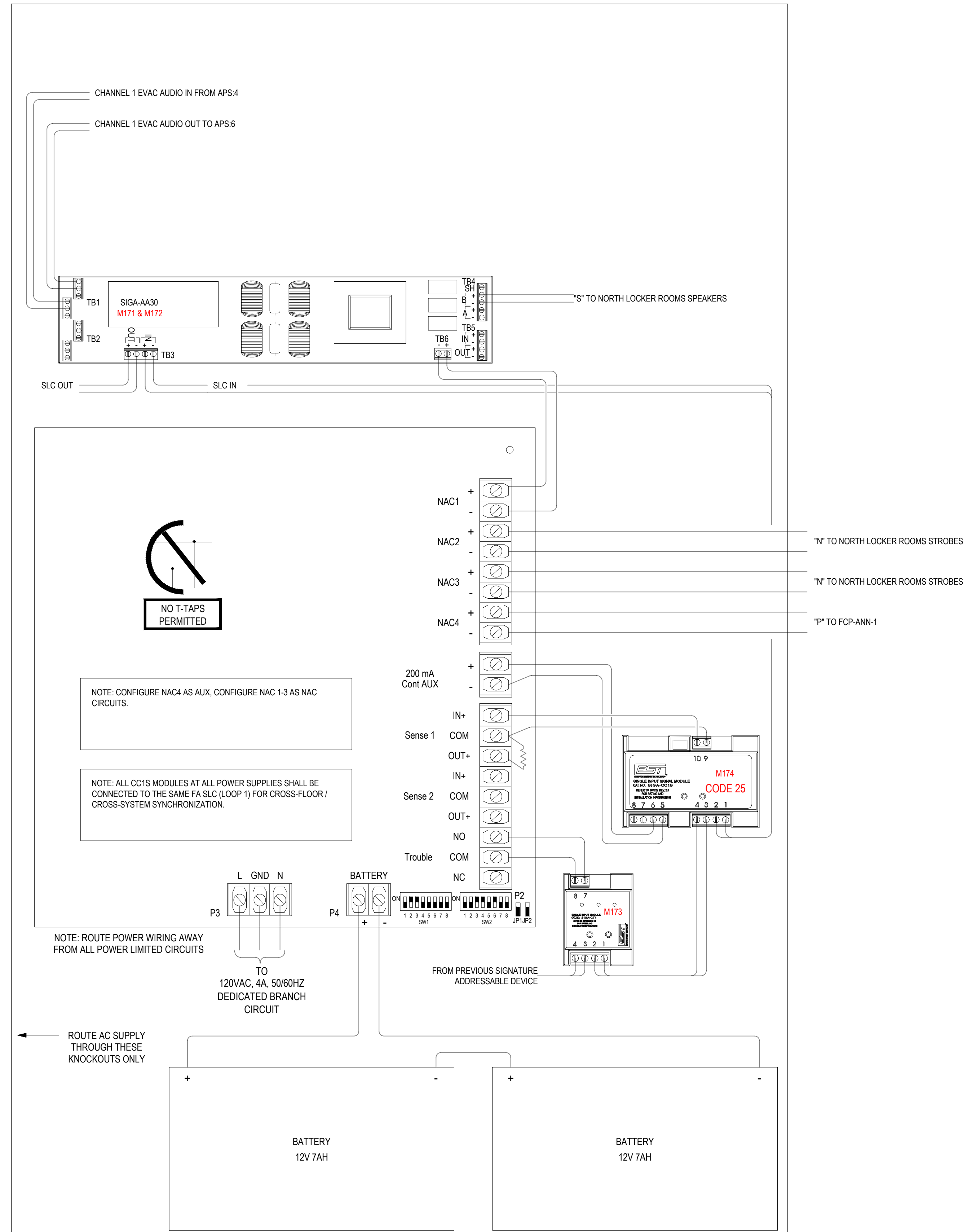
SHEET TITLE
HEADEND NAC
WIRING DETAIL

SHEET
FA5.4

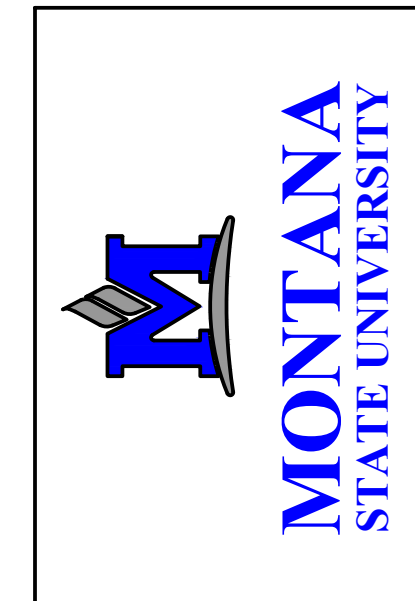
DATE
10/22/2025



1 APS:4 WIRING AND DIP SWITCH CONFIGURATION
FA5.5 N.T.S



2 APS:5 WIRING AND DIP SWITCH CONFIGURATION
FA5.5 N.T.S



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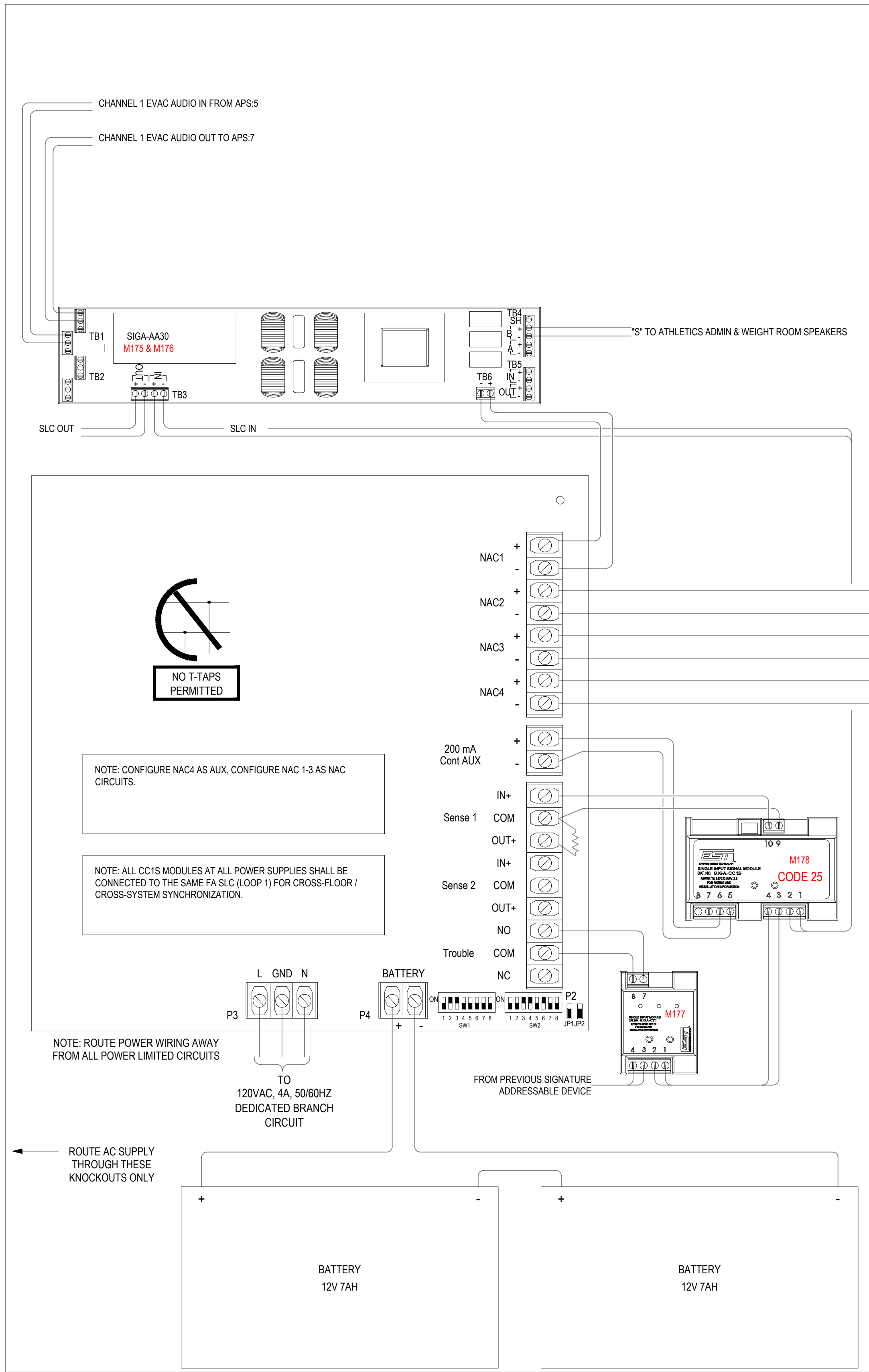


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REV.	DESCRIPTION	DATE

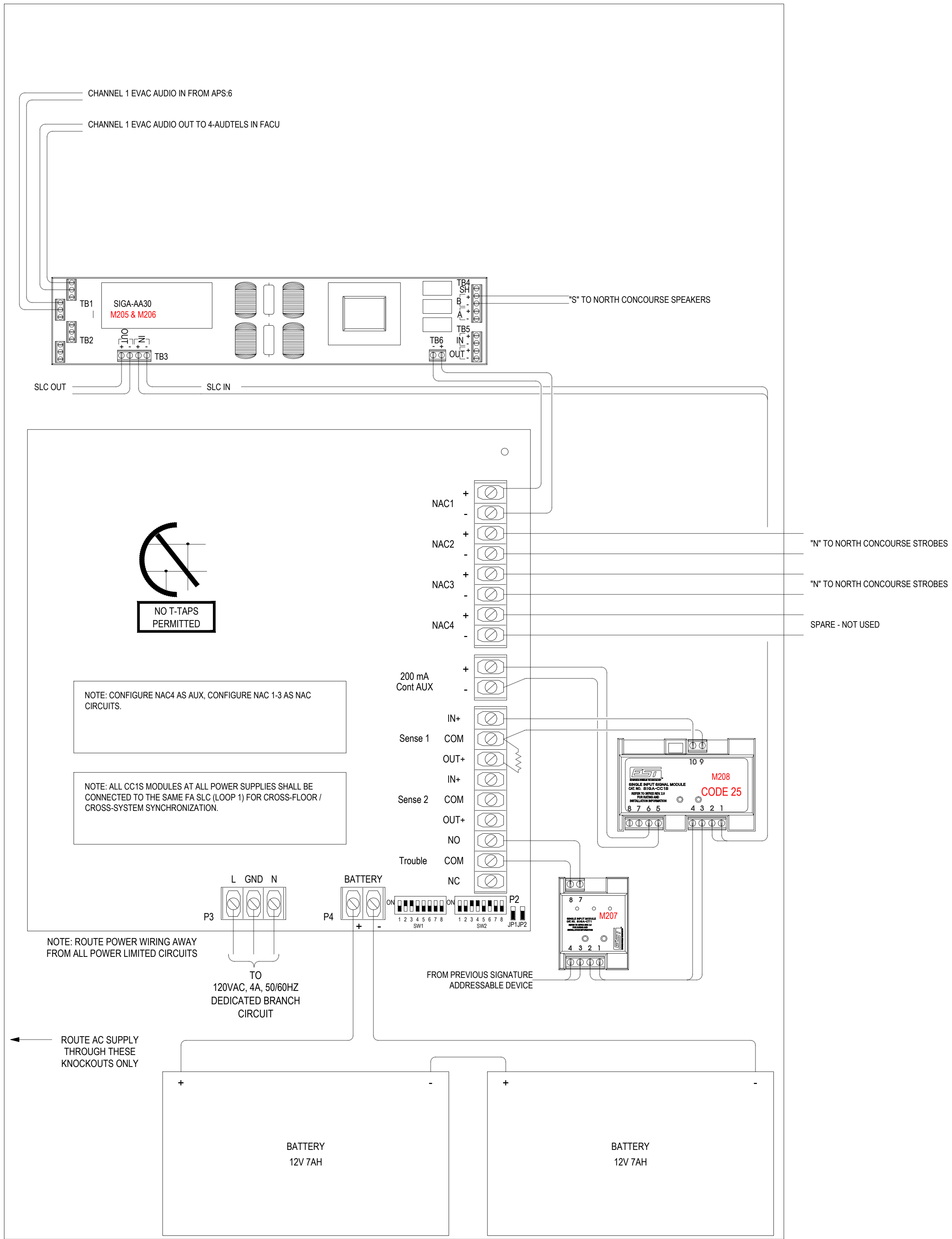


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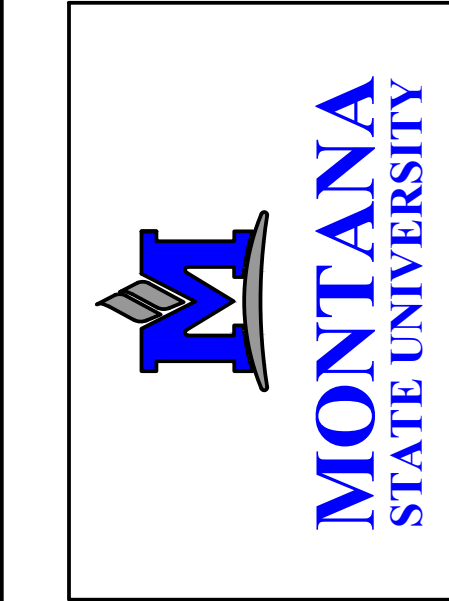
SHEET TITLE
HEADEND NAC
WIRING DETAIL
SHEET
FA5.5
DATE
10/22/2025



1 APS:6 WIRING AND DIP SWITCH CONFIGURATION
FA5.6 N.T.S



2 APS:7 WIRING AND DIP SWITCH CONFIGURATION
FA5.6 N.T.S



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FIRE ALARM REPLACEMENT

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REVIEWED BY: BSM		
REV.	DESCRIPTION	DATE

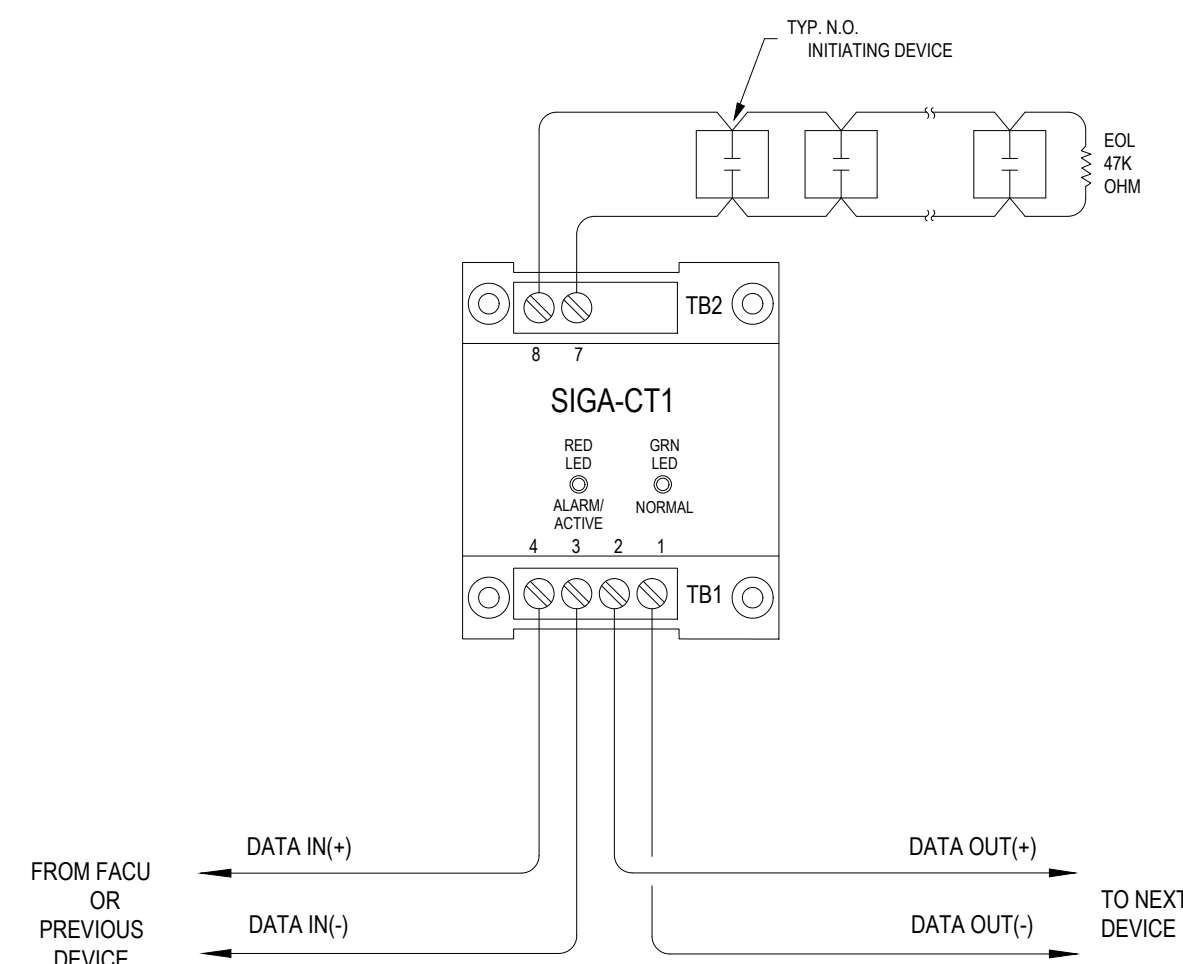


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AE# 2024-02-04D

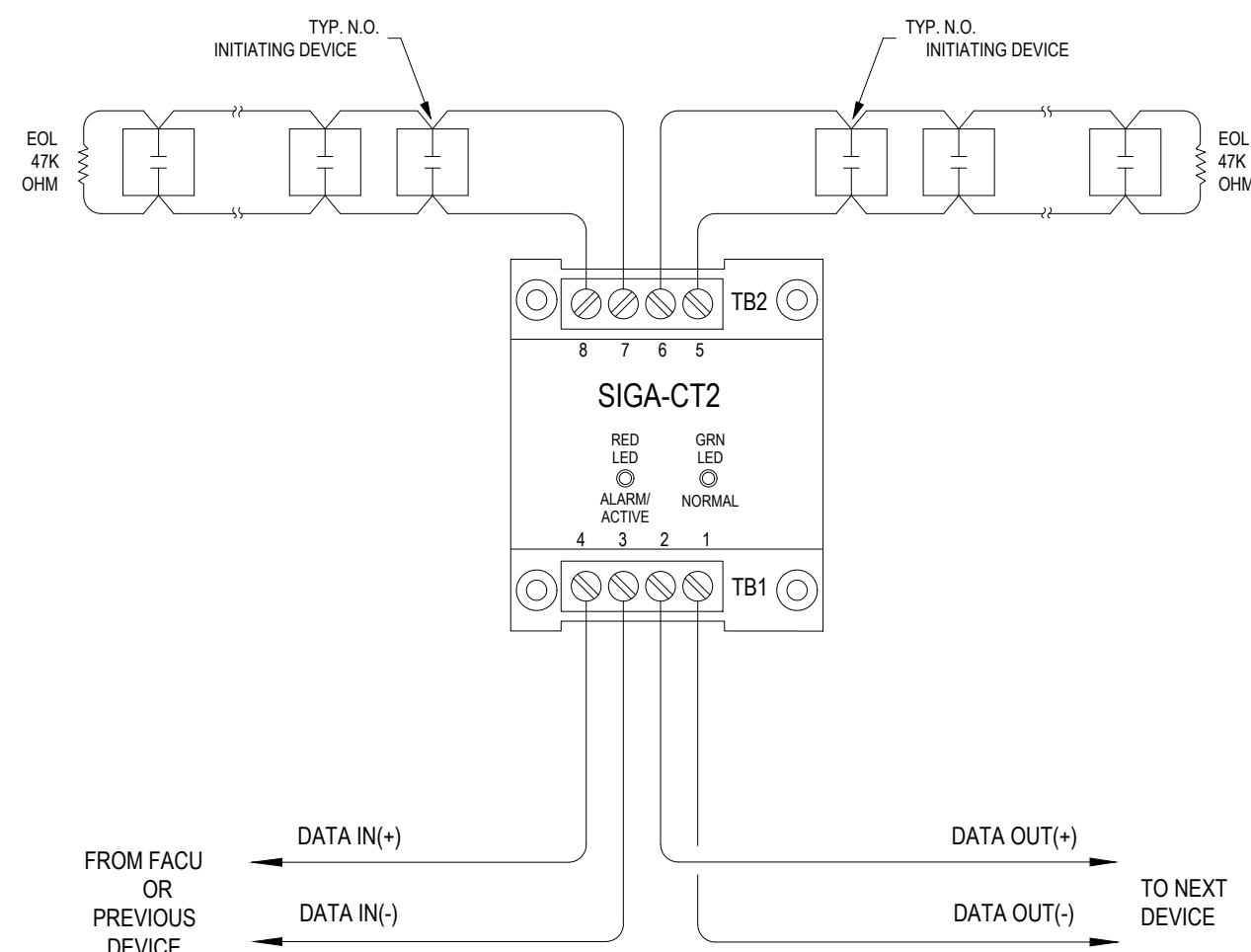
SHEET TITLE
HEADEND NAC
WIRING DETAIL

SHEET
FA5.6

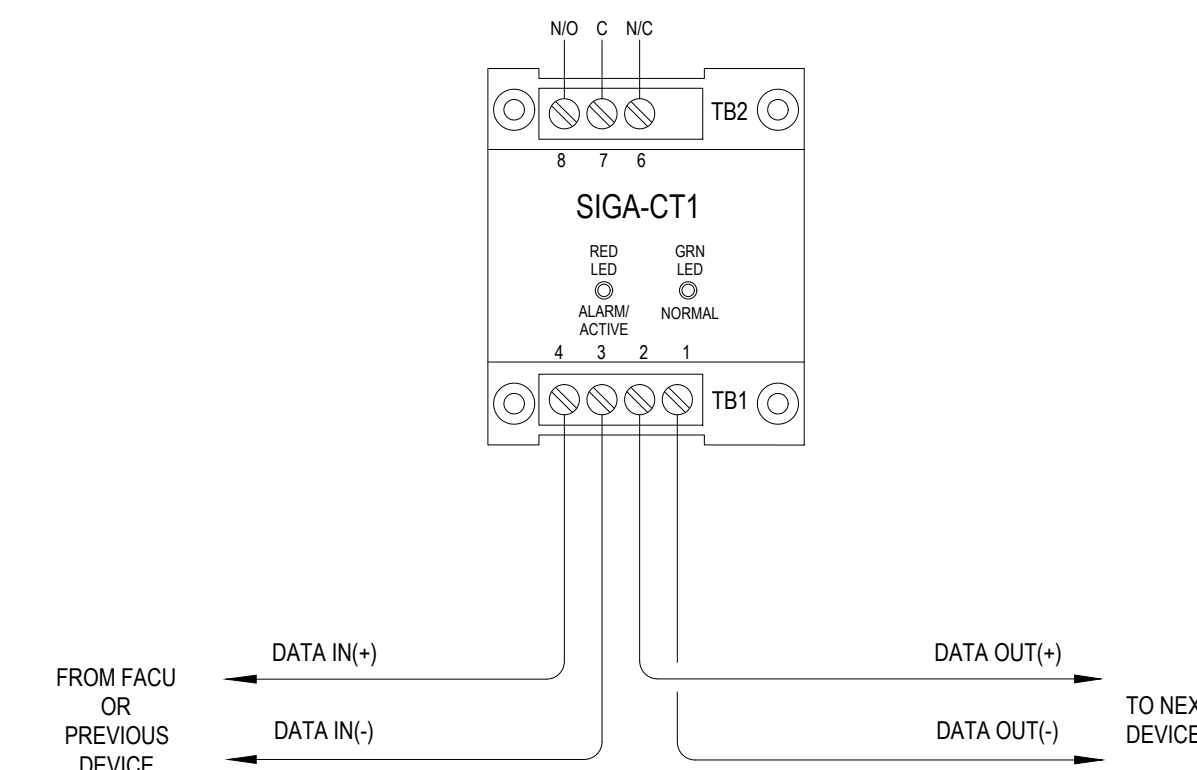
DATE
10/22/2025



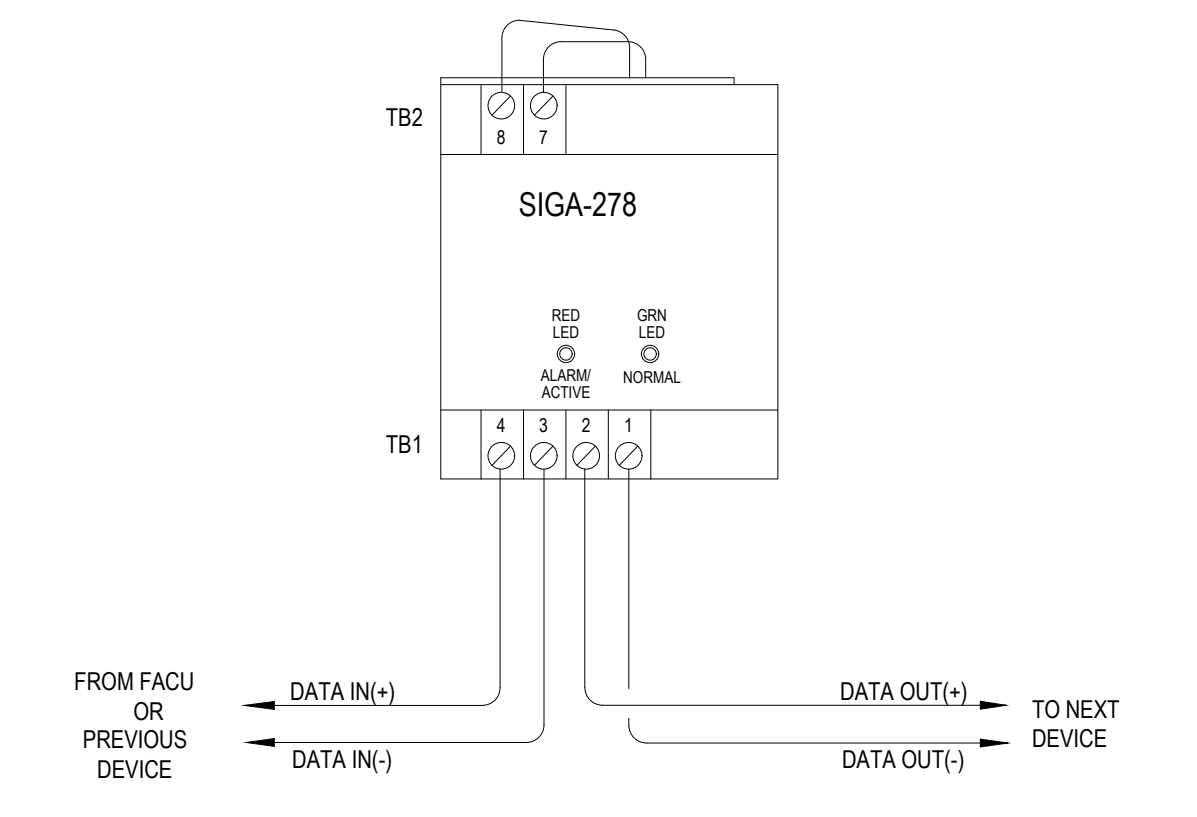
1 SINGLE INPUT MODULE - SIGA-CT1
FA5.3 N.T.S.



