

FIRE ALARM NOTES	
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 CORRECTING 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. CONCEALED CONDUITS IN WALL AND CEILING SPACES WHEREVER FEASIBLE. 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 CONCEALED 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. REMOVE 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.

PHASE PLAN	
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 EXISTING 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 BE 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.

ELECTRICAL NOTES	
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 STANDAR 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.

SCOPE OF WORK	
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 SYSTEM WILL BE TOTAL EVACUATION WITH A SINGLE VOICE CHANNEL.
4.	SYSTEM WILL HAVE 8 MANUAL PAGING ZONES, BUT WILL NOT COMPLY WITH IBC MINIMUM PAGING ZONES DUE TO EXISTING BUILDING LAYOUT.
5.	AUXILIARY SYSTEMS INCLUDE ELEVATOR RECALL, DOOR MAG RELEASE, ROLL-DOWN FIRE DOOR RELEASE, HVAC DETECTION AND SHUTDOWN, KITCHEN HOOD AND SPRINKLER SYSTEM MONITORING.
6.	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.
7.	PULLS, SMOKES FOR PROTECTION OF EQUIPMENT AND WATERFLOW WILL BE ALARM DEVICES AND ACTIVATE THE EVACUATION MESSAGE.
8.	ALL SMOKE DETECTORS CONFIGURED FOR FIRE ALARM SHALL EMPLOY ALARM VERIFICATION PER NFPA 72 2019.
9.	PROVIDE NEW CELLULAR COMMUNICATOR WITH NEW SYSTEM. OLD COMMUNICATOR SHALL REMAIN FUNCTIONAL UNTIL EXISTING SYSTEM IS REMOVED.
* IMPORTANT NOTE *	
THE EXISTING CMU WALLS ASSOCIATED WITH THIS PROJECT MAY CONTAIN ASBESTOS MATERIALS IN THE FORM OF VERMICULITE INSULATION. SEE THE PRE-RENOVATION ASBESTOS INSPECTION REPORT IDENTIFYING THE EXISTING CMU WALLS POTENTIALLY CONTAINING VERMICULITE INSULATION. THE FIRE ALARM CONDUIT ROUTING IS SHOWN IN APPROXIMATE LOCATION AND GENERAL ROUTING FOR BIDDING PURPOSES. THE CONTRACTOR SHALL FIELD VERY EXACT LOCATION AND QUANTITY OF PENETRATIONS IN ASSUMED ASBESTOS-CONTAINING CMU WALLS. THE CONTRACTOR SHALL FOLLOW SPECIFICATION SECTION 028300 FOR REMEDIATION REQUIREMENTS.*	

ACRONYMS/ABBREVIATIONS:	
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.	WI WITH
41.	WO WITHOUT

SHEET INDEX	
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.)
FA7.3	FIRE ALARM NAC CALCS (CONT.)
FA7.4	FIRE ALARM BATTERY CALCS

		ANNUNCIATION				NOTIFICATION				CONTROL				OFF-SITE TRANSMITTED SIGNALS							
		A.1	A.2	A.3	A.4	B.1	B.2	B.3	B.4	C.1	C.2	C.3	C.4	C.5	C.6	C.7	D.1	D.2	D.3	D.4	
FIRE ALARM SYSTEM INPUTS	INITIATING DEVICES	MANUAL PULL STATION	1.1	X	X			X	X	X								X			
		KITCHEN HOOD	1.2	X	X			X	X	X								X			
		SMOKE DETECTOR, SPOT PROTECTION (MEDIA BOOTHS)	1.3	X	X			X	X	X								X			
		SMOKE DETECTOR, EQUIPMENT PROTECTION (CONTROL PANELS)	1.4	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.																					

CABLE AND WIRE LEGEND							
LABEL	APPLICATION	MANUFACTURER	PART NO	RESISTANCE MFT	AWG	DESCRIPTION	TOTAL LENGTH
A	16/2 FPLP (SLC)	WEST PENN	D60991	4.10	16	2 COND. SOLID COPPER FPLP ADDRESSABLE UNSHIELDED (LOW CAP)	4290'
H	12/2 FPLP (SPEAKER) *	WEST PENN	60995B	1.80	12	2 COND. SOLID COPPER FPLP ANALOG HYPERSPIKE SPEAKER	3776'
N	16/2 FPLP (4-NET-TP)	WEST PENN	D60991	4.10	16	2 COND. SOLID COPPER FPLP TWISTED PAIR (LOW CAP)	1137'
P	14/2 THHN/THWN PAIR (AUX)	GENERIC	N/A	3.07	14	2 COND. PAIR STRANDED COPPER THHN/THWN	1514'
S	16/2 FPLP (SPEAKER)	WEST PENN	60990B	4.10	16	2 COND. SOLID COPPER FPLP ANALOG EDWARDS SPEAKER	7005'
L	16/2 FPLP (25V AUDIO RISER)	WEST PENN	60990B	4.10	16	2 COND. SOLID COPPER FPLP ANALOG AUDIO RISER	1637'
V	14/2 THHN/THWN PAIR (NAC) *	GENERIC	N/A	3.07	14	2 COND. PAIR STRANDED COPPER THHN/THWN	10847'

* WHEN WIRING OF STROBES AND/OR HYPERSPIKE SPEAKERS ON CATWALK, USE SOUTHWIRE RED ALERT MC CABLE 14/2 (STROBE) 12/2 (SPEAKER) #55454002 OR EQUIVALENT.



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
1	MSU COMMENT	1/22/25

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

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

SHEET TITLE
FIRE ALARM
COVER SHEET

SHEET
FA0.1

DATE
01/29/2025



MONTANA STATE UNIVERSITY
BOZEMAN

100% SHOP DRAWING FOR PERMIT/CONSTRUCTION

(BRICK BREEDEN) FIELDHOUSE
FIRE ALARM REPLACEMENT

MONTANA STATE UNIVERSITY
BOZEMAN

APEX
FIRE ALARM DESIGN, LLC
bross@apexfirealarm.com

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

REV.	DESCRIPTION	DATE
1	MSU COMMENT	1/22/25

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

Bryan Moss

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

SHEET TITLE
FIRE ALARM
DEVICE LEGEND

SHEET
FA0.2

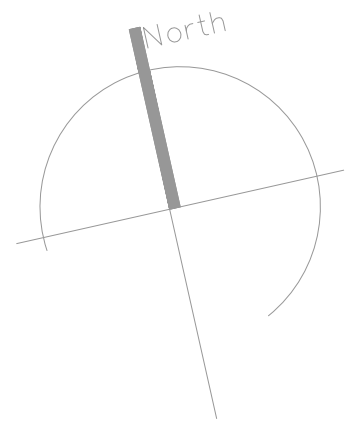
DATE
01/29/2025

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 MIOFT		ON 4-AUDTELS @ INNER DOOR		
	1	EDWARDS	4-PPS/M	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-ZA20A	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			
[FA]	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-ANNAUDEL	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		
6	EDWARDS	4-NET-TP	TWISTED PAIR SFP NETWORK CONTROLLER		ON 4-ANNCPU			
[CELL]	1	DMP	DUAL COMNF-LA (24V)	UNIVERSAL FIRE ALARM COMMUNICATOR LITE-AT&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] AA30z	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-PPS/M	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		
3	EDWARDS	SIGA-MCT2	DUAL INPUT MODULE - UIO MOUNT		ON SIGA-UIO6R			
[MFC] FP	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		
	2	EDWARDS	SIGA-MCT2	DUAL INPUT MODULE - UIO MOUNT		ON SIGA-UIO2R		

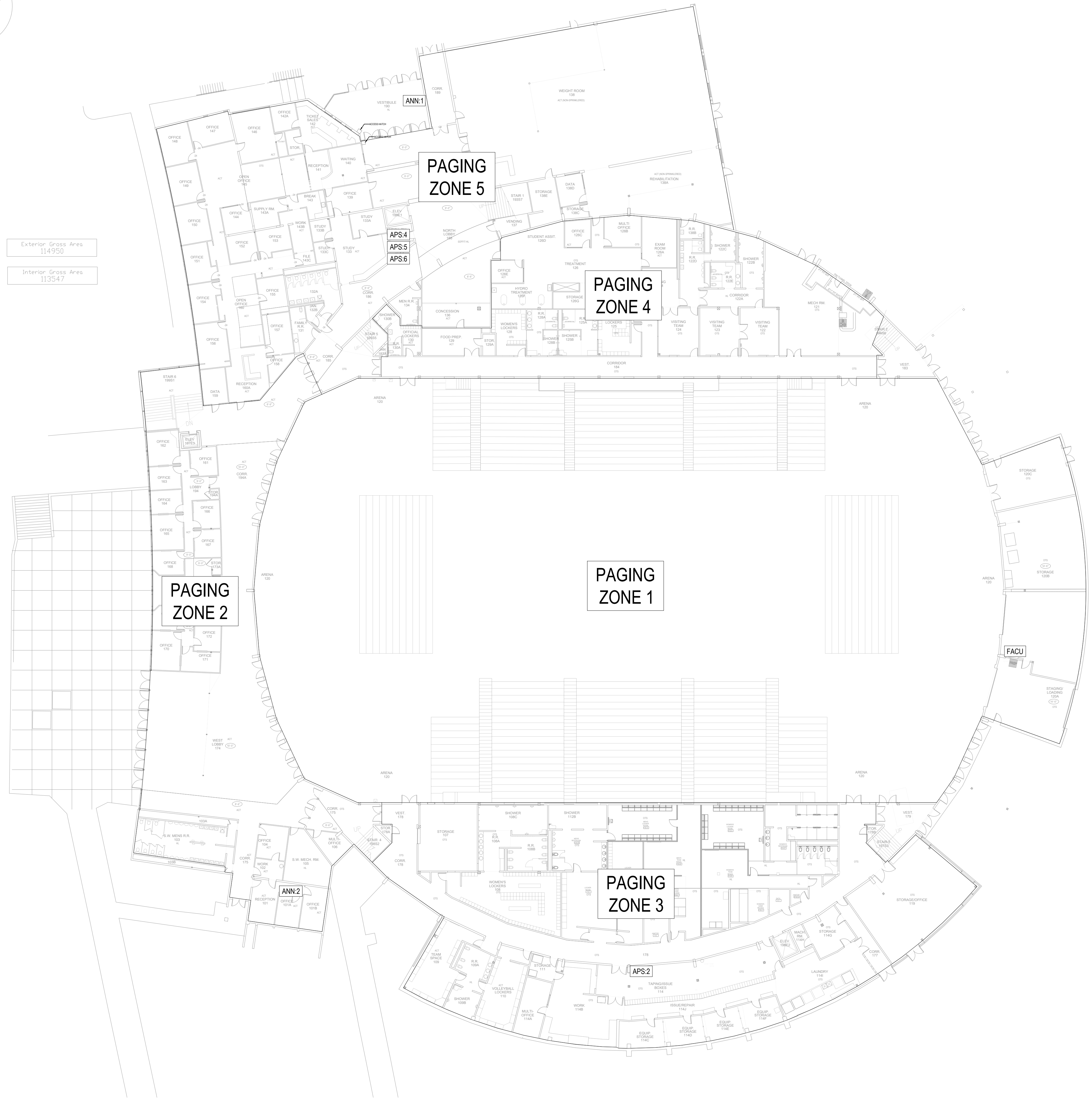
DEVICE LEGEND

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
[E]	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, 276B-RSB SURFACE MOUNT BOX RED
[IM]	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
[CCIS]	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
[OSD]	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
[IB]	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
[HRD]	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
[OSHD]	6		EDWARDS	SIGA-OSHD 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
[DDOS]	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
[SD-TRK]	13		EDWARDS	SD-TRK	AIR SAMPLE TUBE, FIELD VERIFY		FIELD VERIFY REQUIRED TUBE LENGTH	N/A	
[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
[GCSWA]	71		EDWARDS	GCSWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	6.8"Ø X 1.82"D		GCTW, GRSW-10	4" SQUARE BACKBOX - 2-1/8" DEEP (FLUSH) OR 27193-26 (SURFACE)
[GCSWA]	44		EDWARDS	GCSWA	SPEAKER, CEILING, WHITE, ALERT	6.8"Ø X 1.82"D		GCTW, GRSW-10	4" SQUARE BACKBOX - 2-1/8" DEEP (FLUSH) OR 27193-26 (SURFACE)
[G4SWA]	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)
[G4SWA]	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]	22		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
[G4VWN]	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	TWO-GANG (FLUSH) OR 27193-26 (SURFACE)
[GCVWN]	4		EDWARDS	GCVWN W/ GCVWA-CVR	STROBE, CEILING, WHITE, ALERT COVER	6.8"Ø X 1.82"D		GCTW, GP-10 & GCVWA-CVR	TWO-GANG (FLUSH) OR 27193-26 (SURFACE)
[HC]	16		EDWARDS	GCVHWA	STROBE, CEILING, WHITE, ALERT, HI CANDELA	6.8"Ø X 1.82"D		GCTW, GP-10 & GCVWA-CVR	TWO-GANG (FLUSH) OR 27193-26 (SURFACE)
[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, 8'-10" ABOVE GRADE	N/A	742347U (RED)
[JWB]	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
[JBC]	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
[ECC]	1		SPACE AGE ELECTRONICS	SSU00885	FIRE ALARM DOCUMENT CABINET W/8GB USB DRIVE (ACE-11), RED WITH CUSTOM LOGO	N/A	EXISTING HARDWARE	N/A	N/A
[FC]	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
[VTS]	14		GENERIC	N/A	VALVE TAMPER SUPERVISORY SWITCH	N/A	EXISTING SWITCH	N/A	N/A
[BV]	2		GENERIC	N/A	BACKFLOW VALVE	N/A	EXISTING SWITCH	N/A	N/A
[VAC]	28		GENERIC	N/A	24VAC/DC	N/A	EXISTING HARDWARE	N/A	N/A



Exterior Gross Area
114950

Interior Gross Area
113547



1 MAIN LEVEL - OVERALL REFERENCE PLAN
3/64" = 1'-0"



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

MONTANA STATE UNIVERSITY
BOZEMAN



100% SHOP DRAWING FOR PERMIT/CONSTRUCTION

REV.	DESCRIPTION	DATE
1	MSU COMMENT	1/22/25

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

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

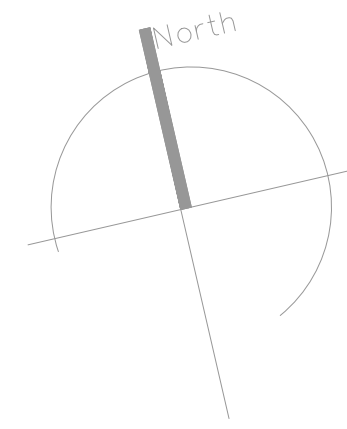
Bryan Moss

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

SHEET TITLE
MAIN LEVEL -
OVERALL REF. PLAN

SHEET
FA0.3

DATE
01/29/2025



Exterior Gross Area
23216

Interior Gross Area
22754



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
1	MSU COMMENT	1/22/25

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

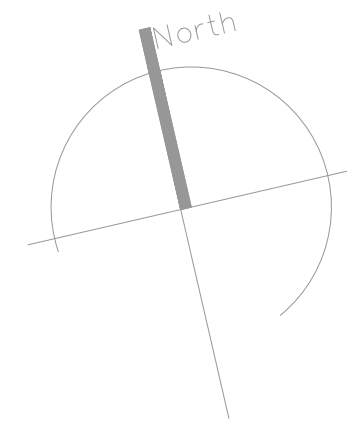
Bryan Moss
 PPA#23-0928
 AE# 2024-02-04D

SHEET TITLE
 UPPER LEVEL -
 OVERALL REF. PLAN

SHEET
FA0.5

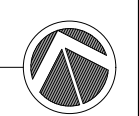
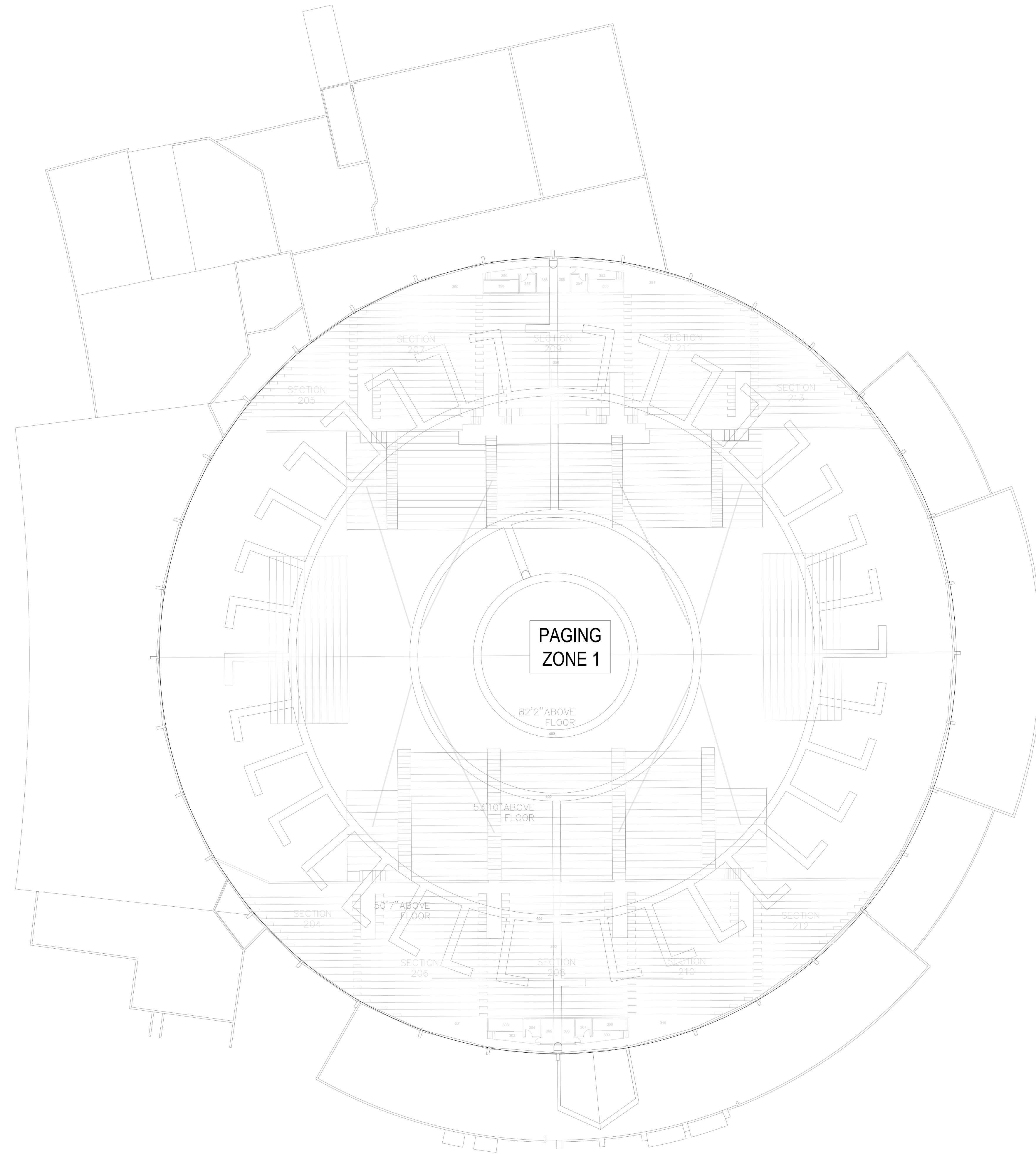
DATE
 01/29/2025





Exterior Gross Area
5692

Interior Gross Area
5692



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
1	MSU COMMENT	1/22/25

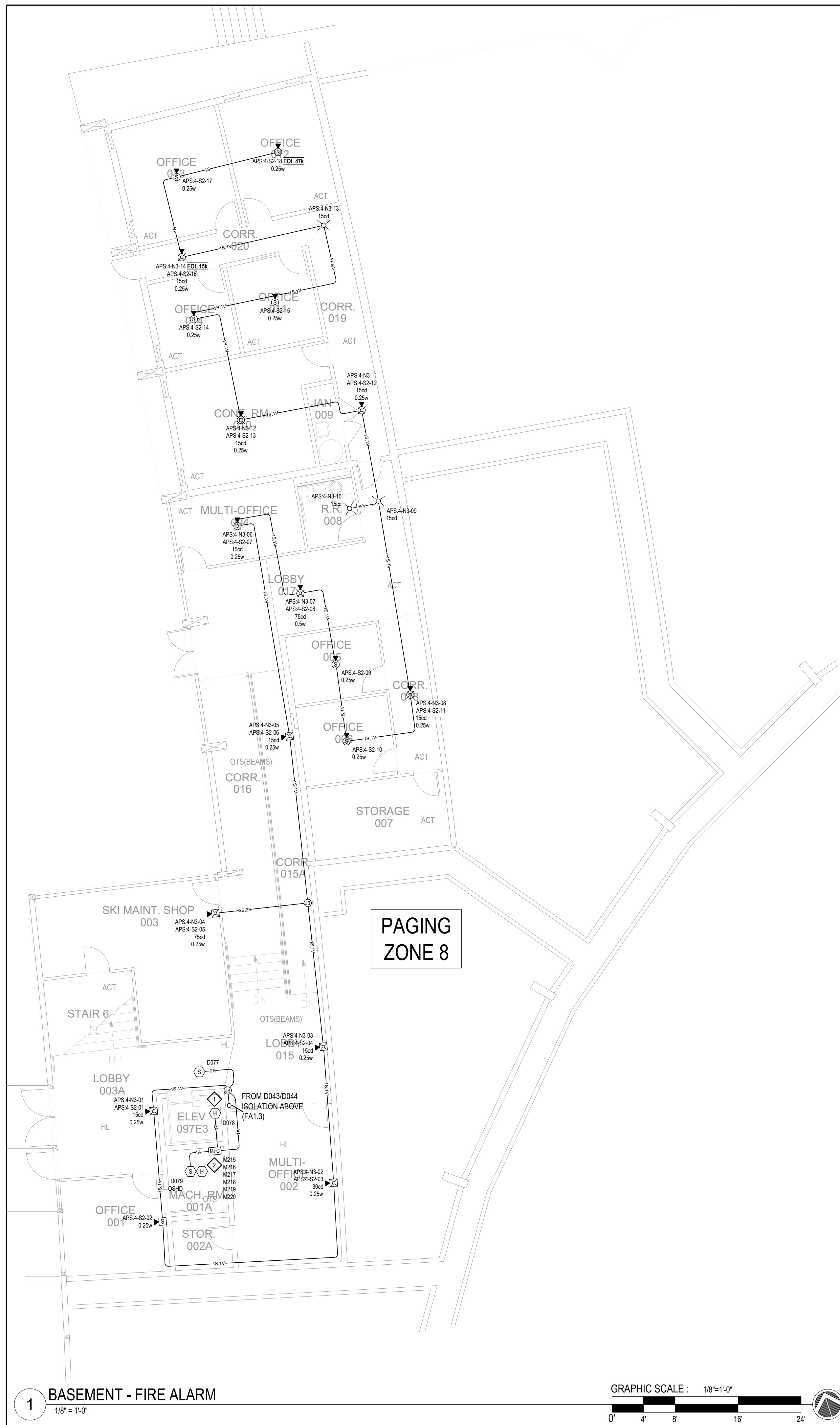
Bryan Moss, SET
 Apex Fire Alarm Design
 NICET 110772
 Fire Alarm Systems, Level IV
 State of Montana DL#
 FPL-IEL-000888

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

SHEET TITLE
 CATWALK -
 OVERALL REF. PLAN

SHEET
FA0.6

DATE
 01/29/2025



- 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).



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

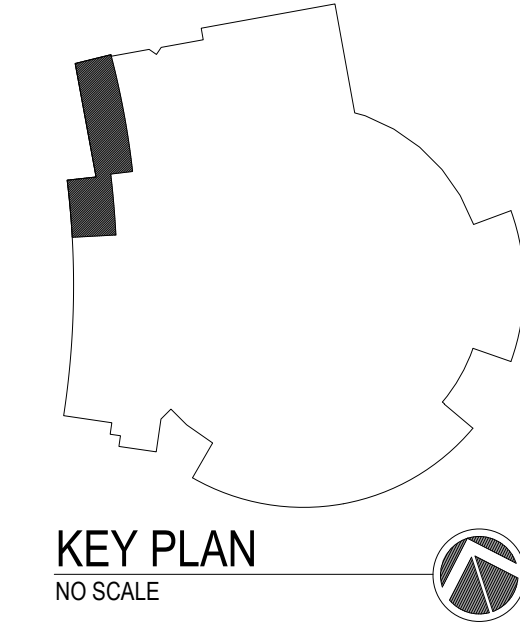
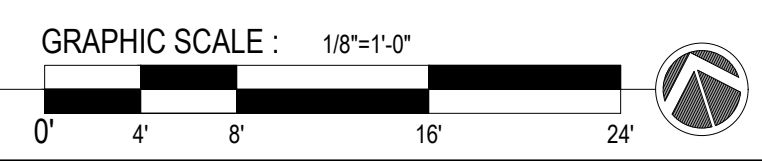


DRAWN BY: BSM		
REVIEWED BY: BSM		
REV.	DESCRIPTION	DATE
1	MSU COMMENT	1/22/25

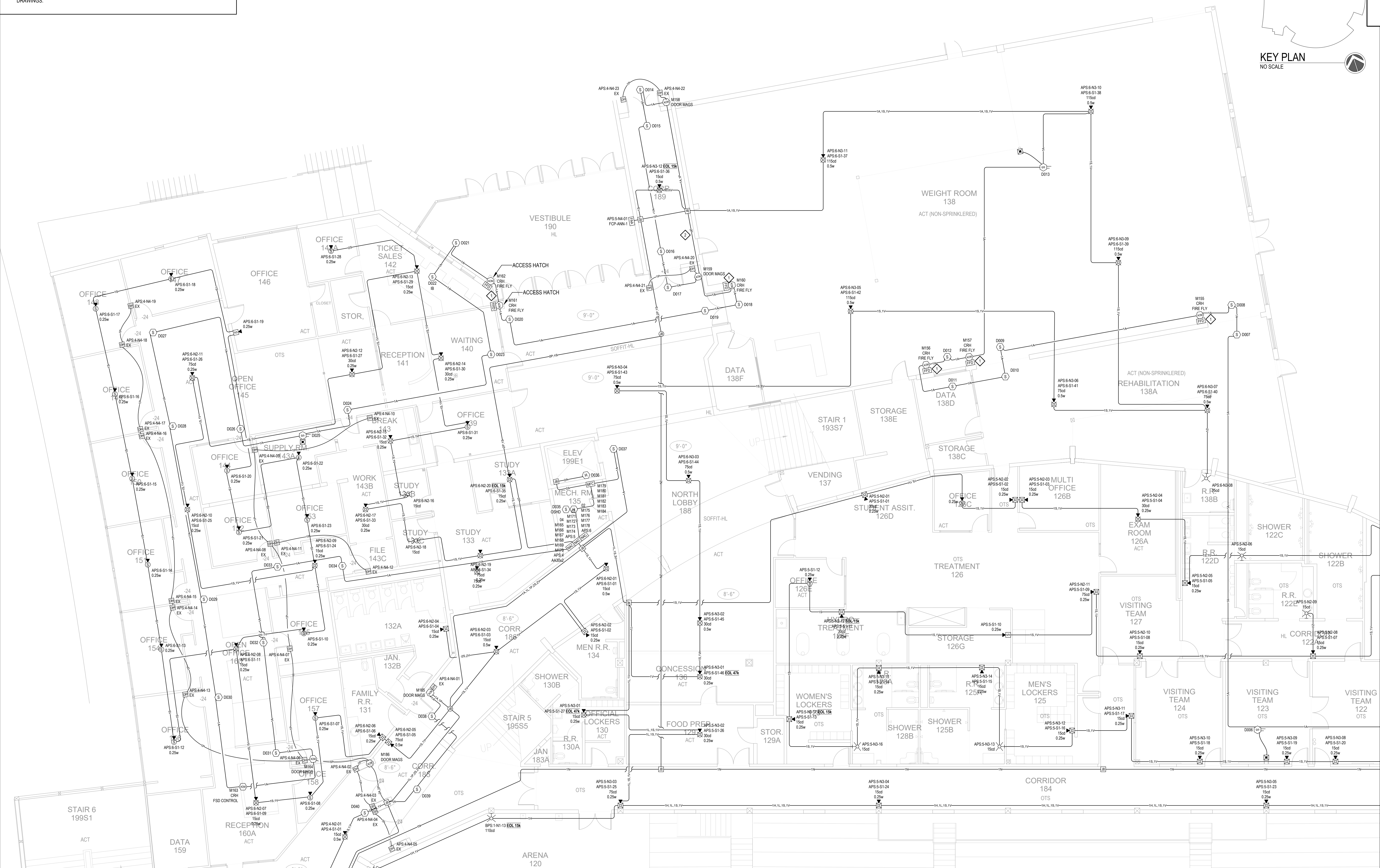
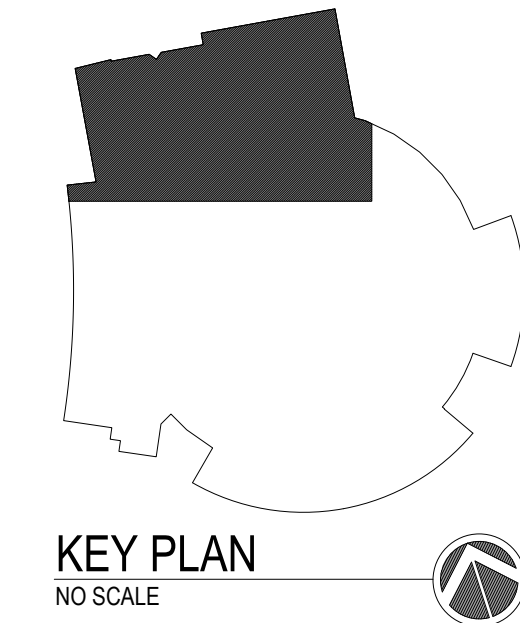
Bryan Moss, SET
 Apex Fire Alarm Design
 NICET 110772
 Fire Alarm Systems, Level IV
 State of Montana DLJ
 FPL-IEL-000888
Bryan Moss
PPA#23-0928
AE# 2024-02-04D