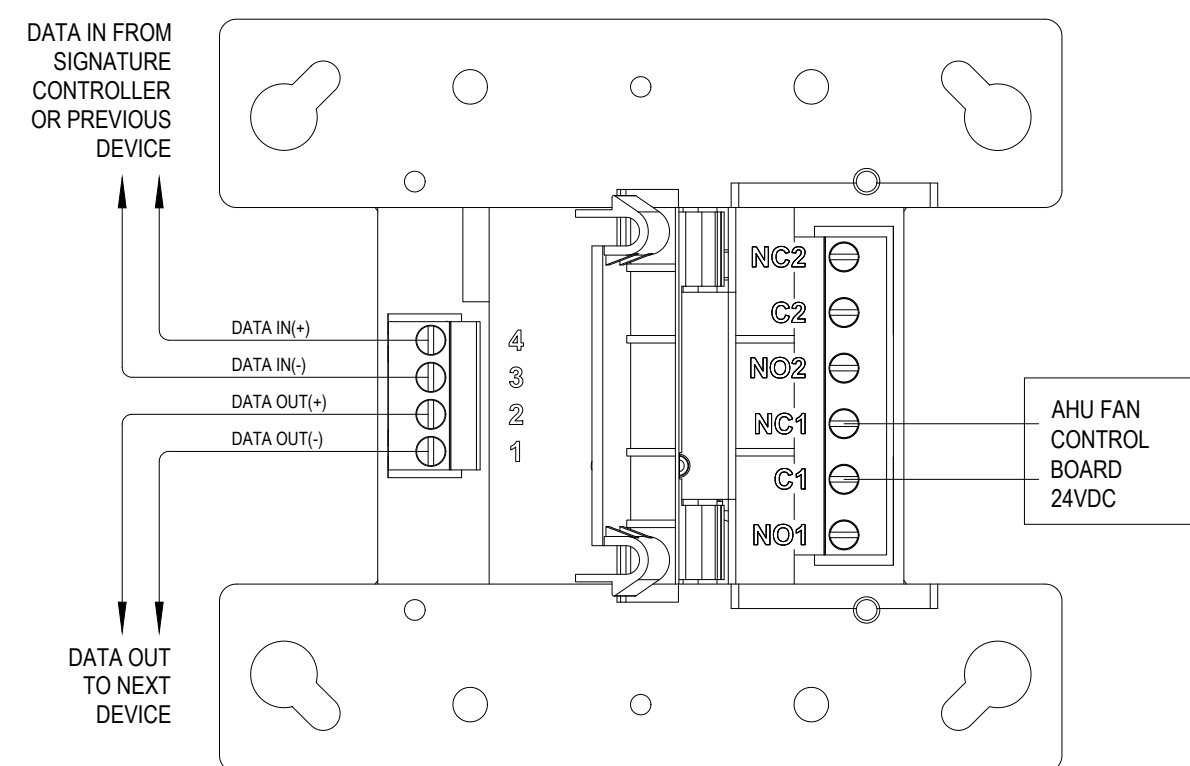
2 DUAL INPUT MODULE - SIGA-CT2
FA5.3 N.T.S.



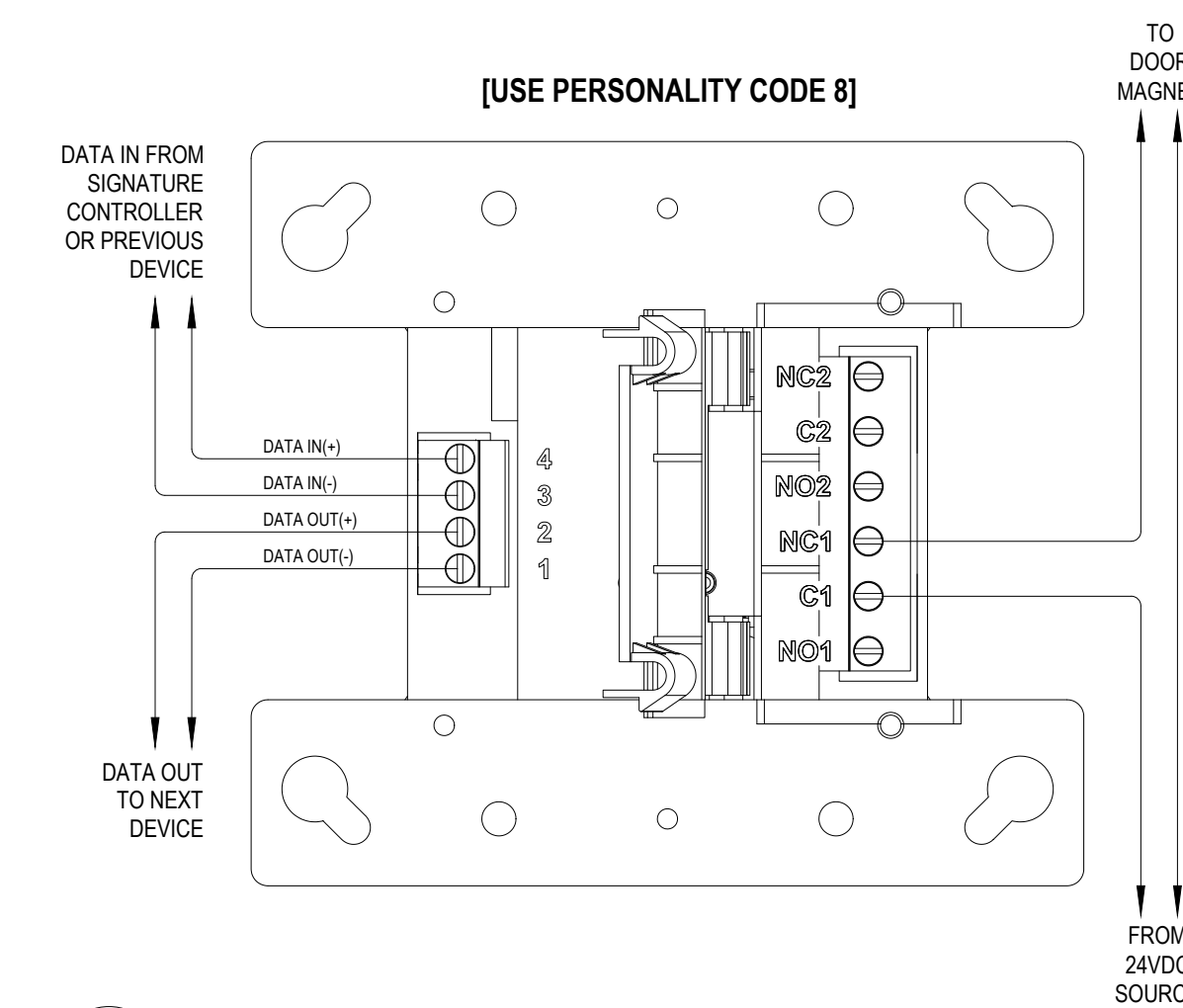
3 RELAY MODULE - SIGA-CR
FA5.3 N.T.S.



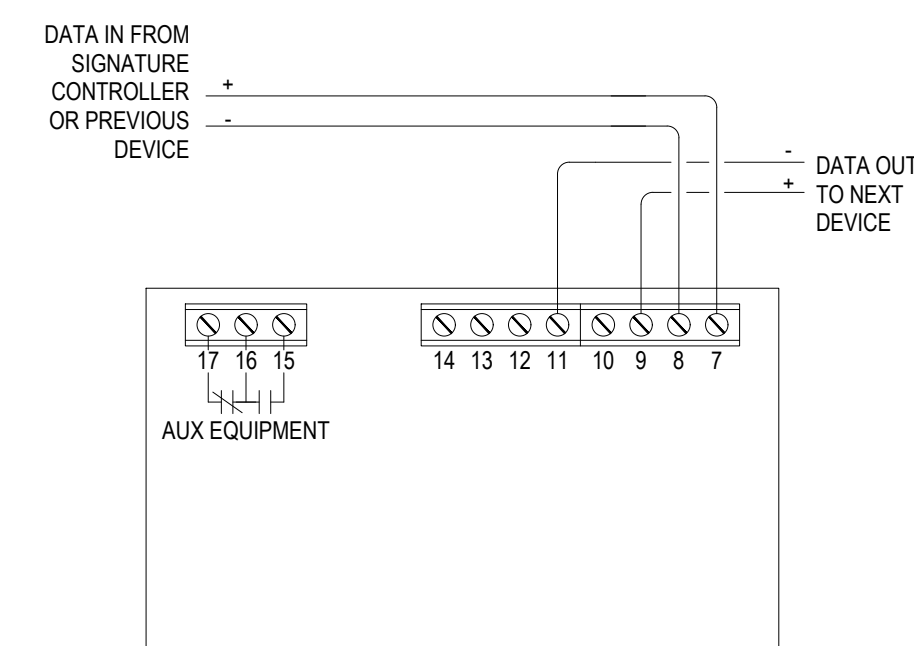
4 MANUAL STATION - SIGA-278
FA5.3 N.T.S.



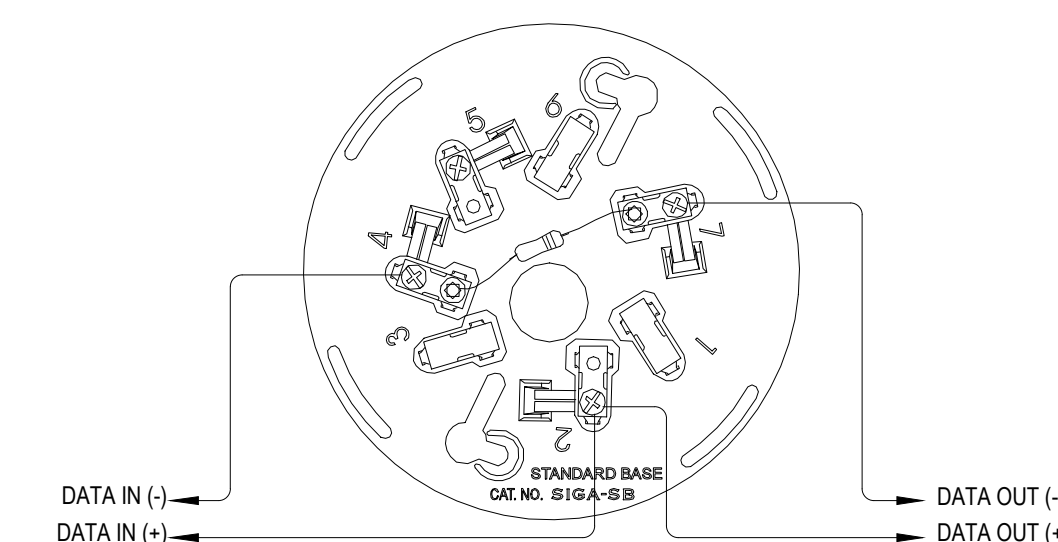
5 RELAY MODULE - SIGA-CRH (FAN / FSD CONTROL)
FA5.3 N.T.S.



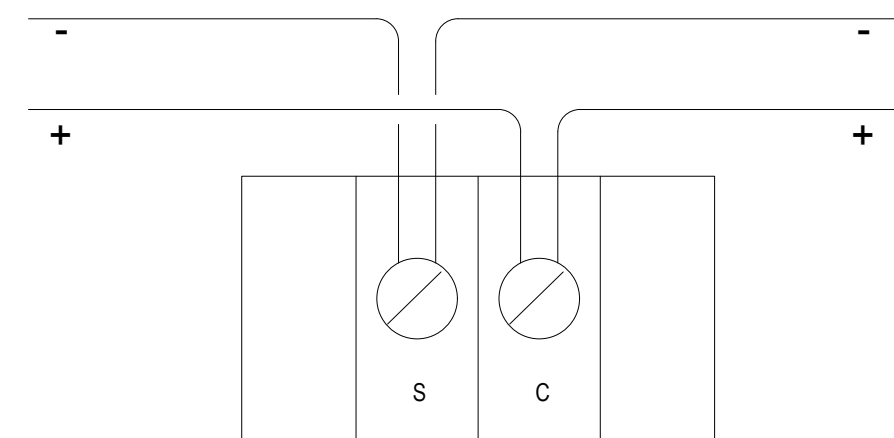
5 RELAY MODULE - SIGA-CRH (DOOR HOLDERS)
FA5.3 N.T.S.



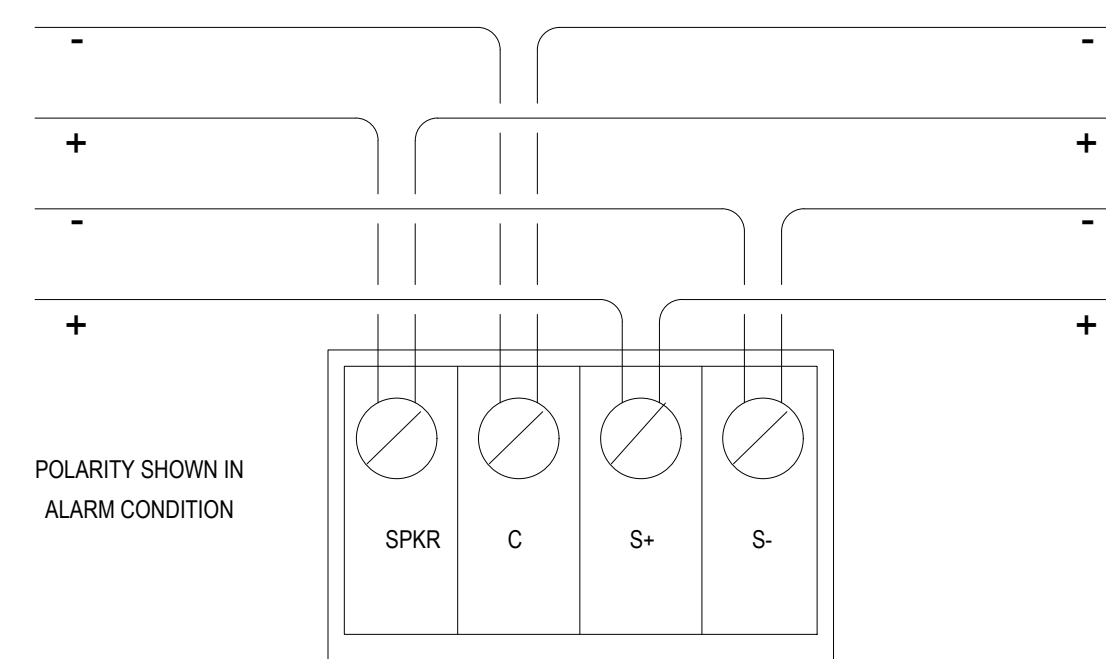
6 DUCT SMOKE DETECTOR EST SIGA-DDOS
FA5.3 N.T.S.



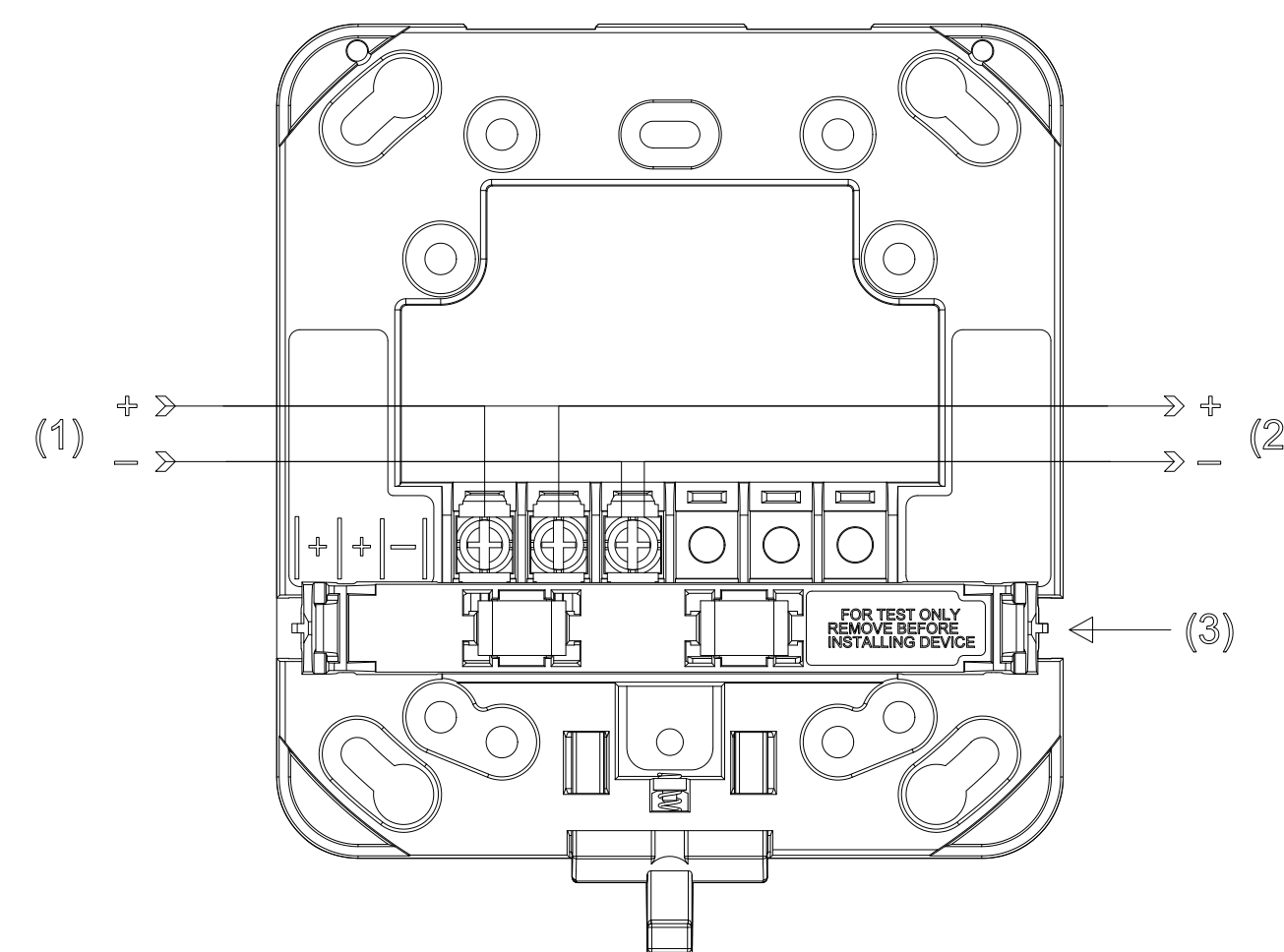
7 SIGA DETECTOR - SIGA-OSD/HFD W/ SIGA-SB/SB4
FA5.3 N.T.S.



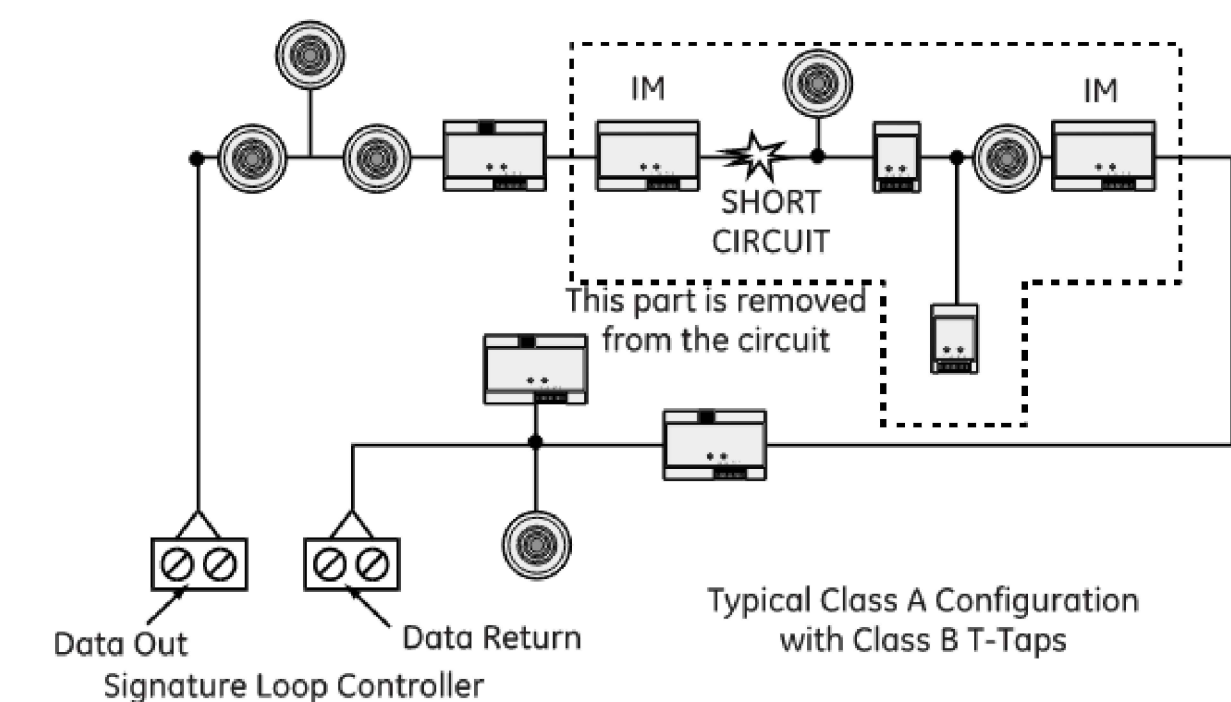
9 SPEAKER ONLY EST G4SWA/GCSWA
FA5.3 N.T.S.



10 SPEAKER/STROBE G4SVWA/GCSVWA
FA5.3 N.T.S.



11 STROBES - G4 SERIES NOTIFICATION
FA5.3 N.T.S.



4 SLC ISOLSTION - SIGA-IM2 (TYPICAL)
FA5.3 N.T.S.

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(BRICK BREEDEN) FIELDHOUSE
FIRE ALARM REPLACEMENT

MONTANA STATE UNIVERSITY
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APEX
FIRE ALARM DESIGN, LLC

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REVIEWED BY: BSM
REV. DESCRIPTION DATE

NICET
CERTIFIED
Bryan Moss, SET
Apex Fire Alarm Design
NICET 110772
Fire Alarm Systems, Level IV
State of Montana DLI
FPL-IEL-000888

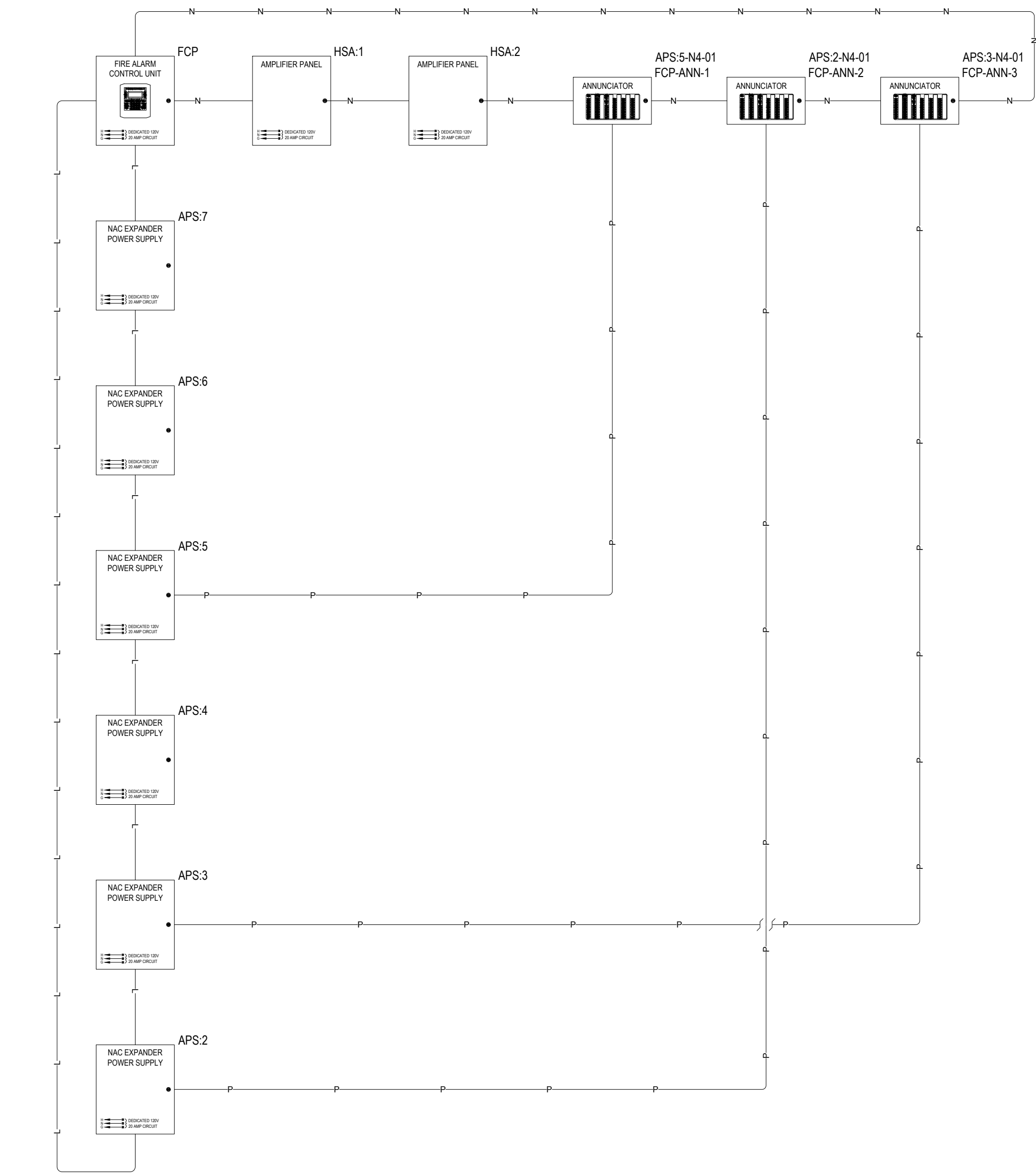
PPA#23-0928
AE# 2024-02-04D

SHEET TITLE
DEVICE WIRING
DETAIL

SHEET
FA5.7

DATE
10/22/2025

			CIRCUIT SETTINGS		TOTALS	
FCP L1 DEVICE SCHEDULE			MAX. CIRCUIT LENGTH (FT)	20000	TOTAL CIRCUIT LENGTH (FT)	4330
			MAX. SLC EST3 SENSORS:	125	TOTAL USED SLC EST3 SENSORS:	79
			MAX. SLC EST3 MODULES:	125	TOTAL USED SLC EST3 MODULES:	95
CIRCUIT WIRING PROPERTIES: 'A' 18/2 FPLP (SLC) 18 AWG, 2 COND. SOLID COPPER FPLP ADDRESSABLE UNSHIELDED (LOW CAP)						
DISTANCE MEASURED USING DRAWN SEGMENT LENGTHS WITH 30.00 % ADDITIONAL LENGTH CALCULATED						
DEVICE LABEL	PART NO	DESCRIPTION	DEVICE LABEL	PART NO	DESCRIPTION	
D001	SIGA-IM2	ISOLATOR MODULE	D005	SIGA-OSHD W/SIGA-SB4 BASE	MECH RM 135 MULTISENSOR SMOKE AND HEAT DETECTOR	
M126	SIGA-278	FACU - MANUAL FIRE ALARM STATION	M179	SIGA-MCR (MFC-A)	MECH RM 135 - ELEV 1 PHASE 1 DESIGNATED LEVEL RECALL	
D002	SIGA-OSD W/SIGA-SB4 BASE	FACU - SMOKE DETECTOR	M180	SIGA-MCR (MFC-A)	MECH RM 135 - ELEV 1 PHASE 1 ALTERNATE LEVEL RECALL	
D003	SIGA-IM2	ISOLATOR MODULE	M181	SIGA-MCR (MFC-A)	MECH RM 135 - ELEV 1 POWER SHUTDOWN	
D004	SIGA-IM2	ISOLATOR MODULE	M182	SIGA-MCR (MFC-A)	MECH RM 135 - ELEV 1 FIRE HAT (FUTURE USE)	
M127	SIGA-MCT2 (MFC-A)	MECH RM 121 - FIRE PUMP RUNNING	M183	SIGA-MCT2 (MFC-A)	MECH RM 135 - ELEV 1 SHUNT CONTROL POWER MONITOR	
M128		MECH RM 121 - FIRE PUMP LOSS OF POWER	M184		SPARE (OTHER HALF OF MCT2)	
M129	SIGA-MCT2 (MFC-A)	MECH RM 121 - FIRE PUMP PHASE REVERSAL	D036	SIGA-HRD W/SIGA-SB4 BASE	ELEVATOR 1 - BOTTOM OF SHAFT HEAT DETECTOR	
M130		SPARE (OTHER HALF OF MCT2)	D037	SIGA-OSD W/SIGA-SB4 BASE	ELEVATOR 1 MAIN LOBBY SMOKE DETECTOR	
M131	SIGA-278	MECH RM 121 - MANUAL FIRE ALARM STATION	M185	SIGA-CR	JANITOR 132B DOOR MAG CONTROL	
M132	SIGA-CT2	MECH RM 121 - ARENA SYSTEM #1 - TAMPER	D038	SIGA-OSD W/SIGA-SB4 BASE	CORRIDOR 185 @ JANITOR 132B SMOKE DETECTOR	
M133		MECH RM 121 - ARENA SYSTEM #1 - FLOW	D039	SIGA-OSD W/SIGA-SB4 BASE	CORRIDOR 185 WEST FIRE DOORS SMOKE DETECTOR	
M134	SIGA-CT2	MECH RM 121 - ARENA SYSTEM #4 - TAMPER	M186	SIGA-CR	CORRIDOR 185 WEST FIRE DOOR MAGS	
M135		MECH RM 121 - ARENA SYSTEM #4 - FLOW	D040	SIGA-OSD W/SIGA-SB4 BASE	CORRIDOR 185 WEST FIRE DOORS SMOKE DETECTOR	
M136	SIGA-CT2	MECH RM 121 - NORTH CONCOURSE & ARENA - TAMPER	D041	SIGA-OSHD W/SIGA-SB4 BASE	ELEV 3 TOP OF SHAFT MULTISENSOR SMOKE AND HEAT DETECTOR	
M137		MECH RM 121 - NORTH CONCOURSE & ARENA - FLOW	D042	SIGA-OSD W/SIGA-IB BASE	ELEVATOR 3 MAIN LOBBY SMOKE DETECTOR	
M138	SIGA-CT2	MECH RM 121 - SOUTH CONCOURSE & ARENA - TAMPER	D043	SIGA-IM2	ISOLATOR MODULE	
M139		MECH RM 121 - SOUTH CONCOURSE & ARENA - FLOW	M187	SIGA-CR	CORRIDOR 175 WEST FIRE DOOR MAGS	
M140	SIGA-CT2	MECH RM 121 - ARENA SYSTEM #2 - TAMPER	D044	SIGA-OSD W/SIGA-SB4 BASE	CORRIDOR 175 WEST FIRE DOORS SMOKE DETECTOR	
M141		MECH RM 121 - ARENA SYSTEM #2 - FLOW	D045	SIGA-DDOS	OFFICE 104 DUCT SMOKE DETECTOR	
M142	SIGA-CT2	MECH RM 121 - ARENA SYSTEM #3 - TAMPER	M188	SIGA-278	RECEPTION 101 MANUAL FIRE ALARM STATION	
M143		MECH RM 121 - ARENA SYSTEM #3 - FLOW	M189	SIGA-CRH	S.W. MECH RM. 105 DAMPER CONTROL	
M144	SIGA-CT1	MECH RM 121 - TEST HEADER VALVE TAMPER	D046	SIGA-OSD W/SIGA-SB4 BASE	CORRIDOR 175 WEST FIRE DOORS SMOKE DETECTOR	
M145		MECH RM 121 - WEST LOBBY & LOWER LEVEL - TAMPER	D047	SIGA-OSD W/SIGA-SB4 BASE	CORRIDOR 175 EAST FIRE DOORS SMOKE DETECTOR	
M146	SIGA-CT2	MECH RM 121 - WEST LOBBY & LOWER LEVEL - FLOW	M190	SIGA-CR	CORRIDOR 175 EAST FIRE DOOR MAGS	
M147		MECH RM 121 - PUMP TEST VALVE #2	D048	SIGA-OSD W/SIGA-IB BASE	VESTIBULE 178 SMOKE DETECTOR	
M148	SIGA-CT2	MECH RM 121 - PUMP ISOLATION OS&Y #2	D049	SIGA-DDOS	SHOWER 108C DUCT DETECTOR	
M149		MECH RM 121 - PUMP BYPASS VALVE #2	M191	SIGA-CRH	SOUTH LOCKER ROOM FSD CONTROL	
M150	SIGA-CT2	MECH RM 121 - PUMP BYPASS VALVE #1	M192	APS6A W/SIGA-AA30	TAPING ISSUE BOXES 114 - APS.2 AA30	
M151		MECH RM 121 - PUMP ISOLATION OS&Y #1	M193			
M152	SIGA-CT2	MECH RM 121 - PUMP TEST VALVE #1	M194	SIGA-CT1	TAPING ISSUE BOXES 114 - APS.2 TROUBLE MONITOR	
M153		MECH RM 121 - BACK FLOW OS&Y #1	M195	SIGA-CC1S	TAPING ISSUE BOXES 114 - APS.2 SENSE 1 NAC TRIGGER	
M154	SIGA-CT2	MECH RM 121 - BACK FLOW OS&Y #2	D050	SIGA-OSD W/SIGA-SB4 BASE	TAPING ISSUE BOXES APS.2 SMOKE DETECTOR	
D005		SIGA-IM2	ISOLATOR MODULE	D051	SIGA-OSD W/SIGA-SB4 BASE	ELEVATOR 2 LOWER LOBBY SMOKE DETECTOR
D006	SIGA-DDOS	VISITING TEAM 123 - DUCT SMOKE DETECTOR	M196	SIGA-MCR (MFC-A)	MECH RM 114H - ELEV 1 PHASE 1 DESIGNATED LEVEL RECALL	
D007	SIGA-OSD W/SIGA-SB4 BASE	REHABILITATION 138A S.E. SMOKE DETECTOR	M197	SIGA-MCR (MFC-A)	MECH RM 114H - ELEV 1 PHASE 1 ALTERNATE LEVEL RECALL	
D008	SIGA-OSD W/SIGA-SB4 BASE	WEIGHT ROOM 138 S.E. SMOKE DETECTOR	M198	SIGA-MCR (MFC-A)	MECH RM 114H - ELEV 1 POWER SHUTDOWN	
M155	SIGA-CRH	WEIGHT ROOM / REHAB S.E. ROLL DOWN DOOR	M199	SIGA-MCR (MFC-A)	MECH RM 114H - ELEV 1 FIRE HAT (FUTURE USE)	
D009	SIGA-OSD W/SIGA-SB4 BASE	WEIGHT ROOM 138 S.W. SMOKE DETECTOR	M200	SIGA-MCT2 (MFC-A)	MECH RM 114H - ELEV 1 SHUNT CONTROL POWER MONITOR	
D010	SIGA-OSD W/SIGA-SB4 BASE	REHABILITATION 138A S.W. SMOKE DETECTOR	M201		SPARE (OTHER HALF OF MCT2)	
D011	SIGA-OSD W/SIGA-SB4 BASE	DATA 138D SMOKE DETECTOR	D052	SIGA-HRD W/SIGA-SB4 BASE	ELEVATOR 2 - BOTTOM OF SHAFT HEAT DETECTOR	
M156	SIGA-CRH	DATA 138D GLASS ROLL DOWN DOOR	D053	SIGA-OSHD W/SIGA-SB4 BASE	MECH RM 114H MULTISENSOR SMOKE AND HEAT DETECTOR	
D012	SIGA-OSD W/SIGA-SB4 BASE	WEIGHT ROOM / DATA GLASS 138 SMOKE DETECTOR	M202	SIGA-CRH	LAUNDRY 114I FSD CONTROL	
M157	SIGA-CRH	WEIGHT ROOM / REHAB S.W. ROLL DOWN DOOR	D054	SIGA-DDOS	STORAGE OFFICE 119 DUCT SMOKE DETECTOR	
D013	SIGA-DDOS	WEIGHT ROOM 138 DUCT SMOKE DETECTOR	D055	SIGA-IM2	ISOLATOR MODULE	
M158	SIGA-CR	BBFH / SHROYER GYM DOOR MAG RELAY	D056	SIGA-IM2	ISOLATOR MODULE	
D014	SIGA-OSD W/SIGA-SB4 BASE	BBFH / SHROYER GYM NORTH HALL SMOKE DETECTOR	M203	SIGA-CT1	STORAGE 120B - BPS.1 TROUBLE MONITOR	
D015	SIGA-OSD W/SIGA-SB4 BASE	CORRIDOR 189 NORTH HALL SMOKE DETECTOR	M204	SIGA-CC1S	STORAGE 120B - BPS.1 SENSE 1 NAC TRIGGER	
D016	SIGA-OSD W/SIGA-SB4 BASE	CORRIDOR 189 SOUTH HALL SMOKE DETECTOR	D057	SIGA-IM2	ISOLATOR MODULE	
D017	SIGA-OSD W/SIGA-SB4 BASE	NORTH LOBBY TO SHROYER SMOKE DETECTOR	D058	SIGA-DDOS	N.E. MECH RM 226 DUCT SMOKE DETECTOR	
M159	SIGA-CR	NORTH LOBBY TO SHROYER DOOR MAG RELAY	D059	SIGA-OSD W/SIGA-SB4 BASE	N.E MECH RM 226 - APS.7 SMOKE DETECTOR	
M160	SIGA-CRH	WEIGHT ROOM WEST ENTRY ROLL DOWN DOOR	M205	APS6A W/SIGA-AA30	N.E MECH RM 226 - APS.7 AA30	
D018		WEIGHT ROOM WEST ENTRY SMOKE DETECTOR	M206			
D019	SIGA-OSD W/SIGA-SB4 BASE	WEIGHT ROOM WEST ENTRY SMOKE DETECTOR	M207	SIGA-CT1	N.E MECH RM 226 - APS.7 TROUBLE MONITOR	
D020	SIGA-OSD W/SIGA-SB4 BASE	NORTH LOBBY / WAITING 140 SMOKE DETECTOR	M208	SIGA-CC1S	N.E MECH RM 226 - APS.7 SENSE 1 NAC TRIGGER	
M161	SIGA-CRH	NORTH LOBBY / WAITING 140 GLASS ROLL DOWN DOOR	D060	SIGA-DDOS	N.W. MECH RM 236 DUCT SMOKE DETECTOR	
M162	SIGA-CRH	TICKET WINDOW GLASS ROLL DOWN DOOR	D061	SIGA-OSD W/SIGA-SB4 BASE	NORTH CONCOURSE ELEVATOR 1 LOBBY 236 SMOKE DETECTOR	
D021	SIGA-OSD W/SIGA-SB4 BASE	VESTIBULE 190 SMOKE DETECTOR	D062	SIGA-OSHD W/SIGA-SB4 BASE	ELEV 1 TOP OF SHAFT MULTISENSOR SMOKE AND HEAT DETECTOR	
D022	SIGA-OSD W/SIGA-IB BASE	TICKET SALES 142 SMOKE DETECTOR	D063	SIGA-CRH	MEDIA BOOTH 357 SMOKE DETECTOR	
D023	SIGA-OSD W/SIGA-SB4 BASE	WAITING 140 SMOKE DETECTOR	D064	SIGA-CRH	MEDIA BOOTH 355 & 356 - ARENA PA & SOUND SYSTEM SHUTDOWN	
D024	SIGA-OSD W/SIGA-SB4 BASE	RECEPTION 141 @ BREAK RM 143 SMOKE DETECTOR	M209	SIGA-OSD W/SIGA-SB4 BASE	MEDIA BOOTH 355 & 356 SMOKE DETECTOR	
D025	SIGA-DDOS	SUPPLY ROOM 143A DUCT SMOKE DETECTOR	D065	SIGA-OSD W/SIGA-SB4 BASE	MEDIA BOOTH 354 SMOKE DETECTOR	
D026	SIGA-OSD W/SIGA-SB4 BASE	OPEN OFFICE 145 @ OFFICE 144 SMOKE DETECTOR	D066	SIGA-DDOS	S.E. MECH RM 225 DUCT SMOKE DETECTOR	
D027	SIGA-OSD W/SIGA-SB4 BASE	OPEN OFFICE 145 @ OFFICE 147 & 148 SMOKE DETECTOR	D067	SIGA-DDOS	S.W. MECH RM 201 DUCT SMOKE DETECTOR	
D028	SIGA-OSD W/SIGA-SB4 BASE	OPEN OFFICE 145 @ OFFICE 149 & 150 SMOKE DETECTOR	D068	SIGA-OSD W/SIGA-SB4 BASE	S.W. MECH RM 201 - APS.3 SMOKE DETECTOR	
D029	SIGA-OSD W/SIGA-SB4 BASE	OPEN OFFICE 160 @ OFFICE 151 & 154 SMOKE DETECTOR	M210	APS6A W/SIGA-AA30	S.W. MECH RM 201 - APS.3 AA30	
D030	SIGA-OSD W/SIGA-SB4 BASE	OPEN OFFICE 160 @ OFFICE 156 SMOKE DETECTOR	M211			
M163	SIGA-CRH	ATHLETIC ADMIN FSD DAMPER CONTROL	M212	SIGA-CT1	S.W. MECH RM 201 - APS.3 TROUBLE MONITOR	
M164	SIGA-CR	ATHLETIC ADMIN DOOR MAG CONTROL	M213	SIGA-CC1S	S.W. MECH RM 201 - APS.3 SENSE 1 NAC TRIGGER	
D031	SIGA-OSD W/SIGA-SB4 BASE	OPEN OFFICE 160 @ OFFICE 157 SMOKE DETECTOR	M214	SIGA-CT1	PREP / CATERING 204A - KITCHEN HOOD ALARM	
D032	SIGA-OSD W/SIGA-SB4 BASE	OPEN OFFICE 160 @ OFFICE 155 SMOKE DETECTOR	D069	SIGA-DDOS	SOUTH CONCOURSE 249 DUCT SMOKE DETECTOR #1	
D033	SIGA-OSD W/SIGA-SB4 BASE	OPEN OFFICE 160 @ OFFICE 152 & 153 SMOKE DETECTOR	D070	SIGA-DDOS	SOUTH CONCOURSE 249 DUCT SMOKE DETECTOR #2	
D034	SIGA-OSD W/SIGA-SB4 BASE	OPEN OFFICE 160 @ FILE 143C SMOKE DETECTOR	D071	SIGA-DDOS	SOUTH CONCOURSE 249 DUCT SMOKE DETECTOR #3	
M165	APS10A W/SIGA-AA30	MECH RM 135 - APS.4 AA30 #1	D072	SIGA-OSD W/SIGA-SB4 BASE	SOUTH CONCOURSE ELEVATOR 2 LOBBY 249 SMOKE DETECTOR	
M166			D073	SIGA-OSHD W/SIGA-SB4 BASE	ELEV 2 TOP OF SHAFT MULTISENSOR SMOKE AND HEAT DETECTOR	
M167	APS10A W/SIGA-AA30	MECH RM 135 - APS.4 AA30 #2	D074	SIGA-OSD W/SIGA-SB4 BASE	MEDIA BOOTH 307 SMOKE DETECTOR	
M168			D075	SIGA-OSD W/SIGA-SB4 BASE	MEDIA BOOTH 305 & 306 SMOKE DETECTOR	
M169	SIGA-CT1	MECH RM 135 - APS.4 TROUBLE MONITOR	D076	SIGA-OSD W/SIGA-SB4 BASE	MEDIA BOOTH 304 SMOKE DETECTOR	
M170	SIGA-CC1S	MECH RM 135 - APS.4 SENSE 1 NAC TRIGGER	D077	SIGA-OSD W/SIGA-SB4 BASE	ELEVATOR 3 LOWER LOBBY SMOKE DETECTOR	
M171	APS6A W/SIGA-AA30	MECH RM 135 - APS.5 AA30	M215	SIGA-MCR (MFC-A)	MECH RM 001A - ELEV 1 PHASE 1 DESIGNATED LEVEL RECALL	
M172			M216	SIGA-MCR (MFC-A)	MECH RM 001A - ELEV 1 PHASE 1 ALTERNATE LEVEL RECALL	
M173	SIGA-CT1	MECH RM 135 - APS.5 TROUBLE MONITOR	M217	SIGA-MCR (MFC-A)	MECH RM 001A - ELEV 1 POWER SHUTDOWN	
M174	SIGA-CC1S	MECH RM 135 - APS.5 SENSE 1 NAC TRIGGER	M218	SIGA-MCR (MFC-A)	MECH RM 001A - ELEV 1 FIRE HAT (FUTURE USE)	
M175	APS6A W/SIGA-AA30	MECH RM 135 - APS.6 AA30	M219	SIGA-MCT2 (MFC-A)	MECH RM 001A - ELEV 1 SHUNT CONTROL POWER MONITOR	
M176			M220		SPARE (OTHER HALF OF MCT2)	
M177	SIGA-CT1	MECH RM 135 - APS.6 TROUBLE MONITOR	D078	SIGA-HRD W/SIGA-SB4 BASE	ELEVATOR 3 - BOTTOM OF SHAFT HEAT DETECTOR	
M178	SIGA-CC1S	MECH RM 135 - APS.6 SENSE 1 NAC TRIGGER	D079	SIGA-OSHD W/SIGA-SB4 BASE	MECH RM 001A MULTISENSOR SMOKE AND HEAT DETECTOR	



2 HEADEND - NETWORK (AUDIO AND DATA) RISER DIAGRAM
FA6.1 N.T.S



100% SHOP DRAWING FOR PERMIT/CONSTRUCTION
(BRICK BREEDEN) FIELDHOUSE
FIRE ALARM REPLACEMENT
MONTANA STATE UNIVERSITY
BOZEMAN



DRAWN BY: BSM	REVIEWED BY: BSM
REV.	DESCRIPTION

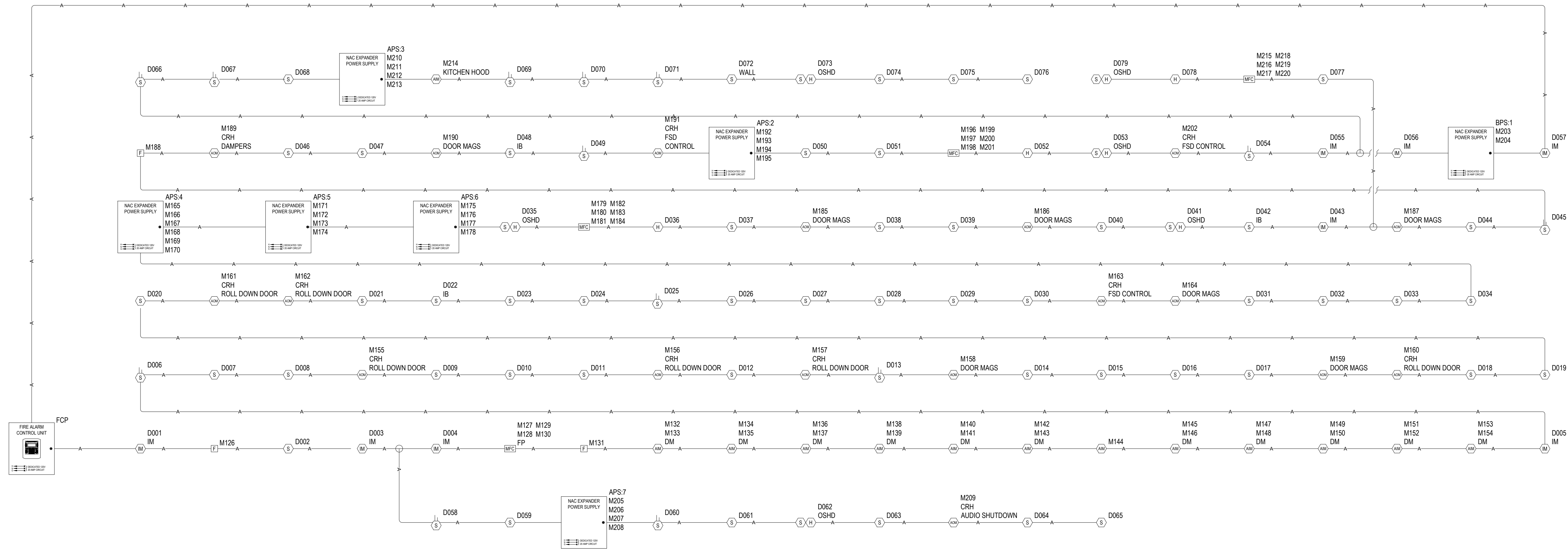
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Apex Fire Alarm Design
NICET 110772
Fire Alarm Systems, Level IV
State of Montana DLI
FPL-IEL-000888

PPA#23-0928
AE# 2024-02-04D

SHEET TITLE
DEVICE ADDRESSES
HEADEND RISER

SHEET
FA6.1

DATE
10/22/2025



1 FACU - SLC RISER DIAGRAM
FA6.2 N.T.S



100% SHOP DRAWING FOR PERMIT/CONSTRUCTION
(BRICK BREEDEN) FIELDHOUSE
FIRE ALARM REPLACEMENT
MONTANA STATE UNIVERSITY
BOZEMAN

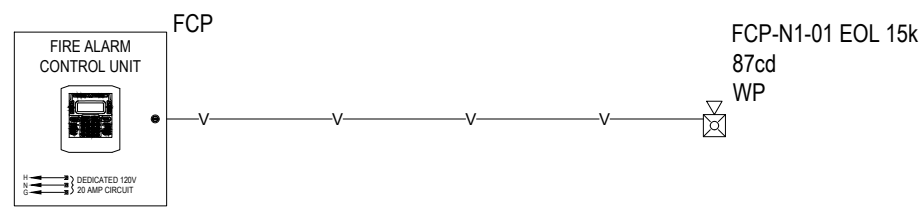
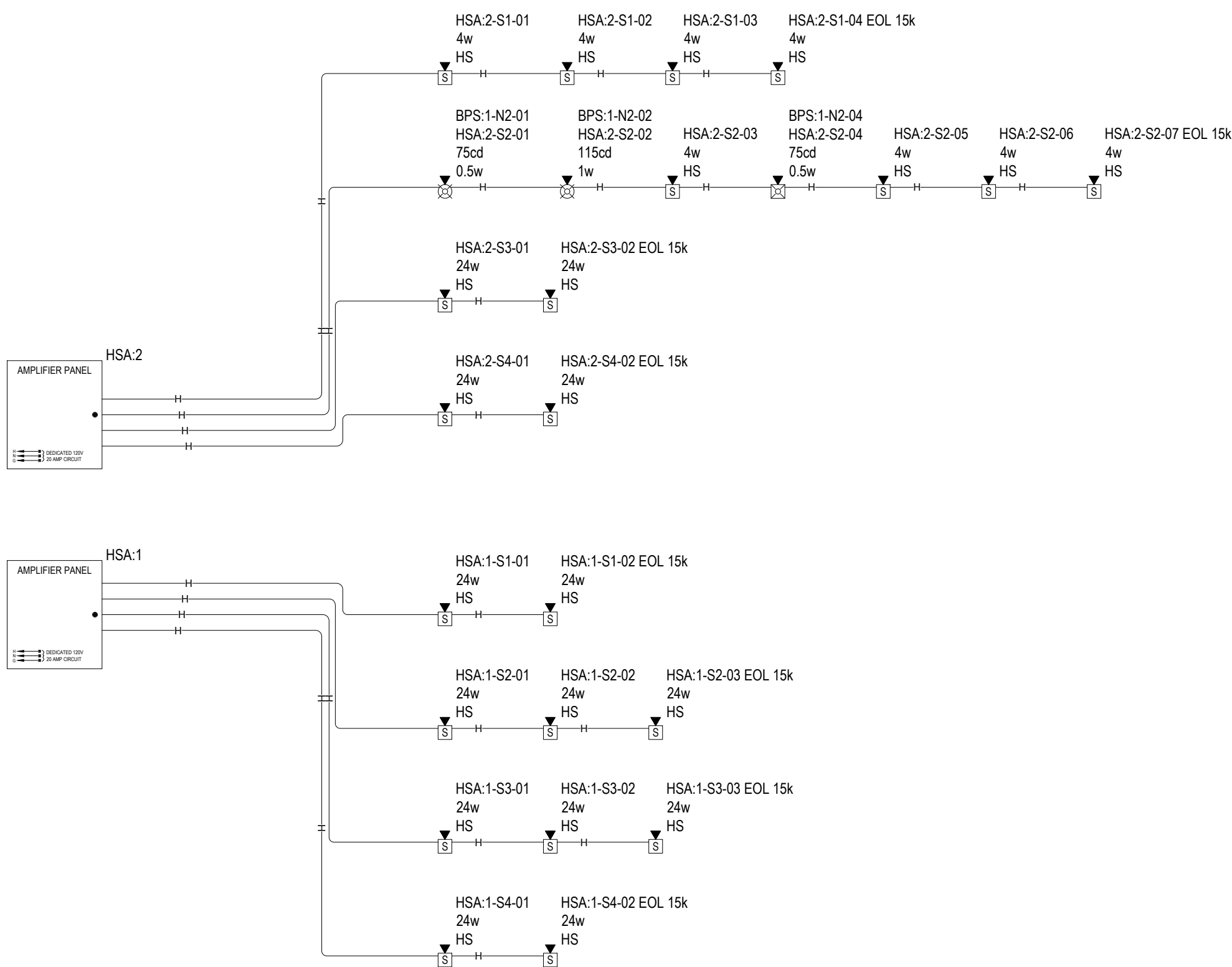
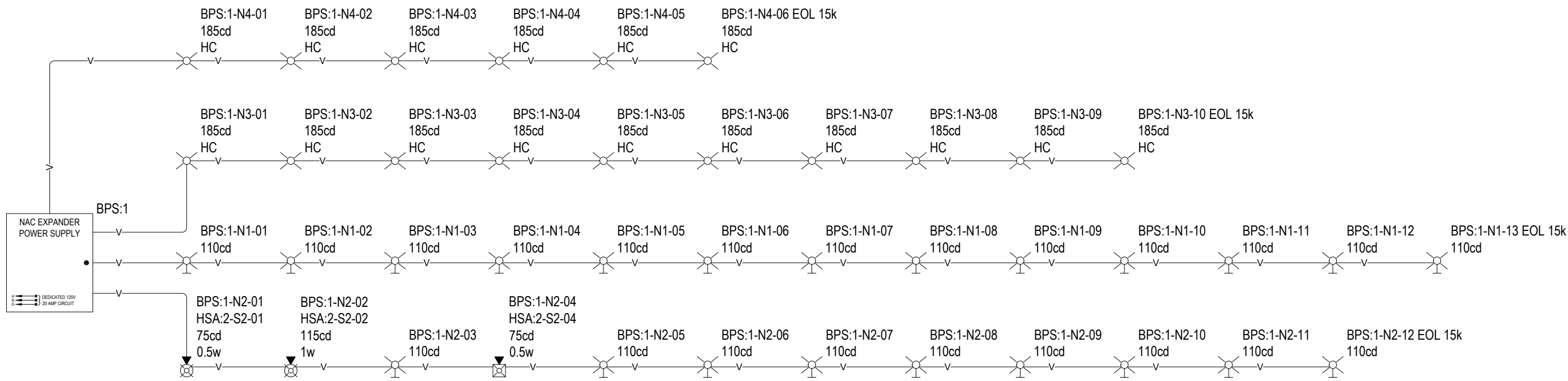