SHEET TITLE
 BASEMENT
 FIRE ALARM
SHEET
FA1.0
DATE
01/29/2025

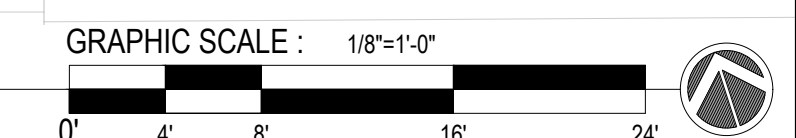
1 BASEMENT - FIRE ALARM
1/8" = 1'-0"



- 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/SHROYER 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"



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

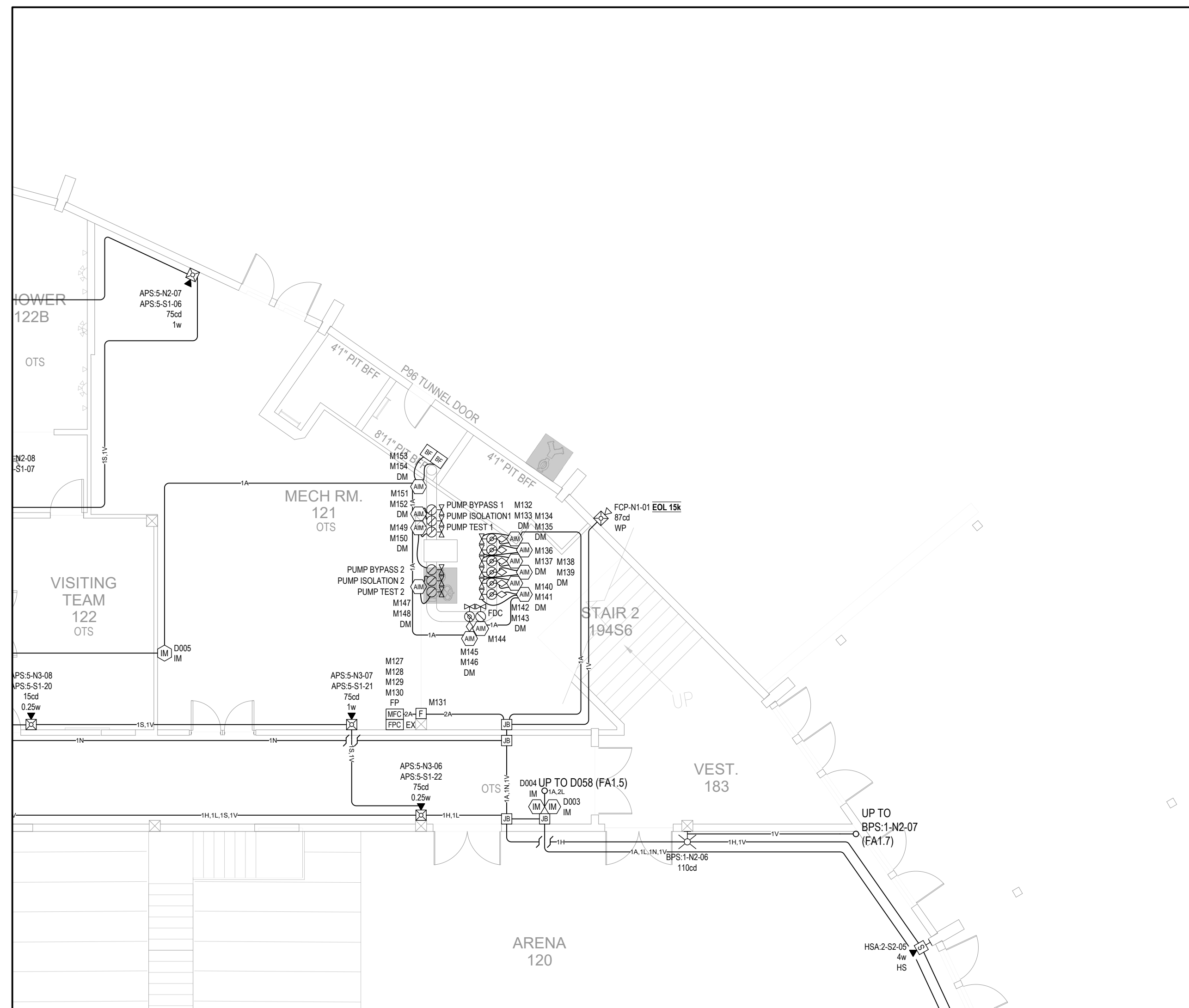


DRAWN BY: BSM		
REVIEWED BY: BSM		
REV.	DESCRIPTION	DATE
1	MSU COMMENT	1/22/25

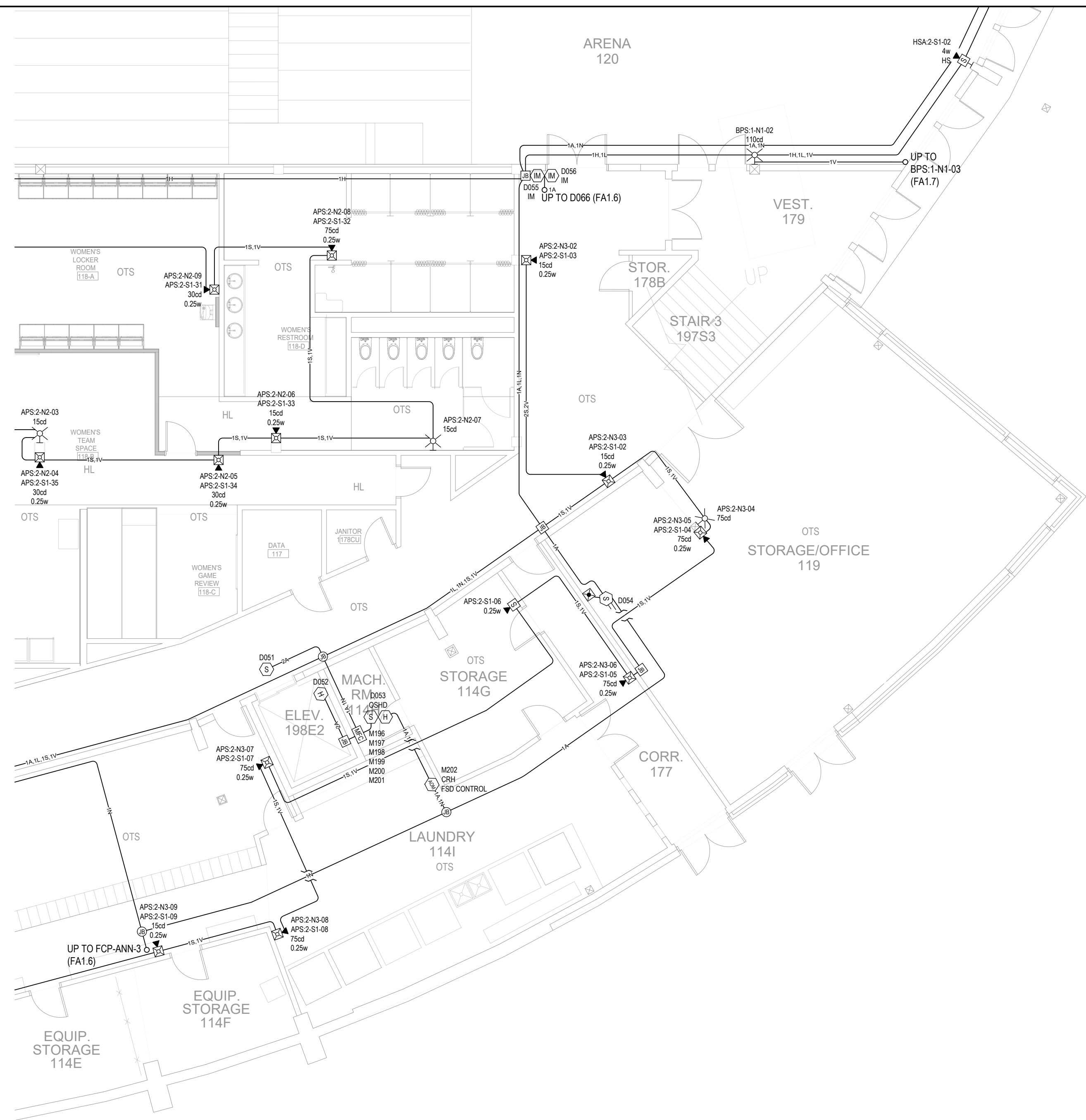
Bryan Moss, SET
Apex Fire Alarm Design
NICET 110772
Fire Alarm Systems, Level IV
State of Montana DLJ
FPL-IEL-000888

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

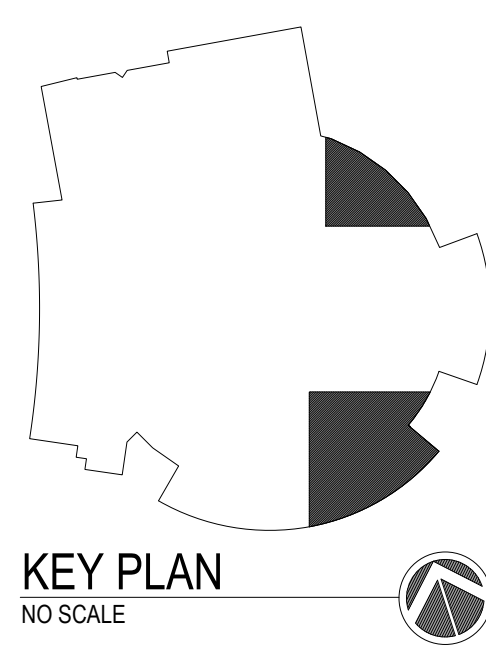
SHEET TITLE
MAIN LEVEL NORTH
FIRE ALARM
SHEET
FA1.1
DATE
01/29/2025



1 MAIN LEVEL - NORTH EAST FIRE ALARM
 1/8" = 1'-0"
 GRAPHIC SCALE: 1/8" = 1'-0"



2 MAIN LEVEL - SOUTH EAST FIRE ALARM
 1/8" = 1'-0"
 GRAPHIC SCALE: 1/8" = 1'-0"



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

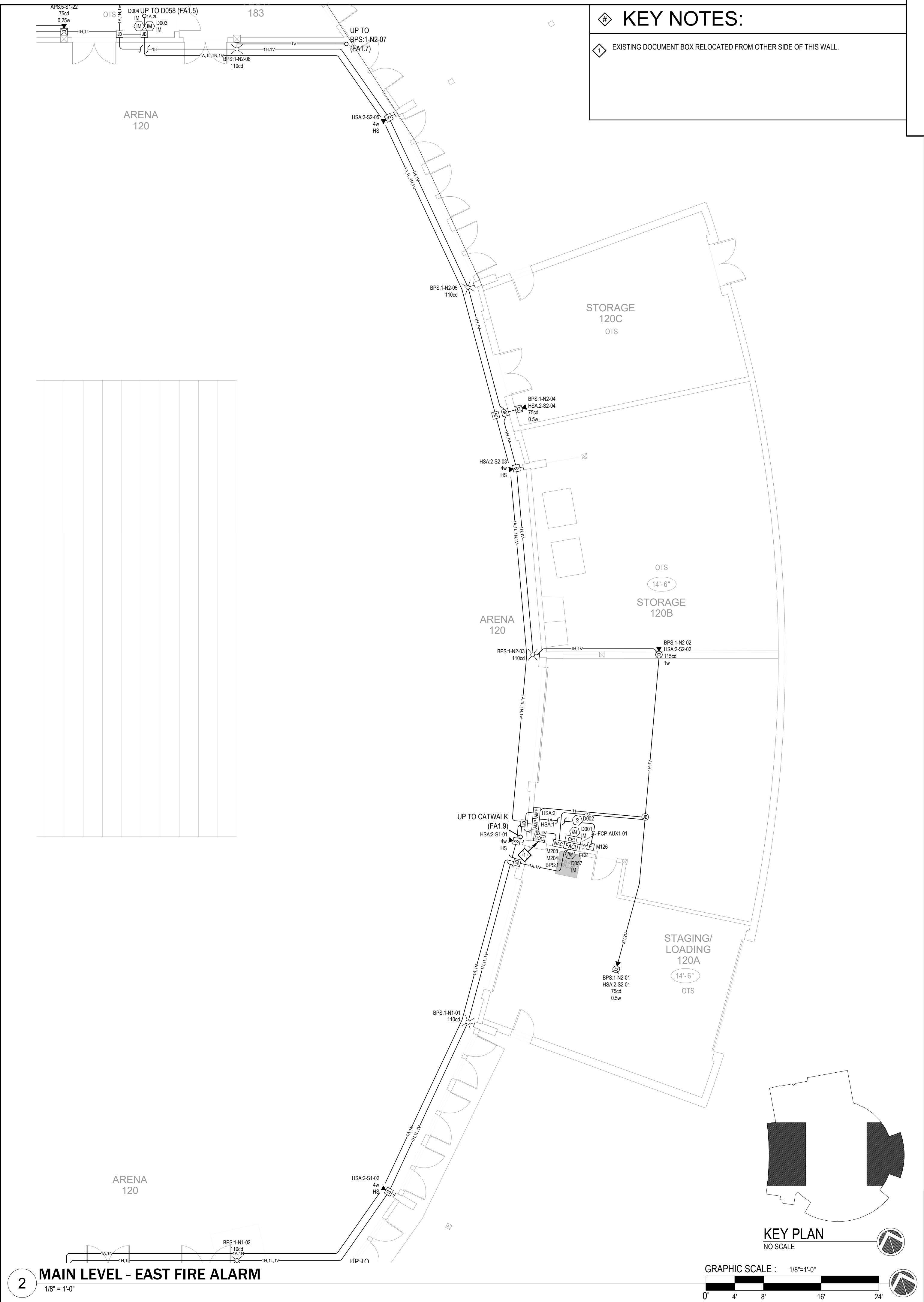
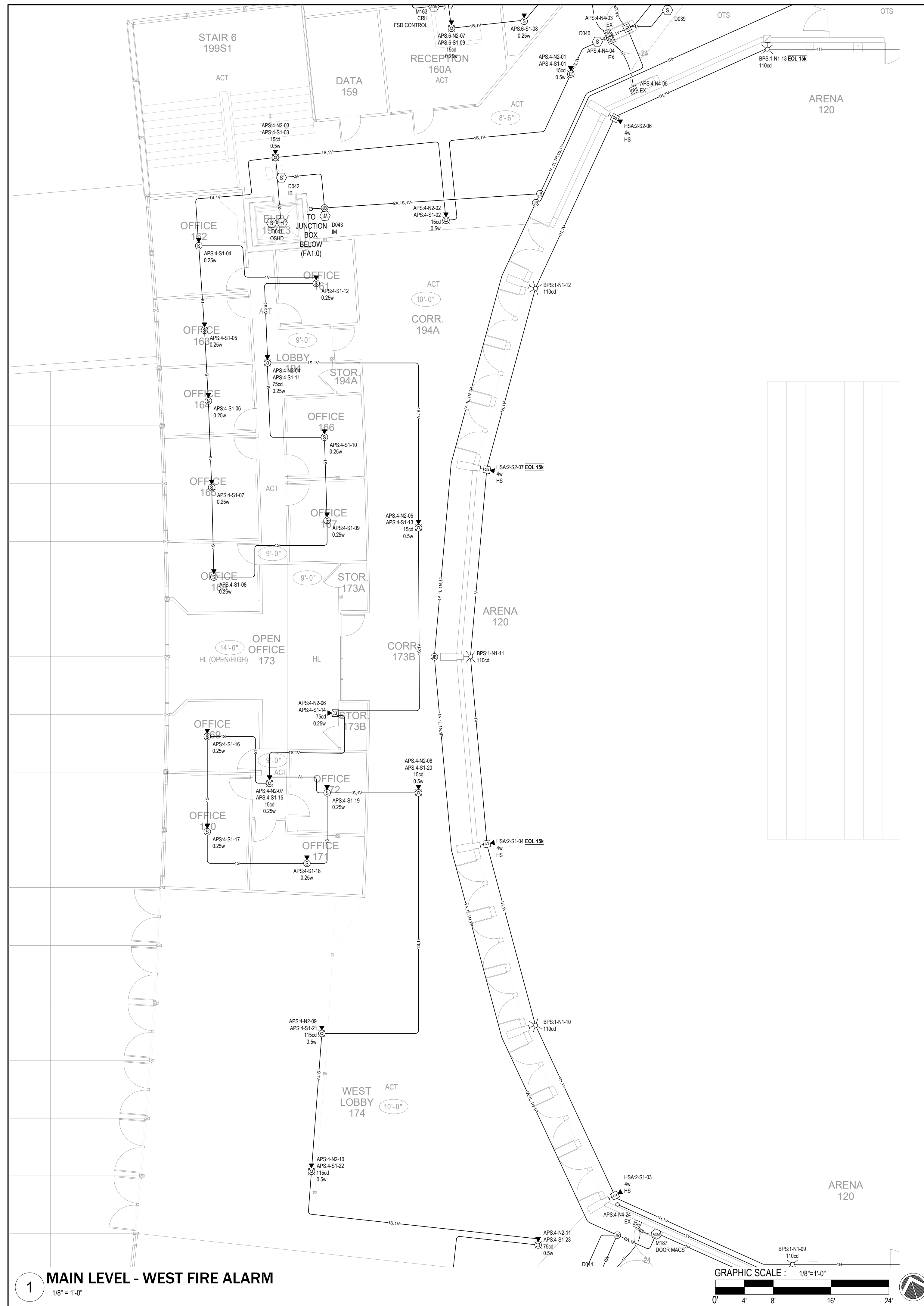


DRAWN BY: BSM		
REVIEWED BY: BSM		
REV.	DESCRIPTION	DATE
1	MSU COMMENT	1/22/25

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

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

SHEET TITLE
 MAIN LEVEL N.E. &
 S.E. FIRE ALARM
SHEET
FA1.2
DATE
 01/29/2025



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
1	MSU COMMENT	1/22/25

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

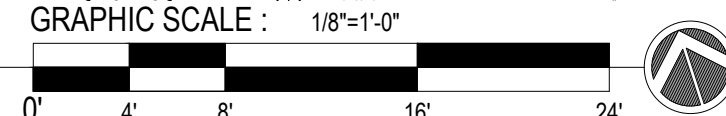
PPA#23-0928
 AE# 2024-02-04D

SHEET TITLE
 MAIN LEVEL EAST & WEST FIRE ALARM

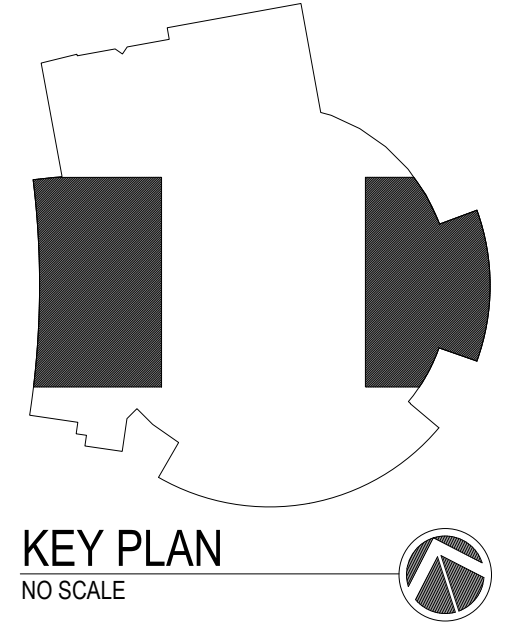
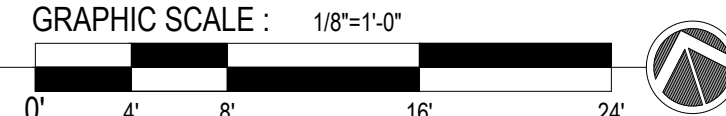
SHEET
FA1.3

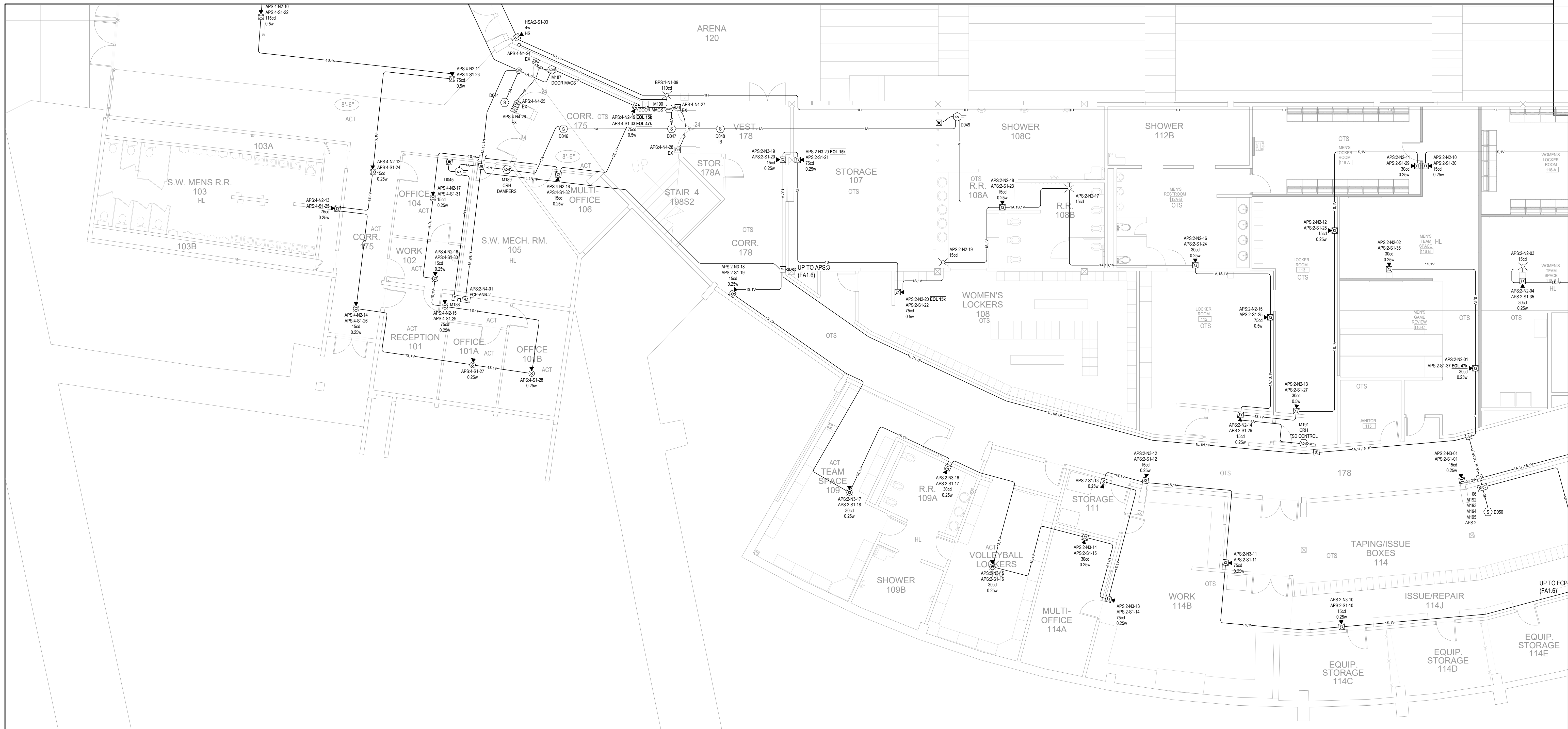
DATE
 01/29/2025

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

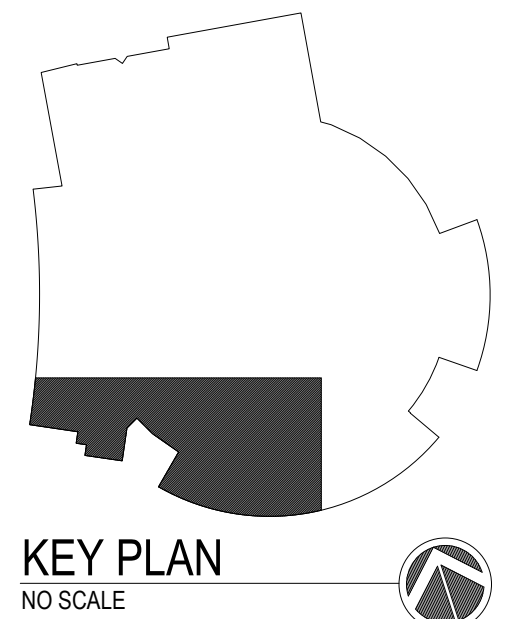
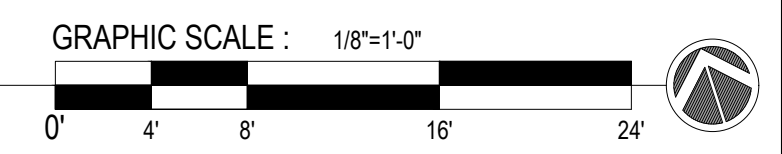