DRAWN BY: BSM		
REVIEWED BY: BSM		
REV.	DESCRIPTION	DATE

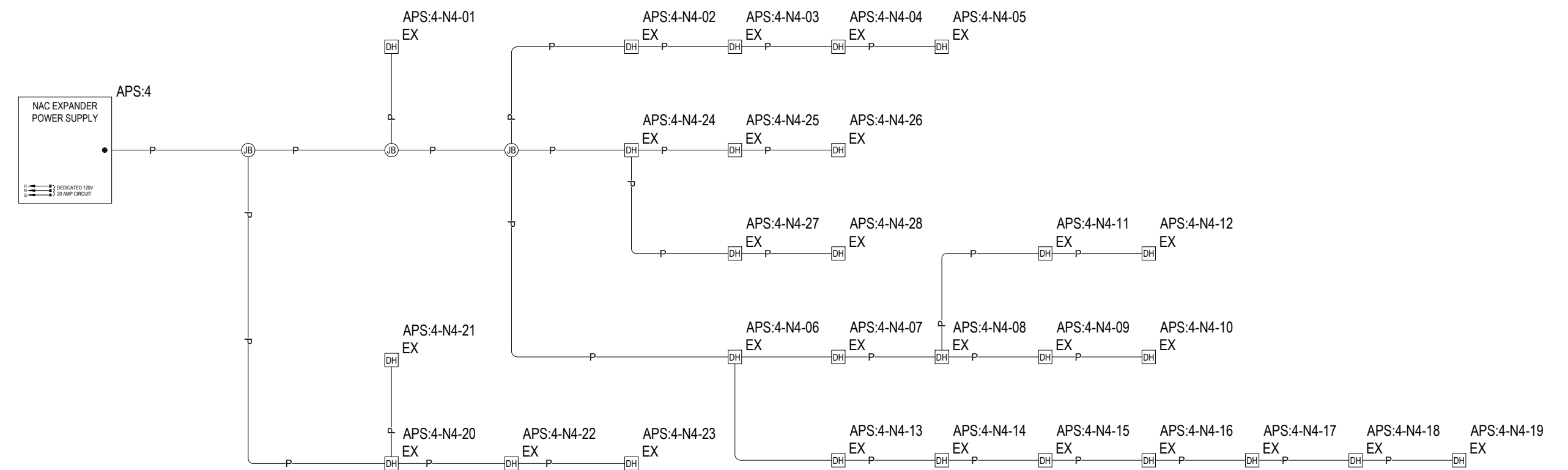


PPA#23-0928
AE# 2024-02-04D

SHEET TITLE
FIRE ALARM SLC
RISER DIAGRAM
SHEET
FA6.2
DATE
10/22/2025



1 HEADEND - NOTIFICATION RISER DIAGRAM
FA6.3 N.T.S



2 APS.4 - DOOR MAG RISER DIAGRAM
FA6.2 N.T.S



(BRICK BREEDEN) FIELDHOUSE
FIRE ALARM REPLACEMENT
MONTANA STATE UNIVERSITY
BOZEMAN



DRAWN BY: BSM		
REVIEWED BY: BSM		
REV.	DESCRIPTION	DATE



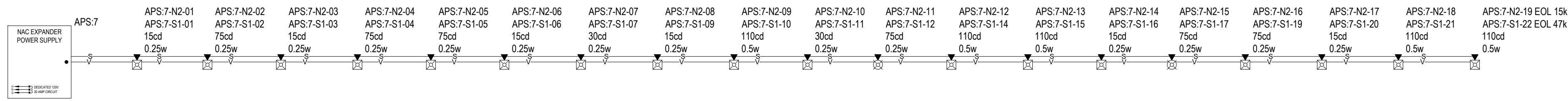
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AE# 2024-02-04D

SHEET TITLE
FA HEADEND
NOTIFICATION RISER

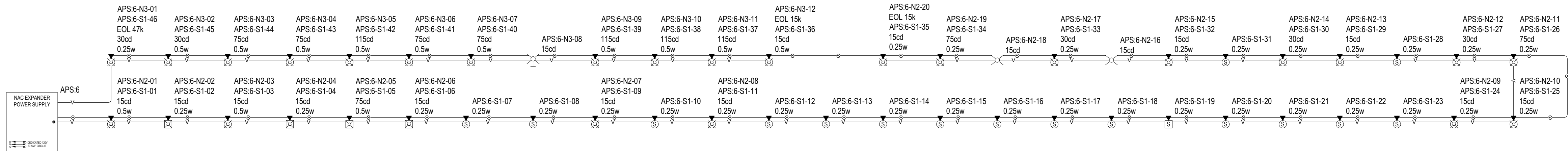
SHEET
FA6.3

DATE
10/22/2025

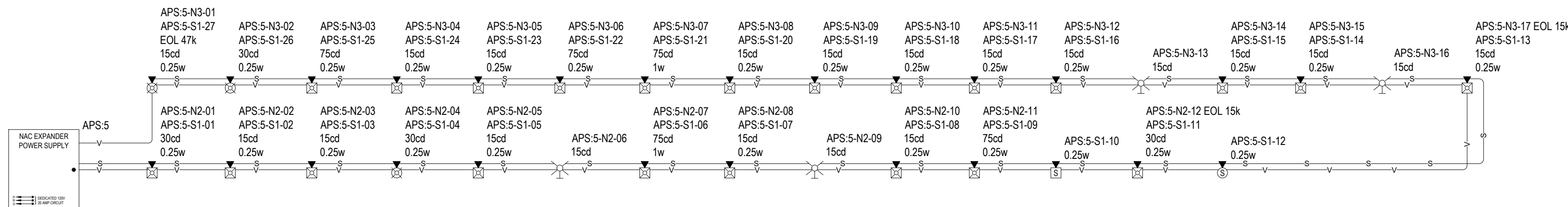




1 APS.7 - NOTIFICATION RISER DIAGRAM
FA6.5 N.T.S.



2 APS.6 - NOTIFICATION RISER DIAGRAM
FA6.5 N.T.S.



3 APS.5 - NOTIFICATION RISER DIAGRAM
FA6.5 N.T.S.



(BRICK BREEDEN) FIELDHOUSE
FIRE ALARM REPLACEMENT
MONTANA STATE UNIVERSITY
BOZEMAN



DRAWN BY: BSM		
REVIEWED BY: BSM		
REV.	DESCRIPTION	DATE



PPA#23-0928
AE# 2024-02-04D

SHEET TITLE
FA APS
NOTIFICATION RISER

SHEET
FA6.5

DATE
10/22/2025

FCP N1 POINT-TO-POINT REPORT				CURRENT SUMMARY				POWER SUMMARY			
				MAX. CIRCUIT CURRENT (A):	3.50	TOTAL CIRCUIT CURRENT (A): SPARE CIRCUIT CURRENT (A): SPARE CIRCUIT CURRENT %:	0.238 3.26 93.20 %	STARTING CALC. VOLTAGE:	20.40	MAX. VOLTAGE DROP: VOLTAGE DROP %:	0.29 1.44 %
CIRCUIT WIRING PROPERTIES: "V" 14/2 FPLP (NAC) 60993B 14 AWG, 2 COND. SOLID COPPER FPLP ANALOG UNSHIELDED								MIN. OPERATIONAL VOLTAGE:	16	END OF LINE VOLTAGE:	20.11
DISTANCE MEASURED USING DRAWN SEGMENT LENGTHS WITH 30.00 % ADDITIONAL LENGTH CALCULATED								WIRE RESISTANCE (DIKFT):	2.60	TOTAL CIRCUIT LENGTH (FT): TOTAL CIRCUIT RESISTANCE (I):	238 1.24
DEVICE LABEL	PART NO	DESCRIPTION	CANDELAS	ALARM CURRENT (A)	REMAINING ALARM CURRENT (A)	DISTANCE FROM PREVIOUS	RESISTANCE FROM PREVIOUS (I)	VOLTAGE DROP FROM PREVIOUS			
FCP-N1-01 EOL 15K	WG4RF-HVMC	OUTDOOR RATED HORN-STROBE, RED WITH FIRE MARKING, CLEAR LENS	87CD	0.238	0.238	33	0.170976	0.04	20.11	0.29	1.44 %

CALCULATION METHODS:
RESISTANCE FROM PREVIOUS (I) = WIRE RESISTANCE (DI/FT) X 2 X DIST. FROM PREVIOUS (FT)
VOLTAGE DROP FROM PREVIOUS = RESISTANCE FROM PREVIOUS (I) X REMAINING CURRENT (A)

BPS:1 N1 POINT-TO-POINT REPORT				CURRENT SUMMARY				POWER SUMMARY			
				MAX. CIRCUIT CURRENT (A):	3	TOTAL CIRCUIT CURRENT (A): SPARE CIRCUIT CURRENT (A): SPARE CIRCUIT CURRENT %:	0.364 2.64 87.87 %	STARTING CALC. VOLTAGE:	19.70	MAX. VOLTAGE DROP: VOLTAGE DROP %:	1.02 5.18 %
CIRCUIT WIRING PROPERTIES: "V" 14/2 THHN/THWN PAIR (NAC) N/A 14 AWG, 2 COND. PAIR SOLID COPPER THHN/THWN ANALOG UNSHIELDED								MIN. OPERATIONAL VOLTAGE:	16	END OF LINE VOLTAGE:	18.68
DISTANCE MEASURED USING DRAWN SEGMENT LENGTHS WITH 30.00 % ADDITIONAL LENGTH CALCULATED								WIRE RESISTANCE (DIKFT):	3.07	TOTAL CIRCUIT LENGTH (FT): TOTAL CIRCUIT RESISTANCE (I):	866 5.32
DEVICE LABEL	PART NO	DESCRIPTION	CANDELAS	ALARM CURRENT (A)	REMAINING ALARM CURRENT (A)	DISTANCE FROM PREVIOUS	RESISTANCE FROM PREVIOUS (I)	VOLTAGE DROP FROM PREVIOUS			
BPS-1-N1-01	G4VWN	STROBE, WALL, WHITE, ALERT	110CD	0.028	0.364	43	0.261733	0.1	19.60	0.1	0.48 %
BPS-1-N1-02	G4VWN	STROBE, WALL, WHITE, ALERT	110CD	0.028	0.336	66	0.403203	0.14	19.47	0.23	1.17 %
BPS-1-N1-03	G4VWN	STROBE, WALL, WHITE, ALERT	110CD	0.028	0.308	76	0.4605	0.14	19.33	0.37	1.89 %
BPS-1-N1-04	G4VWN	STROBE, WALL, WHITE, ALERT	110CD	0.028	0.28	50	0.304125	0.09	19.24	0.46	2.32 %
BPS-1-N1-05	G4VWN	STROBE, WALL, WHITE, ALERT	110CD	0.028	0.252	50	0.304133	0.08	19.17	0.530	2.71 %
BPS-1-N1-06	G4VWN	STROBE, WALL, WHITE, ALERT	110CD	0.028	0.224	134	0.825	0.18	18.98	0.720	3.65 %
BPS-1-N1-07	G4VWN	STROBE, WALL, WHITE, ALERT	110CD	0.028	0.196	50	0.305372	0.06	18.92	0.780	3.95 %
BPS-1-N1-08	G4VWN	STROBE, WALL, WHITE, ALERT	110CD	0.028	0.168	50	0.305392	0.05	18.87	0.830	4.22 %
BPS-1-N1-09	G4VWN	STROBE, WALL, WHITE, ALERT	110CD	0.028	0.14	90	0.55260	0.08	18.79	0.910	4.61 %
BPS-1-N1-10	G4VWN	STROBE, WALL, WHITE, ALERT	110CD	0.028	0.112	67	0.408925	0.05	18.75	0.950	4.84 %
BPS-1-N1-11	G4VWN	STROBE, WALL, WHITE, ALERT	110CD	0.028	0.084	66	0.402627	0.03	18.71	0.990	5.01 %
BPS-1-N1-12	G4VWN	STROBE, WALL, WHITE, ALERT	110CD	0.028	0.056	66	0.402694	0.02	18.69	1.01	5.13 %
BPS-1-N1-13 EOL 15K	G4VWN	STROBE, WALL, WHITE, ALERT	110CD	0.028	0.028	62	0.380499	0.01	18.68	1.02	5.18 %

CALCULATION METHODS:
RESISTANCE FROM PREVIOUS (I) = WIRE RESISTANCE (DI/FT) X 2 X DIST. FROM PREVIOUS (FT)
VOLTAGE DROP FROM PREVIOUS = RESISTANCE FROM PREVIOUS (I) X REMAINING CURRENT (A)

BPS:1 N2 POINT-TO-POINT REPORT				CURRENT SUMMARY				POWER SUMMARY			
				MAX. CIRCUIT CURRENT (A):	3	TOTAL CIRCUIT CURRENT (A): SPARE CIRCUIT CURRENT (A): SPARE CIRCUIT CURRENT %:	0.35 2.65 88.33 %	STARTING CALC. VOLTAGE:	19.70	MAX. VOLTAGE DROP: VOLTAGE DROP %:	0.670 3.40 %
CIRCUIT WIRING PROPERTIES: "V" 14/2 THHN/THWN PAIR (NAC) N/A 14 AWG, 2 COND. PAIR SOLID COPPER THHN/THWN ANALOG UNSHIELDED								MIN. OPERATIONAL VOLTAGE:	16	END OF LINE VOLTAGE:	19.03
DISTANCE MEASURED USING DRAWN SEGMENT LENGTHS WITH 30.00 % ADDITIONAL LENGTH CALCULATED								WIRE RESISTANCE (DIKFT):	3.07	TOTAL CIRCUIT LENGTH (FT): TOTAL CIRCUIT RESISTANCE (I):	663 4.07
DEVICE LABEL	PART NO	DESCRIPTION	CANDELAS	ALARM CURRENT (A)	REMAINING ALARM CURRENT (A)	DISTANCE FROM PREVIOUS	RESISTANCE FROM PREVIOUS (I)	VOLTAGE DROP FROM PREVIOUS			
BPS-1-N2-01	GCSVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	75CD	0.035	0.35	46	0.280594	0.1	19.60	0.1	0.50 %
BPS-1-N2-02	GCSVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	115CD	0.035	0.315	54	0.333534	0.11	19.50	0.2	1.03 %
BPS-1-N2-03	G4VWN	STROBE, WALL, WHITE, ALERT	110CD	0.028	0.28	22	0.131147	0.04	19.46	0.24	1.23 %
BPS-1-N2-04	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	75CD	0.028	0.252	43	0.265837	0.07	19.39	0.31	1.57 %
BPS-1-N2-05	G4VWN	STROBE, WALL, WHITE, ALERT	110CD	0.028	0.224	24	0.14797	0.03	19.36	0.34	1.74 %
BPS-1-N2-06	G4VWN	STROBE, WALL, WHITE, ALERT	110CD	0.028	0.196	66	0.403203	0.08	19.28	0.42	2.14 %
BPS-1-N2-07	G4VWN	STROBE, WALL, WHITE, ALERT	110CD	0.028	0.168	75	0.4605	0.08	19.20	0.5	2.53 %
BPS-1-N2-08	G4VWN	STROBE, WALL, WHITE, ALERT	110CD	0.028	0.14	49	0.303885	0.04	19.16	0.540	2.74 %
BPS-1-N2-09	G4VWN	STROBE, WALL, WHITE, ALERT	110CD	0.028	0.112	50	0.304149	0.03	19.13	0.570	2.92 %
BPS-1-N2-10	G4VWN	STROBE, WALL, WHITE, ALERT	110CD	0.028	0.084	134	0.825	0.07	19.06	0.640	3.27 %
BPS-1-N2-11	G4VWN	STROBE, WALL, WHITE, ALERT	110CD	0.028	0.056	49	0.30248	0.02	19.04	0.660	3.36 %
BPS-1-N2-12 EOL 15K	G4VWN	STROBE, WALL, WHITE, ALERT	110CD	0.028	0.028	50	0.308536	0.01	19.03	0.670	3.40 %

CALCULATION METHODS:
RESISTANCE FROM PREVIOUS (I) = WIRE RESISTANCE (DI/FT) X 2 X DIST. FROM PREVIOUS (FT)
VOLTAGE DROP FROM PREVIOUS = RESISTANCE FROM PREVIOUS (I) X REMAINING CURRENT (A)

BPS:1 N3 POINT-TO-POINT REPORT				CURRENT SUMMARY				POWER SUMMARY			
				MAX. CIRCUIT CURRENT (A):	3	TOTAL CIRCUIT CURRENT (A): SPARE CIRCUIT CURRENT (A): SPARE CIRCUIT CURRENT %:	0.530 2.47 82.33 %	STARTING CALC. VOLTAGE:	19.70	MAX. VOLTAGE DROP: VOLTAGE DROP %:	1.58 8.04 %
CIRCUIT WIRING PROPERTIES: "V" 14/2 THHN/THWN PAIR (NAC) N/A 14 AWG, 2 COND. PAIR SOLID COPPER THHN/THWN ANALOG UNSHIELDED								MIN. OPERATIONAL VOLTAGE:	16	END OF LINE VOLTAGE:	18.12
DISTANCE MEASURED USING DRAWN SEGMENT LENGTHS WITH 30.00 % ADDITIONAL LENGTH CALCULATED								WIRE RESISTANCE (DIKFT):	3.07	TOTAL CIRCUIT LENGTH (FT): TOTAL CIRCUIT RESISTANCE (I):	869 5.33
DEVICE LABEL	PART NO	DESCRIPTION	CANDELAS	ALARM CURRENT (A)	REMAINING ALARM CURRENT (A)	DISTANCE FROM PREVIOUS	RESISTANCE FROM PREVIOUS (I)	VOLTAGE DROP FROM PREVIOUS			
BPS-1-N3-01	GCVHWA	STROBE, CEILING, WHITE, ALERT, HI CANDELA	185CD	0.053	0.530	125	0.76750	0.41	19.29	0.41	2.06 %
BPS-1-N3-02	GCVHWA	STROBE, CEILING, WHITE, ALERT, HI CANDELA	185CD	0.053	0.477	43	0.265766	0.13	19.17	0.530	2.71 %
BPS-1-N3-03	GCVHWA	STROBE, CEILING, WHITE, ALERT, HI CANDELA	185CD	0.053	0.424	117	0.719	0.3	18.86	0.840	4.26 %
BPS-1-N3-04	GCVHWA	STROBE, CEILING, WHITE, ALERT, HI CANDELA	185CD	0.053	0.371	71	0.437549	0.16	18.70	1	5.08 %
BPS-1-N3-05	GCVHWA	STROBE, CEILING, WHITE, ALERT, HI CANDELA	185CD	0.053	0.318	86	0.528	0.17	18.53	1.17	5.93 %
BPS-1-N3-06	GCVHWA	STROBE, CEILING, WHITE, ALERT, HI CANDELA	185CD	0.053	0.265	71	0.437564	0.12	18.42	1.28	6.52 %
BPS-1-N3-07	GCVHWA	STROBE, CEILING, WHITE, ALERT, HI CANDELA	185CD	0.053	0.212	117	0.719	0.15	18.26	1.44	7.29 %
BPS-1-N3-08	GCVHWA	STROBE, CEILING, WHITE, ALERT, HI CANDELA	185CD	0.053	0.159	49	0.301225	0.05	18.22	1.48	7.54 %
BPS-1-N3-09	GCVHWA	STROBE, CEILING, WHITE, ALERT, HI CANDELA	185CD	0.053	0.106	117	0.719	0.08	18.14	1.56	7.93 %
BPS-1-N3-10 EOL 15K	GCVHWA	STROBE, CEILING, WHITE, ALERT, HI CANDELA	185CD	0.053	0.053	71	0.437549	0.02	18.12	1.58	8.04 %

CALCULATION METHODS:
RESISTANCE FROM PREVIOUS (I) = WIRE RESISTANCE (DI/FT) X 2 X DIST. FROM PREVIOUS (FT)
VOLTAGE DROP FROM PREVIOUS = RESISTANCE FROM PREVIOUS (I) X REMAINING CURRENT (A)

BPS:1 N4 POINT-TO-POINT REPORT				CURRENT SUMMARY				POWER SUMMARY			
				MAX. CIRCUIT CURRENT (A):	3	TOTAL CIRCUIT CURRENT (A): SPARE CIRCUIT CURRENT (A): SPARE CIRCUIT CURRENT %:	0.318 2.68 89.40 %	STARTING CALC. VOLTAGE:	19.70	MAX. VOLTAGE DROP: VOLTAGE DROP %:	1.09 5.51 %
CIRCUIT WIRING PROPERTIES: "V" 14/2 THHN/THWN PAIR (NAC) N/A 14 AWG, 2 COND. PAIR SOLID COPPER THHN/THWN ANALOG UNSHIELDED								MIN. OPERATIONAL VOLTAGE:	16	END OF LINE VOLTAGE:	18.61
DISTANCE MEASURED USING DRAWN SEGMENT LENGTHS WITH 30.00 % ADDITIONAL LENGTH CALCULATED								WIRE RESISTANCE (DIKFT):	3.07	TOTAL CIRCUIT LENGTH (FT): TOTAL CIRCUIT RESISTANCE (I):	1019 6.26
DEVICE LABEL	PART NO	DESCRIPTION	CANDELAS	ALARM CURRENT (A)	REMAINING ALARM CURRENT (A)	DISTANCE FROM PREVIOUS	RESISTANCE FROM PREVIOUS (I)	VOLTAGE DROP FROM PREVIOUS			
BPS-1-N4-01	GCVHWA	STROBE, CEILING, WHITE, ALERT, HI CANDELA	185CD	0.053	0.318	250	1.54	0.49	19.21	0.49	2.48 %
BPS-1-N4-02	GCVHWA	STROBE, CEILING, WHITE, ALERT, HI CANDELA	185CD	0.053	0.265	71	0.437553	0.12	19.10	0.60	3.07 %
BPS-1-N4-03	GCVHWA	STROBE, CEILING, WHITE, ALERT, HI CANDELA	185CD	0.053	0.212	151	0.928220	0.2	18.90	0.80	4.07 %
BPS-1-N4-04	GCVHWA	STROBE, CEILING, WHITE, ALERT, HI CANDELA	185CD	0.053	0.159	110	0.677	0.11	18.79	0.910	4.61 %
BPS-1-N4-05	GCVHWA	STROBE, CEILING, WHITE, ALERT, HI CANDELA	185CD	0.053	0.106	108	0.664	0.07	18.72	0.980	4.97 %
BPS-1-N4-06 EOL 15K	GCVHWA	STROBE, CEILING, WHITE, ALERT, HI CANDELA	185CD	0.053	0.053	328	2.01	0.11	18.61	1.09	5.51 %

CALCULATION METHODS:
RESISTANCE FROM PREVIOUS (I) = WIRE RESISTANCE (DI/FT) X 2 X DIST. FROM PREVIOUS (FT)
VOLTAGE DROP FROM PREVIOUS = RESISTANCE FROM PREVIOUS (I) X REMAINING CURRENT (A)

APS:2 N2 POINT-TO-POINT REPORT				CURRENT SUMMARY				POWER SUMMARY			
				MAX. CIRCUIT CURRENT (A):	3	TOTAL CIRCUIT CURRENT (A): SPARE CIRCUIT CURRENT (A): SPARE CIRCUIT CURRENT %:	0.560 2.44 81.33 %	STARTING CALC. VOLTAGE:	19.70	MAX. VOLTAGE DROP: VOLTAGE DROP %:	1.01 5.12 %
CIRCUIT WIRING PROPERTIES: "V" 14/2 THHN/THWN PAIR (NAC) N/A 14 AWG, 2 COND. PAIR SOLID COPPER THHN/THWN ANALOG UNSHIELDED								MIN. OPERATIONAL VOLTAGE:	16	END OF LINE VOLTAGE:	18.69
DISTANCE MEASURED USING DRAWN SEGMENT LENGTHS WITH 30.00 % ADDITIONAL LENGTH CALCULATED								WIRE RESISTANCE (DIKFT):	3.07	TOTAL CIRCUIT LENGTH (FT): TOTAL CIRCUIT RESISTANCE (I):	529 3.25
DEVICE LABEL	PART NO	DESCRIPTION	CANDELAS	ALARM CURRENT (A)	REMAINING ALARM CURRENT (A)	DISTANCE FROM PREVIOUS	RESISTANCE FROM PREVIOUS (I)	VOLTAGE DROP FROM PREVIOUS			
APS-2-N2-01	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	30CD	0.028	0.560	56	0.34454	0.19	19.51	0.19	0.98 %
APS-2-N2-02	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	30CD	0.028	0.5320	38	0.233768	0.12	19.38	0.32	1.61 %
APS-2-N2-03	G4VWN	STROBE, WALL, WHITE, ALERT	15CD	0.028	0.5040	28	0.169353	0.09	19.30	0.4	2.04 %
APS-2-N2-04	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	30CD	0.028	0.476	6	0.035703	0.02	19.28	0.42	2.13 %
APS-2-N2-05	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	30CD	0.028	0.448	22	0.136447	0.06	19.22	0.48	2.44 %
APS-2-N2-06	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	15CD	0.028	0.42	9	0.055031	0.02	19.20	0.5	2.56 %
APS-2-N2-07	G4VWN	STROBE, WALL, WHITE, ALERT	15CD	0.028	0.392	20	0.119734	0.05	19.15	0.550	2.80 %
APS-2-N2-08	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	75CD	0.028	0.364	42	0.255693	0.09	19.06	0.640	3.27 %
APS-2-N2-09	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	30CD	0.028	0.336	20	0.121768	0.04	19.02	0.680	3.46 %
APS-2-N2-10	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	15CD	0.028	0.308	50	0.305295	0.09	18.92	0.780	3.95 %
APS-2-N2-11	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	30CD	0.028	0.28	1	0.003243	0	18.92	0.780	3.96 %
APS-2-N2-12	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	15CD	0.028	0.252	36	0.21953	0.06	18.86	0.840	4.24 %
APS-2-N2-13	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	30CD	0.028	0.224	45	0.278305	0.06	18.80	0.90	4.56 %
APS-2-N2-14	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	15CD	0.028	0.196	12	0.075411	0.01	18.79	0.910	4.63 %
APS-2-N2-15	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	75CD	0.028	0.168	26	0.15871	0.03	18.76	0.940	4.77 %
APS-2-N2-16	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	30CD	0.028	0.14	25	0.156262	0.02	18.74	0.960	4.88 %
APS-2-N2-17	G4VWN	STROBE, WALL, WHITE, ALERT	15CD	0.028	0.112	42	0.258072	0.03	18.71	0.990	5.02 %
APS-2-N2-18	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	15CD	0.028	0.084	17	0.103605	0.01	18.69	1	5.07 %
APS-2-N2-19	G4VWN	STROBE, WALL, WHITE, ALERT	15CD	0.028	0.056	23	0.140669	0.01	18.70	1.01	5.11 %
APS-2-N2-20 EOL 15K	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	75CD	0.028	0.028	13	0.079757	0	18.69	1.01	5.12 %
CALCULATION METHODS:											
RESISTANCE FROM PREVIOUS (I) = WIRE RESISTANCE (DI/FT) X 2 X DIST. FROM PREVIOUS (FT)											
VOLTAGE DROP FROM PREVIOUS = RESISTANCE FROM PREVIOUS (I) X REMAINING CURRENT (A)											

AP3:3 N3 POINT-TO-POINT REPORT				CURRENT SUMMARY				POWER SUMMARY			
				MAX. CIRCUIT CURRENT (A):	3	TOTAL CIRCUIT CURRENT (A): SPARE CIRCUIT CURRENT (A): SPARE CIRCUIT CURRENT %:	0.7490 2.25 75.03 %	STARTING CALC. VOLTAGE: MIN. OPERATIONAL VOLTAGE:	19.70 16	MAX. VOLTAGE DROP: VOLTAGE DROP %: END OF LINE VOLTAGE:	1.82 9.26 % 17.88
CIRCUIT WIRING PROPERTIES: "V" 14/2 THHN/THWN PAIR (NAC) N/A 14 AWG, 2 COND. PAIR SOLID COPPER THHN/THWN ANALOG UNSHIELDED								WIRE RESISTANCE (Ω/KFT):	3.07	TOTAL CIRCUIT LENGTH (FT): TOTAL CIRCUIT RESISTANCE (Ω):	751 4.61
DISTANCE MEASURED USING DRAWN SEGMENT LENGTHS WITH 30.00 % ADDITIONAL LENGTH CALCULATED											
DEVICE LABEL	PART NO	DESCRIPTION	CANDELAS	ALARM CURRENT (A)	REMAINING ALARM CURRENT (A)	DISTANCE FROM PREVIOUS	RESISTANCE FROM PREVIOUS (Ω)	VOLTAGE DROP FROM PREVIOUS			
APS-3-N3-01	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	110CD	0.028	0.7490	37	0.227629	0.17	19.53	0.17	0.87 %
APS-3-N3-02	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	110CD	0.028	0.7210	61	0.374866	0.27	19.26	0.44	2.24 %
APS-3-N3-03	GCSVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.6930	17	0.10595	0.07	19.19	0.510	2.61 %
APS-3-N3-04	GCSVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.6580	26	0.156979	0.1	19.08	0.620	3.13 %
APS-3-N3-05	GCSVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.6230	19	0.116431	0.07	19.01	0.680	3.50 %
APS-3-N3-06	GCSVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.5880	42	0.25904	0.15	18.86	0.840	4.28 %
APS-3-N3-07	GCSVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.5530	36	0.221388	0.12	18.74	0.960	4.90 %
APS-3-N3-08	GCSVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.5180	19	0.116851	0.06	18.67	1.03	5.20 %
APS-3-N3-09	GCSVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.483	29	0.180309	0.09	18.59	1.11	5.65 %
APS-3-N3-10	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	110CD	0.028	0.4480	60	0.367799	0.16	18.42	1.28	6.48 %
APS-3-N3-11	GCSVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	75CD	0.035	0.42	20	0.125753	0.05	18.37	1.33	6.75 %
APS-3-N3-12	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	15CD	0.028	0.385	42	0.254888	0.1	18.27	1.43	7.25 %
APS-3-N3-13	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	15CD	0.028	0.357	29	0.17792	0.06	18.21	1.49	7.57 %
APS-3-N3-14	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	110CD	0.028	0.329	19	0.117603	0.04	18.17	1.53	7.77 %
APS-3-N3-15	GCSVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.301	9	0.054602	0.02	18.15	1.55	7.85 %
APS-3-N3-16	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	15CD	0.028	0.266	28	0.173963	0.05	18.11	1.59	8.08 %
APS-3-N3-17	GCSVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.238	37	0.229373	0.05	18.05	1.65	8.36 %
APS-3-N3-18	GCSVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	75CD	0.035	0.203	17	0.102232	0.03	18.03	1.67	8.47 %
APS-3-N3-19	GCSVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.168	68	0.419811	0.07	17.96	1.74	8.82 %
APS-3-N3-20	GCSVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.133	82	0.504	0.07	17.89	1.81	9.16 %
APS-3-N3-21	GCSVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.098	10	0.060876	0.01	17.89	1.81	9.20 %
APS-3-N3-22	GCSVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.063	25	0.152042	0.01	17.88	1.82	9.24 %
APS-3-N3-23	EOL 15K	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	110CD	0.028	0.028	0.113138	0	17.88	1.82	9.26 %
CALCULATION METHODS: RESISTANCE FROM PREVIOUS (Ω) = WIRE RESISTANCE (Ω/FT) X 2 X DIST. FROM PREVIOUS (FT) VOLTAGE DROP FROM PREVIOUS = RESISTANCE FROM PREVIOUS (Ω) X REMAINING CURRENT (A)											

AP3:4 N2 POINT-TO-POINT REPORT				CURRENT SUMMARY				POWER SUMMARY			
				MAX. CIRCUIT CURRENT (A):	3	TOTAL CIRCUIT CURRENT (A): SPARE CIRCUIT CURRENT (A): SPARE CIRCUIT CURRENT %:	0.6370 2.36 78.77 %	STARTING CALC. VOLTAGE: MIN. OPERATIONAL VOLTAGE:	19.70 16	MAX. VOLTAGE DROP: VOLTAGE DROP %: END OF LINE VOLTAGE:	1.85 9.39 % 17.85
CIRCUIT WIRING PROPERTIES: "V" 14/2 THHN/THWN PAIR (NAC) N/A 14 AWG, 2 COND. PAIR SOLID COPPER THHN/THWN ANALOG UNSHIELDED								WIRE RESISTANCE (Ω/KFT):	3.07	TOTAL CIRCUIT LENGTH (FT): TOTAL CIRCUIT RESISTANCE (Ω):	775 4.76
DISTANCE MEASURED USING DRAWN SEGMENT LENGTHS WITH 30.00 % ADDITIONAL LENGTH CALCULATED											
DEVICE LABEL	PART NO	DESCRIPTION	CANDELAS	ALARM CURRENT (A)	REMAINING ALARM CURRENT (A)	DISTANCE FROM PREVIOUS	RESISTANCE FROM PREVIOUS (Ω)	VOLTAGE DROP FROM PREVIOUS			
APS-4-N2-01	GCSVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.6370	103	0.630	0.4	19.30	0.4	2.04 %
APS-4-N2-02	GCSVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.6020	43	0.264408	0.16	19.14	0.560	2.85 %
APS-4-N2-03	GCSVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.5670	41	0.254565	0.14	19	0.70	3.58 %
APS-4-N2-04	GCSVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	75CD	0.035	0.5320	74	0.451846	0.24	18.75	0.950	4.80 %
APS-4-N2-05	GCSVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.497	55	0.335513	0.17	18.59	1.11	5.64 %
APS-4-N2-06	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	75CD	0.028	0.462	47	0.286141	0.13	18.46	1.24	6.32 %
APS-4-N2-07	GCSVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.434	25	0.153173	0.07	18.39	1.31	6.65 %
APS-4-N2-08	GCSVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.399	27	0.166038	0.07	18.32	1.38	6.99 %
APS-4-N2-09	GCSVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	115CD	0.035	0.364	59	0.363543	0.13	18.19	1.51	7.66 %
APS-4-N2-10	GCSVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	115CD	0.035	0.329	23	0.140566	0.05	18.14	1.56	7.90 %
APS-4-N2-11	GCSVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	75CD	0.035	0.294	48	0.295919	0.09	18.06	1.64	8.34 %
APS-4-N2-12	GCSVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.259	34	0.209363	0.05	18	1.70	8.61 %
APS-4-N2-13	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	75CD	0.028	0.224	13	0.081987	0.02	17.98	1.72	8.71 %
APS-4-N2-14	GCSVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.196	25	0.150761	0.03	17.96	1.74	8.86 %
APS-4-N2-15	GCSVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	75CD	0.035	0.161	75	0.458829	0.07	17.88	1.82	9.23 %
APS-4-N2-16	GCSVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.126	7	0.043068	0.01	17.88	1.82	9.26 %
APS-4-N2-17	GCSVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.091	18	0.111331	0.01	17.87	1.83	9.31 %
APS-4-N2-18	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	15CD	0.028	0.056	35	0.212067	0.01	17.85	1.85	9.37 %
APS-4-N2-19	EOL 15K	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	75CD	0.028	0.028	0.150341	0	17.85	1.85	9.39 %
CALCULATION METHODS: RESISTANCE FROM PREVIOUS (Ω) = WIRE RESISTANCE (Ω/FT) X 2 X DIST. FROM PREVIOUS (FT) VOLTAGE DROP FROM PREVIOUS = RESISTANCE FROM PREVIOUS (Ω) X REMAINING CURRENT (A)											

AP3:4 N3 POINT-TO-POINT REPORT				CURRENT SUMMARY				POWER SUMMARY			
				MAX. CIRCUIT CURRENT (A):	3	TOTAL CIRCUIT CURRENT (A): SPARE CIRCUIT CURRENT (A): SPARE CIRCUIT CURRENT %:	0.448 2.55 85.07 %	STARTING CALC. VOLTAGE: MIN. OPERATIONAL VOLTAGE:	19.70 16	MAX. VOLTAGE DROP: VOLTAGE DROP %: END OF LINE VOLTAGE:	3.19 16.21 % 16.51
CIRCUIT WIRING PROPERTIES: "V" 14/2 THHN/THWN PAIR (NAC) N/A 14 AWG, 2 COND. PAIR SOLID COPPER THHN/THWN ANALOG UNSHIELDED								WIRE RESISTANCE (Ω/KFT):	3.07	TOTAL CIRCUIT LENGTH (FT): TOTAL CIRCUIT RESISTANCE (Ω):	1335 8.20
DISTANCE MEASURED USING DRAWN SEGMENT LENGTHS WITH 30.00 % ADDITIONAL LENGTH CALCULATED											
DEVICE LABEL	PART NO	DESCRIPTION	CANDELAS	ALARM CURRENT (A)	REMAINING ALARM CURRENT (A)	DISTANCE FROM PREVIOUS	RESISTANCE FROM PREVIOUS (Ω)	VOLTAGE DROP FROM PREVIOUS			
APS-4-N3-01	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	15CD	0.028	0.448	928	5.70	2.55	17.15	2.55	12.96 %
APS-4-N3-02	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	30CD	0.028	0.42	64	0.39051	0.16	16.98	2.72	13.79 %
APS-4-N3-03	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	15CD	0.028	0.392	21	0.130679	0.05	16.93	2.77	14.05 %
APS-4-N3-04	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	75CD	0.028	0.364	37	0.225507	0.08	16.85	2.85	14.47 %
APS-4-N3-05	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	15CD	0.028	0.336	41	0.248961	0.08	16.77	2.93	14.89 %
APS-4-N3-06	GCSVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.308	37	0.22626	0.07	16.70	3	15.25 %
APS-4-N3-07	GCSVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	75CD	0.035	0.273	20	0.124845	0.03	16.66	3.04	15.42 %
APS-4-N3-08	GCSVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.238	41	0.25206	0.06	16.60	3.10	15.72 %
APS-4-N3-09	GCWVN	STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.203	31	0.18792	0.04	16.56	3.14	15.92 %
APS-4-N3-10	G4WVN	STROBE, WALL, WHITE, ALERT	15CD	0.028	0.168	3	0.018491	0	16.56	3.14	15.93 %
APS-4-N3-11	GCSVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.14	17	0.106079	0.01	16.55	3.15	16.01 %
APS-4-N3-12	GCSVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.105	20	0.12477	0.01	16.53	3.17	16.08 %
APS-4-N3-13	GCSVWA	STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.07	52	0.319843	0.02	16.51	3.19	16.19 %
APS-4-N3-14	EOL 15K	GCSVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.035	0.141452	0	16.51	3.19	16.21 %
CALCULATION METHODS: RESISTANCE FROM PREVIOUS (Ω) = WIRE RESISTANCE (Ω/FT) X 2 X DIST. FROM PREVIOUS (FT) VOLTAGE DROP FROM PREVIOUS = RESISTANCE FROM PREVIOUS (Ω) X REMAINING CURRENT (A)											

APS:5 N2 POINT-TO-POINT REPORT				CURRENT SUMMARY				POWER SUMMARY			
				MAX. CIRCUIT CURRENT (A):	3	TOTAL CIRCUIT CURRENT (A):	0.343	STARTING CALC. VOLTAGE:	19.70	MAX. VOLTAGE DROP:	0.560
						SPARE CIRCUIT CURRENT (A):	2.66			VOLTAGE DROP %:	2.82 %
						SPARE CIRCUIT CURRENT %:	88.57 %	MIN. OPERATIONAL VOLTAGE:	16	END OF LINE VOLTAGE:	19.14
CIRCUIT WIRING PROPERTIES: "V" 14/2 THHN/THWN PAIR (NAC) N/A 14 AWG, 2 COND. PAIR SOLID COPPER THHN/THWN ANALOG UNSHIELDED								WIRE RESISTANCE (Ω/KFT):	3.07	TOTAL CIRCUIT LENGTH (FT):	479
DISTANCE MEASURED USING DRAWN SEGMENT LENGTHS WITH 30.00 % ADDITIONAL LENGTH CALCULATED										TOTAL CIRCUIT RESISTANCE (Ω):	2.94
DEVICE LABEL	PART NO	DESCRIPTION	CANDELAS	ALARM CURRENT (A)	REMAINING ALARM CURRENT (A)	DISTANCE FROM PREVIOUS	RESISTANCE FROM PREVIOUS (Ω)	VOLTAGE DROP FROM PREVIOUS			
APS-5-N2-01	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	30CD	0.028	0.343	104	0.637	0.22	19.48	0.22	1.11 %
APS-5-N2-02	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	15CD	0.028	0.315	43	0.266997	0.08	19.40	0.3	1.54 %
APS-5-N2-03	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	15CD	0.028	0.287	0	0.002661	0	19.40	0.3	1.54 %
APS-5-N2-04	GCSVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	30CD	0.035	0.259	30	0.185836	0.05	19.35	0.35	1.78 %
APS-5-N2-05	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	15CD	0.028	0.224	25	0.155494	0.03	19.31	0.39	1.96 %
APS-5-N2-06	G4WVN	STROBE, WALL, WHITE, ALERT	15CD	0.028	0.196	18	0.11309	0.02	19.29	0.41	2.07 %
APS-5-N2-07	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	75CD	0.028	0.168	48	0.297666	0.05	19.24	0.46	2.33 %
APS-5-N2-08	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	15CD	0.028	0.14	51	0.310602	0.04	19.20	0.5	2.55 %
APS-5-N2-09	G4WVN	STROBE, WALL, WHITE, ALERT	15CD	0.028	0.112	10	0.081514	0.01	19.19	0.510	2.58 %
APS-5-N2-10	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	15CD	0.028	0.084	51	0.310951	0.03	19.16	0.540	2.72 %
APS-5-N2-11	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	75CD	0.028	0.066	25	0.150999	0.01	19.16	0.540	2.76 %
APS-5-N2-12	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	30CD	0.028	0.028	73	0.447286	0.01	19.14	0.560	2.82 %
EOL 15K											
CALCULATION METHODS:											
RESISTANCE FROM PREVIOUS (Ω) = WIRE RESISTANCE (Ω/KFT) X 2 X DIST. FROM PREVIOUS (FT)											
VOLTAGE DROP FROM PREVIOUS = RESISTANCE FROM PREVIOUS (Ω) X REMAINING CURRENT (A)											

APS:7 N2 POINT-TO-POINT REPORT				CURRENT SUMMARY				POWER SUMMARY				
				MAX. CIRCUIT CURRENT (A):	3	TOTAL CIRCUIT CURRENT (A):	0.5460	STARTING CALC. VOLTAGE:	19.70	MAX. VOLTAGE DROP:	1.04	
						SPARE CIRCUIT CURRENT (A):	2.45			VOLTAGE DROP %:	5.30 %	
						SPARE CIRCUIT CURRENT %:	81.80 %	MIN. OPERATIONAL VOLTAGE:	16	END OF LINE VOLTAGE:	18.66	
CIRCUIT WIRING PROPERTIES: "V" 14/2 THHN/THWN PAIR (NAC) N/A 14 AWG, 2 COND. PAIR SOLID COPPER THHN/THWN ANALOG UNSHIELDED								WIRE RESISTANCE (Ω/KFT):	3.07	TOTAL CIRCUIT LENGTH (FT):	668	
DISTANCE MEASURED USING DRAWN SEGMENT LENGTHS WITH 30.00 % ADDITIONAL LENGTH CALCULATED										TOTAL CIRCUIT RESISTANCE (Ω):	4.10	
DEVICE LABEL	PART NO	DESCRIPTION	CANDELAS	ALARM CURRENT (A)	REMAINING ALARM CURRENT (A)	DISTANCE FROM PREVIOUS	RESISTANCE FROM PREVIOUS (Ω)	VOLTAGE DROP FROM PREVIOUS				
APS-7-N2-01	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	15CD	0.028	0.5460	11	0.066751	0.04	19.66	0.04	0.19 %	
APS-7-N2-02	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	75CD	0.028	0.5180	8	0.046072	0.02	19.64	0.06	0.31 %	
APS-7-N2-03	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	15CD	0.028	0.49	53	0.328164	0.16	19.48	0.22	1.12 %	
APS-7-N2-04	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	75CD	0.028	0.462	0	0.002696	0	19.48	0.22	1.13 %	
APS-7-N2-05	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	75CD	0.028	0.434	17	0.1051	0.05	19.43	0.27	1.36 %	
APS-7-N2-06	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	15CD	0.028	0.406	75	0.458206	0.19	19.25	0.45	2.30 %	
APS-7-N2-07	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	30CD	0.028	0.378	1	0.004989	0	19.24	0.46	2.31 %	
APS-7-N2-08	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	15CD	0.028	0.35	51	0.31157	0.11	19.14	0.550	2.87 %	
APS-7-N2-09	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	110CD	0.028	0.322	54	0.334444	0.11	19.03	0.670	3.41 %	
APS-7-N2-10	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	30CD	0.028	0.294	18	0.113484	0.03	18.99	0.710	3.58 %	
APS-7-N2-11	GCSVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	75CD	0.035	0.266	51	0.310865	0.08	18.91	0.790	4.00 %	
APS-7-N2-12	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	110CD	0.028	0.231	33	0.205322	0.05	18.86	0.840	4.24 %	
APS-7-N2-13	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	110CD	0.028	0.203	75	0.460108	0.09	18.77	0.930	4.72 %	
APS-7-N2-14	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	15CD	0.028	0.175	28	0.17071	0.03	18.74	0.960	4.87 %	
APS-7-N2-15	GCSVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	75CD	0.035	0.147	13	0.08031	0.01	18.73	0.970	4.93 %	
APS-7-N2-16	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	75CD	0.028	0.112	44	0.269134	0.03	18.70	1	5.08 %	
APS-7-N2-17	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	15CD	0.028	0.084	35	0.216782	0.02	18.68	1.02	5.18 %	
APS-7-N2-18	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	110CD	0.028	0.056	44	0.270403	0.02	18.67	1.03	5.25 %	
APS-7-N2-19	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	110CD	0.028	0.028	57	0.347651	0.01	18.66	1.04	5.30 %	
EOL 15K												
CALCULATION METHODS:												
RESISTANCE FROM PREVIOUS (Ω) = WIRE RESISTANCE (Ω/FT) X 2 X DIST. FROM PREVIOUS (FT)												
VOLTAGE DROP FROM PREVIOUS = RESISTANCE FROM PREVIOUS (Ω) X REMAINING CURRENT (A)												

SPEAKER SCHEDULE SUMMARY																	
DISTANCE MEASURED USING DRAWN SEGMENT LENGTHS WITH 30.00 % ADDITIONAL LENGTH CALCULATED																	
SOURCE	CIRCUIT	PART NO	MAX. CARD WATTS	TOTAL CARD WATTS	MAX. CIRCUIT WATTS	TOTAL CIRCUIT WATTS	SPARE CIRCUIT WATTS	SPARE CIRCUIT WATTS %	WIRE GAUGE	WIRE RESISTANCE (Ω/KFT)	TOTAL CIRCUIT LENGTH (FT)	TOTAL CIRCUIT RESISTANCE (Ω)	STARTING CALCULATION VOLTAGE	MIN. OPERATIONAL VOLTAGE	MAX. DB LOSS	END OF LINE VOLTAGE	VOLTAGE DROP %
APS:2 (APS6A WISIGA-AA30)	S1	SIGA-AA30	N/A	10	30	10	20	66.67 %	16	4.10	1260	10.33	70.70	63	-0.1010	69.89	1.15 %
	S1	SIGA-AA30	N/A	11	30	11	19	63.33 %	16	4.10	998	8.18	70.70	63	-0.080	70.05	0.92 %
APS:4 (APS10A WISIGA-AA30)	S1	SIGA-AA30	N/A	10.50	30	10.50	19.50	65.00 %	16	4.10	944	7.74	70.70	63	-0.0780	70.06	0.90 %
	S2	SIGA-AA30	N/A	4.75	30	4.75	25.25	84.17 %	16	4.10	630	5.17	70.70	63	-0.0290	70.46	0.34 %
APS:5 (APS6A WISIGA-AA30)	S1	SIGA-AA30	N/A	8.25	30	8.25	21.75	72.50 %	16	4.10	1021	8.38	70.70	63	-0.0630	70.19	0.72 %
APS:6 (APS6A WISIGA-AA30)	S1	SIGA-AA30	N/A	14.75	30	14.75	15.25	50.83 %	16	4.10	1521	12.47	70.70	63	-0.1540	69.46	1.76 %
APS:7 (APS6A WISIGA-AA30)	S1	SIGA-AA30	N/A	6.75	30	6.75	23.25	77.50 %	16	4.10	668	5.48	70.70	63	-0.0330	70.43	0.38 %
HSA-1 (3-RCC21R W/3-ZA95)	S1	3-ZA95	N/A	48	95	48	47	49.47 %	12	1.80	379	1.37	70.70	63	-0.1140	69.78	1.31 %
	S2	3-ZA95	N/A	72	95	72	23	24.21 %	12	1.80	463	1.67	70.70	63	-0.1950	69.13	2.22 %
	S3	3-ZA95	N/A	72	95	72	23	24.21 %	12	1.80	510	1.84	70.70	63	-0.2170	68.95	2.47 %
	S4	3-ZA95	N/A	48	95	48	47	49.47 %	12	1.80	508	1.83	70.70	63	-0.1530	69.46	1.75 %
HSA-2 (3-RCC21R W/3-ZA95)	S1	3-ZA95	N/A	16	95	16	79	83.16 %	12	1.80	482	1.74	70.70	63	-0.0240	70.50	0.28 %
	S2	3-ZA95	N/A	18	95	18	77	81.05 %	12	1.80	628	2.26	70.70	63	-0.0410	70.37	0.47 %
	S3	3-ZA95	N/A	48	95	48	47	49.47 %	12	1.80	337	1.21	70.70	63	-0.1010	69.88	1.16 %
	S4	3-ZA95	N/A	48	95	48	47	49.47 %	12	1.80	468	1.69	70.70	63	-0.1410	69.56	1.61 %

CALCULATION METHODS:

WATTS TO AMPS CONVERSION = DEVICE WATTS / VOLTAGE

RESISTANCE FROM PREVIOUS (D) = WIRE RESISTANCE (Ω/FT) X 2 X DIST. FROM PREVIOUS (FT)

VOLTAGE DROP FROM PREVIOUS = RESISTANCE FROM PREVIOUS (Ω) X REMAINING CURRENT (A)

DB LOSS FROM PREVIOUS = 20 × LOG (VOLTAGE AT PREVIOUS DEVICE / VOLTAGE AT DEVICE)

MAX. DB LOSS = 20 × LOG (VOLTAGE AT LAST DEVICE / START VOLTAGE)



100% SHOP DRAWING FOR PERMIT/CONSTRUCTION

(BRICK BREEDEN) FIELDHOUSE
FIRE ALARM REPLACEMENT

MONTANA STATE UNIVERSITY
BOZEMAN



DRAWN BY: BSM		
REVIEWED BY: BSM		
REV.	DESCRIPTION	DATE



PPA#23-0928

AE# 2024-02-04D

SHEET TITLE

FIRE ALARM NAC
CALCS CONT.

SHEET

FA7.3

DATE

10/22/2025

PANEL FCP (EST4 VOICE PANEL MSU) BATTERY CALCULATION							
(SECONDARY POWER SOURCE REQUIREMENTS)							
PANEL COMPONENTS	QTY	PART NO.	DESCRIPTION	STANDBY CURRENT (AMPS)		SECONDARY ALARM CURRENT (AMPS)	
				CURRENT DRAW (A)	TOTAL (A)	CURRENT DRAW (A)	TOTAL
	1	3-MODCOM	Modem Communicator and Dialer	0.06	0.06	0.095	0.095
	1	3-SSDC2	Signature Single Driver Controller (LRM)	0.144	0.144	0.204	0.204
	1	3-2A20A	20 Watt Zoned Amplifier, Class A, 25 or 70Vrms	0.062	0.062	1.12	1.12
	1	4-24L24S	24 Indicator 24 Control Display Module	0.009	0.009	0.009	0.009
	1	4-AUDTELS	Audio IO and Telephone Riser Source Module	0.085	0.085	0.101	0.101
	1	4-CPU	Main CPU	0.211	0.211	0.211	0.211
	1	4-LCDANN	Color LCD display	0.04	0.04	0.093	0.093
	1	4-LCDAUDEL	Separate LCD for Mic/FT	0.04	0.04	0.093	0.093
CIRCUIT							
FCP-ANN		4		0		0	
FCP-L1		138		CALCULATED AS MAX LOAD IN 3-SSDC2 ABOVE		CALCULATED AS MAX LOAD IN 3-SSDC2 ABOVE	
FCP-N1		1		0		0.238	
				TOTAL STANDBY (A)	0.740	TOTAL ALARM (A)	2.34
					REQUIRED STANDBY TIME = 24 HOURS		
					REQUIRED ALARM TIME = 15 MINUTES		
			0.740	24		17.76	
			2.34	0.25		0.590	
					18.35		
					1.25		
					22.93		
PROVIDE (2) 12V 40AH BATTERIES IN BC-1 CABINET MOUNTED BELOW FACU							

TYPICAL FAA BATTERY CALCULATION (ADDED TO APS-2, APS-3, AND APS-5							
(SECONDARY POWER SOURCE REQUIREMENTS)							
				STANDBY CURRENT (AMPS)		SECONDARY ALARM CURRENT (AMPS)	
				CURRENT DRAW (A)	TOTAL (A)	CURRENT DRAW (A)	TOTAL
PANEL COMPONENTS	QTY	PART NO.	DESCRIPTION				
	1	4-24L24S	24 Indicator 24 Control Display Module	0.009	0.009	0.009	0.009
	1	4-ANNAUDEL	Annunciator Audio Telephone Interface Module (Required for Master Only)	0.098	0.098	0.098	0.098
	1	4-ANNCPU	Annunciator Central Processor Unit (CPU)	0.125	0.125	0.125	0.125
	1	4-LCDLE	DISPLAY MAIN LCD MODULE	0.04	0.04	0.093	0.093
	1	4-MIC	Paging Microphone	0.008	0.008	0.038	0.038
	2	4-NET-TP	Twisted Pair SFP network controller	0.032	0.064	0.032	0.064
	TOTAL DEVICE QTY			TOTAL STANDBY (A)		TOTAL ALARM (A)	
CIRCUIT				TOTAL STANDBY (A)	0.344	TOTAL ALARM (A)	0.427

PANEL HSA-1 (3-RCC21R W/3-ZA95) BATTERY CALCULATION							
(SECONDARY POWER SOURCE REQUIREMENTS)							
PANEL COMPONENTS			STANDBY CURRENT (AMPS)		SECONDARY ALARM CURRENT (AMPS)		
			CURRENT DRAW (A)	TOTAL (A)	CURRENT DRAW (A)	TOTAL	
			0	0	0	0	
			0	0	0	0	
			0.085	0.34	5.54	22.16	
			0	0	0	0	
			TOTAL STANDBY (A)		TOTAL ALARM (A)		
CIRCUIT			TOTAL DEVICE QTY				
HSA-1-S1			2		0		
HSA-1-S2			3		0		
HSA-1-S3			3		0		
HSA-1-S4			2		0		
				TOTAL STANDBY (A)	0.34	TOTAL ALARM (A)	22.16
				REQUIRED STANDBY TIME = 24 HOURS			
				REQUIRED ALARM TIME = 15 MINUTES			
SECONDARY STANDBY LOAD (A)			0.34	24	8.16		
SECONDARY ALARM LOAD (A)			22.16	0.25	5.54		
STANDBY AND ALARM SUBTOTAL (AMP HOURS)					13.70		
DERATING FACTOR					1.25		
SECONDARY LOAD REQUIREMENTS (AMP HOURS)					17.13		
PROVIDE (2) 12V 24AH BATTERIES							