2 MAIN LEVEL - EAST FIRE ALARM
 1/8" = 1'-0"





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



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

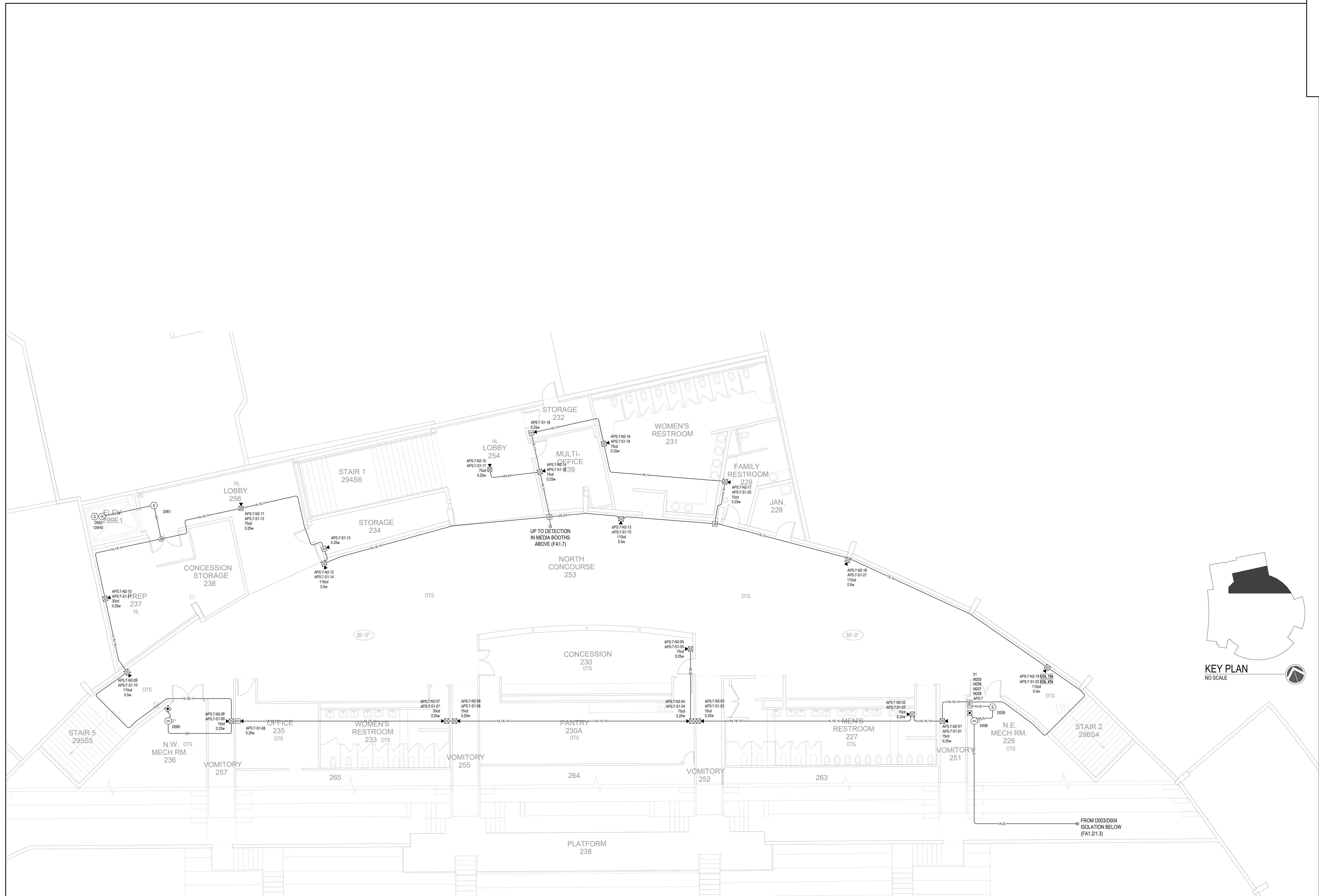


DRAWN BY: BSM		
REVIEWED BY: BSM		
REV.	DESCRIPTION	DATE
1	MSU COMMENT	1/22/25

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

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

SHEET TITLE
MAIN LEVEL SOUTH
FIRE ALARM
SHEET
FA1.4
DATE
01/29/2025



1 NORTH CONCOURSE - 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



REVIEWED BY:	BSM	
REV.	DESCRIPTION	DATE
1	MSU COMMENT	1/22/25

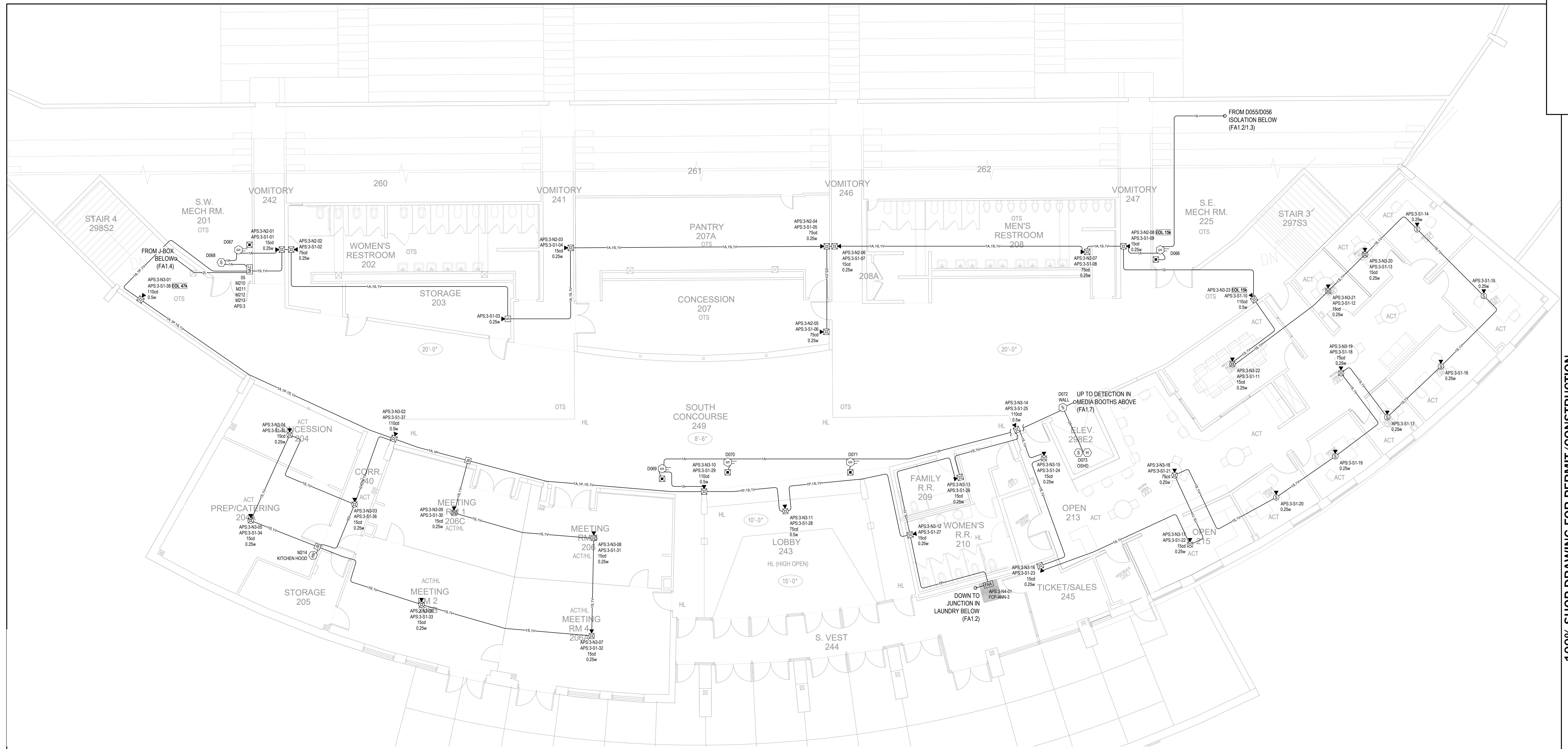
Bryan Moss, SET
Apex Fire Alarm Design
NICET 110772
Fire Alarm Systems, Level IV
State of Montana DLJ
FPL-IEL-000888

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

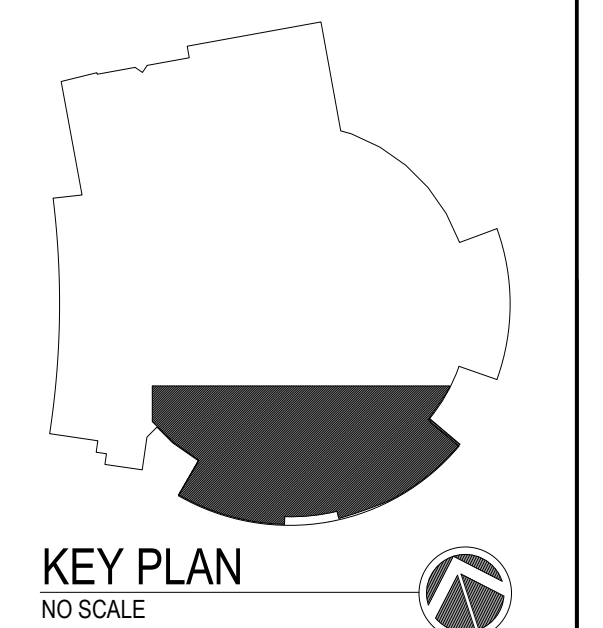
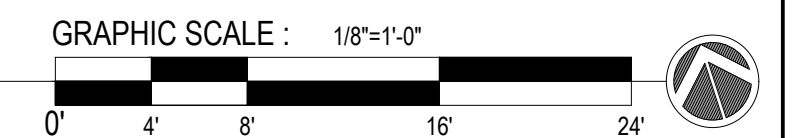
SHEET TITLE
NORTH CONCOURSE
FIRE ALARM

SHEET
FA1.5

DATE
01/29/2025



1 SOUTH CONCOURSE - FIRE ALARM
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
1	MSU COMMENT	1/22/25

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

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

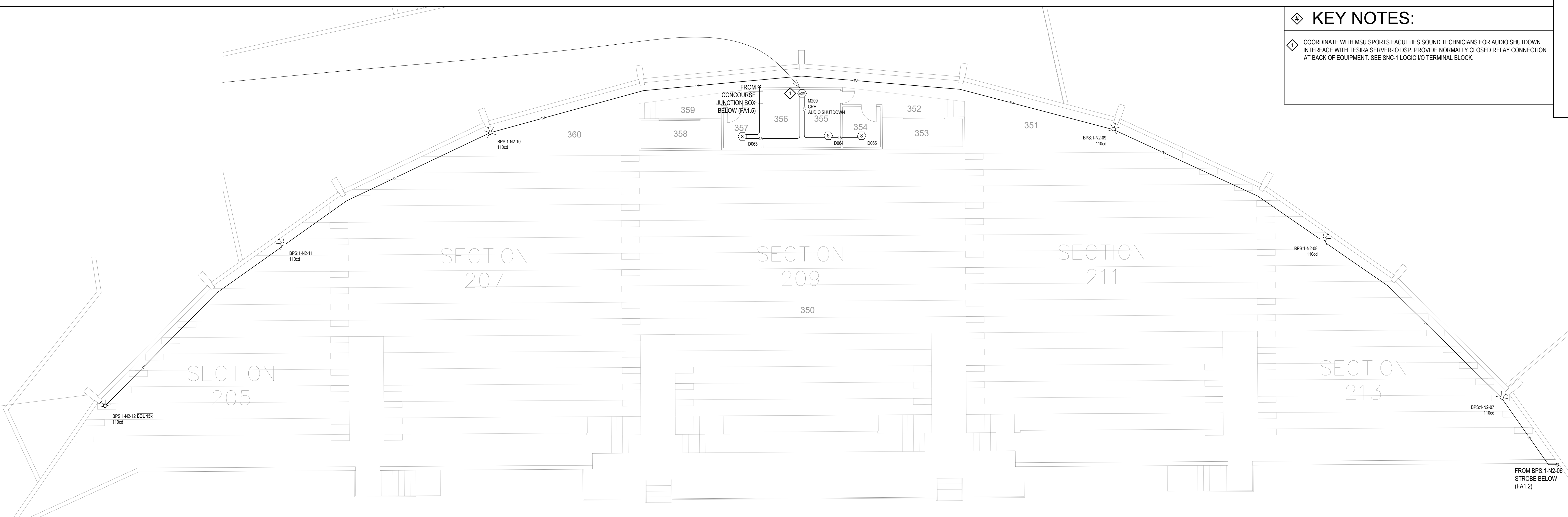
SHEET TITLE
SOUTH CONCOURSE
FIRE ALARM

SHEET
FA1.6

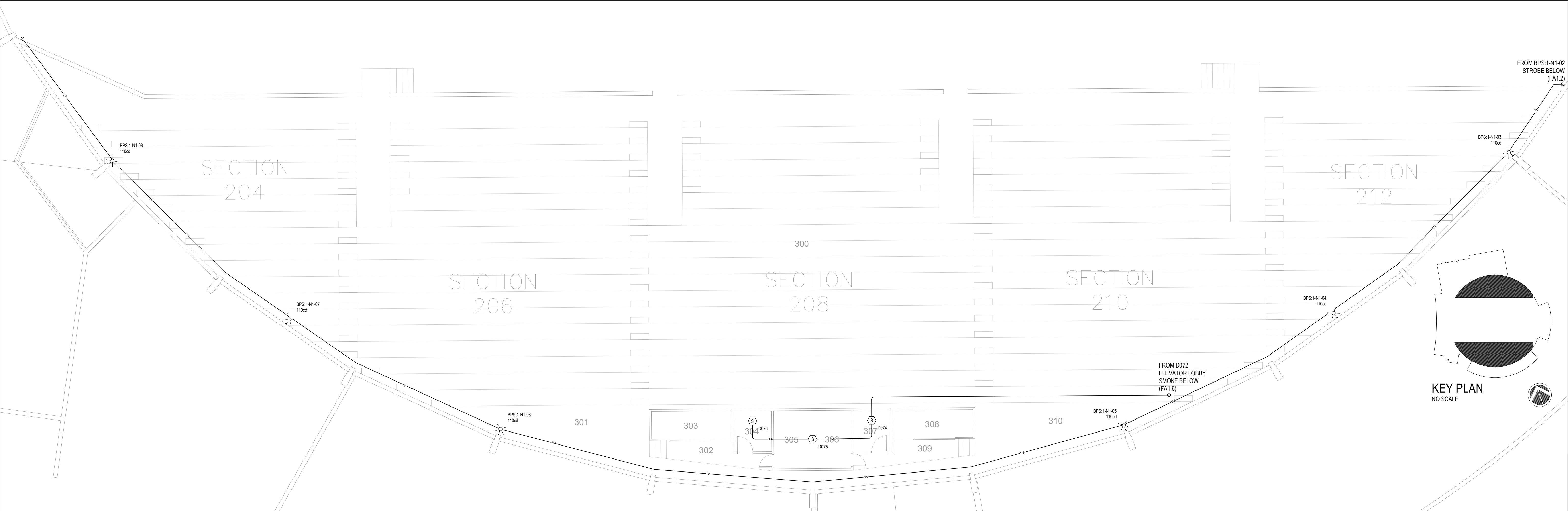
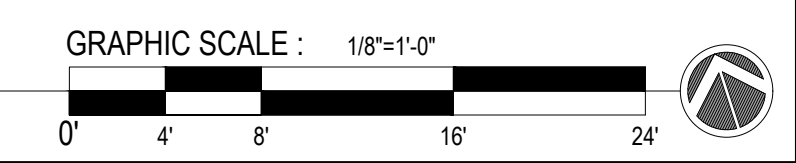
DATE
01/29/2025

KEY NOTES:

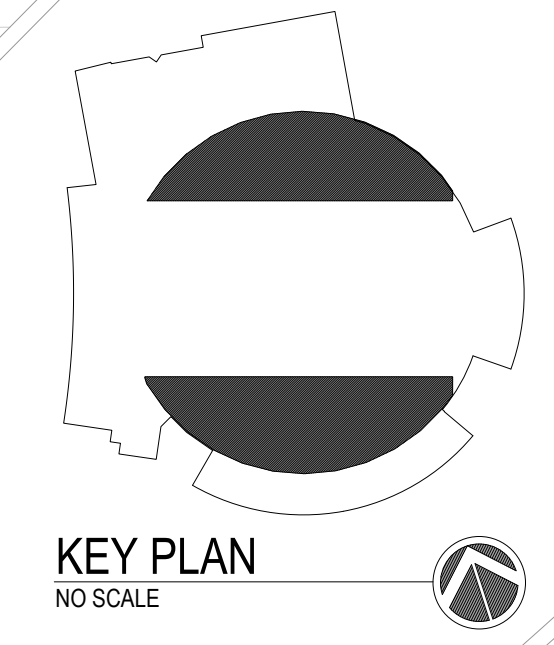
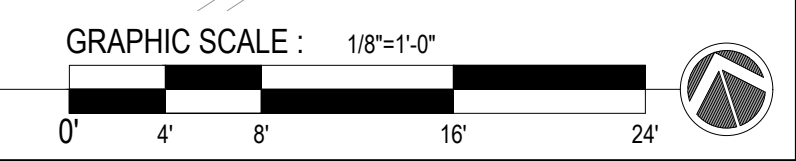
COORDINATE WITH MSU SPORTS FACILITIES SOUND TECHNICIANS FOR AUDIO SHUTDOWN INTERFACE WITH TESIRA SERVER-IO DSP. PROVIDE NORMALLY CLOSED RELAY CONNECTION AT BACK OF EQUIPMENT. SEE SNC-1 LOGIC I/O TERMINAL BLOCK.



1 NORTH UPPER ARENA - FIRE ALARM
1/8" = 1'-0"



2 SOUTH UPPER ARENA - FIRE ALARM
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
1	MSU COMMENT	1/22/25

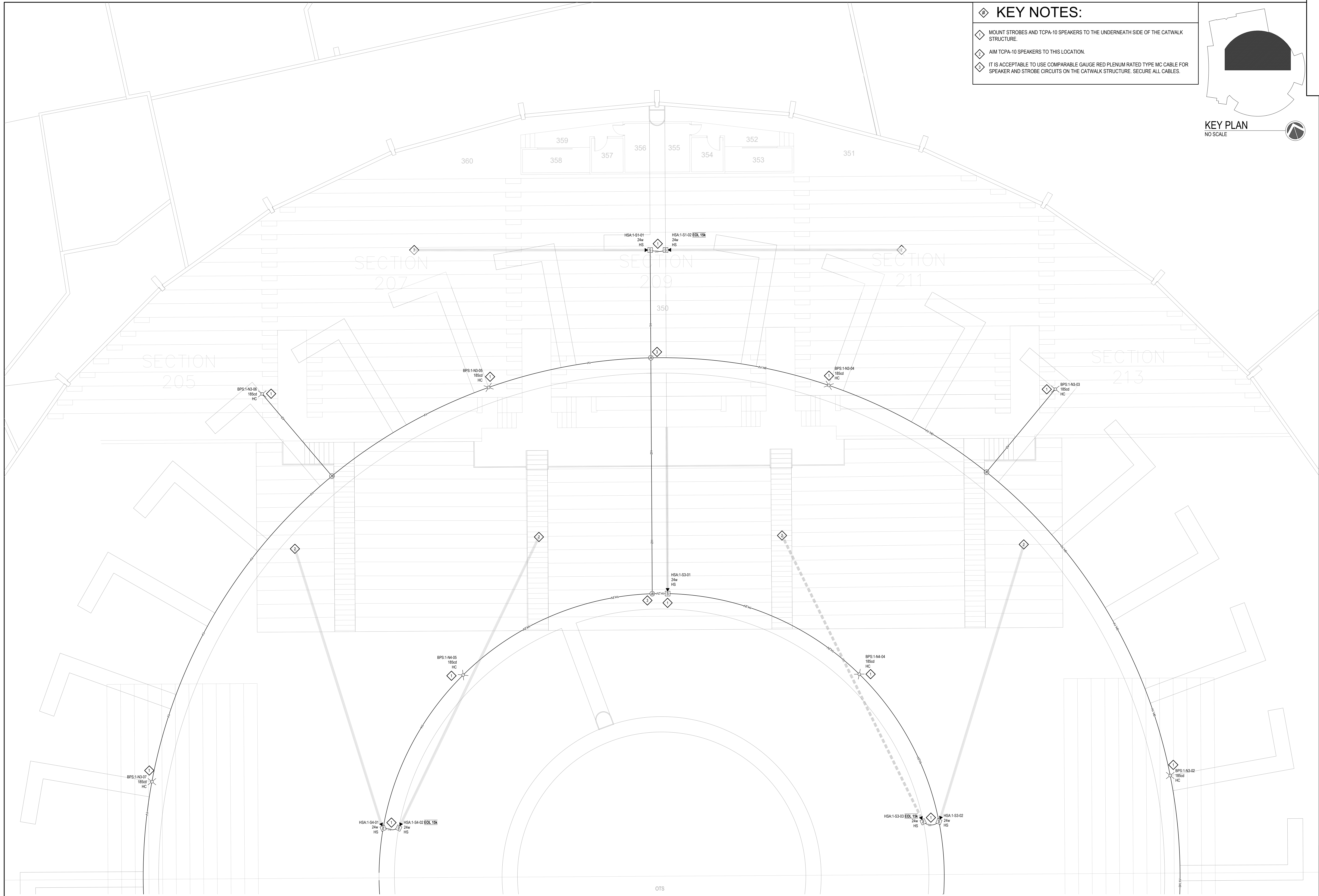
Bryan Moss, SET
Apex Fire Alarm Design
NICET 110772
Fire Alarm Systems, Level IV
State of Montana DLI
FPL-IEL-000888

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

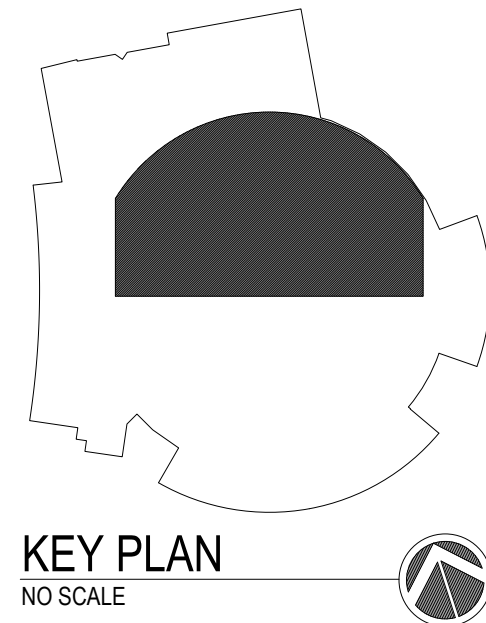
SHEET TITLE
UPPER ARENA
FIRE ALARM

SHEET
FA1.7

DATE
01/29/2025



- 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.



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
1	MSU COMMENT	1/22/25

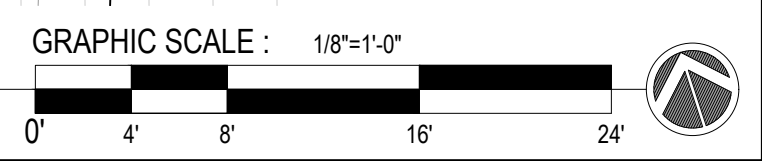
Bryan Moss, SET
 Apex Fire Alarm Design
 NICET 110772
 Fire Alarm Systems, Level IV
 State of Montana DLJ
 FPL-IEL-000888

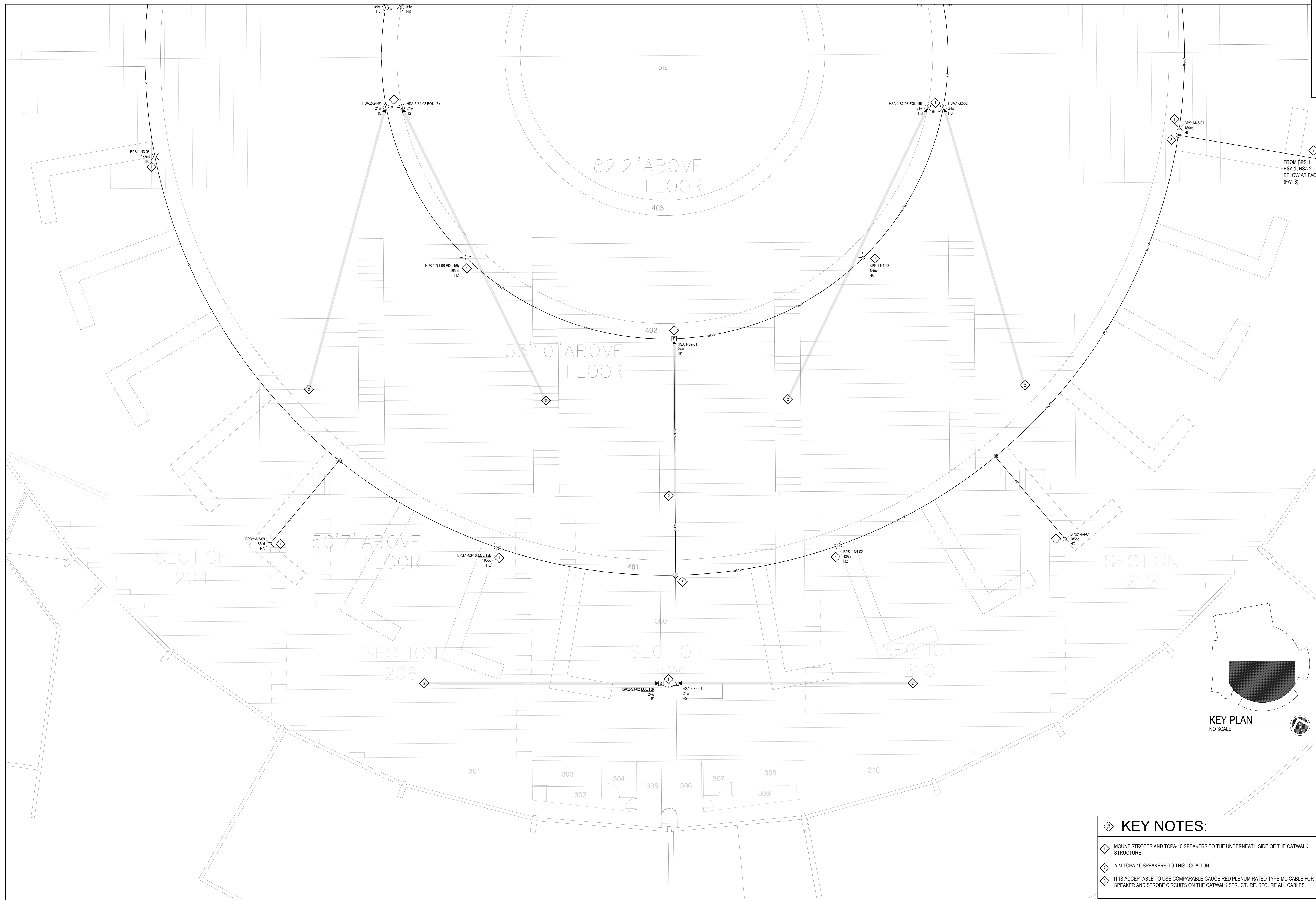
Bryan Moss
 PPA#23-0928
 AE# 2024-02-04D

SHEET TITLE
 NORTH CATWALK
 FIRE ALARM
SHEET
FA1.8

DATE
 01/29/2025

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





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

MONTANA STATE UNIVERSITY
BOZEMAN



100% SHOP DRAWING FOR PERMIT/CONSTRUCTION

REV.	DESCRIPTION	DATE
1	MSU COMMENT	1/22/25

Drawn by: **BSM**
 Reviewed by: **BSM**

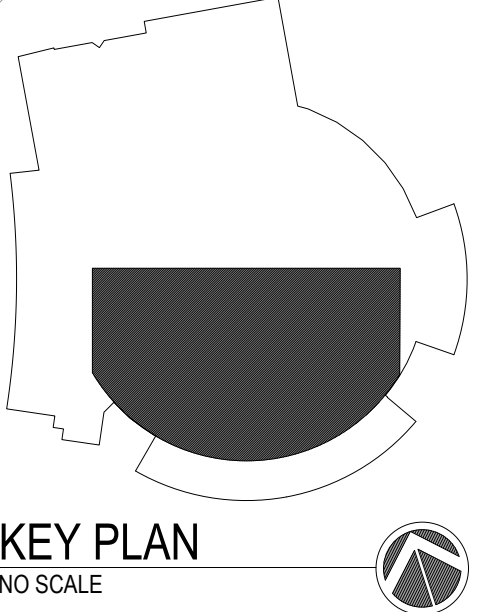
Bryan Moss, SET
 Apex Fire Alarm Design
 NICET 110772
 Fire Alarm Systems, Level IV
 State of Montana DL#
 FPL-IEL-000888

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

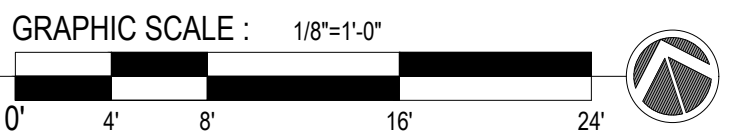
SHEET TITLE
 SOUTH CATWALK
 FIRE ALARM

SHEET
FA1.9

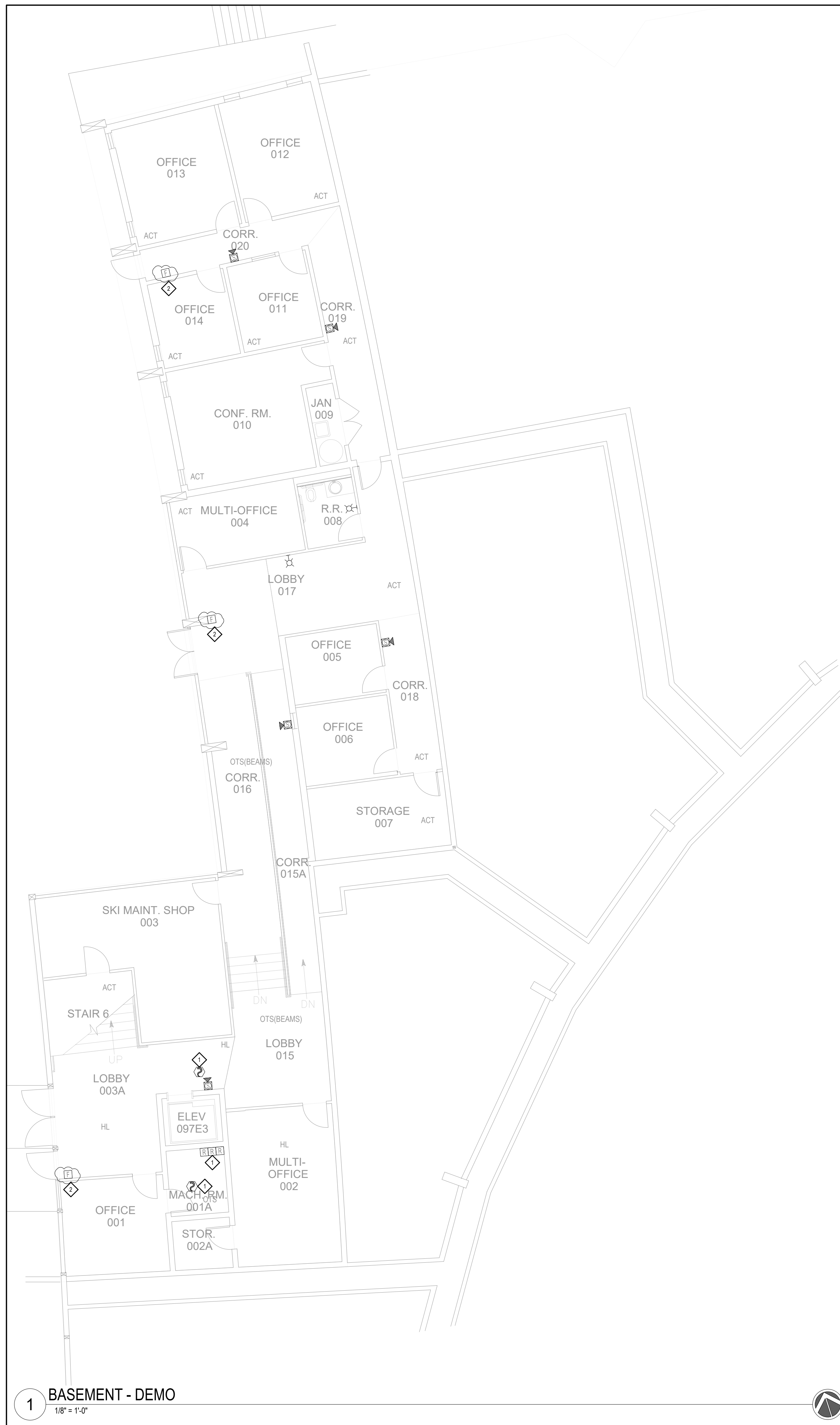
DATE
 01/29/2025



- 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.