PANEL HSA-2 (3-RCC21R W/3-ZA95) BATTERY CALCULATION							
(SECONDARY POWER SOURCE REQUIREMENTS)							
PANEL COMPONENTS	QTY	PART NO.	DESCRIPTION	STANDBY CURRENT (AMPS)		SECONDARY ALARM CURRENT (AMPS)	
				CURRENT DRAW (A)	TOTAL (A)	CURRENT DRAW (A)	TOTAL
	3	3-CHAS7	Chassis Assy for 7 LRMs	0	0	0	0
	1	3-RCC21R	Red Remote Chassis Cabinet w/ Cover	0	0	0	0
	4	3-ZA95	95 Watt Zoned Amplifier, Class B/A, 25 or 70Vrms	0.085	0.34	5.54	22.16
	4	4-PPS/M	Primary Power Supply 120V	0	0	0	0
			TOTAL DEVICE QTY		TOTAL STANDBY (A)		TOTAL ALARM (A)
CIRCUIT							
HSA-2-S1			4	0		0	
HSA-2-S2			7	0		0	
HSA-2-S3			2	0		0	
HSA-2-S4			2	0		0	
				TOTAL STANDBY (A)	0.34	TOTAL ALARM (A)	22.16
				REQUIRED STANDBY TIME = 24 HOURS			
				REQUIRED ALARM TIME = 15 MINUTES			
SECONDARY STANDBY LOAD (A)			0.34	24		8.16	
SECONDARY ALARM LOAD (A)			22.16	0.25		5.54	
STANDBY AND ALARM SUBTOTAL (AMP HOURS)					13.70		
DERATING FACTOR					1.25		
SECONDARY LOAD REQUIREMENTS (AMP HOURS)					17.13		
PROVIDE (2) 12V 24AH BATTERIES							

PANEL BPS-1 (BPS10A) BATTERY CALCULATION							
(SECONDARY POWER SOURCE REQUIREMENTS)							
PANEL COMPONENTS	QTY	PART NO.	DESCRIPTION	STANDBY CURRENT (AMPS)		SECONDARY ALARM CURRENT (AMPS)	
	1	BPS10A Mainboard	Mainboard for BPS10A assembly	CURRENT DRAW (A)	TOTAL (A)	CURRENT DRAW (A)	TOTAL
				0.07	0.07	0.27	0.27
	TOTAL DEVICE QTY			TOTAL STANDBY (A)		TOTAL ALARM (A)	
	BPS-1-N1		13	0		0.364	
	BPS-1-N2		12	0		0.35	
	BPS-1-N3		10	0		0.530	
	BPS-1-N4		6	0		0.318	
				TOTAL STANDBY (A)	0.07	TOTAL ALARM (A)	1.83
				REQUIRED STANDBY TIME = 24 HOURS			
			REQUIRED ALARM TIME = 15 MINUTES				
SECONDARY STANDBY LOAD (A)			0.07	24		1.68	
SECONDARY ALARM LOAD (A)							
STANDBY AND ALARM SUBTOTAL (AMP HOURS)			1.83	0.25	2.14	0.46	
DERATING FACTOR					1.25		
SECONDARY LOAD REQUIREMENTS (AMP HOURS)					2.67		
PROVIDE (2) 12V 7AH BATTERIES							

PANEL APS-2 (APS6A WISIGA-AA30) BATTERY CALCULATION							
(SECONDARY POWER SOURCE REQUIREMENTS)							
PANEL POWER SUPPLY MAX CURRENT = 6A				TOTAL USED CAPACITY (IN ALARM) = 3.381A (66.35 %)			
PANEL COMPONENTS	QTY	PART NO.	DESCRIPTION	STANDBY CURRENT (AMPS)		SECONDARY ALARM CURRENT (AMPS)	
				CURRENT DRAW (A)	TOTAL (A)	CURRENT DRAW (A)	TOTAL
	1	APS10A Mainboard	Mainboard for APS10A assembly	0.07	0.07	0.27	0.27
	1	SIGA-AA30	30 Watt Intelligent Audio Amplifier	0.002	0.002	1.55	1.55
	TOTAL DEVICE QTY			TOTAL STANDBY (A)		TOTAL ALARM (A)	
	APS-2-N2			0		0.560	
	APS-2-N3			0		0.5740	
	APS-2-N4			0.344		0.427	
	APS-2-S1			0		0	
				TOTAL STANDBY (A)	0.416	TOTAL ALARM (A)	3.38
				REQUIRED STANDBY TIME = 24 HOURS			
				REQUIRED ALARM TIME = 15 MINUTES			
SECONDARY STANDBY LOAD (A)			24		9.98		
SECONDARY ALARM LOAD (A)			0.25		0.850		
STANDBY AND ALARM SUBTOTAL (AMP HOURS)					10.83		
DERATING FACTOR					1.25		
SECONDARY LOAD REQUIREMENTS (AMP HOURS)					13.54		
PROVIDE (2) 12V 18AH BATTERIES							

PANEL APS-3 (APS6A W/SIGA-AA30) BATTERY CALCULATION							
(SECONDARY POWER SOURCE REQUIREMENTS)							
PANEL POWER SUPPLY MAX CURRENT = 6A				TOTAL USED CAPACITY (IN ALARM) = 3.22A (53.67 %)			
PANEL COMPONENTS	QTY	PART NO.	DESCRIPTION	STANDBY CURRENT (AMPS)		SECONDARY ALARM CURRENT (AMPS)	
				CURRENT DRAW (A)	TOTAL (A)	CURRENT DRAW (A)	TOTAL
	1	APS10A Mainboard	Mainboard for APS10A assembly	0.07	0.07	0.27	0.27
	1	SIGA-AA30	30 Watt Intelligent Audio Amplifier	0.002	0.002	1.55	1.55
	TOTAL DEVICE QTY			TOTAL STANDBY (A)		TOTAL ALARM (A)	
	APS-3-N2			0		0.224	
	APS-3-N3			0		0.7490	
	APS-3-N4			0.344		0.427	
	APS-3-S1			0		0	
					TOTAL STANDBY (A)	0.416	TOTAL ALARM (A)
REQUIRED STANDBY TIME = 24 HOURS							
REQUIRED ALARM TIME = 15 MINUTES							
SECONDARY STANDBY LOAD (A)			24		9.98		
SECONDARY ALARM LOAD (A)			0.25		0.810		
STANDBY AND ALARM SUBTOTAL (AMP HOURS)					10.79		
DERATING FACTOR					1.25		
SECONDARY LOAD REQUIREMENTS (AMP HOURS)					13.49		
PROVIDE (2) 12V 18AH BATTERIES							

PANEL LOAD SUMMARY						STANDBY CURRENT (AMPS)		ALARM CURRENT (AMPS)	
						CURRENT DRAW (A)	TOTAL (A)	CURRENT DRAW (A)	TOTAL
PANEL COMPONENT SUMMARY						QTY	PART NO	DESCRIPTION	
						1	3-CAB14B	Back Box w/ 14 LRM Space w/o Door	1 x 0 = 0
						1	3-CHAS7	Chassis Assy for 7 LRMs	1 x 0 = 0
						1	3-MODCOM	Modem Communicator and Dialer	1 x 0.06 = 0.06
						1	3-SSDC2	Signature Single Driver Controller (LRM)	1 x 0.144 = 0.144
						1	3-ZA20A	20 Watt Zoned Amplifier, Class A, 25 or 70Vrms	1 x 0.062 = 0.062
						1	4-24L24S	24 Indicator 24 Control Display Module	1 x 0.009 = 0.009
						1	4-AUDTELS	Audio IO and Telephone Riser Source Module	1 x 0.085 = 0.085
						1	4-CPU	Main CPU	1 x 0.211 = 0.211
						1	4-LCDANN	Color LCD display	1 x 0.04 = 0.04
						1	4-LCDAUDEL	Separate LCD for MicFT	1 x 0.04 = 0.04
						1	4-LCDLE	DISPLAY MAIN LCD MODULE	1 x 0.04 = 0.04
						1	4-MIC	Paging Microphone	1 x 0.008 = 0.008
						1	4-NET-TP	Twisted Pair SFP network controller	1 x 0.032 = 0.032
						1	4-PPSM	Primary Power Supply 120V	1 x 0 = 0
CIRCUIT SUMMARY						CIRCUIT			
						ANN		1 x 0 = 0	1 x 0 = 0
						Audio-25V		1 x 0 = 0	1 x 0 = 0
						AUX1		1 x 0.03 = 0.03	1 x 0.082 = 0.082
						L1		1 x 0.01 = 0.01	1 x 0.014 = 0.014
						N1		1 x 0 = 0	1 x 0.238 = 0.238
						TOTAL STANDBY CURRENT		0.77	TOTAL ALARM CURRENT 2.422

PANEL FCP (EST4 VOICE) SUMMARY REPORT

CIRCUIT DETAILS AND CALCULATIONS									STANDBY CURRENT	ALARM CURRENT	POINT-TO-POINT VOLTAGE DROP CALCULATION SUMMARY			SPEAKER POWER/DB LOSS CALCULATIONS				
SOURCE	MAX CAPACITY	TOTAL USED CAPACITY	AVAILABLE CAPACITY	CIRCUIT	AWG	TOTAL DEVICE QTY	CIRCUIT LENGTH	CIRCUIT RESISTANCE (Ω/ft)	TOTAL STANDBY (A)	TOTAL ALARM (A)	STARTING CALCULATION VOLTAGE	END OF LINE VOLTAGE	VOLTAGE DROP	TOTAL USED WATTS	STARTING CALCULATION VOLTAGE	END OF LINE VOLTAGE	POWER LOSS PERCENT	TOTAL DB LOSS
3-SSDC2				L1	16	194	4321'	0.004	0.01	0.014								
3-ZA20A				Audio-25V	16	7	1627'	0.004	0	0				0w	25v	25v	0.00 %	0dB
4-CPU				N1	14	7	238'	0.003	0	0.238	20.4v	20.05v	0.35v					
4-PPSM				ANN	16	7	1141'	0.004	0	0								
				AUX1	14	1	1'	0.003	0.03	0.082	20.4v	20.4v	0v					

SECONDARY POWER SOURCE REQUIREMENTS					PROVIDE (2) 12V 40AH BATTERIES IN BC-1 CABINET MOUNTED BELOW FACU
		REQUIRED STANDBY TIME = 24 HOURS			
		REQUIRED ALARM TIME = 15 MINUTES			
	SECONDARY STANDBY LOAD	0.77	x 24	= 18.48 AH	
	SECONDARY ALARM LOAD	2.422	x 0.25	= 0.61 AH	
	STANDBY AND ALARM LOAD SUBTOTAL			19.09 AH	
	DERATING FACTOR			x 1.25	
	SECONDARY LOAD REQUIREMENTS (AMP HOURS)			23.86 AH	

PANEL LOAD SUMMARY						STANDBY CURRENT (AMPS)		ALARM CURRENT (AMPS)	
						CURRENT DRAW (A)	TOTAL (A)	CURRENT DRAW (A)	TOTAL
PANEL COMPONENT SUMMARY						QTY	PART NO	DESCRIPTION	
						3	3-CHAS7	Chassis Assy for 7 LRMs	3 x 0 = 0
						1	3-RCC21R	Red Remote Chassis Cabinet w/ Cover	1 x 0 = 0
						4	3-ZA95	95 Watt Zoned Amplifier, Class B/A, 25 or 70Vrms	4 x 0.085 = 0.34
						4	4-PPSM	Primary Power Supply 120V	4 x 0 = 0
CIRCUIT SUMMARY						CIRCUIT			
						S1		1 x 0 = 0	1 x 0 = 0
						S2		1 x 0 = 0	1 x 0 = 0
						S3		1 x 0 = 0	1 x 0 = 0
						S4		1 x 0 = 0	1 x 0 = 0
						TOTAL STANDBY CURRENT		0.34	TOTAL ALARM CURRENT 22.16

PANEL HSA:1 (3-RCC21R W/3-ZA95) SUMMARY REPORT

CIRCUIT DETAILS AND CALCULATIONS									STANDBY CURRENT	ALARM CURRENT	POINT-TO-POINT VOLTAGE DROP CALCULATION SUMMARY			SPEAKER POWER/DB LOSS CALCULATIONS				
SOURCE	MAX CAPACITY	TOTAL USED CAPACITY	AVAILABLE CAPACITY	CIRCUIT	AWG	TOTAL DEVICE QTY	CIRCUIT LENGTH	CIRCUIT RESISTANCE (Ω/ft)	TOTAL STANDBY (A)	TOTAL ALARM (A)	STARTING CALCULATION VOLTAGE	END OF LINE VOLTAGE	VOLTAGE DROP	TOTAL USED WATTS	STARTING CALCULATION VOLTAGE	END OF LINE VOLTAGE	POWER LOSS PERCENT	TOTAL DB LOSS
3-ZA95				S2	12	5	463'	0.002	0	0				72w	70.7v	69.13v	2.22 %	-0.211dB
3-ZA95				S4	12	4	508'	0.002	0	0				48w	70.7v	69.46v	1.75 %	-0.154dB
3-ZA95				S1	12	4	379'	0.002	0	0				48w	70.7v	69.78v	1.31 %	-0.115dB
3-ZA95				S3	12	5	510'	0.002	0	0				72w	70.7v	68.95v	2.47 %	-0.233dB

SECONDARY POWER SOURCE REQUIREMENTS					PROVIDE (2) 12V 24AH BATTERIES @ 24VDC
			REQUIRED STANDBY TIME = 24 HOURS		
			REQUIRED ALARM TIME = 15 MINUTES		
SECONDARY STANDBY LOAD			0.34	x 24 = 8.16 AH	
SECONDARY ALARM LOAD			22.16	x 0.25 = 5.54 AH	
STANDBY AND ALARM LOAD SUBTOTAL				13.7 AH	
DERATING FACTOR				x 1.25	
SECONDARY LOAD REQUIREMENTS (AMP HOURS)				17.13 AH	

PANEL LOAD SUMMARY						STANDBY CURRENT (AMPS)		ALARM CURRENT (AMPS)	
						CURRENT DRAW (A)	TOTAL (A)	CURRENT DRAW (A)	TOTAL
PANEL COMPONENT SUMMARY						QTY	PART NO	DESCRIPTION	
						3	3-CHAS7	Chassis Assy for 7 LRMs	3 x 0 = 0
						1	3-RCC21R	Red Remote Chassis Cabinet w/ Cover	1 x 0 = 0
						4	3-ZA95	95 Watt Zoned Amplifier, Class B/A, 25 or 70Vrms	4 x 0.085 = 0.34
						4	4-PPSM	Primary Power Supply 120V	4 x 0 = 0
CIRCUIT SUMMARY						CIRCUIT			
						S1		1 x 0 = 0	1 x 0 = 0
						S2		1 x 0 = 0	1 x 0 = 0
						S3		1 x 0 = 0	1 x 0 = 0
						S4		1 x 0 = 0	1 x 0 = 0
						TOTAL STANDBY CURRENT		0.34	TOTAL ALARM CURRENT 22.16

PANEL HSA:2 (3-RCC21R W/3-ZA95) SUMMARY REPORT

CIRCUIT DETAILS AND CALCULATIONS									STANDBY CURRENT	ALARM CURRENT	POINT-TO-POINT VOLTAGE DROP CALCULATION SUMMARY			SPEAKER POWER/DB LOSS CALCULATIONS				
SOURCE	MAX CAPACITY	TOTAL USED CAPACITY	AVAILABLE CAPACITY	CIRCUIT	AWG	TOTAL DEVICE QTY	CIRCUIT LENGTH	CIRCUIT RESISTANCE (Ω/ft)	TOTAL STANDBY (A)	TOTAL ALARM (A)	STARTING CALCULATION VOLTAGE	END OF LINE VOLTAGE	VOLTAGE DROP	TOTAL USED WATTS	STARTING CALCULATION VOLTAGE	END OF LINE VOLTAGE	POWER LOSS PERCENT	TOTAL DB LOSS
3-ZA95				S1	12	4	482'	0.002	0	0				16w	70.7v	70.5v	0.28 %	-0.048dB
3-ZA95				S3	12	4	337'	0.002	0	0				48w	70.7v	69.88v	1.16 %	-0.102dB
3-ZA95				S4	12	4	468'	0.002	0	0				48w	70.7v	69.56v	1.61 %	-0.142dB
3-ZA95				S2	12	7	628'	0.002	0	0				18w	70.7v	70.37v	0.47 %	-0.071dB

SECONDARY POWER SOURCE REQUIREMENTS									
				REQUIRED STANDBY TIME = 24 HOURS					
				REQUIRED ALARM TIME = 15 MINUTES					
SECONDARY STANDBY LOAD				0.34	x 24	= 8.16 AH			
SECONDARY ALARM LOAD				22.16	x 0.25	= 5.54 AH			
STANDBY AND ALARM LOAD SUBTOTAL						13.7 AH			
DERATING FACTOR						x 1.25			
SECONDARY LOAD REQUIREMENTS (AMP HOURS)						17.13 AH			

PROVIDE (2) 12V 24AH BATTERIES @ 24VDC



100% SHOP DRAWING FOR PERMIT/CONSTRUCTION

(BRICK BREEDEN) FIELDHOUSE
FIRE ALARM REPLACEMENT

MONTANA STATE UNIVERSITY
BOZEMAN



DRAWN BY: BSM		
REVIEWED BY: BSM		
REV.	DESCRIPTION	DATE



PPA#23-0928
AE# 2024-02-04D

SHEET TITLE
FIRE ALARM CALC
SUMMARY 1

SHEET
FA8.1

DATE
10/22/2025

PANEL LOAD SUMMARY										STANDBY CURRENT (AMPS)		ALARM CURRENT (AMPS)								
PANEL COMPONENT SUMMARY				QTY	PART NO	DESCRIPTION		CURRENT DRAW (A)	TOTAL (A)	CURRENT DRAW (A)	TOTAL									
				1	BPS10A Mainboard	Mainboard for BPS10A assembly		1 x 0.07	= 0.07	1 x 0.27	= 0.27									
CIRCUIT SUMMARY				CIRCUIT																
				N1				1 x 0	= 0	1 x 0.364	= 0.364									
				N2				1 x 0	= 0	1 x 0.35	= 0.35									
				N3				1 x 0	= 0	1 x 0.53	= 0.53									
				N4				1 x 0	= 0	1 x 0.318	= 0.318									
				TOTAL STANDBY CURRENT				0.07	TOTAL ALARM CURRENT	1.832										
CIRCUIT DETAILS AND CALCULATIONS										STANDBY CURRENT		ALARM CURRENT		POINT-TO-POINT VOLTAGE DROP CALCULATION SUMMARY			SPEAKER POWER/DB LOSS CALCULATIONS			
SOURCE	MAX CAPACITY	TOTAL USED CAPACITY	AVAILABLE CAPACITY	CIRCUIT	AWG	TOTAL DEVICE QTY	CIRCUIT LENGTH	CIRCUIT RESISTANCE (Ω/m)	TOTAL STANDBY (A)	TOTAL ALARM (A)	STARTING CALCULATION VOLTAGE	END OF LINE VOLTAGE	VOLTAGE DROP	TOTAL USED WATTS	STARTING CALCULATION VOLTAGE	END OF LINE VOLTAGE	POWER LOSS PERCENT	TOTAL DB LOSS		
BPS10A Mainboard				N1	14	13	866"	0.003	0	0.364	19.7v	18.68v	1.02v							
				N2	14	12	663"	0.003	0	0.35	19.7v	19.03v	0.67v							
				N3	14	10	869"	0.003	0	0.53	19.7v	18.12v	1.58v							
				N4	14	6	1019"	0.003	0	0.318	19.7v	18.61v	1.09v							
SECONDARY POWER SOURCE REQUIREMENTS																				
									REQUIRED STANDBY TIME = 24 HOURS											
									REQUIRED ALARM TIME = 15 MINUTES											
						SECONDARY STANDBY LOAD			0.07	x 24	= 1.68 AH									
						SECONDARY ALARM LOAD			1.832	x 0.25	= 0.46 AH									
						STANDBY AND ALARM LOAD SUBTOTAL					2.14 AH									
						DERATING FACTOR					x 1.25									
						SECONDARY LOAD REQUIREMENTS (AMP HOURS)					2.67 AH									
PROVIDE (2) 12V 7AH BATTERIES @ 24VDC																				

PANEL LOAD SUMMARY										STANDBY CURRENT (AMPS)		ALARM CURRENT (AMPS)								
PANEL COMPONENT SUMMARY				QTY	PART NO	DESCRIPTION		CURRENT DRAW (A)	TOTAL (A)	CURRENT DRAW (A)	TOTAL									
				1	APS10A Mainboard	Mainboard for APS10A assembly		1 x 0.07	= 0.07	1 x 0.27	= 0.27									
				1	SIGA-AA30	30 Watt Intelligent Audio Amplifier		1 x 0.002	= 0.002	1 x 1.55	= 1.55									
CIRCUIT SUMMARY				CIRCUIT																
				N2				1 x 0	= 0	1 x 0.56	= 0.56									
				N3				1 x 0	= 0	1 x 0.574	= 0.574									
				N4				1 x 0.344	= 0.344	1 x 0.427	= 0.427									
				S1				1 x 0	= 0	1 x 0	= 0									
								TOTAL STANDBY CURRENT	0.416	TOTAL ALARM CURRENT	3.381									
CIRCUIT DETAILS AND CALCULATIONS										STANDBY CURRENT		ALARM CURRENT		POINT-TO-POINT VOLTAGE DROP CALCULATION SUMMARY			SPEAKER POWER/DB LOSS CALCULATIONS			
SOURCE	MAX CAPACITY	TOTAL USED CAPACITY	AVAILABLE CAPACITY	CIRCUIT	AWG	TOTAL DEVICE QTY	CIRCUIT LENGTH	CIRCUIT RESISTANCE (Ohm)	TOTAL STANDBY (A)	TOTAL ALARM (A)	STARTING CALCULATION VOLTAGE	END OF LINE VOLTAGE	VOLTAGE DROP	TOTAL USED WATTS	STARTING CALCULATION VOLTAGE	END OF LINE VOLTAGE	POWER LOSS PERCENT	TOTAL DB LOSS		
APS10A Mainboard				N2	14	20	497"	0.003	0	0.56	19.7v	18.8v	0.9v							
				N3	14	20	711"	0.003	0	0.574	19.7v	18.28v	1.42v							
				N4	14	1	261"	0.003	0.344	0.427	19.7v	19.02v	0.68v							
SIGA-AA30	30w	10w	20w	S1	16	37	1232"	0.004	0	0				10w	70.7v	69.92v	1.11 %	-0.177dB		
SECONDARY POWER SOURCE REQUIREMENTS																				
									REQUIRED STANDBY TIME = 24 HOURS											
									REQUIRED ALARM TIME = 15 MINUTES											
SECONDARY STANDBY LOAD									0.416	x 24	= 9.98 AH									
SECONDARY ALARM LOAD									3.381	x 0.25	= 0.85 AH									
STANDBY AND ALARM LOAD SUBTOTAL											10.83 AH									
DERATING FACTOR											x 1.25									
SECONDARY LOAD REQUIREMENTS (AMP HOURS)											13.54 AH									
PROVIDE (2) 12V 18AH BATTERIES @ 24VDC																				

PANEL COMPONENT SUMMARY										STANDBY CURRENT (AMPS)		ALARM CURRENT (AMPS)	
PANEL COMPONENT SUMMARY				QTY	PART NO	DESCRIPTION		CURRENT DRAW (A)	TOTAL (A)	CURRENT DRAW (A)	TOTAL		
				1	APS10A Mainboard	Mainboard for APS10A assembly		1 x 0.07	= 0.07	1 x 0.27	= 0.27		
				1	SIGA-AA30	30 Watt Intelligent Audio Amplifier		1 x 0.002	= 0.002	1 x 1.55	= 1.55		
CIRCUIT SUMMARY				CIRCUIT				1 x 0	= 0	1 x 0.224	= 0.224		
				N2				1 x 0	= 0	1 x 0.749	= 0.749		
				N3				1 x 0.344	= 0.344	1 x 0.427	= 0.427		
				N4				1 x 0	= 0	1 x 0	= 0		
				S1				TOTAL STANDBY CURRENT	0.416	TOTAL ALARM CURRENT	3.22		

PANEL APS:3 (APS6A W/SIGA-AA30) SUMMARY REPORT

PANEL POWER SUPPLY MAX CURRENT = 6A

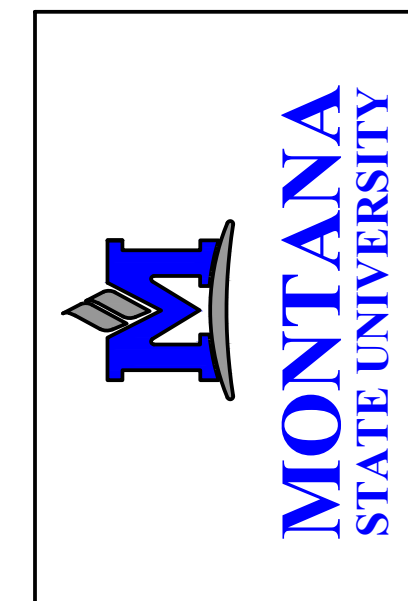
TOTAL USED CAPACITY = 3.22A (53.67 %)

CIRCUIT DETAILS AND CALCULATIONS										STANDBY CURRENT		ALARM CURRENT		POINT-TO-POINT VOLTAGE DROP CALCULATION SUMMARY			SPEAKER POWER/DB LOSS CALCULATIONS				
SOURCE	MAX CAPACITY	TOTAL USED CAPACITY	AVAILABLE CAPACITY	CIRCUIT	AWG	TOTAL DEVICE QTY	CIRCUIT LENGTH	CIRCUIT RESISTANCE (Ω/ft)	TOTAL STANDBY (A)	TOTAL ALARM (A)	STARTING CALCULATION VOLTAGE	END OF LINE VOLTAGE	VOLTAGE DROP	TOTAL USED WATTS	STARTING CALCULATION VOLTAGE	END OF LINE VOLTAGE	POWER LOSS PERCENT	TOTAL DB LOSS			
APS10A Mainboard				N2	14	8	246"	0.003	0	0.224	19.7v	19.51v	0.19v								
				N3	14	23	751"	0.003	0	0.749	19.7v	18.82v									
				N4	14	1	253"	0.003	0.344	0.427	19.7v	19.04v	0.66v								
SIGA-AA30	30w	11w	19w	S1	16	38	998"	0.004	0	0				11w	70.7v	70.05v	0.92 %	-0.158dB			

SECONDARY POWER SOURCE REQUIREMENTS

REQUIRED STANDBY TIME = 24 HOURS	
REQUIRED ALARM TIME = 15 MINUTES	
SECONDARY STANDBY LOAD	0.416 x 24 = 9.98 AH
SECONDARY ALARM LOAD	3.22 x 0.25 = 0.81 AH
STANDBY AND ALARM LOAD SUBTOTAL	10.79 AH
DERATING FACTOR	x 1.25
SECONDARY LOAD REQUIREMENTS (AMP HOURS)	13.49 AH

PROVIDE (2) 12V 18AH BATTERIES @ 24VDC

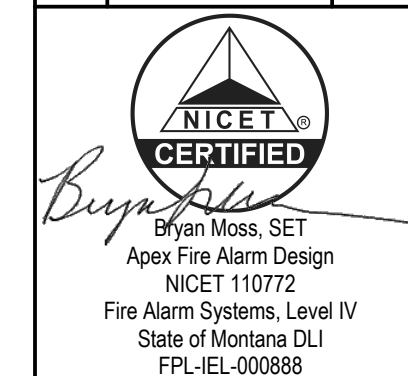


TOP DRAWING FOR PERMIT/CONSTRUCTION
(BRICK BREEDEN) FIELDHOUSE
FIRE ALARM REPLACEMENT

MONTANA STATE UNIVERSITY
BOZEMAN



DRAWN BY: BSM		
REVIEWED BY: BSM		
REV.	DESCRIPTION	DATE



PPA#23-0928

AE# 2024-02-04D

SHEET TITLE
FIRE ALARM CALC
SUMMARY 2

SHEET
FA8.2

DATE
10/22/2025

PANEL LOAD SUMMARY						STANDBY CURRENT (AMPS)		ALARM CURRENT (AMPS)																	
PANEL COMPONENT SUMMARY						QTY	PART NO	DESCRIPTION	CURRENT DRAW (A)	TOTAL (A)	CURRENT DRAW (A)	TOTAL													
						1	APS10A Mainboard	Mainboard for APS10A assembly	1 x 0.07	= 0.07	1 x 0.27	= 0.27													
						2	SIGA-AA30	30 Watt Intelligent Audio Amplifier	2 x 0.002	= 0.004	2 x 1.55	= 3.1													
CIRCUIT SUMMARY						CIRCUIT																			
						N2			1 x 0	= 0	1 x 0.637	= 0.637													
						N3			1 x 0	= 0	1 x 0.448	= 0.448													
						N4			1 x 0.42	= 0.42	1 x 0	= 0													
						S1			1 x 0	= 0	1 x 0	= 0													
						S2			1 x 0	= 0	1 x 0	= 0													
									TOTAL STANDBY CURRENT	0.494	TOTAL ALARM CURRENT	4.455													
CIRCUIT DETAILS AND CALCULATIONS									STANDBY CURRENT		ALARM CURRENT		POINT-TO-POINT VOLTAGE DROP CALCULATION SUMMARY			SPEAKER POWER/DB LOSS CALCULATIONS									
SOURCE	MAX CAPACITY	TOTAL USED CAPACITY	AVAILABLE CAPACITY	CIRCUIT	AWG	TOTAL DEVICE QTY	CIRCUIT LENGTH	CIRCUIT RESISTANCE (Ω/ft)	TOTAL STANDBY (A)	TOTAL ALARM (A)	STARTING CALCULATION VOLTAGE	END OF LINE VOLTAGE	VOLTAGE DROP	TOTAL USED WATTS	STARTING CALCULATION VOLTAGE	END OF LINE VOLTAGE	POWER LOSS PERCENT	TOTAL DB LOSS							
APS10A Mainboard				N2	14	19	775'	0.003	0	0.637	19.7v	17.85v	1.85v												
				N3	14	14	1335'	0.003	0	0.448	19.7v	16.51v	3.19v												
				N4	14	31	917'	0.003	0.42	0	19.7v	19.7v	0v												
SIGA-AA30	30w	4.75w	25.25w	S2	16	18	630'	0.004	0	0				4.75w	70.7v	70.46v	0.34 %	-0.043dB							
SIGA-AA30	30w	10.5w	19.5w	S1	16	33	944'	0.004	0	0				10.5w	70.7v	70.06v	0.90 %	-0.142dB							
SECONDARY POWER SOURCE REQUIREMENTS																									
						REQUIRED STANDBY TIME = 24 HOURS						PROVIDE (2) 12V 18AH BATTERIES @ 24VDC													
						REQUIRED ALARM TIME = 15 MINUTES																			
						SECONDARY STANDBY LOAD			0.494	x 24	= 11.86 AH														
						SECONDARY ALARM LOAD			4.455	x 0.25	= 1.11 AH														
						STANDBY AND ALARM LOAD SUBTOTAL					12.97 AH														
						DERATING FACTOR					x 1.25														
						SECONDARY LOAD REQUIREMENTS (AMP HOURS)					16.21 AH														

PANEL LOAD SUMMARY										STANDBY CURRENT (AMPS)		ALARM CURRENT (AMPS)									
PANEL COMPONENT SUMMARY				QTY	PART NO	DESCRIPTION		CURRENT DRAW (A)	TOTAL (A)	CURRENT DRAW (A)	TOTAL										
				1	APS10A Mainboard	Mainboard for APS10A assembly		1 x 0.07	= 0.07	1 x 0.27	= 0.27										
CIRCUIT SUMMARY				1	SIGA-AA30	30 Watt Intelligent Audio Amplifier		1 x 0.002	= 0.002	1 x 1.55	= 1.55										
				CIRCUIT																	
				N2				1 x 0	= 0	1 x 0.343	= 0.343										
				N3				1 x 0	= 0	1 x 0.49	= 0.49										
				N4				1 x 0.344	= 0.344	1 x 0.427	= 0.427										
				S1				1 x 0	= 0	1 x 0	= 0										
								TOTAL STANDBY CURRENT	0.416	TOTAL ALARM CURRENT	3.08										
CIRCUIT DETAILS AND CALCULATIONS										STANDBY CURRENT		ALARM CURRENT		POINT-TO-POINT VOLTAGE DROP CALCULATION SUMMARY			SPEAKER POWER/DB LOSS CALCULATIONS				
SOURCE	MAX CAPACITY	TOTAL USED CAPACITY	AVAILABLE CAPACITY	CIRCUIT	AWG	TOTAL DEVICE QTY	CIRCUIT LENGTH	CIRCUIT RESISTANCE (Ω/ft)	TOTAL STANDBY (A)	TOTAL ALARM (A)	STARTING CALCULATION VOLTAGE	END OF LINE VOLTAGE	VOLTAGE DROP	TOTAL USED WATTS	STARTING CALCULATION VOLTAGE	END OF LINE VOLTAGE	POWER LOSS PERCENT	TOTAL DB LOSS			
APS10A Mainboard				N2	14	12	479'	0.003	0	0.343	19.7v	19.14v	0.56v								
				N3	14	17	577'	0.003	0	0.49	19.7v	18.62v	1.08v								
				N4	14	1	124'	0.003	0.344	0.427	19.7v	19.37v	0.33v								
SIGA-AA30	30w	8.25w	21.75w	S1	16	27	1021'	0.004	0	0				8.25w	70.7v	70.19v	0.72 %	-0.121dB			
SECONDARY POWER SOURCE REQUIREMENTS																					
								REQUIRED STANDBY TIME = 24 HOURS				PROVIDE (2) 12V 18AH BATTERIES @ 24VDC									
								REQUIRED ALARM TIME = 15 MINUTES													
								0.416	x 24	= 9.98 AH											
								3.08	x 0.25	= 0.77 AH											
										10.75 AH											
										x 1.25											
										13.44 AH											

PANEL LOAD SUMMARY								STANDBY CURRENT (AMPS)		ALARM CURRENT (AMPS)											
PANEL COMPONENT SUMMARY				QTY	PART NO	DESCRIPTION		CURRENT DRAW (A)	TOTAL (A)	CURRENT DRAW (A)	TOTAL										
				1	APS10A Mainboard	Mainboard for APS10A assembly		1 x 0.07	= 0.07	1 x 0.27	= 0.27										
				1	SIGA-AA30	30 Watt Intelligent Audio Amplifier		1 x 0.002	= 0.002	1 x 1.55	= 1.55										
				CIRCUIT			1 x 0	= 0	1 x 0.672	= 0.672											
				N2			1 x 0	= 0	1 x 0.413	= 0.413											
CIRCUIT SUMMARY				N3			1 x 0	= 0	1 x 0	= 0											
				S1			1 x 0	= 0	1 x 0	= 0											
				TOTAL STANDBY CURRENT			0.072	TOTAL ALARM CURRENT	2.905												
CIRCUIT DETAILS AND CALCULATIONS								STANDBY CURRENT		ALARM CURRENT		POINT-TO-POINT VOLTAGE DROP CALCULATION SUMMARY			SPEAKER POWER/DB LOSS CALCULATIONS						
SOURCE	MAX CAPACITY	TOTAL USED CAPACITY	AVAILABLE CAPACITY	CIRCUIT	AWG	TOTAL DEVICE QTY	CIRCUIT LENGTH	CIRCUIT RESISTANCE (Ω/ft)	TOTAL STANDBY (A)	TOTAL ALARM (A)	STARTING CALCULATION VOLTAGE	END OF LINE VOLTAGE	VOLTAGE DROP	TOTAL USED WATTS	STARTING CALCULATION VOLTAGE	END OF LINE VOLTAGE	POWER LOSS PERCENT	TOTAL DB LOSS			
APS10A Mainboard				N2	14	20	599'	0.003	0	0.672	19.7v	18.34v	1.36v								
				N3	14	12	579'	0.003	0	0.413	19.7v	18.96v	0.74v								
SIGA-AA30				30w	14.75w	15.25w	S1	16	46	1521'	0.004	0	0				14.75w	70.7v	69.46v	1.76 %	-0.326dB
SECONDARY POWER SOURCE REQUIREMENTS																					
								REQUIRED STANDBY TIME = 24 HOURS				PROVIDE (2) 12V 7AH BATTERIES @ 24VDC									
								REQUIRED ALARM TIME = 15 MINUTES													
								SECONDARY STANDBY LOAD											0.072	x 24	= 1.73 AH
								SECONDARY ALARM LOAD											2.905	x 0.25	= 0.73 AH
								STANDBY AND ALARM LOAD SUBTOTAL													2.45 AH
								DERATING FACTOR													x 1.25
								SECONDARY LOAD REQUIREMENTS (AMP HOURS)													3.07 AH

PANEL LOAD SUMMARY										STANDBY CURRENT (AMPS)		ALARM CURRENT (AMPS)	
PANEL COMPONENT SUMMARY						QTY	PART NO	DESCRIPTION	CURRENT DRAW (A)	TOTAL (A)	CURRENT DRAW (A)	TOTAL	
						1	APS10A Mainboard	Mainboard for APS10A assembly	1 x 0.07	= 0.07	1 x 0.27	= 0.27	
						1	SIGA-AA30	30 Watt Intelligent Audio Amplifier	1 x 0.002	= 0.002	1 x 1.55	= 1.55	
						CIRCUIT			1 x 0	= 0	1 x 0.546	= 0.546	
CIRCUIT SUMMARY						N2			1 x 0	= 0	1 x 0	= 0	
						S1							
									TOTAL STANDBY CURRENT	0.072	TOTAL ALARM CURRENT	2.366	

PANEL APS:7 (APS6A W/SIGA-AA30) SUMMARY REPORT

PANEL POWER SUPPLY MAX CURRENT = 6A

TOTAL USED CAPACITY = 2.366A (39.43 %)

CIRCUIT DETAILS AND CALCULATIONS										STANDBY CURRENT		ALARM CURRENT		POINT-TO-POINT VOLTAGE DROP CALCULATION SUMMARY			SPEAKER POWER/DB LOSS CALCULATIONS				
SOURCE	MAX CAPACITY	TOTAL USED CAPACITY	AVAILABLE CAPACITY	CIRCUIT	AWG	TOTAL DEVICE QTY	CIRCUIT LENGTH	CIRCUIT RESISTANCE (Ω/ft)	TOTAL STANDBY (A)	TOTAL ALARM (A)	STARTING CALCULATION VOLTAGE	END OF LINE VOLTAGE	VOLTAGE DROP	TOTAL USED WATTS	STARTING CALCULATION VOLTAGE	END OF LINE VOLTAGE	POWER LOSS PERCENT	TOTAL DB LOSS			
APS10A Mainboard				N2	14	19	668'	0.003	0	0.546	19.7v	18.66v	1.04v								
SIGA-AA30	30w	6.75w	23.25w	S1	16	22	668'	0.004	0	0				6.75w	70.7v	70.43v	0.38 %	-0.065dB			

SECONDARY POWER SOURCE REQUIREMENTS									
						REQUIRED STANDBY TIME = 24 HOURS			
						REQUIRED ALARM TIME = 15 MINUTES			
						SECONDARY STANDBY LOAD			
						0.072	x 24	= 1.73 AH	
						SECONDARY ALARM LOAD			
						2.366	x 0.25	= 0.59 AH	
						STANDBY AND ALARM LOAD SUBTOTAL			
						2.32 AH			
						DERATING FACTOR			
						x 1.25			
						SECONDARY LOAD REQUIREMENTS (AMP HOURS)			
						2.9 AH			

PROVIDE (2) 12V 7AH BATTERIES @ 24VDC

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

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

ELECTRICAL POWER LEGEND			
	PANEL AND CIRCUIT DESIGNATION ARE NEXT TO EACH DEVICE (PANEL NAME - CIRCUIT NUMBER). MINIMUM BRANCH CIRCUIT WIRE SIZE IS #12, UNO. A SINGLE INSULATED GREEN GROUND CONDUCTOR SHALL BE PROVIDED WITH EACH HOME RUN. PROVIDE A SEPARATE NEUTRAL FOR EACH CIRCUIT. HOME RUNS SHALL HAVE NO MORE THAN THREE CIRCUITS. LINE VOLTAGE AND LOW VOLTAGE WIRING IS NOT SHOWN ON PLANS. "X" INDICATES TYPE: C - AUTOMATIC CONTROL GFI - GROUND FAULT INTERRUPTER WP - WEATHERPROOF FLIP COVER WPI - WEATHERPROOF WHILE-IN-USE COVER WR - WEATHER-RESISTANT TYPE U - PROVIDE WITH (2) USB PORTS TR - TAMPER RESISTANT		PANELBOARD OR LOAD CENTER SPECIAL PURPOSE RECEPTACLE (MOUNT AT +18" UNO) "X" INDICATES TYPE: A - NEMA 5-20R, #12 CU; B - NEMA 5-30R, #10 CU; C - NEMA 5-50R, #6 CU; D - NEMA 6-20R, #12 CU; E - NEMA 6-30R, #10 CU; F - NEMA 6-50R, #6 CU; G - NEMA 14-20R, #12 CU; H - NEMA 14-30R, #10 CU; I - NEMA 14-50R, #6 CU * +4" AFF FOR RANGE PUSHBUTTON (MOUNT AT +48" UNO) "X" INDICATES TYPE: EPO - EMERGENCY POWER OFF ADA - HANDICAPPED ACCESSIBLE DOOR (DEVICE BY OTHERS) ODO - OVERHEAD DOOR OPERATOR (DEVICE BY OTHERS) RECESSED TV BOX, WITH BLANK COVERS FOR LOW VOLTAGE OPENINGS, MOUNT AT +72" UNO. "X" INDICATES TYPE: A - 2-GANG, WITH DUPLEX RECEPTACLE & SINGLE GANG DATA OPENING. HUBBELL RACO NSAV62M, WITH NSAV6C COVER B - 3-GANG, WITH DUPLEX RECEPTACLE, LOW VOLTAGE DIVIDER, SINGLE GANG FOR DATA (CENTER), AND REMOVABLE SINGLE GANG FOR AUDIO/VISUAL (SIDE). ARLINGTON TVB5507 NOTE: ROUTE (1) 1" C. TO DATA OPENING AND (1) 1-1/4" C. TO AUDIO/VISUAL OPENING, FROM TOP OF GANG IN WALL INTO ACCESSIBLE CEILING SPACE. ALSO ROUTE 1-1/4" C. FROM AUDIO/VISUAL OPENING TO FLOOR BOX WHERE APPLICABLE.
	SIMPLEX RECEPTACLE - CEILING MOUNT, WALL MOUNT (+18" UNO)		DUPLEX RECEPTACLE - CEILING MOUNT, WALL MOUNT (+18" UNO)
	QUADRUPLX RECEPTACLE - CEILING MOUNT, WALL MOUNT (+18" UNO)		ABOVE COUNTER RECEPTACLE - MOUNT AT +4" ABOVE BACKSPLASH
	FLOOR BOX WITH (2) DUPLEX RECEPTACLES - FURNISH WITH (1) 3/4" MIN. CONDUIT FOR POWER FROM BOX. INCLUDE ALL HARDWARE/ACCESSORIES AS REQUIRED FOR COMPLETE INSTALLATION. PROVIDE COVER (COORDINATE WITH ARCHITECT FOR FLOORING TYPE AND FINISH). "X" INDICATES TYPE: A - 4-GANG FLOOR BOX, CORROSION RESISTANT COATING FOR CONCRETE FLOORS (3" MIN. POUR DEPTH). (HUBBELL NO. CFB4G300R, OAE) B - 4-GANG FLOOR BOX FOR RAISED ACCESS FLOORS, (HUBBELL NO. AFB4G50, OAE) C - FIRE RATED POKE-THROUGH FLOOR BOX FOR ELEVATED CONCRETE SLABS, 3" DIA. CORE (HUBBELL NO. PTF75D, OAE) D - 8" DIA. FIRE RATED POKE-THROUGH FLOOR BOX FOR ELEVATED CONCRETE* SLABS, (HUBBELL NO. S1R8PTFT1, OAE) E - FLUSH, ROUND SINGLE SERVICE FLOOR BOX FOR CONCRETE* FLOORS, UP TO 1" CONDUIT FEED (HUBBELL NO. B2506, OAE) F - TOMBSTONE PEDESTAL FLOOR BOX, 1" CONDUIT FEED (HUBBELL NO. 6301, OAE) *POKE-THROUGH FLOOR BOXES CAN ALSO BE USED FOR TILE, CARPET, OR WOOD FLOORS.		JUNCTION BOX
			DROP-DOWN RECEPTACLE
			SURFACE MOUNTED PLUGSTRIP "X" INDICATES TYPE: A - PLUGSTRIP, POWER ONLY, OUTLET EVERY 3' OC B - WIREMOLD SERIES 4000 POWER AND DATA C - WIREMOLD SERIES 5000 POWER AND DATA
			SURFACE MOUNTED RACEWAY
			RACEWAY CONCEALED IN WALL, FLOOR, OR CEILING IN FINISHED SPACES, EXPOSED IN UNFINISHED SPACES
			RACEWAY BELOW FLOOR OR BELOW GRADE
			RACEWAY STUB-OUT WITH CAPPED END
			RACEWAY STUB-OUT WITH BUSHED END
			GROUNING BUS

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

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

ELECTRICAL PROJECT DEMO NOTES	
A. DURING DEMOLITION, THE CONTRACTOR SHALL NOTE ALL EXISTING RACEWAY (BOTH SURFACE AND CONCEALED) TO THE EXTENT POSSIBLE. THESE RACEWAYS SHALL BE REUSED TO THE GREATEST EXTENT POSSIBLE TO INSURE A CLEAN FINISHED PRODUCT, WHERE PRACTICAL. AND ALLOWED PER CODE, FISHING THROUGH WALLS WITH MC CABLE IS PREFERRED TO SURFACE-MOUNTED CONDUIT. B. CONTRACTOR SHALL REMOVE, TRANSPORT, AND LEGALLY DISPOSE OF LAMPS AND BALLASTS OFF-SITE. IT IS ASSUMED THAT THE BALLASTS DO NOT CONTAIN PCBs. THE CONTRACTOR SHALL NOTIFY THE OWNER IMMEDIATELY IF IT IS SUSPECTED THAT BALLASTS CONTAIN PCBs. C. ALL POWER INTERRUPTIONS SHALL BE COORDINATED WITH OWNER. ANY DISRUPTION OF WORKERS IN THE SPACE SHALL BE KEPT TO A MINIMUM AND BE COORDINATED WITH THE OWNER PRIOR TO WORK COMMENCING IN THAT SPACE. D. CONTRACTOR SHALL EXTEND UNSWITCHED HOT LEG FROM EXISTING EMERGENCY FIXTURE LOCATION TO NEW EMERGENCY FIXTURES, AS NEEDED. SEE DEMO PLANS FOR AN APPROXIMATION OF EXISTING EMERGENCY FIXTURE LOCATIONS. FIELD VERIFY EXACT LOCATION PRIOR TO BID. E. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIR OF ANY EXISTING CONDUIT OR FEEDER CIRCUITS THAT ARE INTENDED TO REMAIN THAT ARE SAW-CUT, OR OTHERWISE DAMAGED, AS PART OF THE DEMOLITION PROCESS. PROVISION FOR THIS WORK SHALL INCLUDE, BUT NOT BE LIMITED TO: ALL NECESSARY CONDUIT AND CONDUCTORS, MOUNTING ACCESSORIES AND LABOR, TO RESTORE THE SYSTEM TO ITS INTENDED FUNCTION. F. ELECTRICAL DRAWINGS SHOWING EXISTING BUILDING CONDITIONS, SUCH AS DEMOLITION DRAWINGS, EXISTING PANEL SCHEDULES, ETC ARE BASED ON RECORD DRAWINGS AND SITE VISITS. IF ACTUAL EXISTING CONDITIONS DIFFER FROM THOSE SHOWN ON DRAWINGS, PLEASE NOTIFY ENGINEER.	

COORDINATION NOTES	
A. FOR EXISTING DEVICES REMOVED FROM WALLS CONTAINING MURALS OR GRAPHICS, CONTTRACTOR SHALL PATCH RESULTING PENETRATIONS. ALL PAINTING OF EXISTING MURALS AND ANY REPAIR OR REPLACEMENT OF GRAPHICS (INCLUDING WRAPS) WILL BE PERFORMED BY THE OWNER.	

ELECTRICAL SHEET INDEX	
NUMBER	SHEET NAME
E0.1	ELECTRICAL SYMBOLS AND ABBREVIATIONS
E1.1	MAIN LEVEL - NORTH POWER
E1.2	MAIN LEVEL - NORTH EAST POWER
E1.4	MAIN LEVEL - SOUTH POWER
E2.1	CONCOURSE - NORTH POWER
E2.2	CONCOURSE - SOUTH POWER
E5.0	ELECTRICAL DETAILS



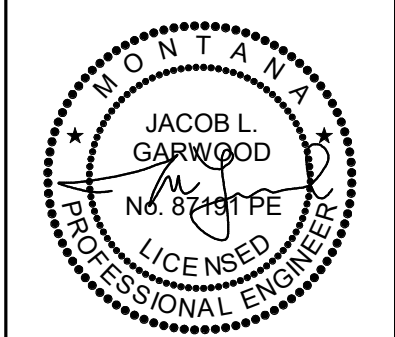
100% SHOP DRAWING FOR PERMIT/CONSTRUCTION

(BRICK BREEDEN) FIELDHOUSE
FIRE ALARM REPLACEMENT

MONTANA STATE UNIVERSITY
BOZEMAN



DRAWN BY: PMH		
REVIEWED BY: JLG		
REV.	DESCRIPTION	DATE



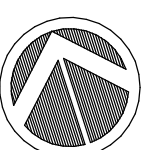
PPA#23-0928
AE#2024-02-04D

MMI PROJ #: 0747.083

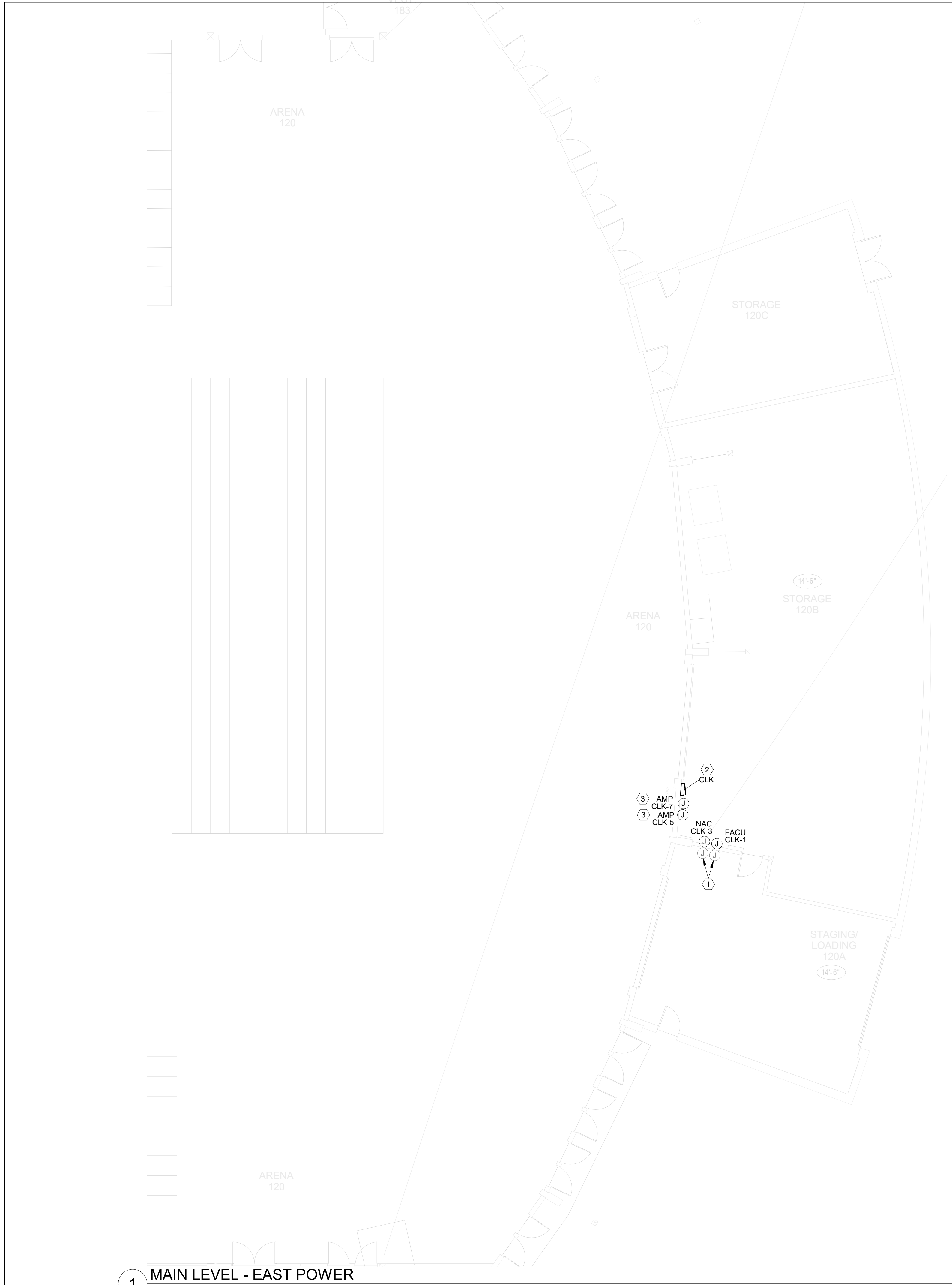
SHEET TITLE
ELECTRICAL SYMBOLS
AND ABBREVIATIONS

SHEET
E0.1

DATE
10/22/2025



10/22/2025



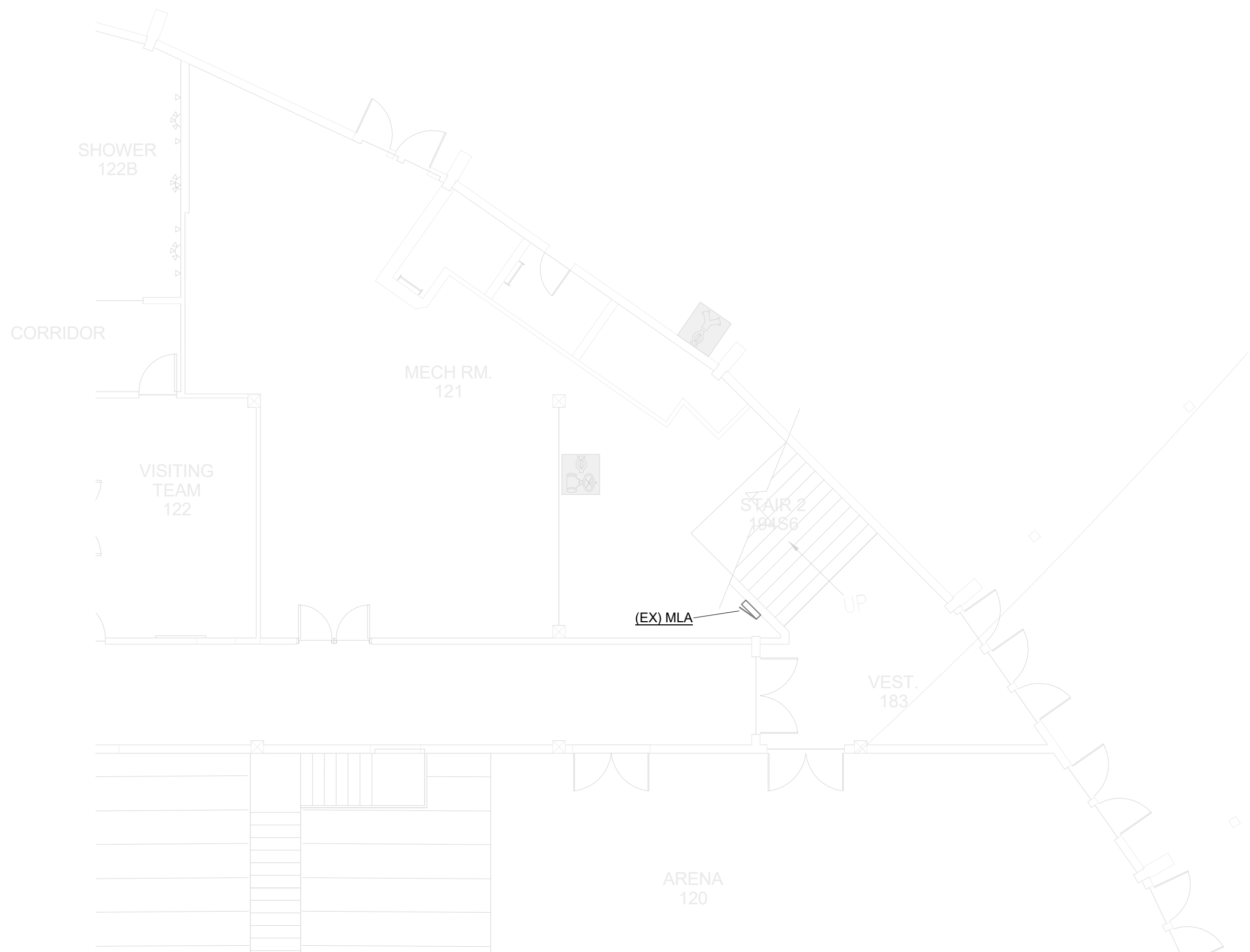
1 MAIN LEVEL - EAST POWER
1/8" = 1'-0"