1 SOUTH CATWALK - FIRE ALARM
 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 FA.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
 BOZEMAN



DRAWN BY: BSM		
REVIEWED BY: BSM		
REV.	DESCRIPTION	DATE
1	MSU COMMENT	1/22/25

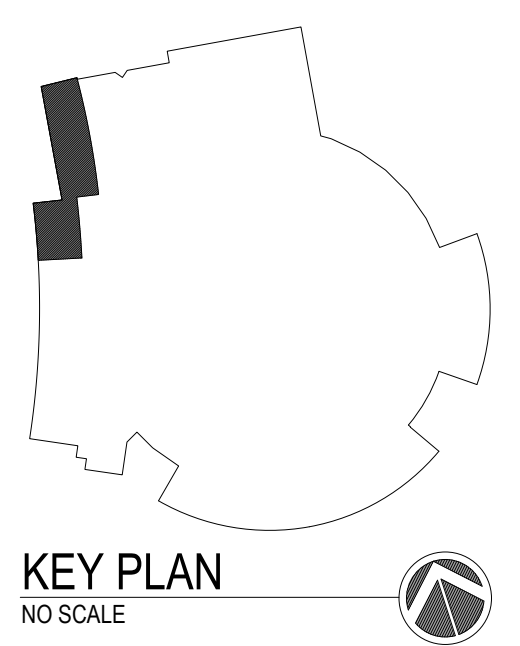
Bryan Moss, SET
 Apex Fire Alarm Design
 NICET 110772
 Fire Alarm Systems, Level IV
 State of Montana DLJ
 FPL-IEL-000888

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

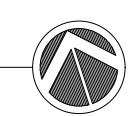
SHEET TITLE
 BASEMENT
 DEMO

SHEET
FA2.0

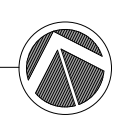
DATE
 01/29/2025



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



KEY PLAN
 NO SCALE

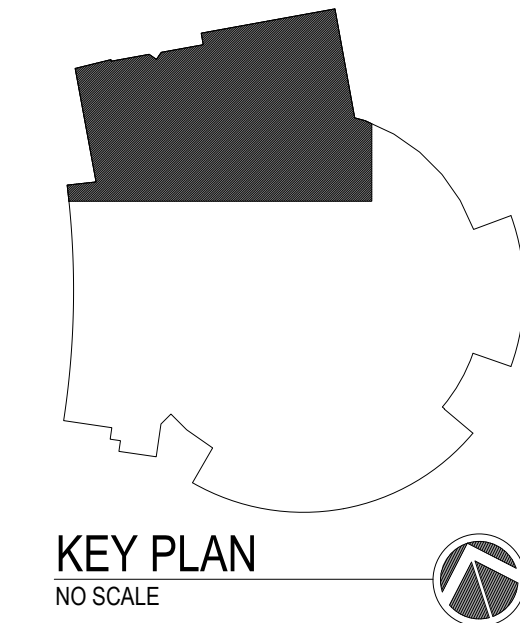


FIRE ALARM SHEET NOTES:

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/MCCABE 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.



1 MAIN LEVEL - NORTH 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
1	MSU COMMENT	1/22/25

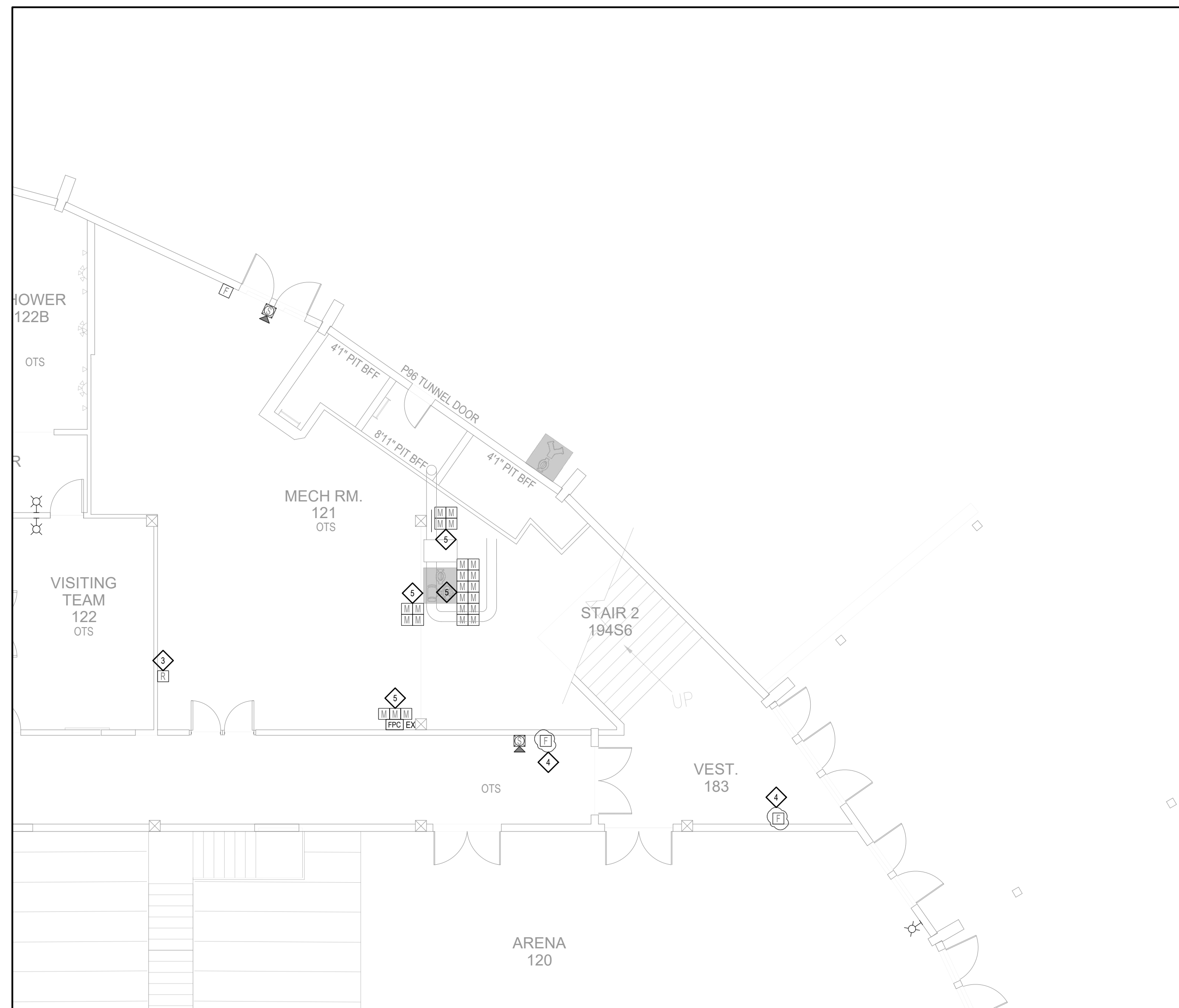
Bryan Moss, SET
Apex Fire Alarm Design
NICET 110772
Fire Alarm Systems, Level IV
State of Montana DJL
FPL-IEL-000888

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

SHEET TITLE
MAIN LEVEL NORTH DEMO

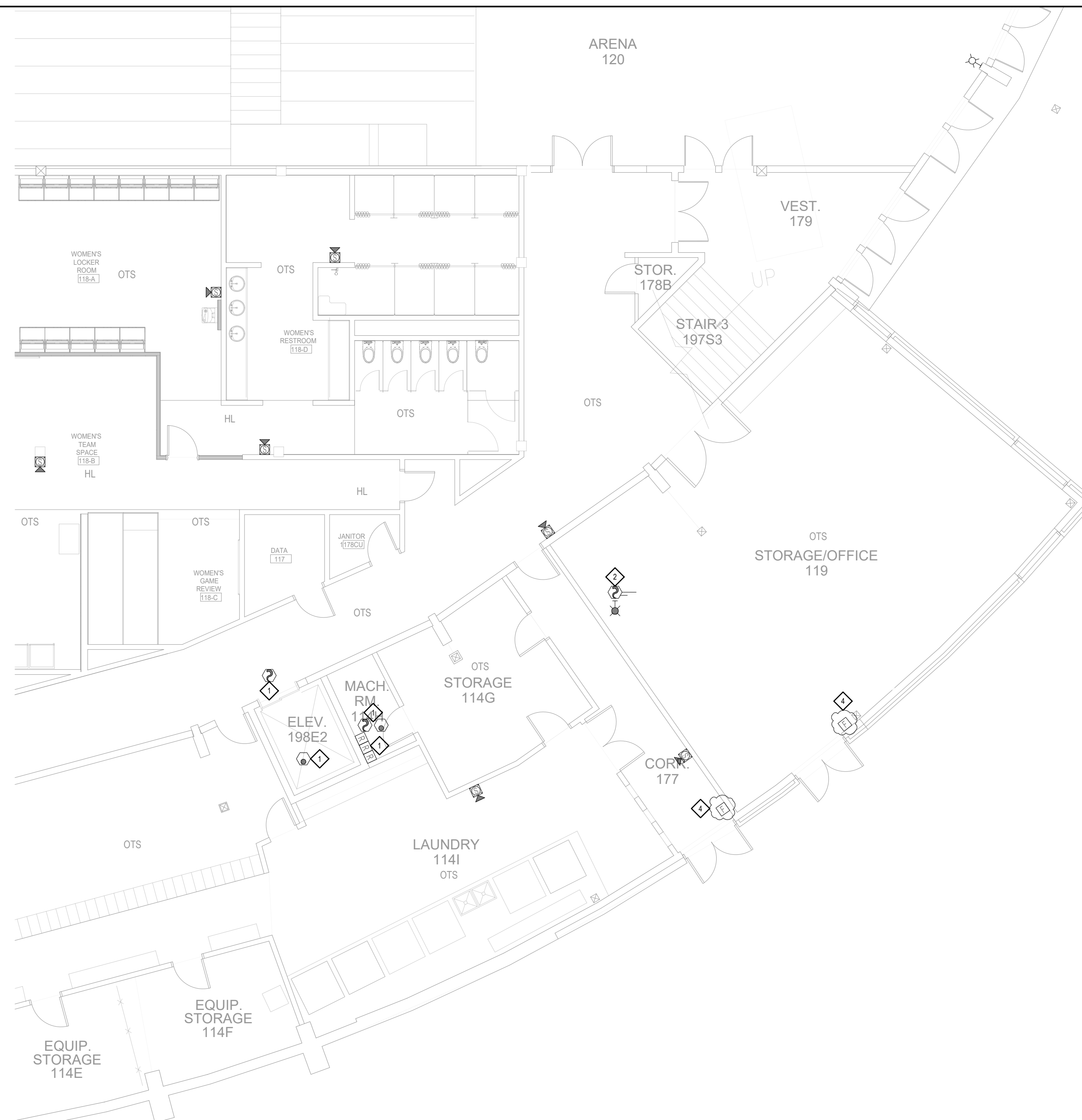
SHEET
FA2.1

DATE
01/29/2025



1 MAIN LEVEL - NORTH EAST DEMO

1/8" = 1'-0"



2 MAIN LEVEL - SOUTH EAST DEMO

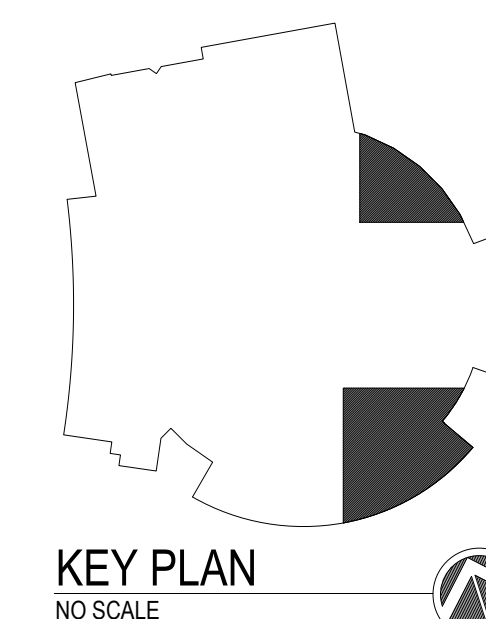
1/8" = 1'-0"

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



KEY PLAN
NO SCALE



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

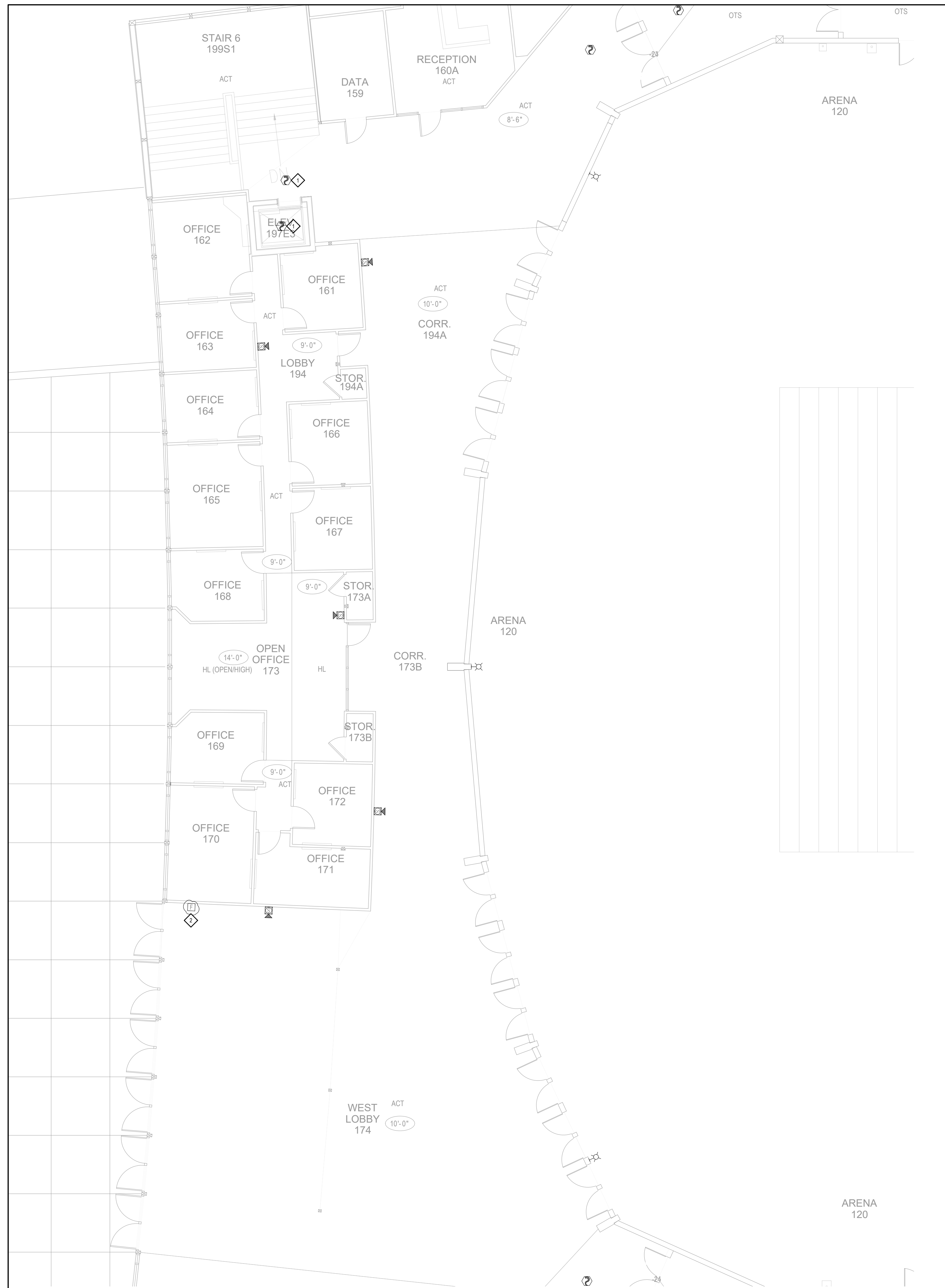


DRAWN BY: BSM		
REVIEWED BY: BSM		
REV.	DESCRIPTION	DATE
1	MSU COMMENT	1/22/25

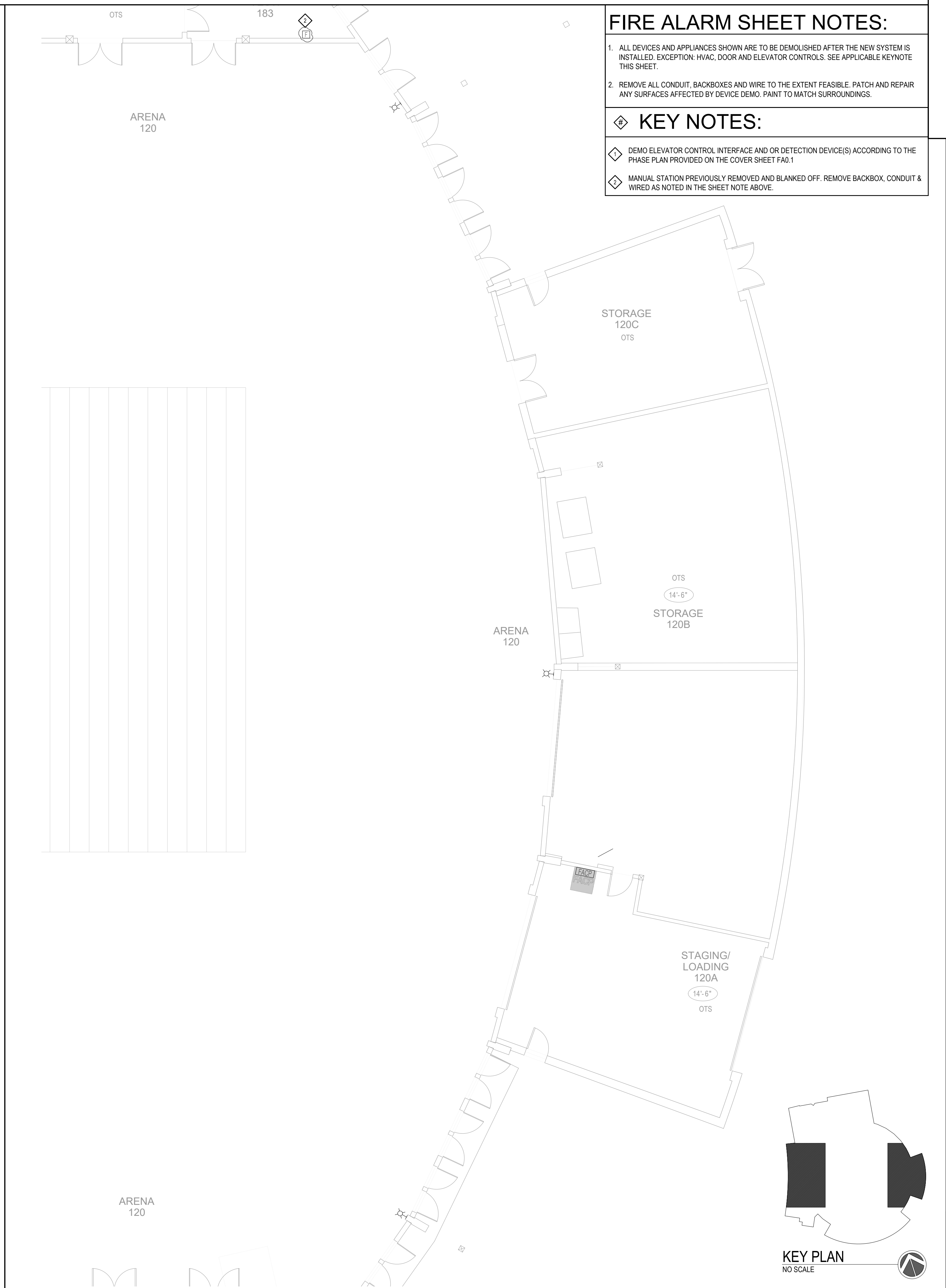
Bryan Moss, SET
 Apex Fire Alarm Design
 NICET 110772
 Fire Alarm Systems, Level IV
 State of Montana DLJ
 FPL-IEL-000888

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

SHEET TITLE
 MAIN LEVEL N.E.
 & S.E. DEMO
SHEET
FA2.2
DATE
 01/29/2025



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



2 MAIN LEVEL - 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. 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.



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
1	MSU COMMENT	1/22/25

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

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

SHEET TITLE
MAIN LEVEL EAST
& WEST DEMO
SHEET
FA2.3
DATE
01/29/2025



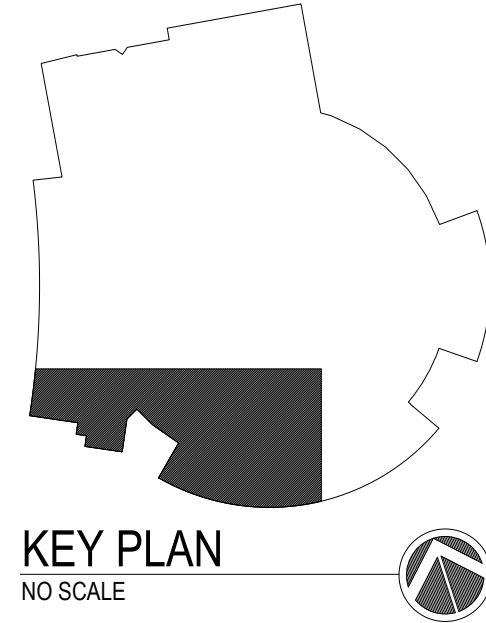
1 MAIN LEVEL - SOUTH DEMO
1/8" = 1'-0"

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.



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



DRAWN BY: BSM		
REVIEWED BY: BSM		
REV.	DESCRIPTION	DATE
1	MSU COMMENT	1/22/25

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

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

SHEET TITLE
MAIN LEVEL SOUTH DEMO

SHEET
FA2.4

DATE
01/29/2025

100% SHOP DRAWING FOR PERMIT/CONSTRUCTION

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.