KEY NOTES:

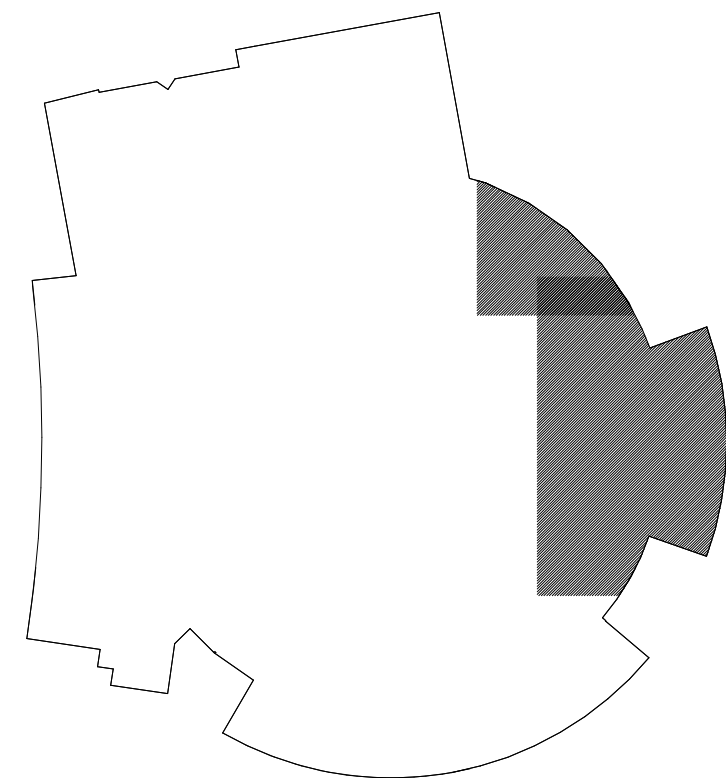
1. EXISTING FIRE ALARM CONTROL PANEL AND AUXILIARY POWER SUPPLY TO BE DEMOLISHED UPON FINAL ACCEPTANCE OF NEW SYSTEM. DEMO EXISTING CIRCUITS AND CONDUIT BACK TO SOURCE (PANEL (EX) MLA).
2. SEE E5.0 FOR RISER DIAGRAM AND PANEL SCHEDULE.
3. EACH AMPLIFIER CABINET CONTAINS 4 POWER SUPPLIES. PROVIDE CONNECTION TO ALL POWER SUPPLIES IN CABINET WITH NOTED CIRCUIT.

POWER PLAN
GENERAL NOTES

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



2 MAIN LEVEL - NORTH EAST POWER
1/8" = 1'-0"



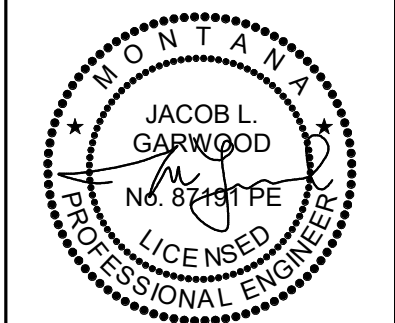
KEY PLAN
NO SCALE



100% SHOP DRAWING FOR PERMIT/CONSTRUCTION
(BRICK BREEDEN) FIELDHOUSE
FIRE ALARM REPLACEMENT
MONTANA STATE UNIVERSITY
BOZEMAN



DRAWN BY: PMH		
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REV.	DESCRIPTION	DATE



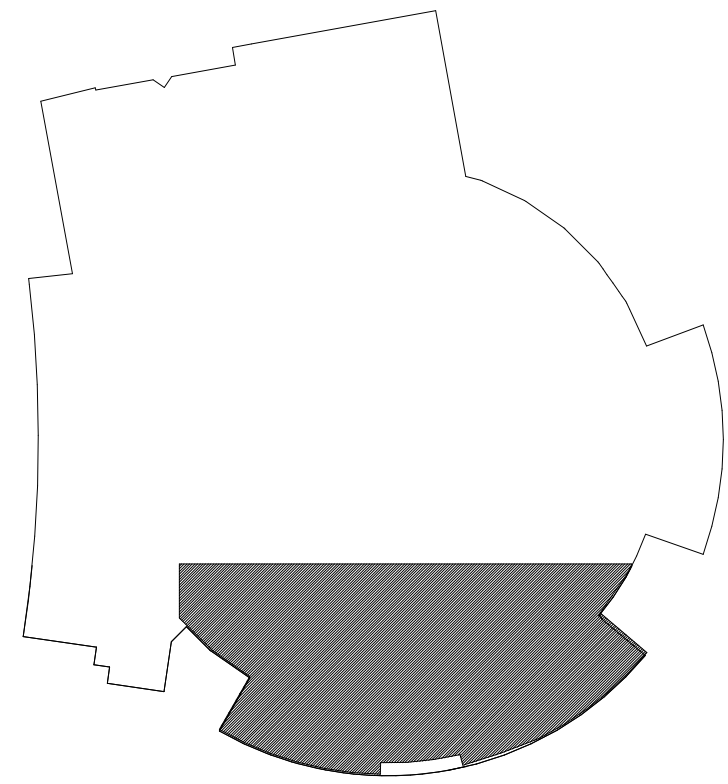
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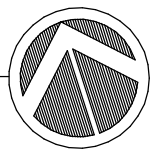
SHEET TITLE
MAIN LEVEL - NORTH
EAST POWER

SHEET
E1.2

DATE
10/22/2025



KEY PLAN
NO SCALE

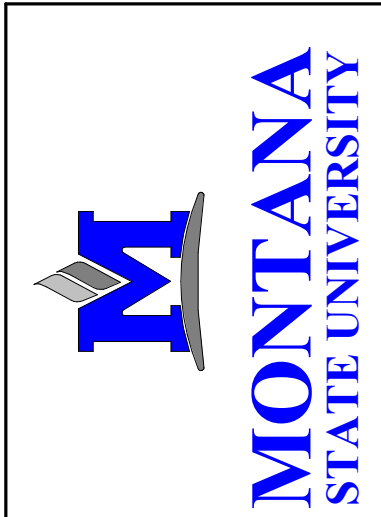


KEY NOTES:

1. PROVIDE CIRCUIT CONSISTING OF #12'S IN 3/4" C FOR EDWARDS NAC PANEL. COORDINATE EXACT LOCATION WITH FIRE ALARM CONTRACTOR.
2. UTILIZE EXISTING 20A-1P SPARE BREAKER IN EXISTING EATON PRL1X PANEL TO SERVE NEW EDWARDS NAC PANEL. BREAKER SHALL HAVE RED MARKING, LOCKABLE, AND BE IDENTIFIED AS "FIRE ALARM CIRCUIT".

POWER PLAN
GENERAL NOTES

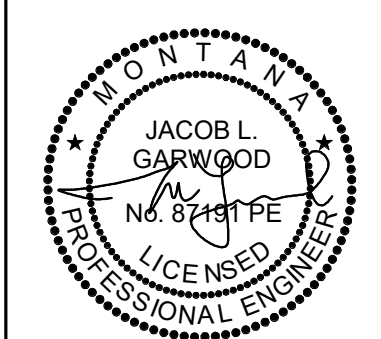
- A. IT IS ABSOLUTELY NECESSARY FOR ALL TRADES INVOLVED TO COORDINATE WITH EACH OTHER AND VERIFY THAT THERE ARE NO CONFLICTS IN LOCATION OF DUCTS, CONDUITS, DIFFUSERS, BOXES, AND OTHER ITEMS THROUGHOUT THIS PROJECT BEFORE FINAL PLACEMENT OF MATERIALS.
- B. ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR ALL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



100% SHOP DRAWING FOR PERMIT/CONSTRUCTION
(BRICK BREEDEN) FIELDHOUSE
FIRE ALARM REPLACEMENT
MONTANA STATE UNIVERSITY
BOZEMAN



DRAWN BY: PMH		
REVIEWED BY: JLG		
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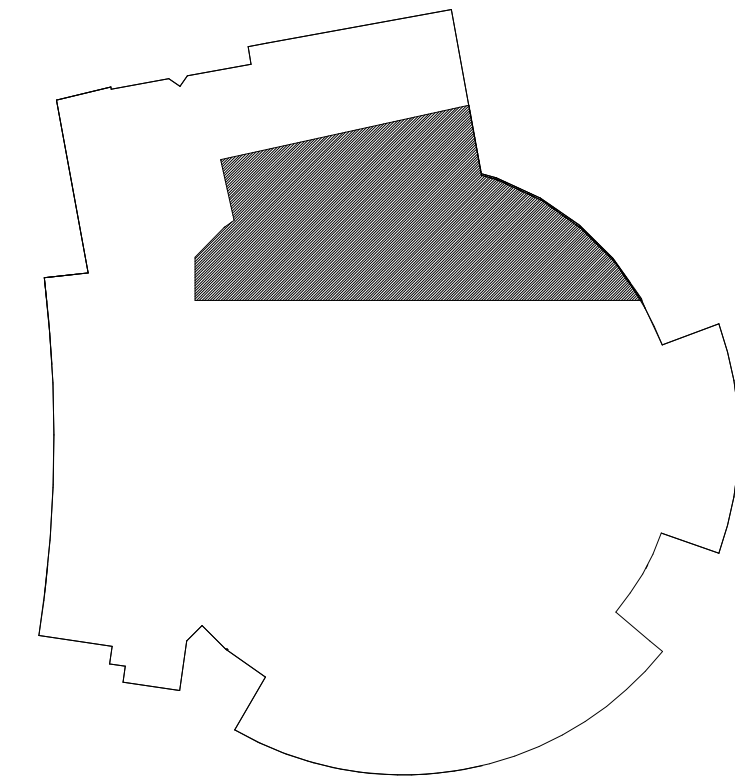
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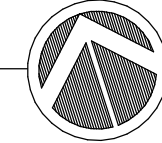
SHEET TITLE
MAIN LEVEL - SOUTH
POWER

SHEET
E1.4

DATE
10/22/2025



KEY PLAN
NO SCALE

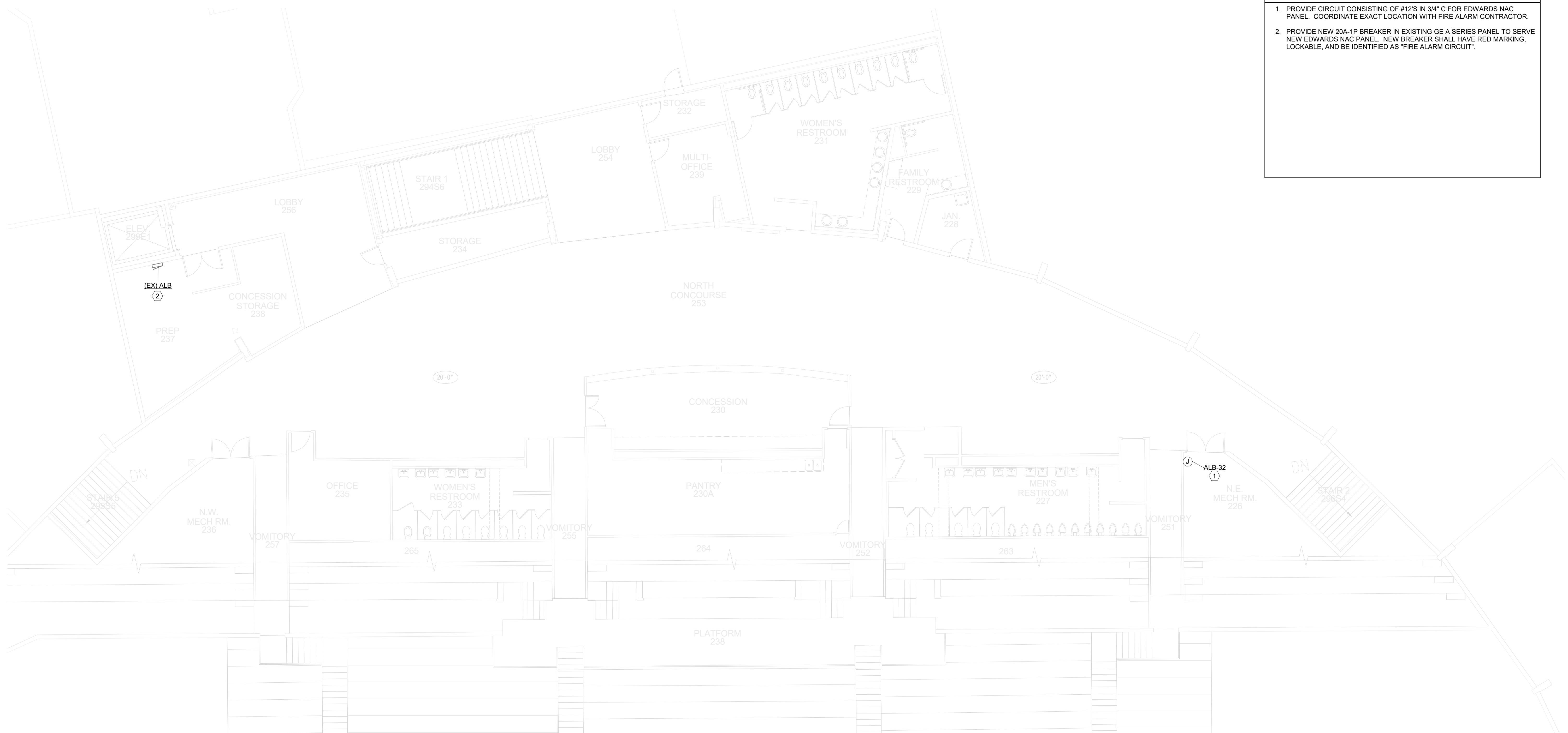


POWER PLAN GENERAL NOTES

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

KEY NOTES:

1. PROVIDE CIRCUIT CONSISTING OF #12'S IN 3/4" C FOR EDWARDS NAC PANEL. COORDINATE EXACT LOCATION WITH FIRE ALARM CONTRACTOR.
2. PROVIDE NEW 20A-1P BREAKER IN EXISTING GE A SERIES PANEL TO SERVE NEW EDWARDS NAC PANEL. NEW BREAKER SHALL HAVE RED MARKING, LOCKABLE, AND BE IDENTIFIED AS "FIRE ALARM CIRCUIT".

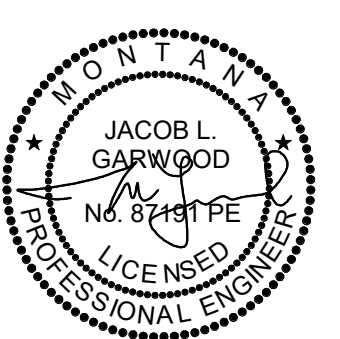


(BRICK BREEDEN) FIELDHOUSE
FIRE ALARM REPLACEMENT

MONTANA STATE UNIVERSITY
BOZEMAN



DRAWN BY: PMH		
REVIEWED BY: JLG		
REV.	DESCRIPTION	DATE



PPA#23-0928
AE#2024-02-04D

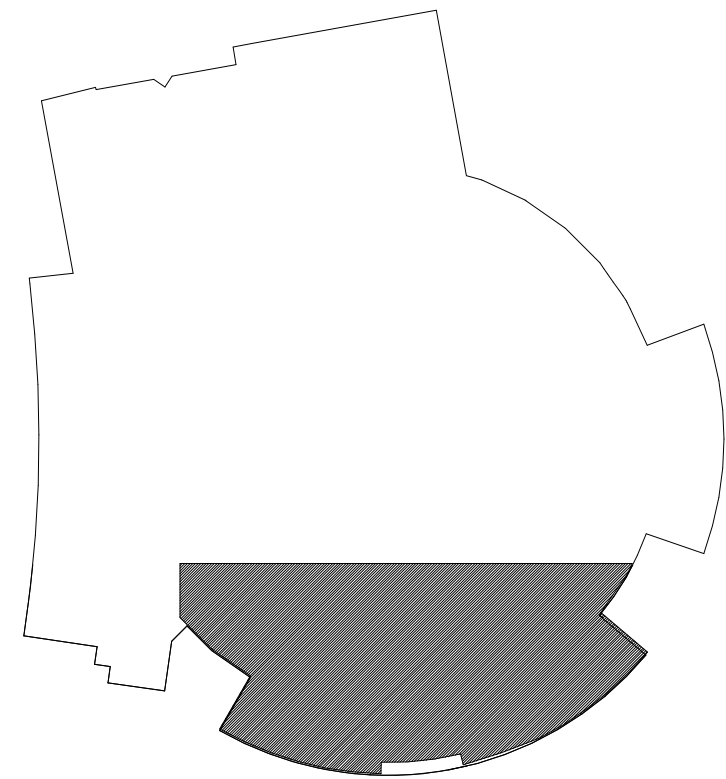
MMI PROJ #: 0747.083

SHEET TITLE
CONCOURSE - NORTH
POWER

SHEET
E2.1

DATE
10/22/2025

100% SHOP DRAWING FOR PERMIT/CONSTRUCTION



KEY PLAN
NO SCALE

- # KEY NOTES:
1. PROVIDE CIRCUIT CONSISTING OF #12'S IN 3/4" C FOR EDWARDS NAC PANEL. COORDINATE EXACT LOCATION WITH FIRE ALARM CONTRACTOR.
 2. PROVIDE NEW 20A-1P BREAKER IN EXISTING GE A SERIES PANEL TO SERVE NEW EDWARDS NAC PANEL. NEW BREAKER SHALL HAVE RED MARKING, LOCKABLE, AND BE IDENTIFIED AS "FIRE ALARM CIRCUIT".

POWER PLAN
GENERAL NOTES

A. IT IS ABSOLUTELY NECESSARY FOR ALL TRADES INVOLVED TO COORDINATE WITH EACH OTHER AND VERIFY THAT THERE ARE NO CONFLICTS IN LOCATION OF DUCTS, CONDUITS, DIFFUSERS, BOXES, AND OTHER ITEMS THROUGHOUT THIS PROJECT BEFORE FINAL PLACEMENT OF MATERIALS.

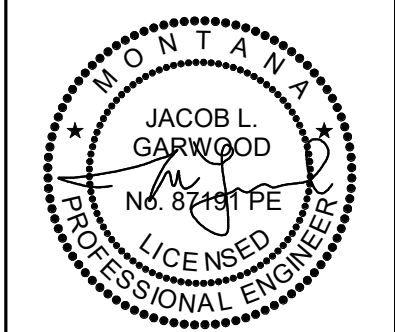
B. ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR ALL CUTTING OF FLOORS, WALLS, CEILINGS, AND ROOFS TO PERFORM THE REQUIRED WORK DEPICTED IN THESE DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE FOR ALL PATCHING OF HOLES TO THE SATISFACTION OF THE OWNER/ENGINEER.



100% SHOP DRAWING FOR PERMIT/CONSTRUCTION
(BRICK BREEDEN) FIELDHOUSE
FIRE ALARM REPLACEMENT
MONTANA STATE UNIVERSITY
BOZEMAN



DRAWN BY: PMH		
REVIEWED BY: JLG		
REV.	DESCRIPTION	DATE



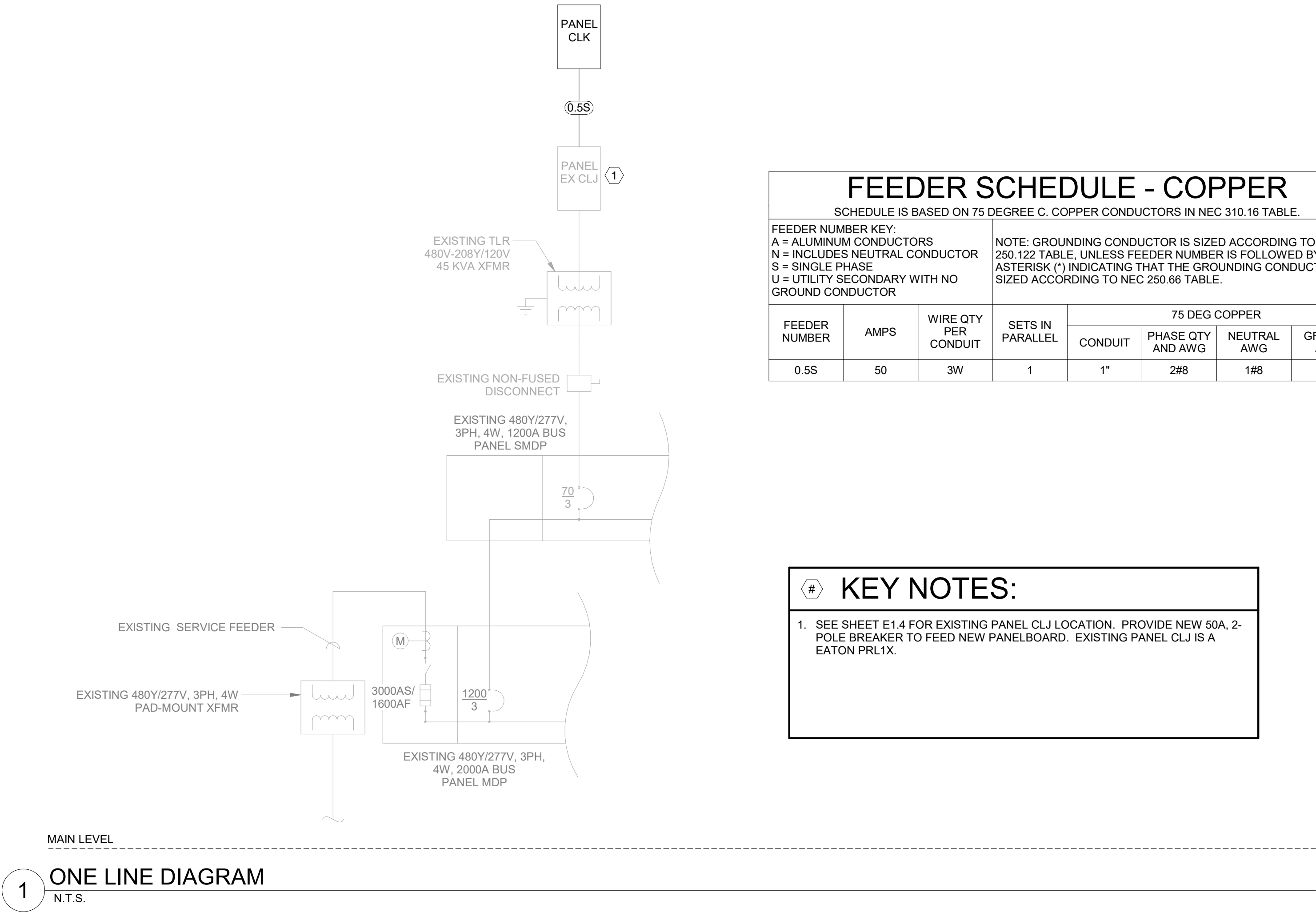
PPA#23-0928
AE#2024-02-04D

MMI PROJ #: 0747.083

SHEET TITLE
CONCOURSE - SOUTH
POWER

SHEET
E2.2

DATE
10/22/2025



Branch Panel: CLK

Location: Storage 120B

Supply From: CLJ

Mounting: Surface

Enclosure: Type 1

Volts: 120/208 Single

Phases: 1

Wires: 3

A.F.C.: 10,000

Mains Type: MLO

Mains Rating: 100 A

Notes:

CKT	Circuit Description	Load Classification	Trip	Poles	B		C		Poles	Trip	Load Classification	Circuit Description	CKT
1	FAU	Power	20 A	1	360	0			1	20 A	--	SPARE	2
3	FA NAC	Power	20 A	1			580	0	1	20 A	--	SPARE	4
5	FA AMP	Power	20 A	1	768	0			1	20 A	--	SPARE	6
7	FA AMP	Power	20 A	1			768	0	1	20 A	--	SPARE	8
9	SPARE	--	20 A	1	0	0			1	20 A	--	SPARE	10
11	SPARE	--	20 A	1			0	0	1	20 A	--	SPARE	12
13	SPARE	--	20 A	1	0	0			1	20 A	--	SPARE	14
15	SPARE	--	20 A	1			0	0	1	20 A	--	SPARE	16
17	SPARE	--	20 A	1	0	0			1	20 A	--	SPARE	18
Total Load:					1128 VA		1348 VA						
Total Amps:					11 A		13 A						

Legend:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals
Power	2476 VA	100.00%	2476 VA	
				Total Conn. Load: 2476 VA
				Total Est. Demand: 2476 VA
				Total Conn.: 12 A
				Total Est. Demand: 12 A

Notes:

ALL CIRCUIT BREAKERS SERVING FIRE ALARM EQUIPMENT SHALL BE RED AND LOCKABLE. CAMPUS STANDARD IS SPACE AGE ELOCK-FA.



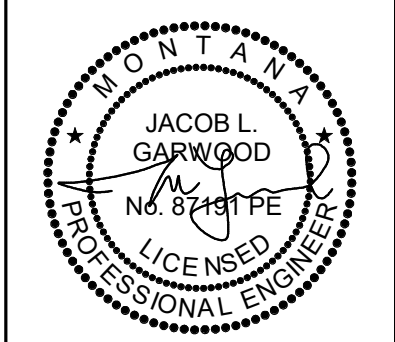
100% SHOP DRAWING FOR PERMIT/CONSTRUCTION

(BRICK BREEDEN) FIELDHOUSE
FIRE ALARM REPLACEMENT

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PPA#23-0928
AE#2024-02-04D

MMI PROJ #: 0747.083

SHEET TITLE
ELECTRICAL DETAILS

SHEET
E5.0

DATE
10/22/2025