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
1	MSU COMMENT	1/22/25

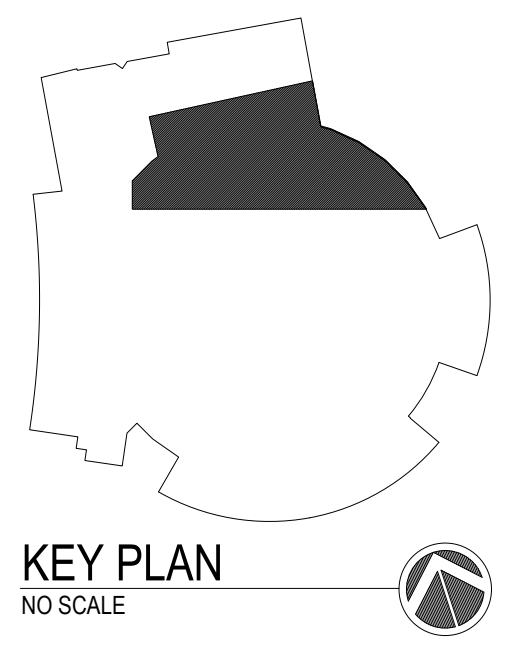
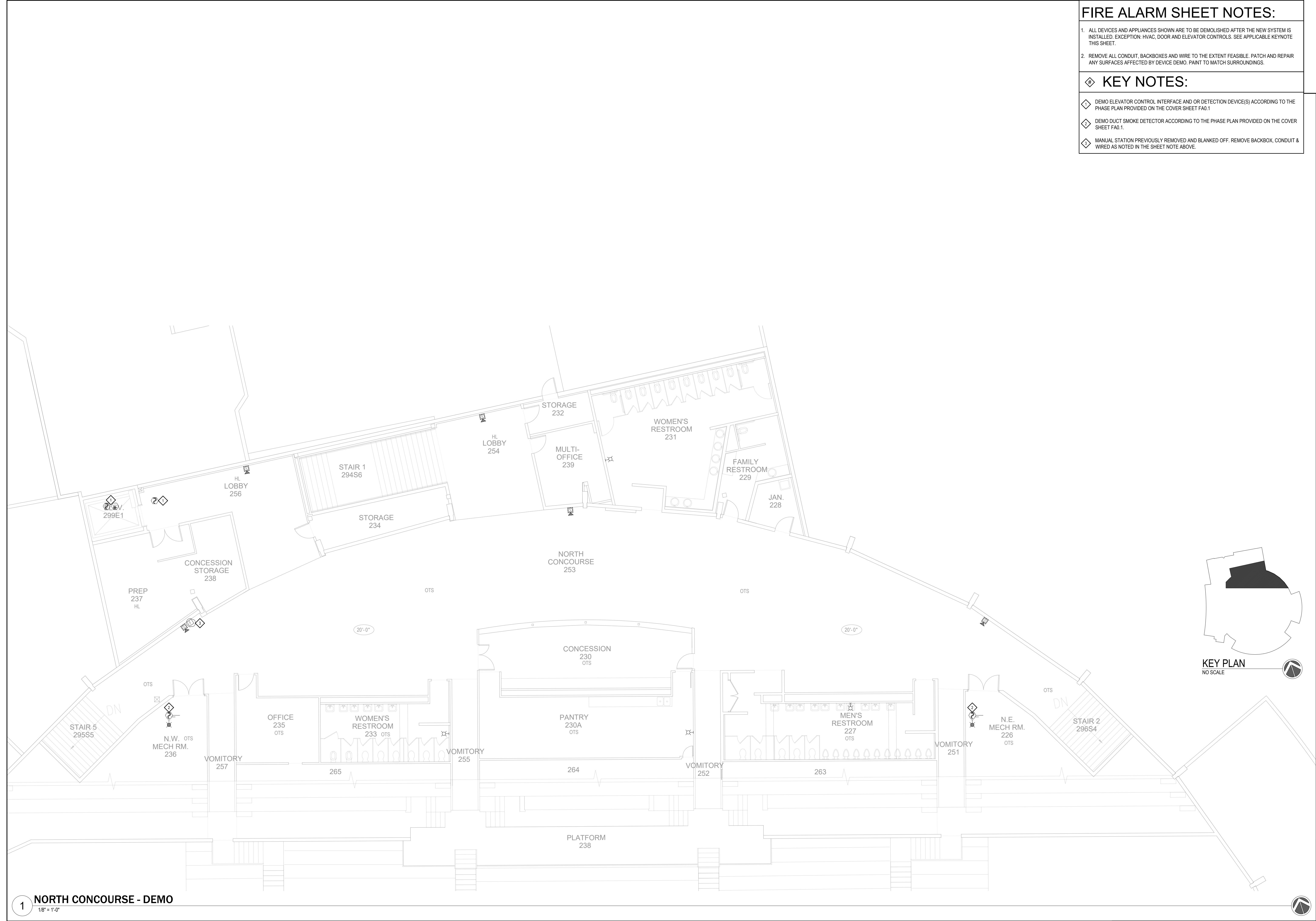
Bryan Moss, SET
 Apex Fire Alarm Design
 NICET 110772
 Fire Alarm Systems, Level IV
 State of Montana DLJ
 FPL-IEL-000888

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

SHEET TITLE
 NORTH CONCOURSE
 DEMO

SHEET
FA2.5

DATE
01/29/2025

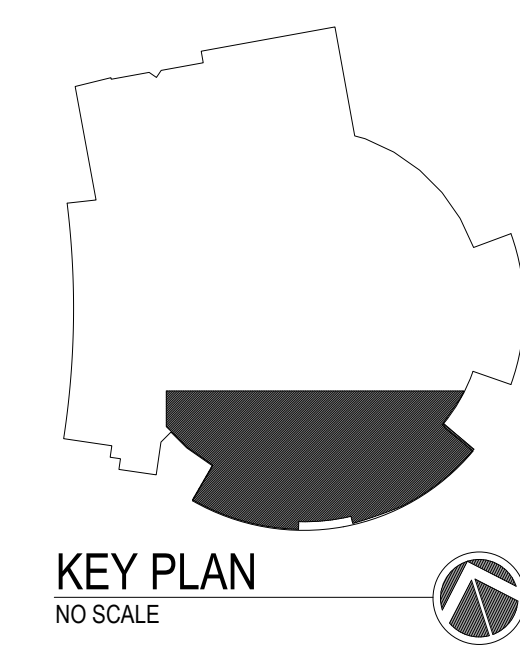


1 NORTH CONCOURSE - DEMO
 1/8" = 1'-0"



1 NORTH CONCOURSE - 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
 - 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.



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
1	MSU COMMENT	1/22/25

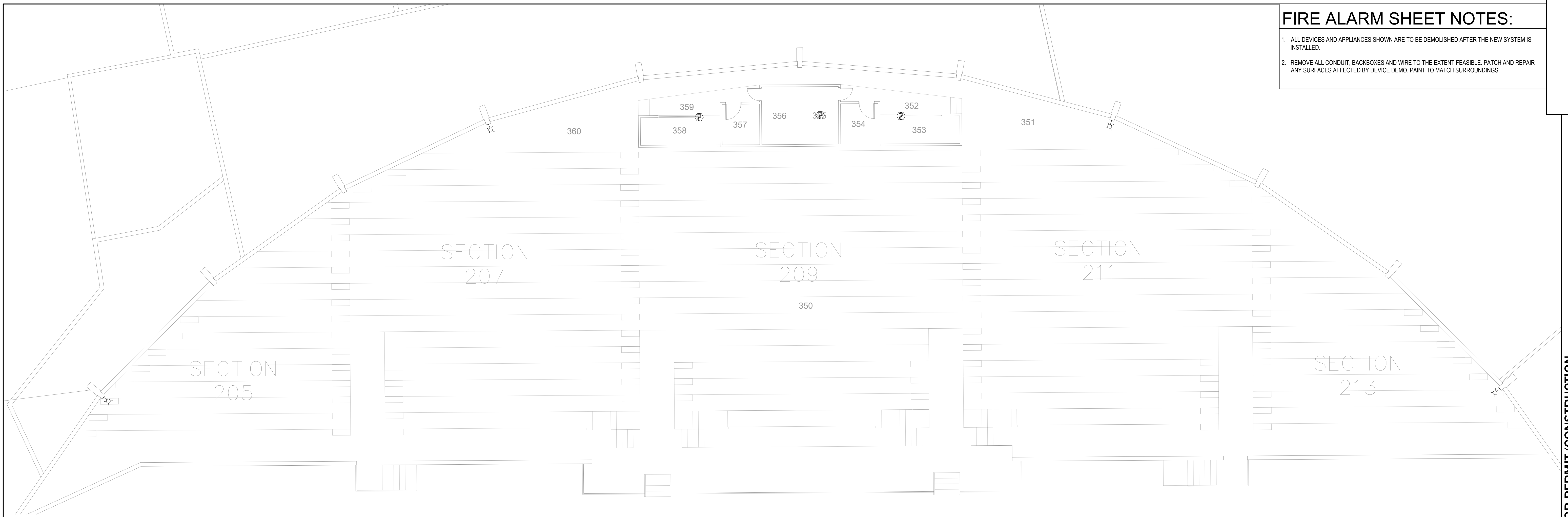
Bryan Moss, SET
Apex Fire Alarm Design
NICET 110772
Fire Alarm Systems, Level IV
State of Montana DJL
FPL-IEL-000888

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

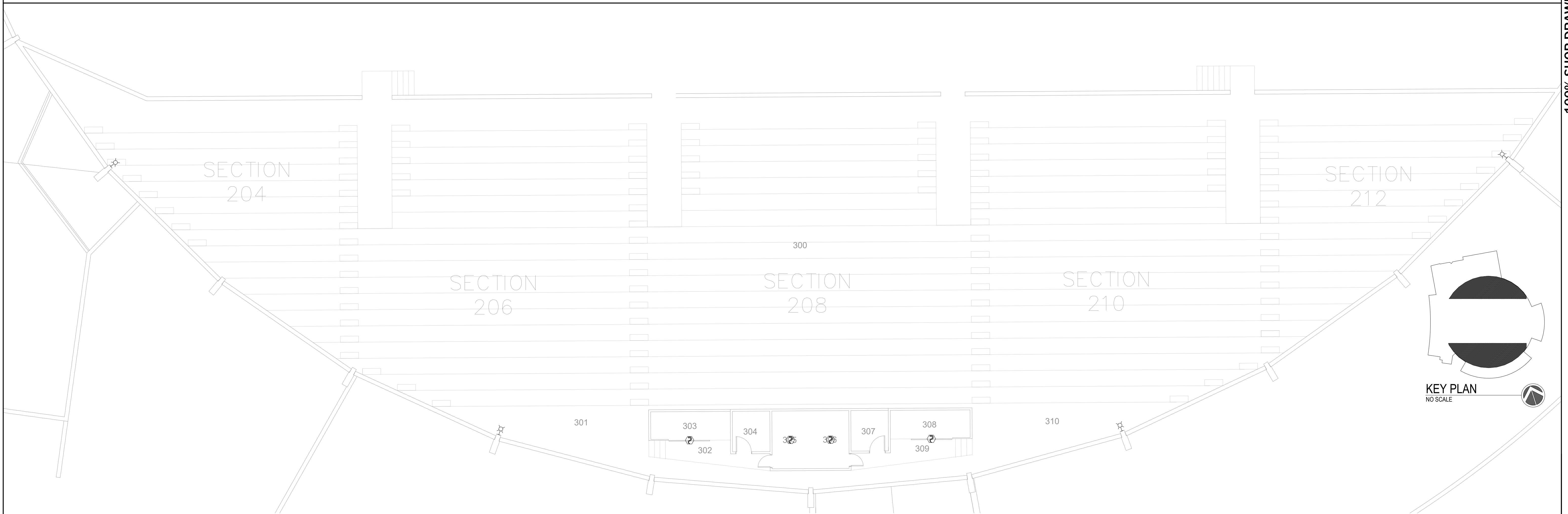
SHEET TITLE
SOUTH CONCOURSE
DEMO
SHEET
FA2.6
DATE
01/29/2025

FIRE ALARM SHEET NOTES:

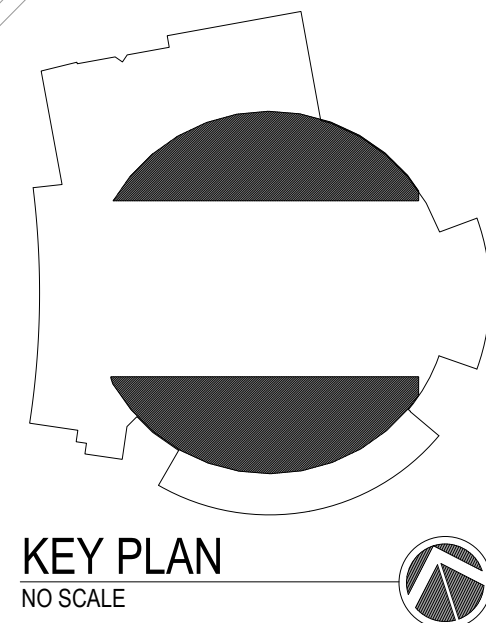
1. ALL DEVICES AND APPLIANCES SHOWN ARE TO BE DEMOLISHED AFTER THE NEW SYSTEM IS INSTALLED.
2. REMOVE ALL CONDUIT, BACKBOXES AND WIRE TO THE EXTENT FEASIBLE. PATCH AND REPAIR ANY SURFACES AFFECTED BY DEVICE DEMO. PAINT TO MATCH SURROUNDINGS.



1 NORTH UPPER ARENA - DEMO
1/8" = 1'-0"



2 SOUTH UPPER ARENA - 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
1	MSU COMMENT	1/22/25

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

Bryan Moss

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

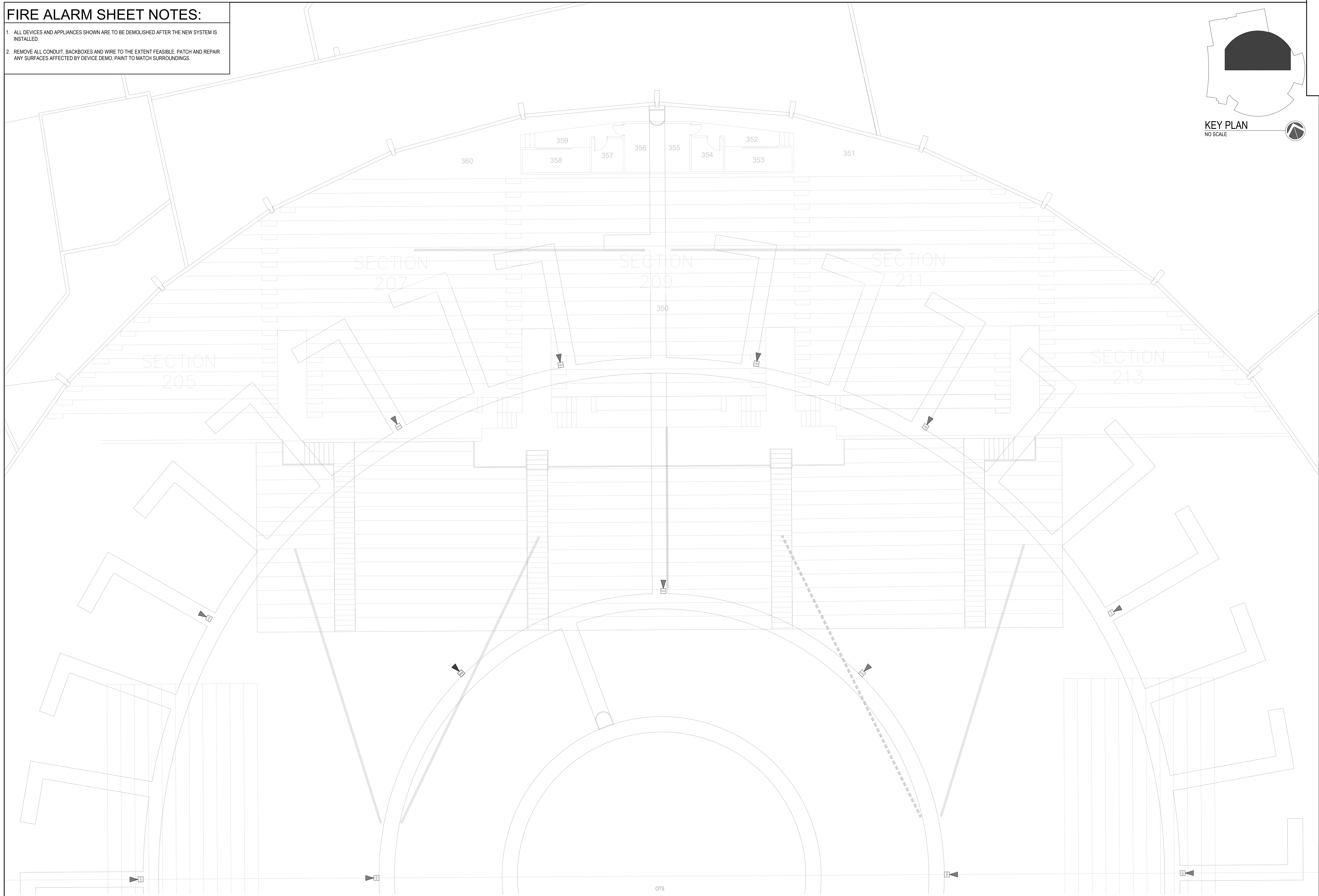
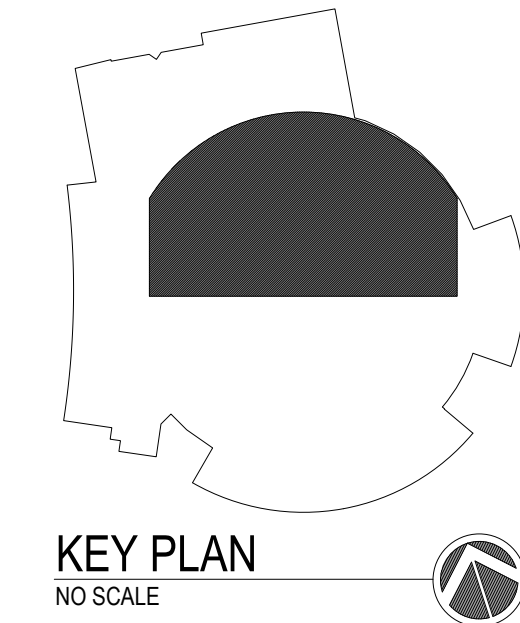
SHEET TITLE
UPPER ARENA
DEMO

SHEET
FA2.7

DATE
01/29/2025

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.



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
1	MSU COMMENT	1/22/25

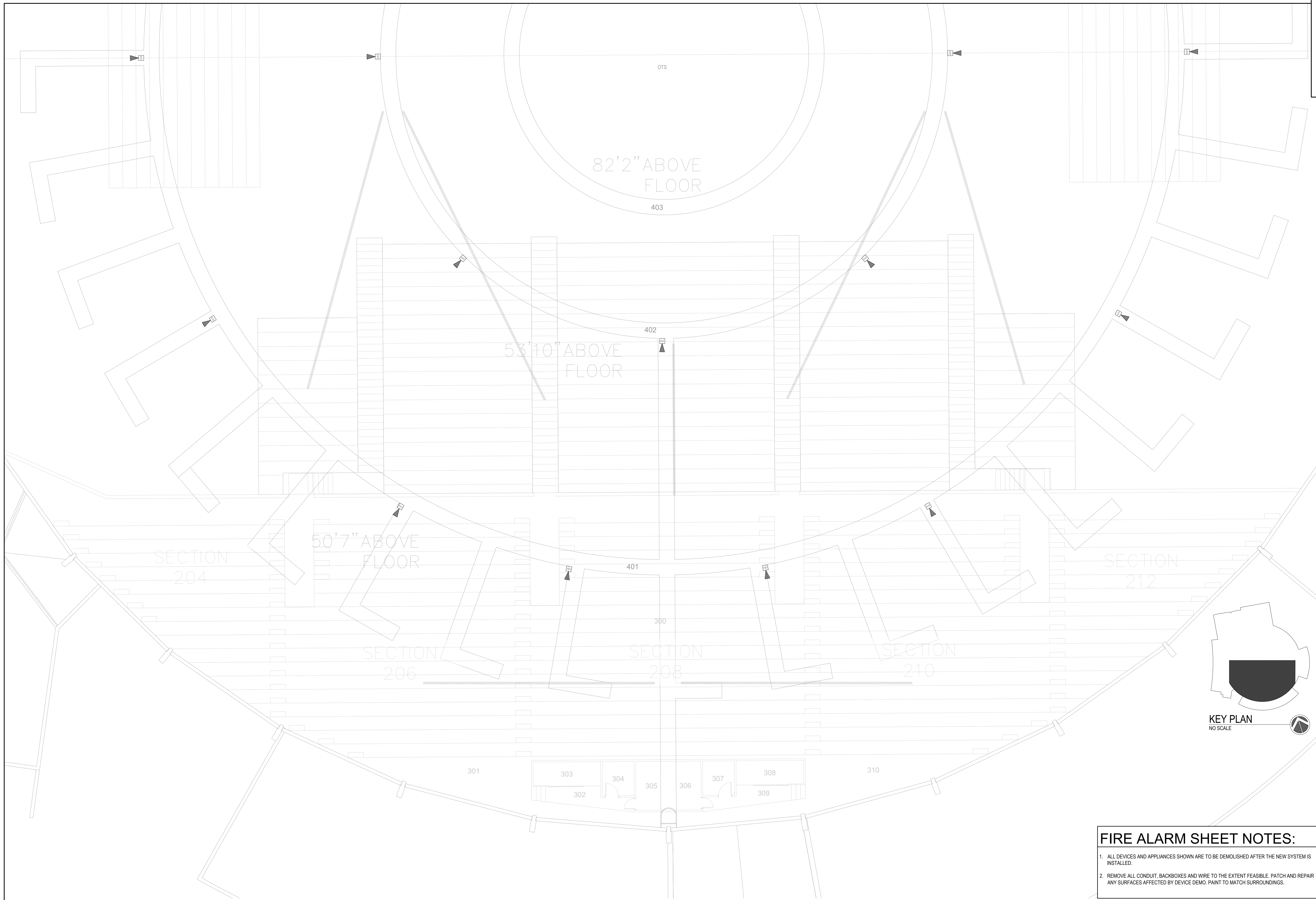
Bryan Moss, SET
Apex Fire Alarm Design
NICET 110772
Fire Alarm Systems, Level IV
State of Montana DLJ
FPL-IEL-000888

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

SHEET TITLE
NORTH CATWALK
DEMO

SHEET
FA2.8

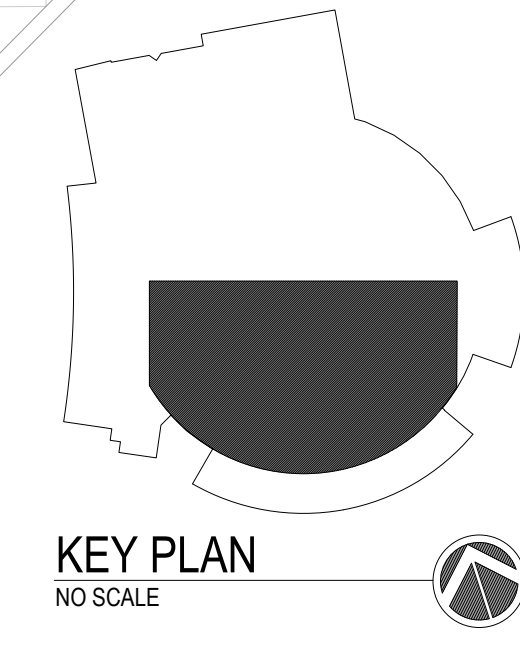
DATE
01/29/2025



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

FIRE ALARM SHEET NOTES:

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



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
1	MSU COMMENT	1/22/25

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

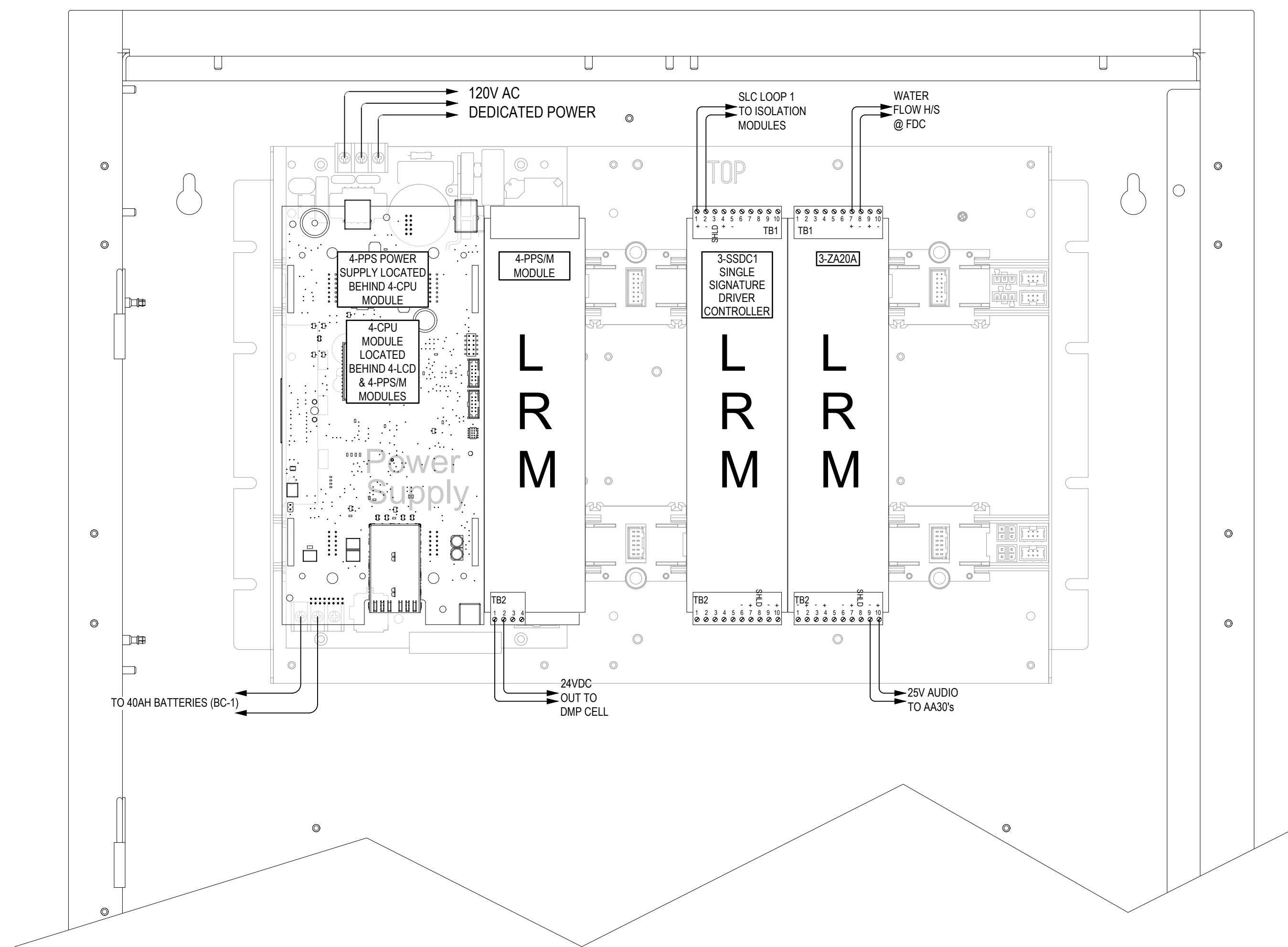
Bryan Moss

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

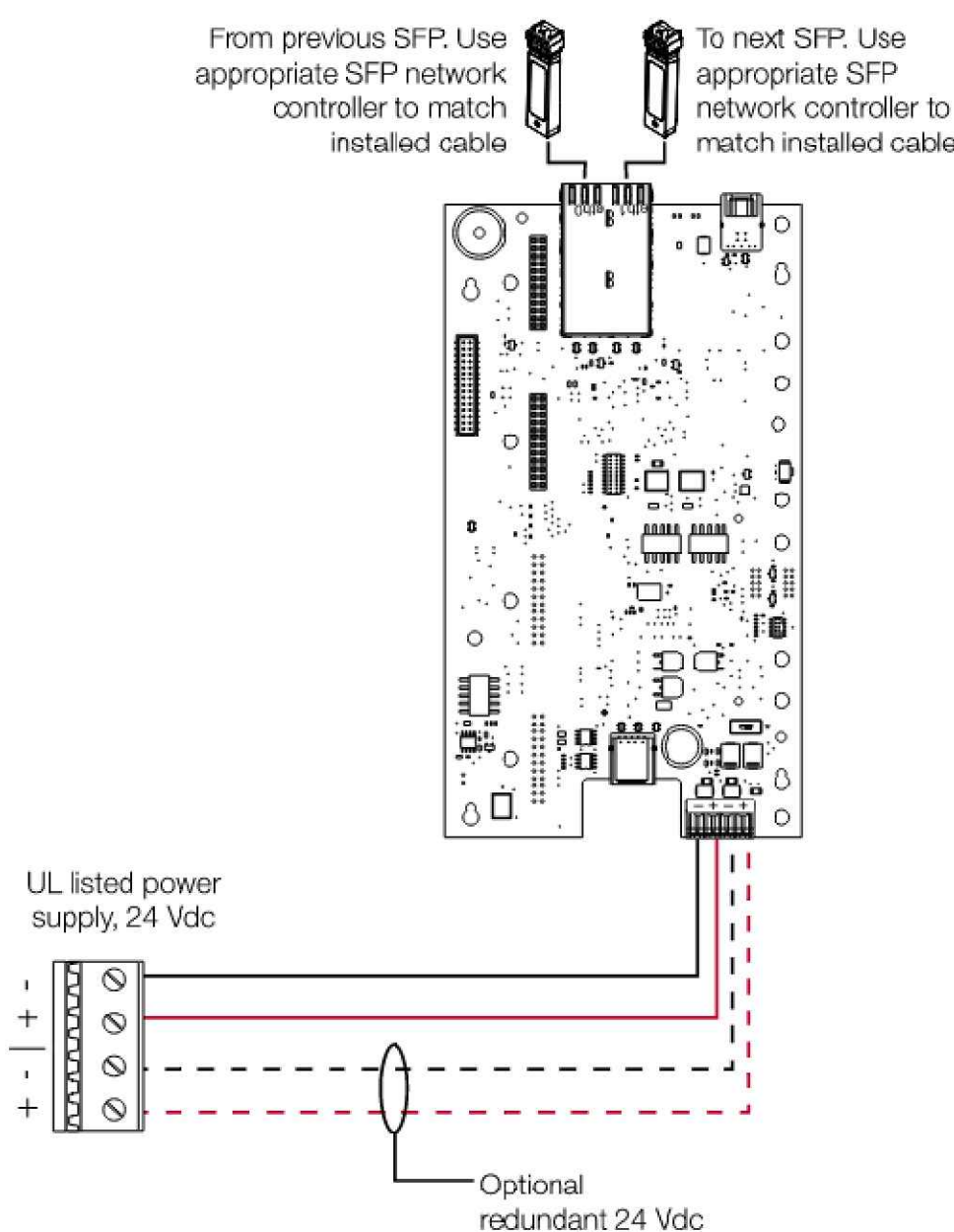
SHEET TITLE
SOUTH CATWALK
DEMO

SHEET
FA2.9

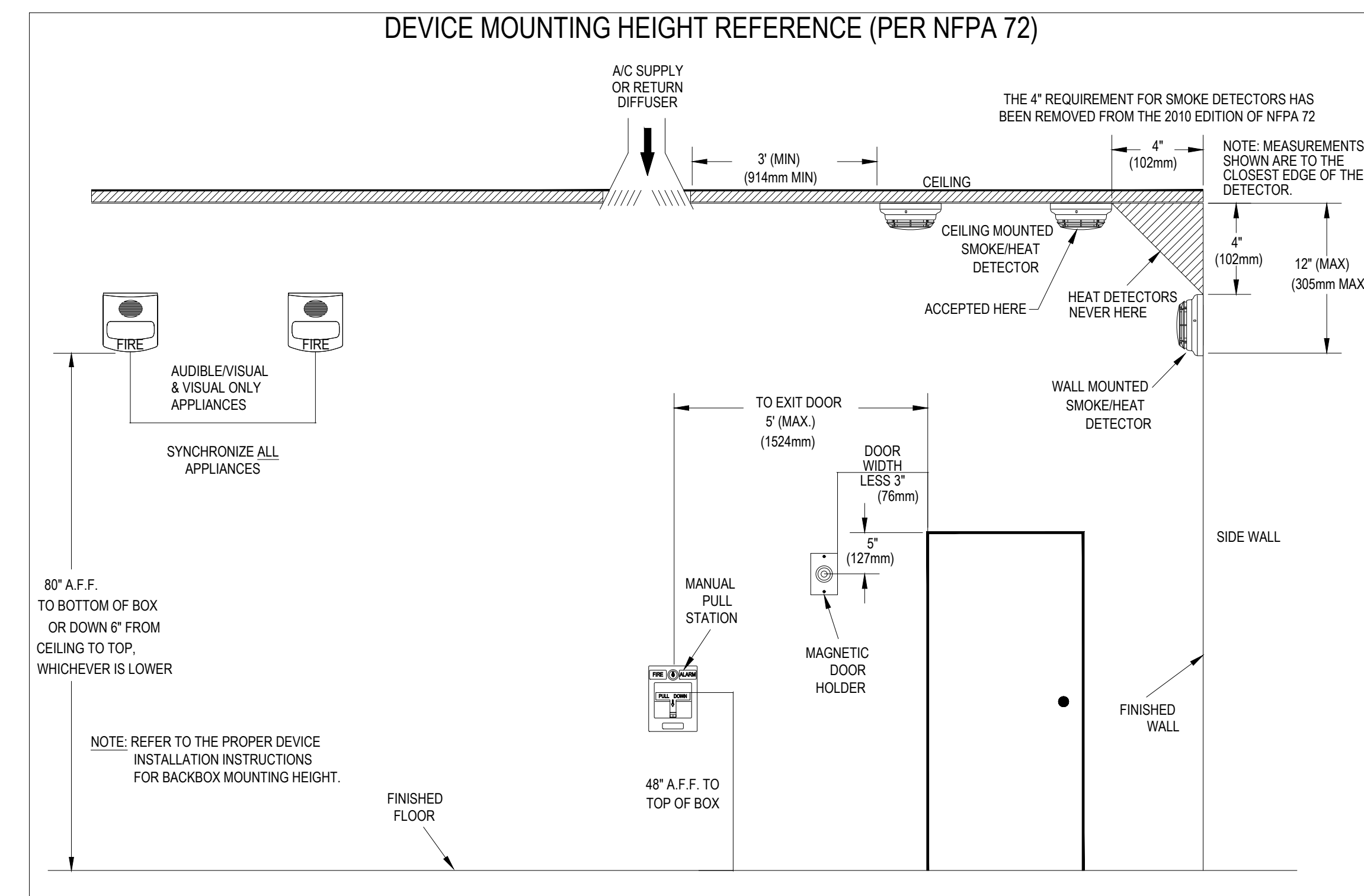
DATE
01/29/2025



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 TPCA-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 100% of broadcast coverage (see section 2.2).

- 1) To mount a single TPCA-10, attach the mounting bracket to the wall bracket (optional accessory or customer supplied) with three 1/2-20 bolts (Figure 4).

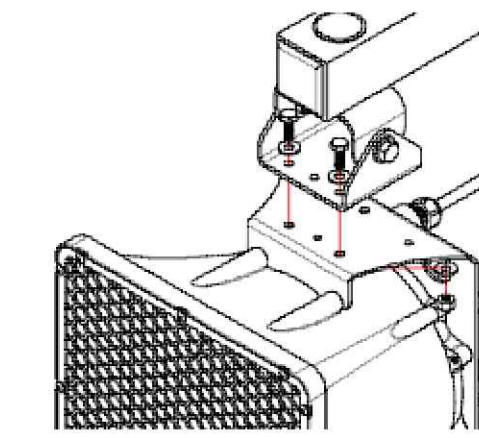


Figure 4: Attaching Wall Mounting Bracket

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

CABLE ROUTING ALL TPCA-10 SYSTEMS UTILIZE AN OUTDOOR RATED SJ/OOW CABLE FOR ELECTRICAL CONNECTIONS. TO CONNECT THE TPCA-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 TPCA-10S ON THE SAME DISTRIBUTED AUDIO LINE).

2 HYPERSPIKE TPCA-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

APEX
FIRE ALARM DESIGN, LLC
bmos@apexfirealarm.com

DRAWN BY: BSM
REVIEWED BY: BSM

REV.	DESCRIPTION	DATE
1	MSU COMMENT	1/22/25

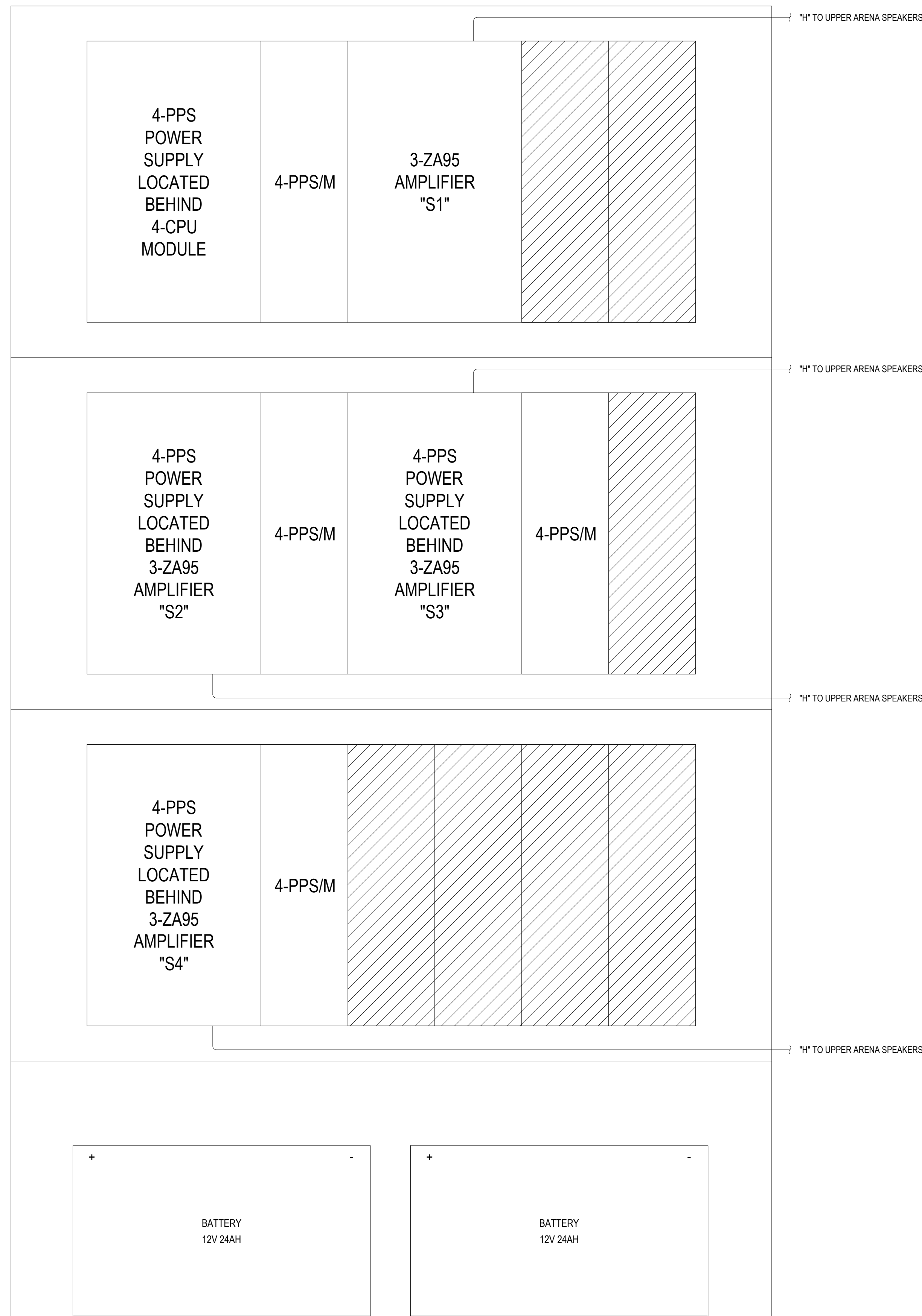
Bryan Moss, SET
Apex Fire Alarm Design
NICET 110772
Fire Alarm Systems, Level IV
State of Montana DLJ
FPL-JEL-000888

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

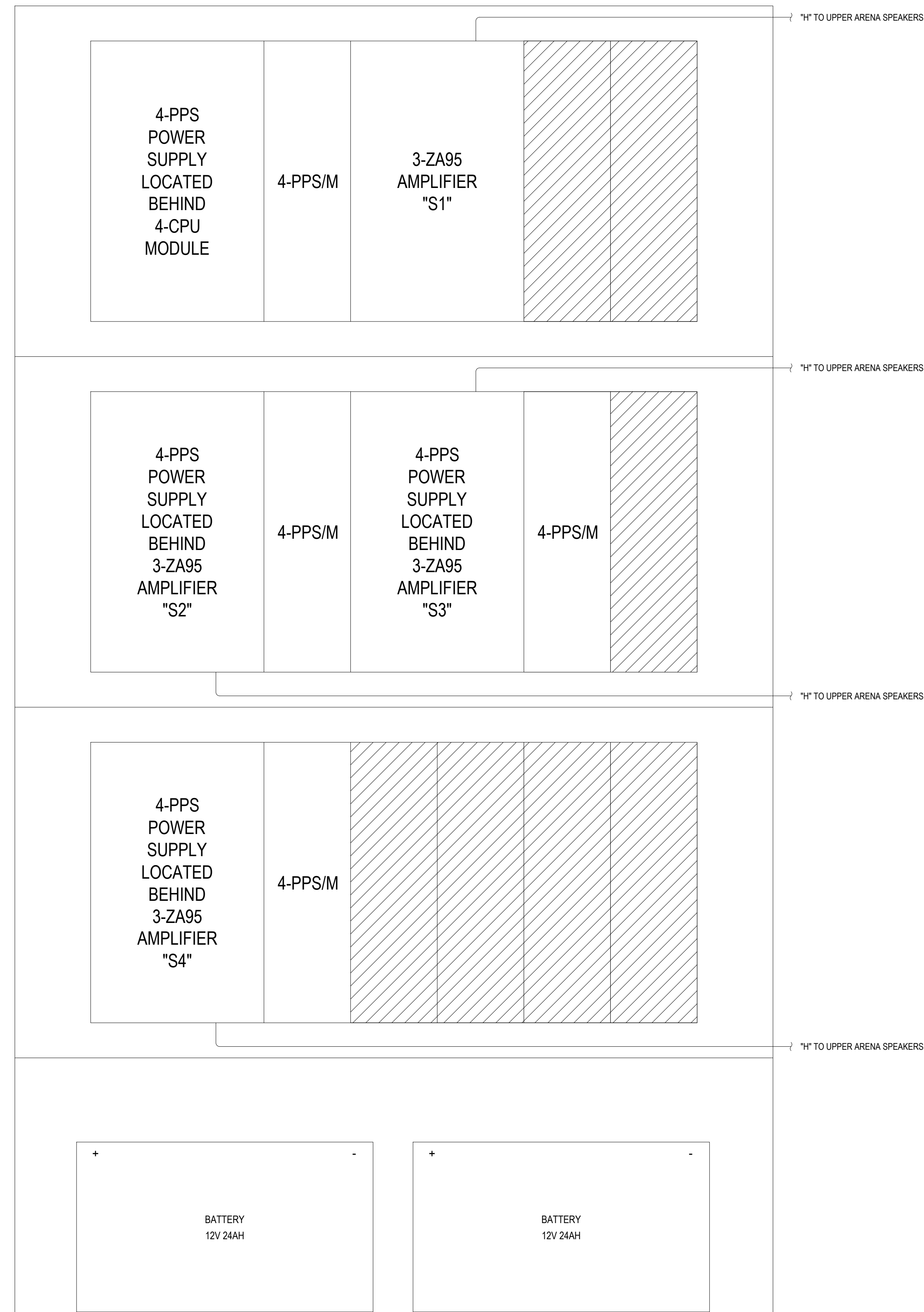
SHEET TITLE
HEADEND FACU
WIRING DETAIL

SHEET
FA5.1

DATE
01/29/2025



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



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



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
1	MSU COMMENT	1/22/25

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

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

SHEET TITLE
HEADEND AMP
WIRING DETAIL

SHEET
FA5.2

DATE
01/29/2025

DRAWN BY: BSM		
REVIEWED BY: BSM		
REV.	DESCRIPTION	DATE
1	MSU COMMENT	1/22/25

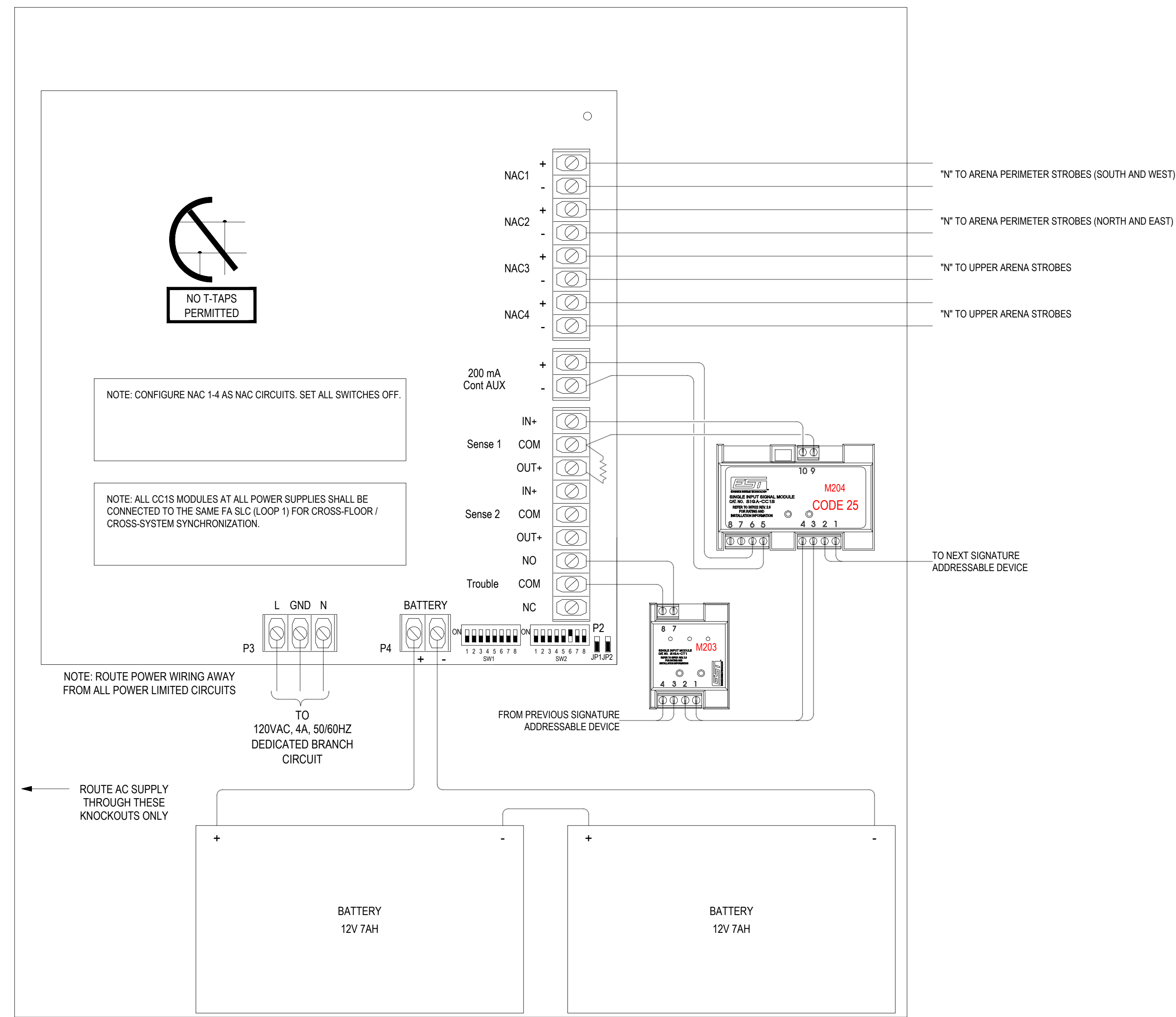
Bryan Moss, SET
Apex Fire Alarm Design
NICET 110772
Fire Alarm Systems, Level IV
State of Montana DL#
FPL-IEL-000888

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

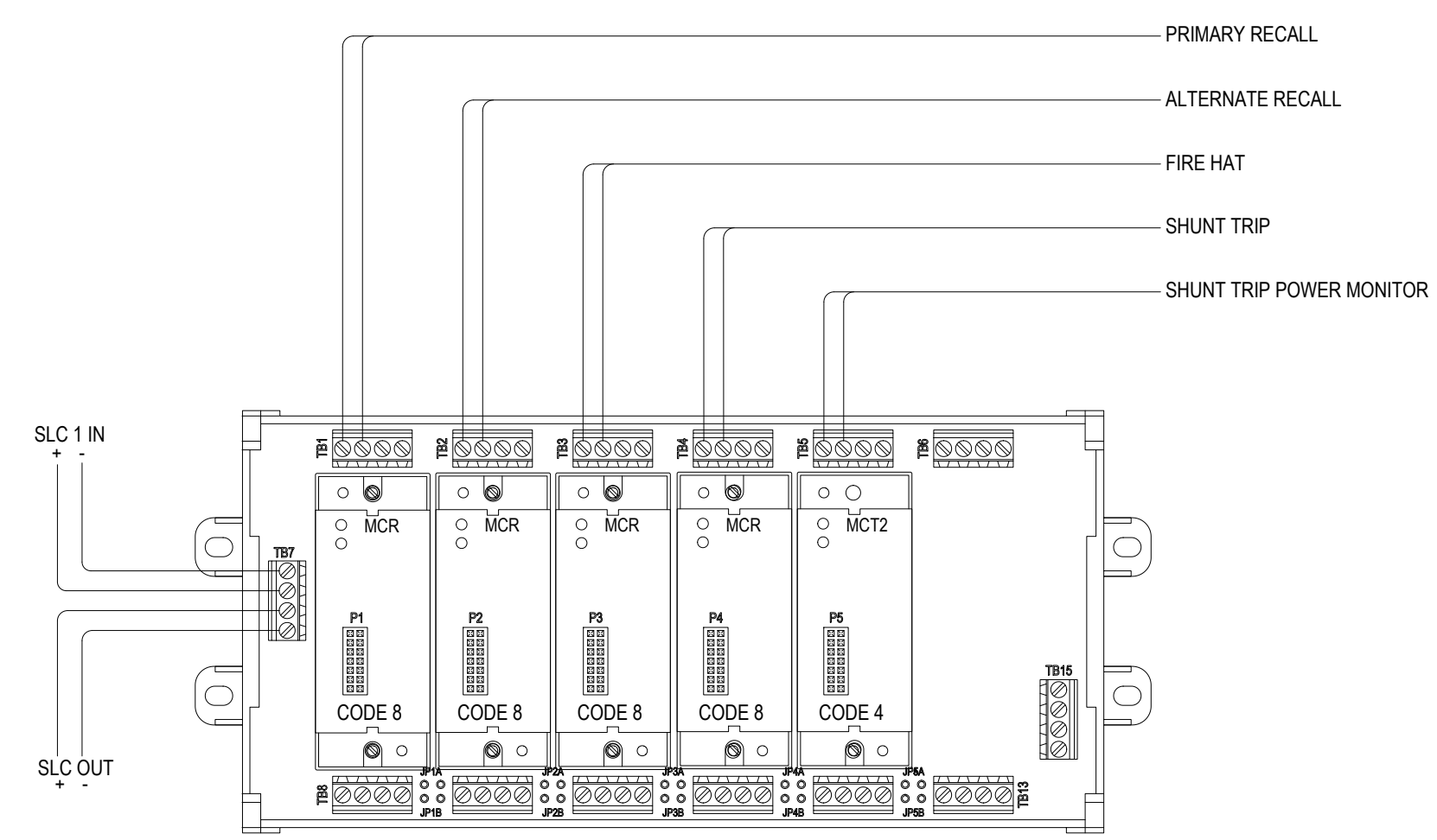
SHEET TITLE
HEADEND NAC
WIRING DETAIL

SHEET
FA5.3

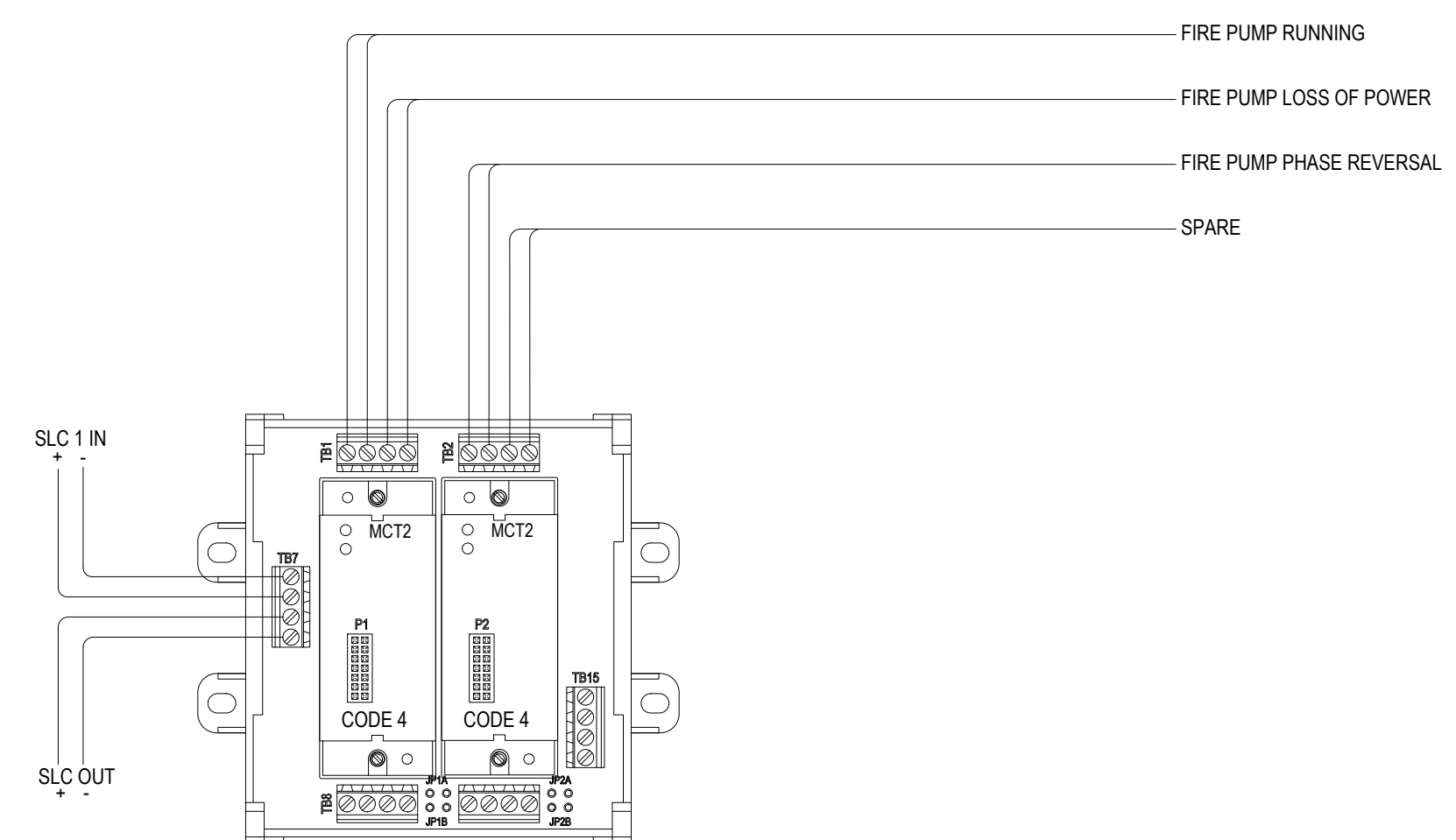
DATE
01/29/2025



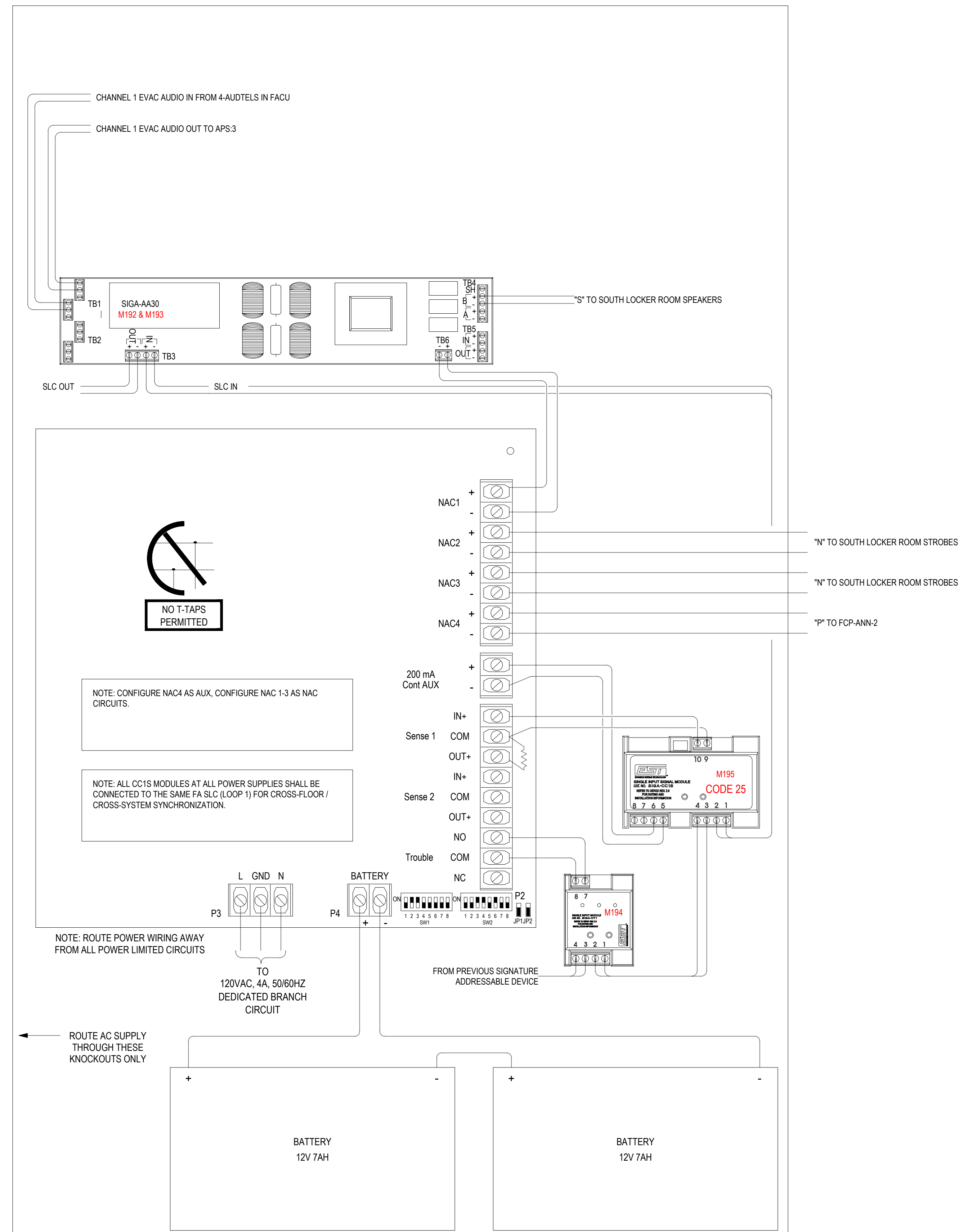
1 BPS:1 WIRING AND DIP SWITCH CONFIGURATION
FA5.3 N.T.S



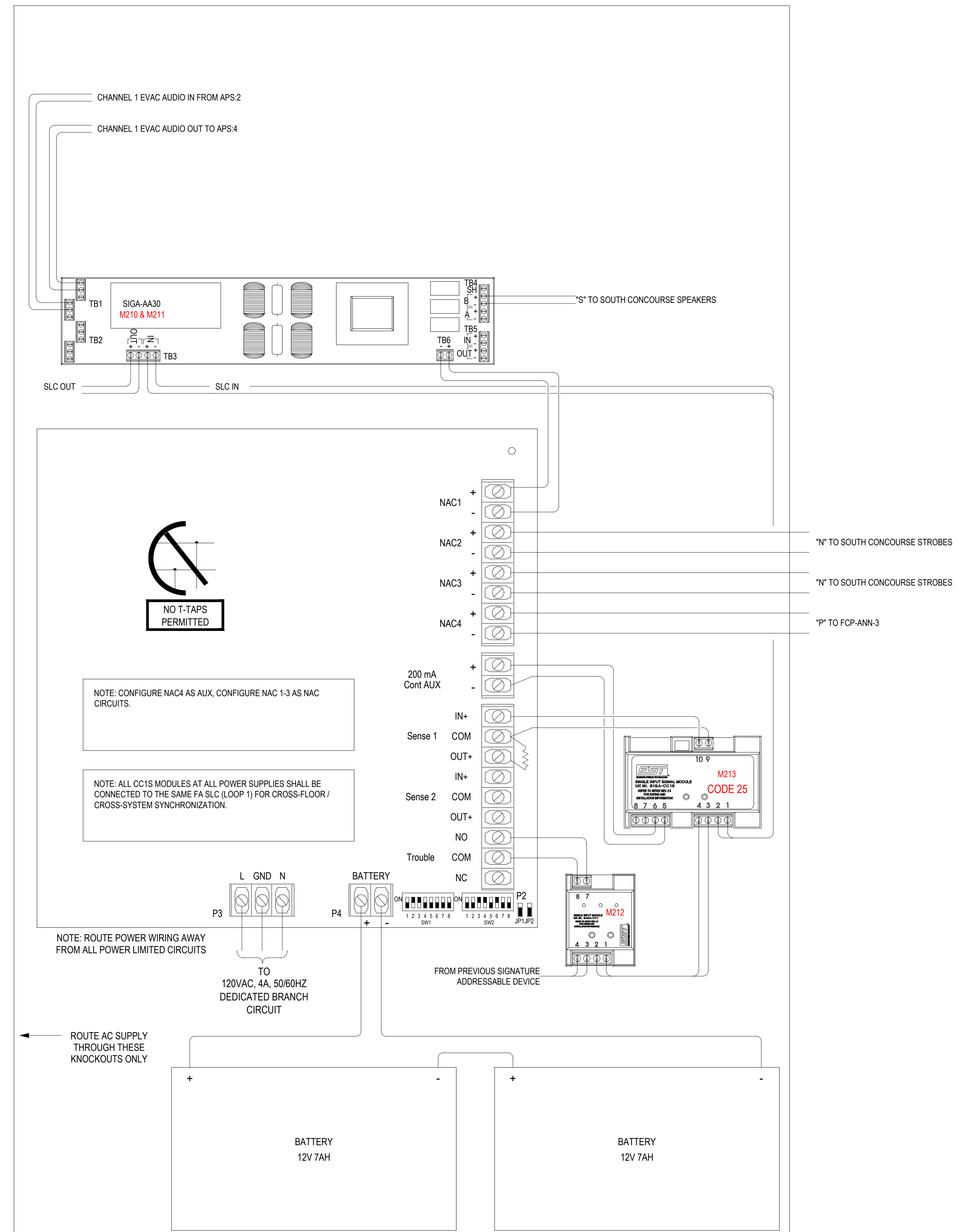
2 MFC-A W/ UIO6R - ELEVATOR CAR CONTROLLER (TYPICAL 3 OCCURRENCES)
FA5.3 N.T.S



3 MFC-A W/ UIO2R - FIRE PUMP CONTROLLER
FA5.3 N.T.S



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



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

100% SHOP DRAWING FOR PERMIT/CONSTRUCTION



DRAWN BY: BSM		
REVIEWED BY: BSM		
REV.	DESCRIPTION	DATE
1	MSU COMMENT	1/23/25

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

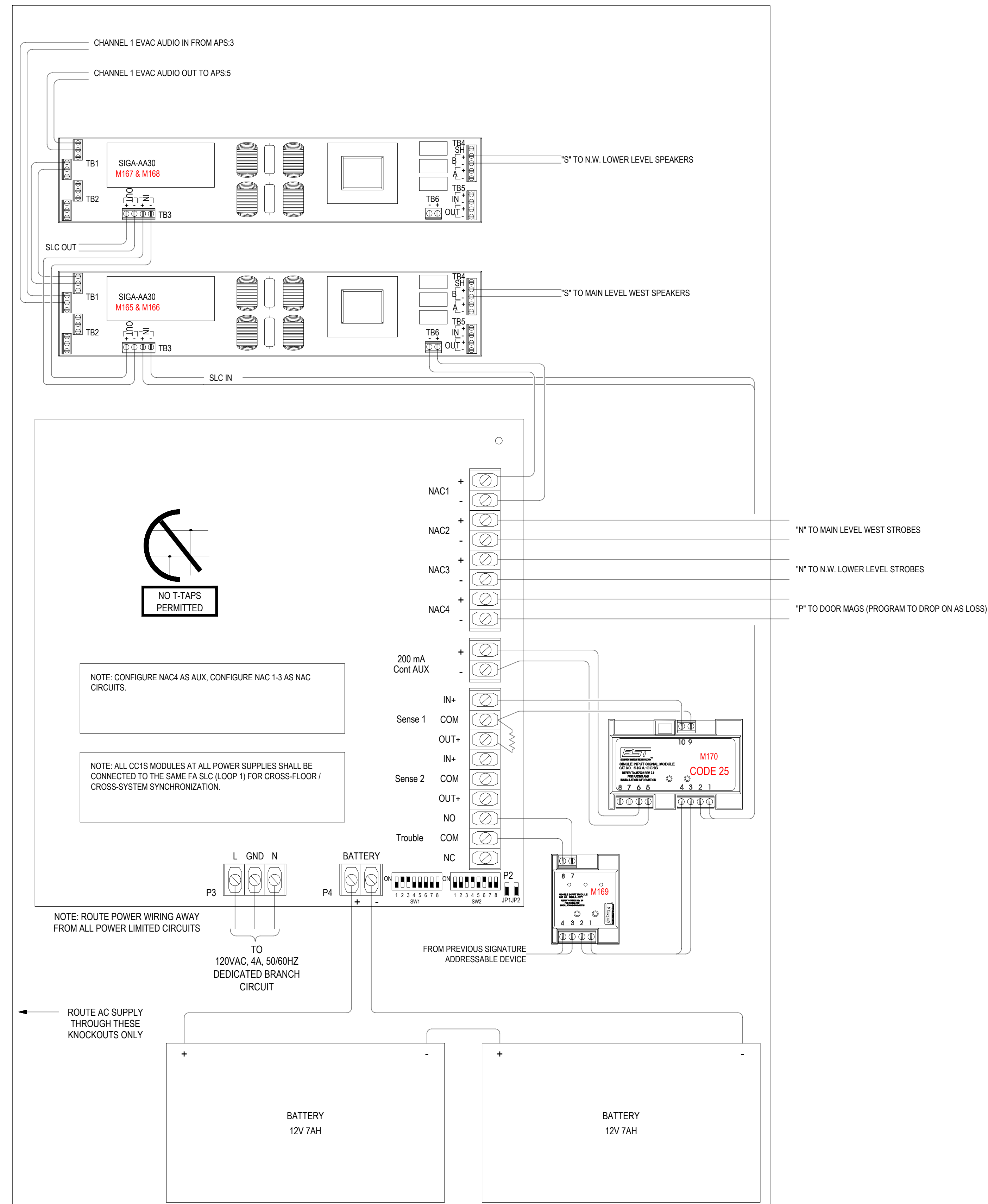
PPA#23-0928

AE# 2024-02-04D

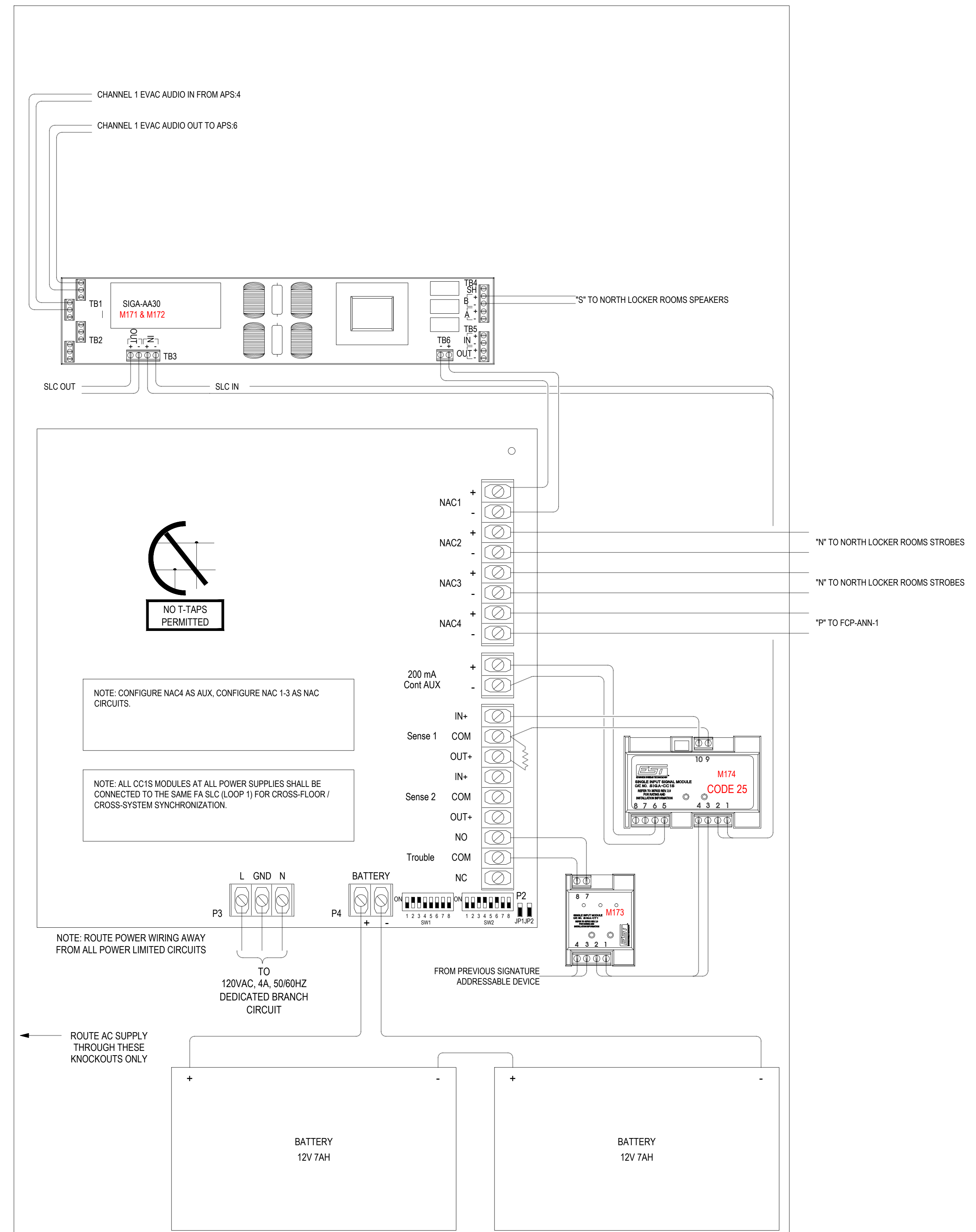
SHEET TITLE
HEADEND NAC
WIRING DETAIL

SHEET
FA5.4

DATE
01/29/2025



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



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
1	MSU COMMENT	1/23/25

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

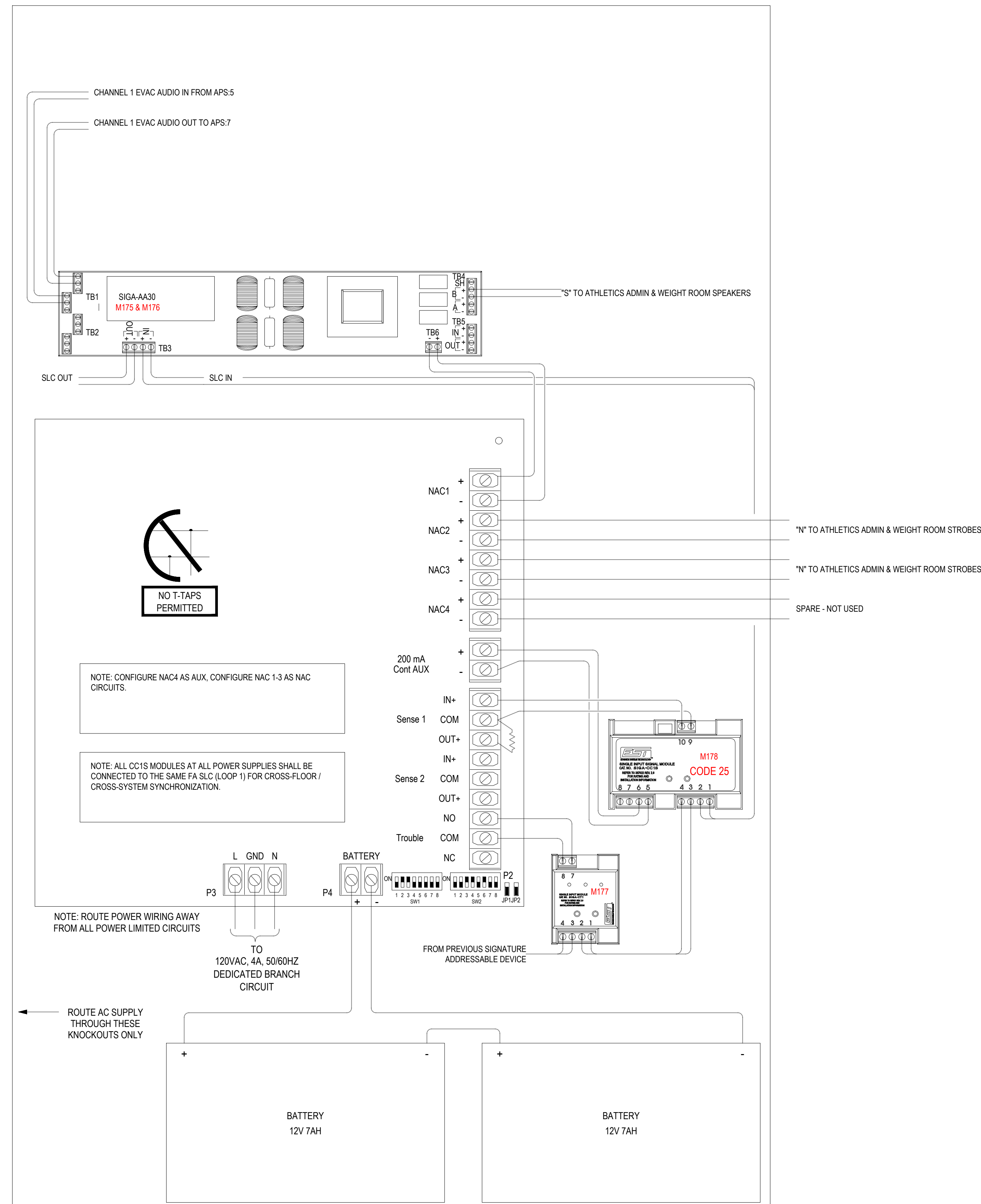
PPA#23-0928

AE# 2024-02-04D

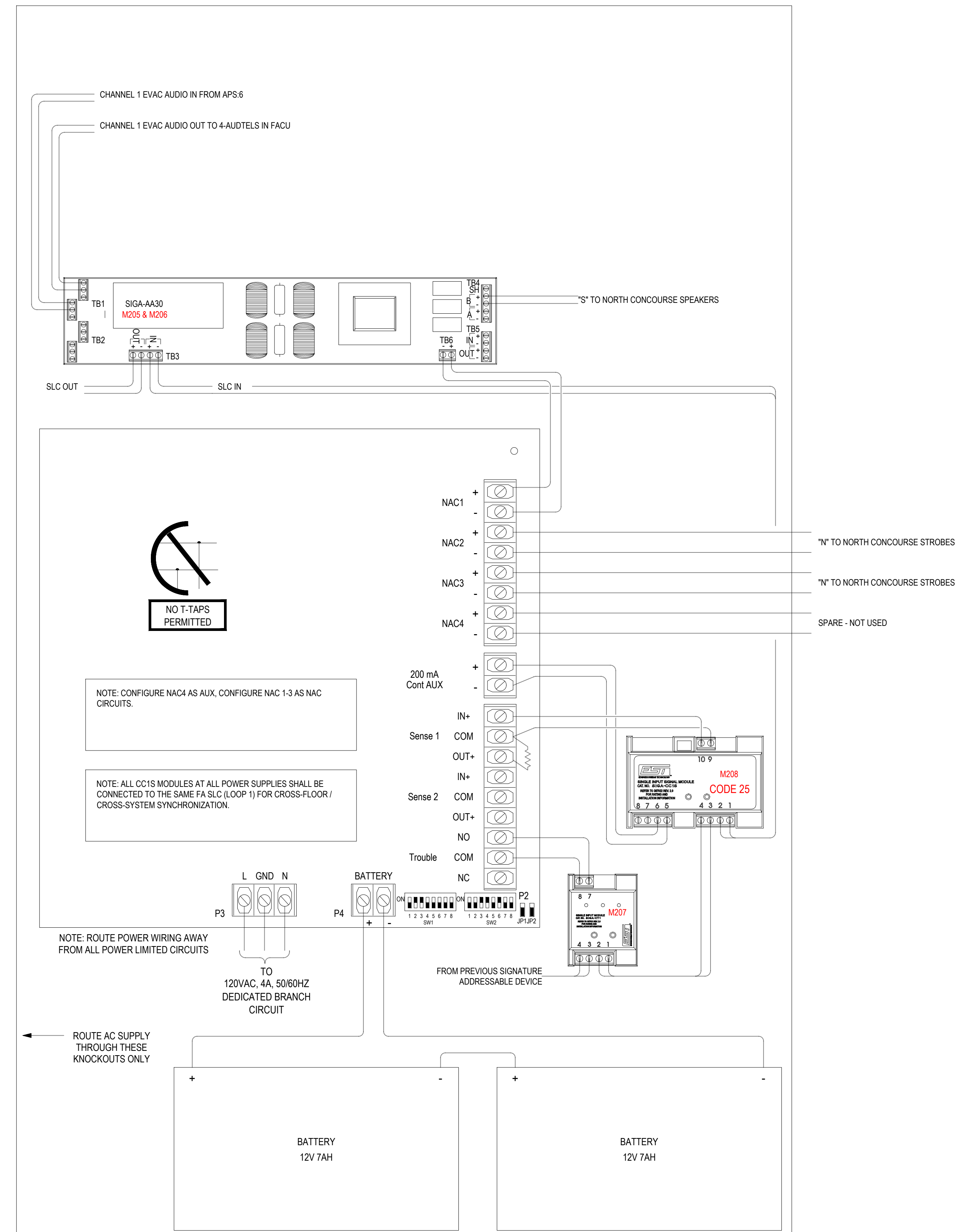
SHEET TITLE
HEADEND NAC
WIRING DETAIL

SHEET
FA5.5

DATE
01/29/2025



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



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
1	MSU COMMENT	1/23/25

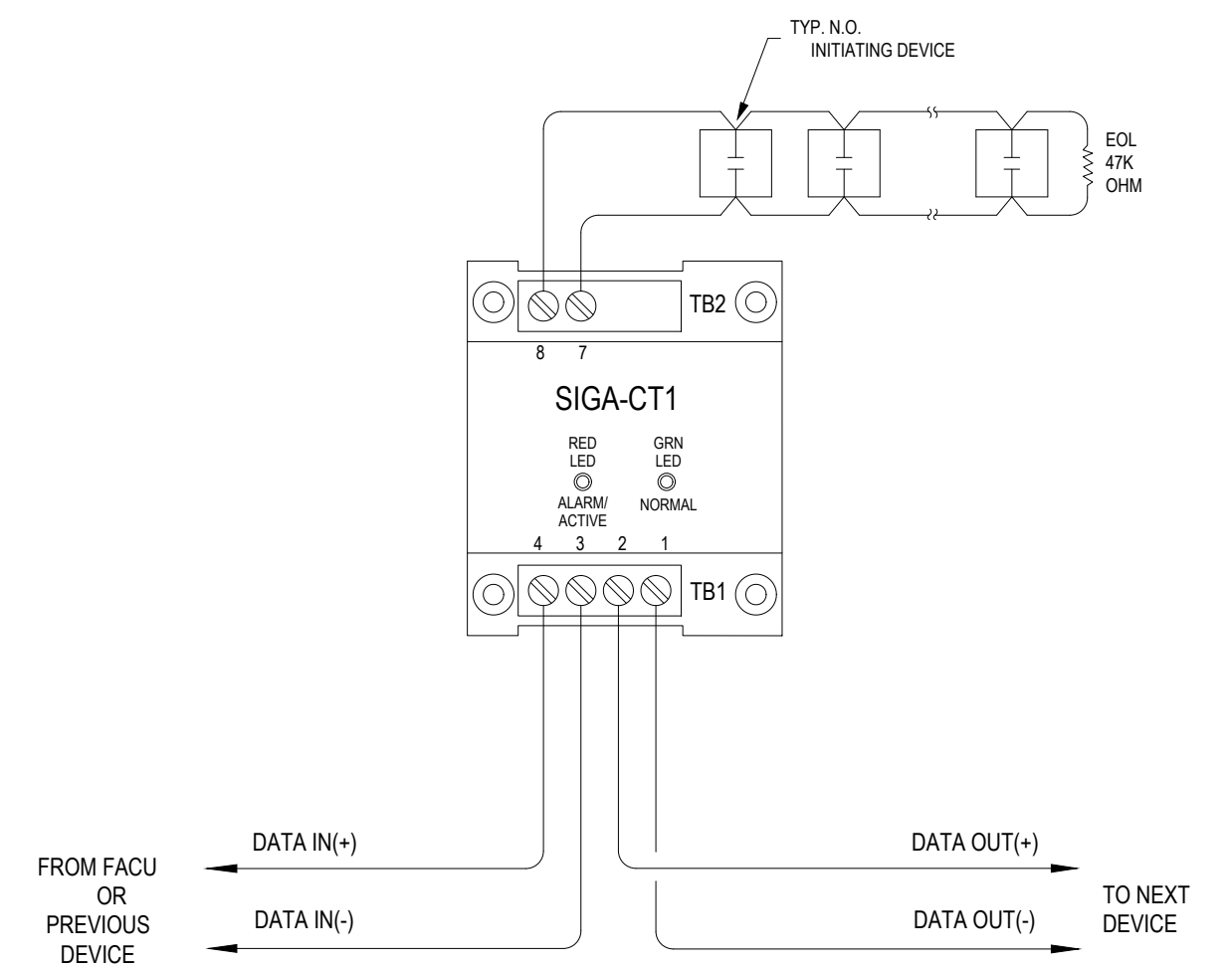
Bryan Moss, SET
Apex Fire Alarm Design
NICET 110772
Fire Alarm Systems, Level IV
State of Montana DLJ
FPL-IEL-000888

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

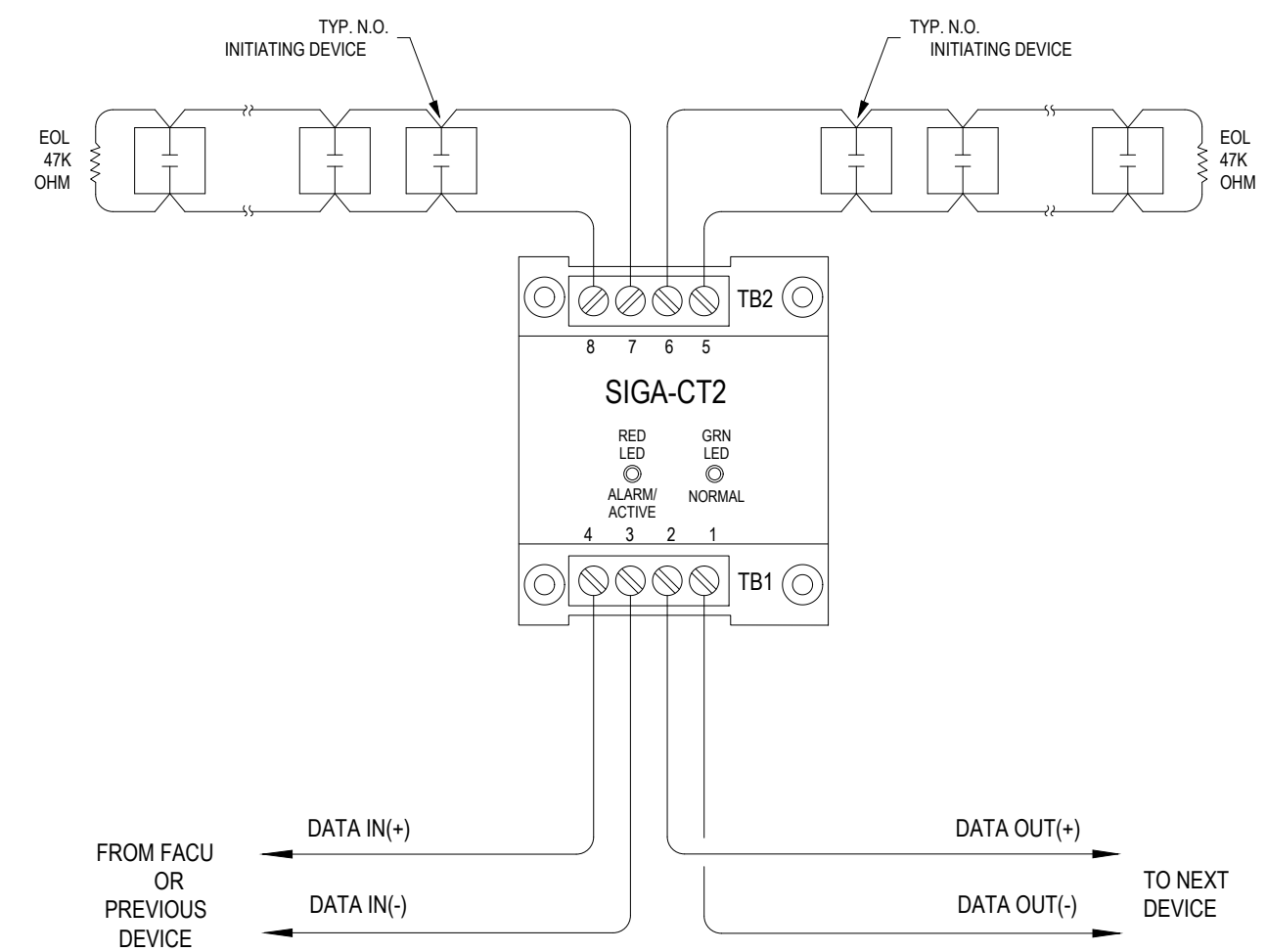
SHEET TITLE
HEADEND NAC
WIRING DETAIL

SHEET
FA5.6

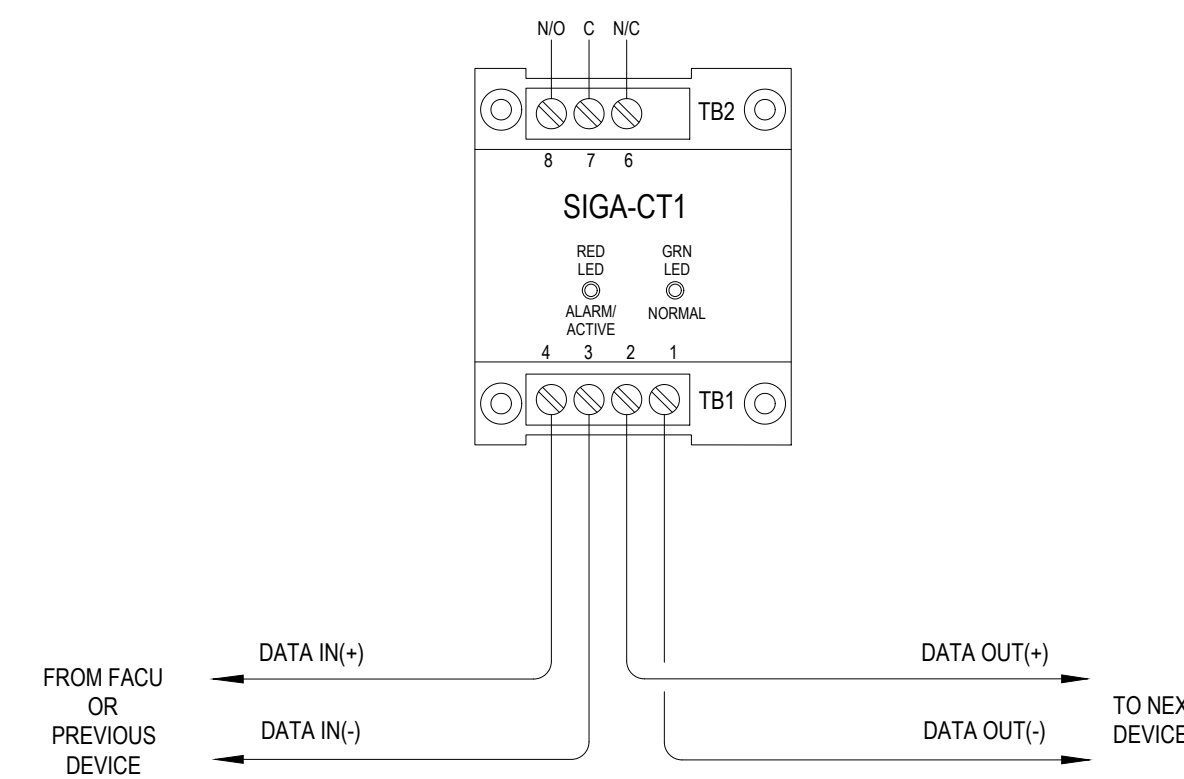
DATE
01/29/2025



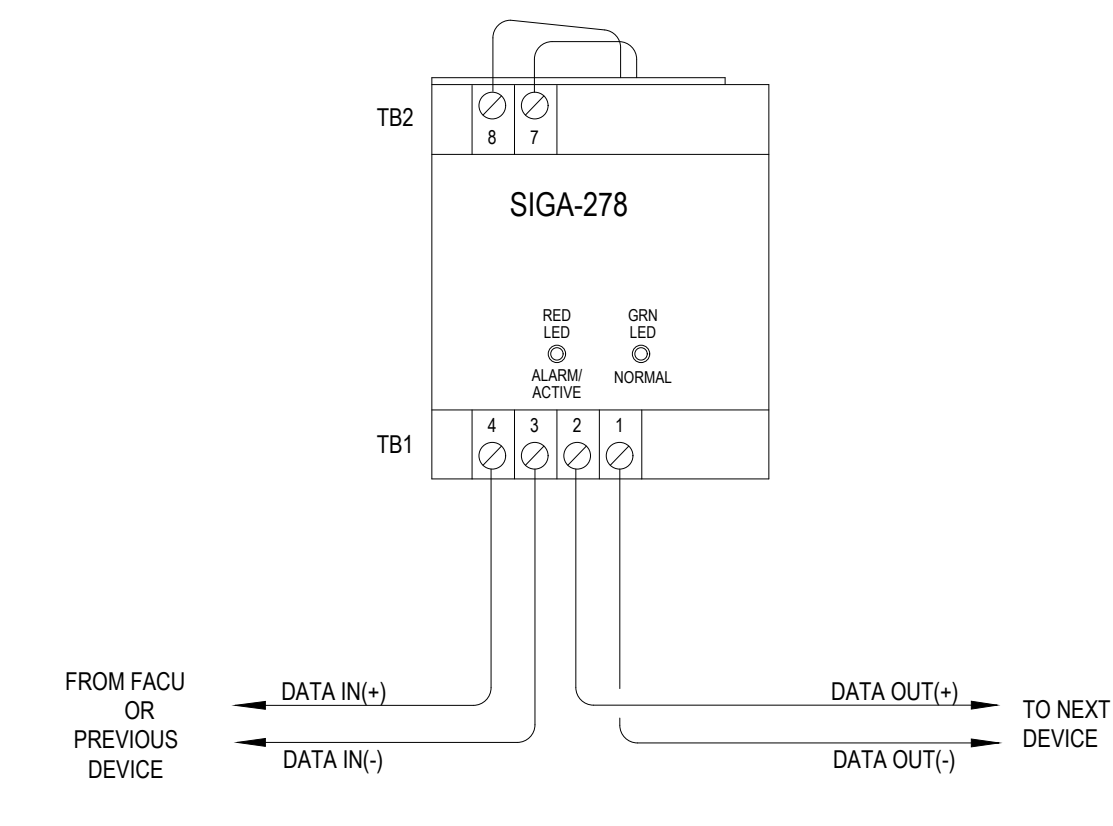
1 SINGLE INPUT MODULE - SIGA-CT1
FA5.3 N.T.S.



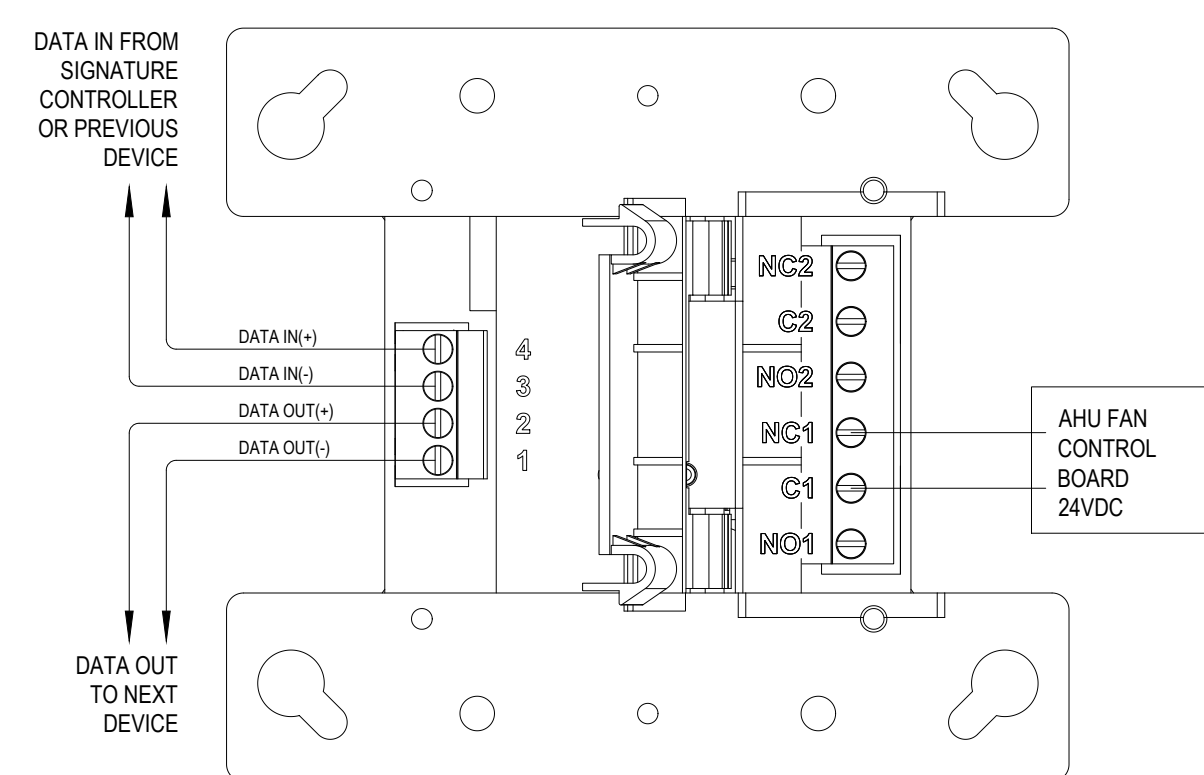
2 DUAL INPUT MODULE - SIGA-CT2
FA5.3 N.T.S.



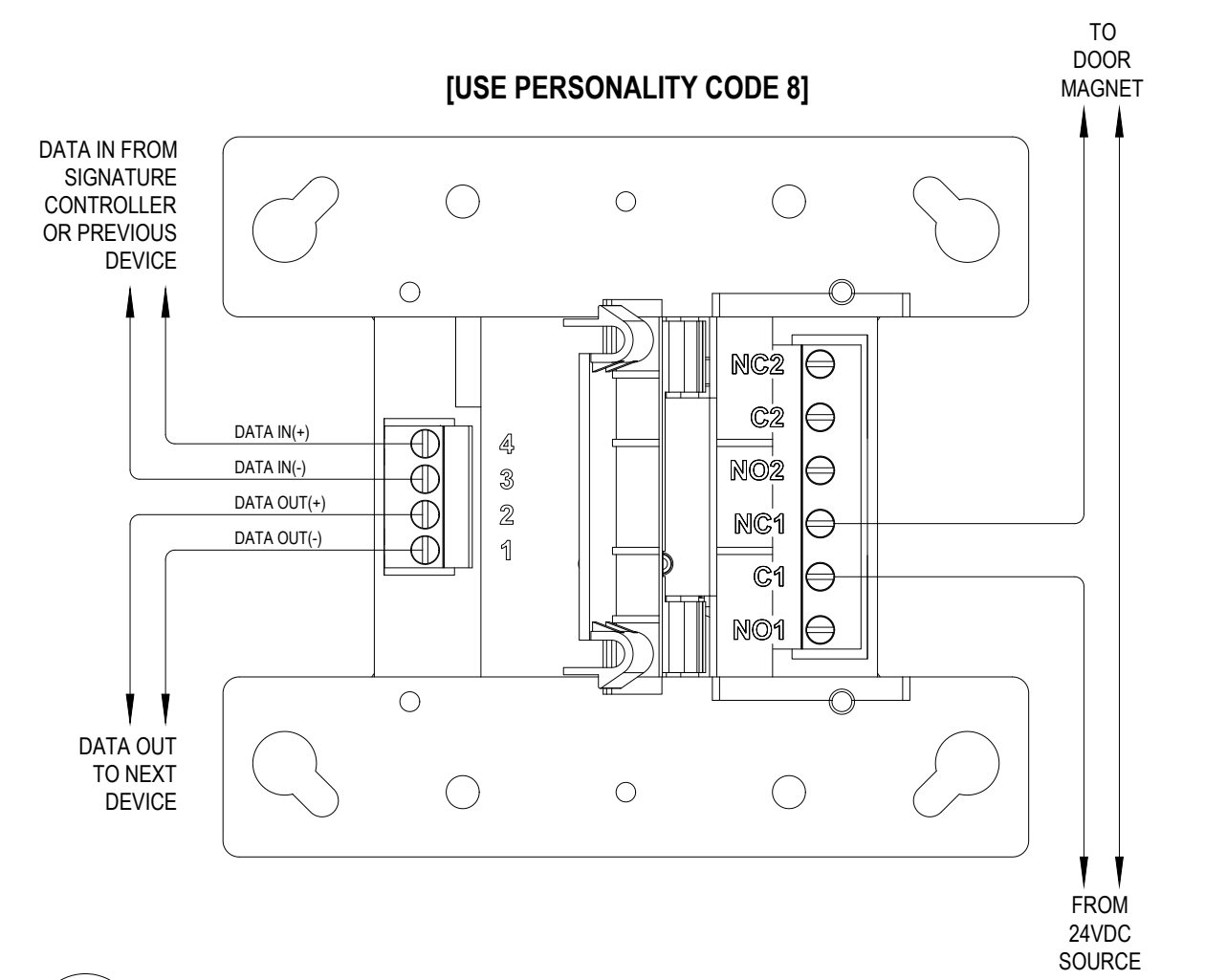
3 RELAY MODULE - SIGA-CR1
FA5.3 N.T.S.



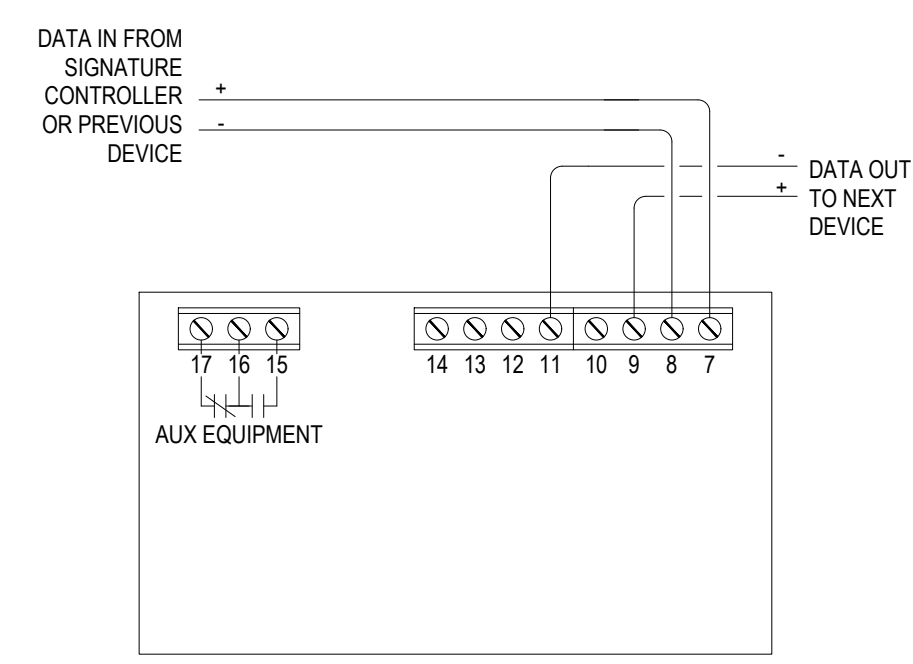
4 MANUAL STATION - SIGA-278
FA5.3 N.T.S.



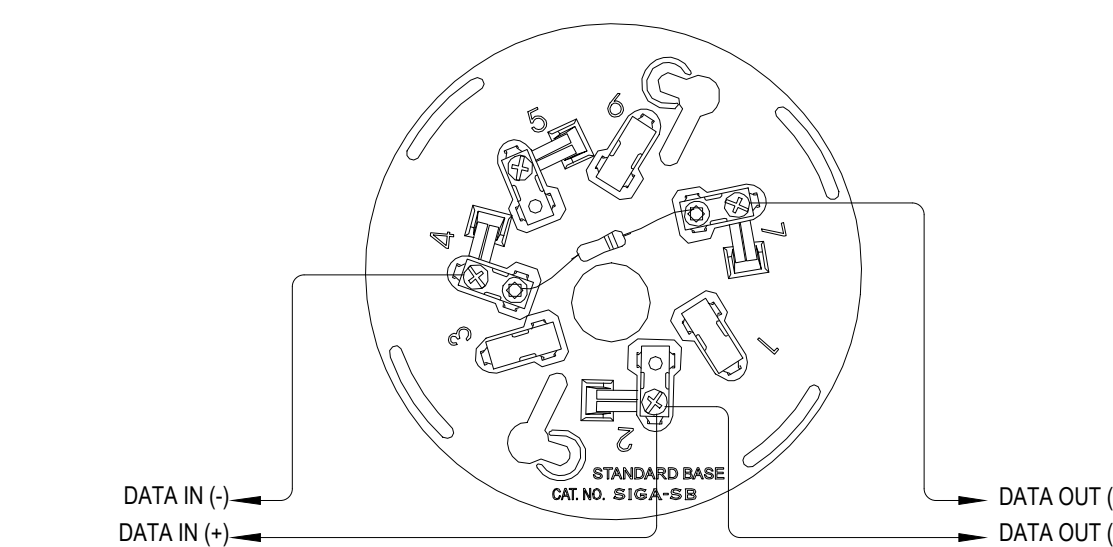
5 RELAY MODULE - SIGA-CRH (FAN / FSD CONTROL)
FA5.3 N.T.S.



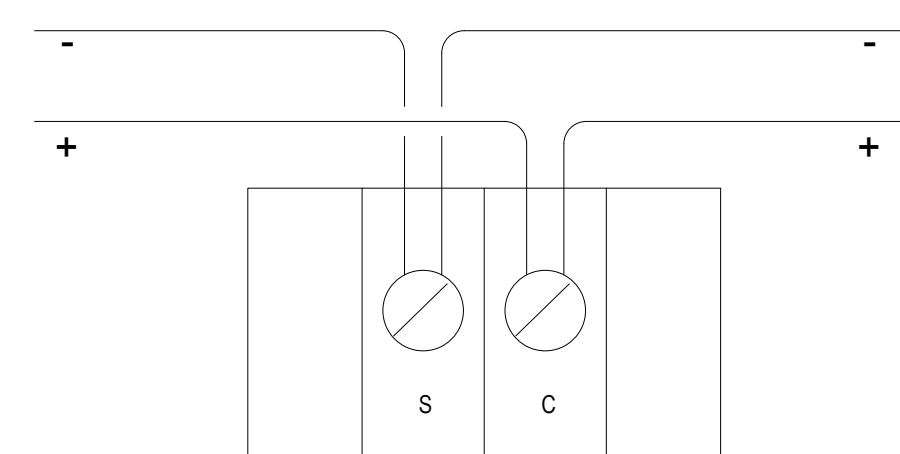
5 RELAY MODULE - SIGA-CRH (DOOR HOLDERS)
FA5.3 N.T.S.



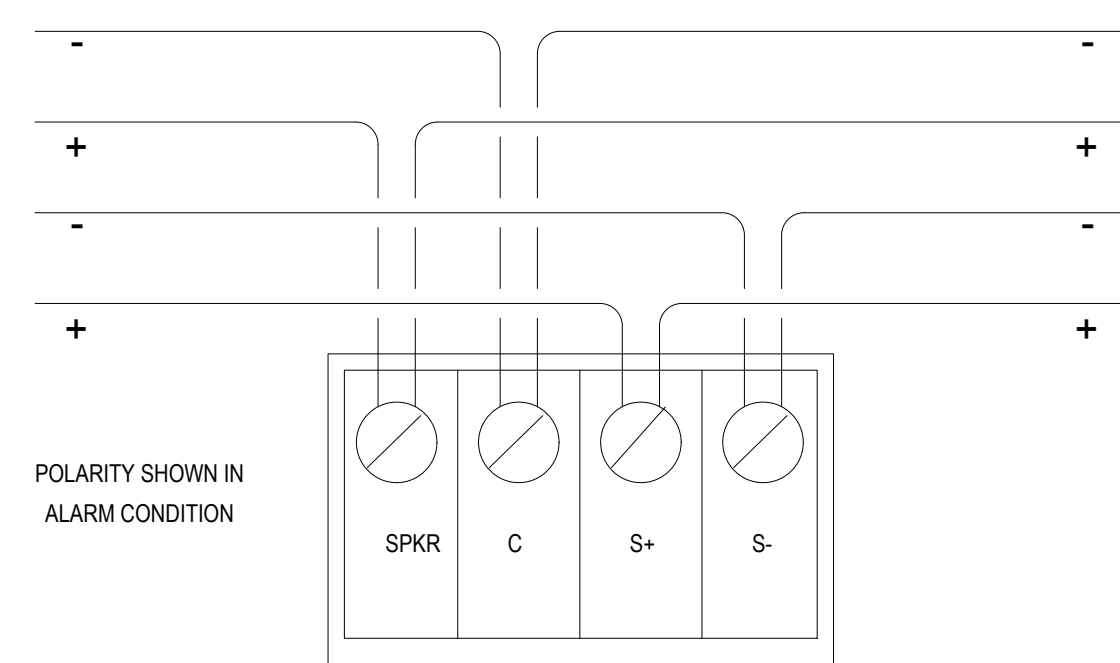
6 DUCT SMOKE DETECTOR EST SIGA-DDOS
FA5.3 N.T.S.



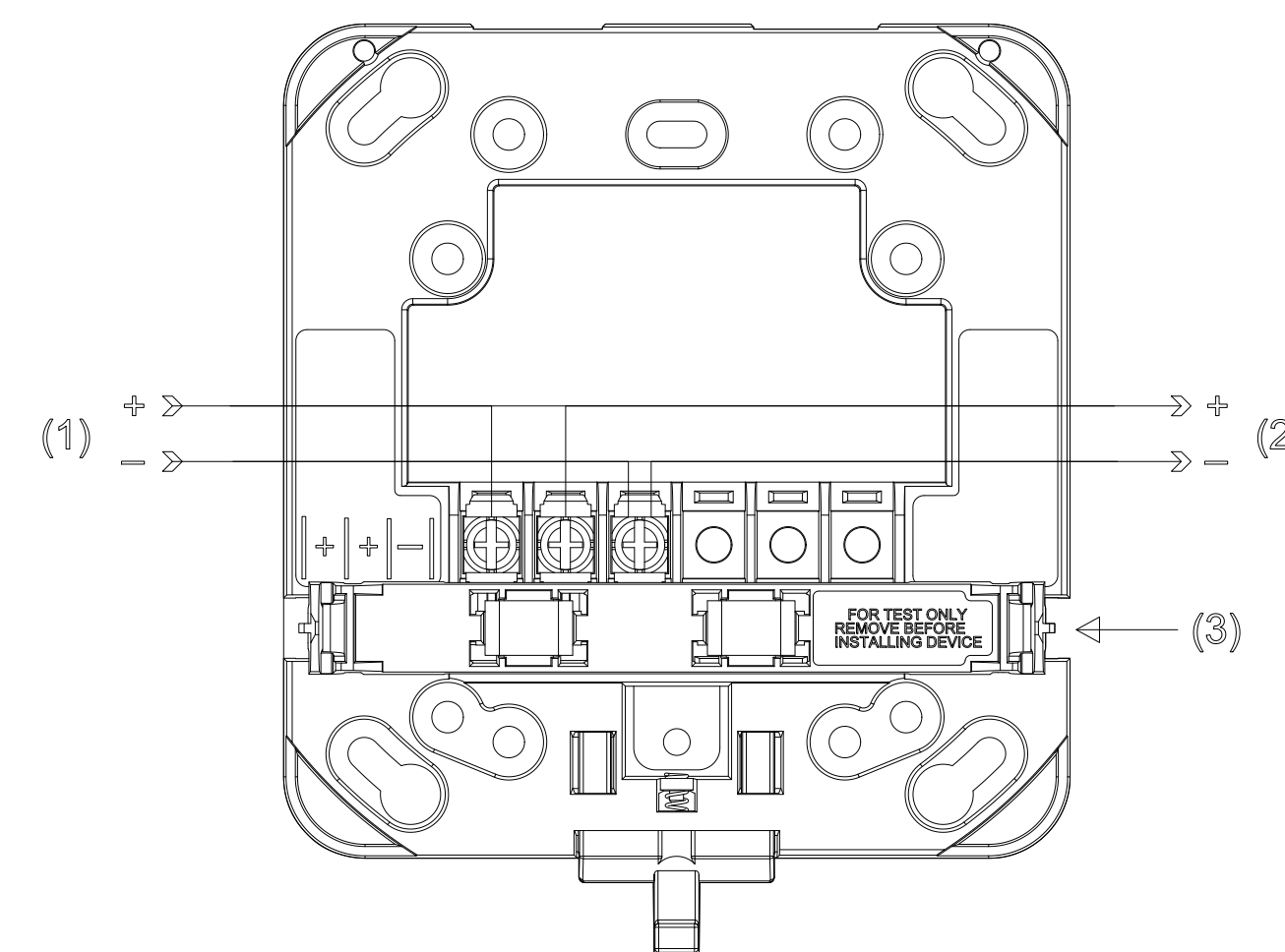
7 SIGA DETECTOR - SIGA-OSD/HFD W/ SIGA-SB/SB4
FA5.3 N.T.S.



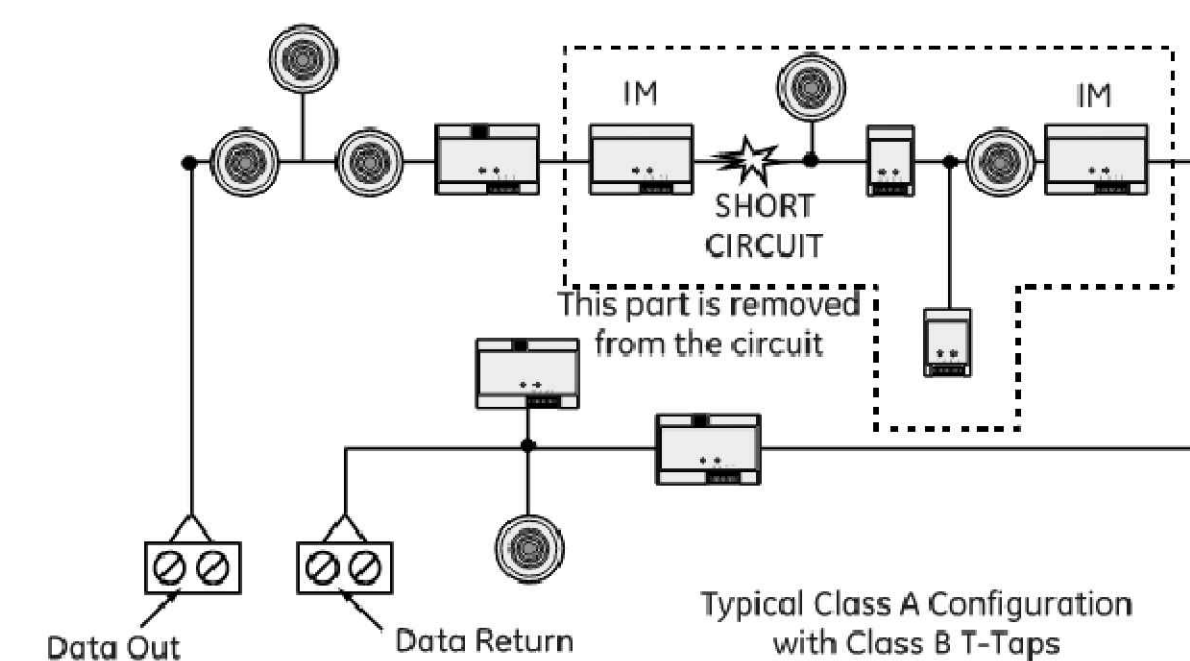
9 SPEAKER ONLY EST G4SWA/GCSWA
FA5.3 N.T.S.



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.

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
1	MSU COMMENT	1/22/25

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

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

SHEET TITLE
DEVICE WIRING
DETAIL

SHEET
FA5.7

DATE
01/29/2025



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

MONTANA STATE UNIVERSITY
BOZEMAN



DRAWN BY: BSM		
REVIEWED BY: BSM		
REV.	DESCRIPTION	DATE
1	MSU COMMENT	1/22/25

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

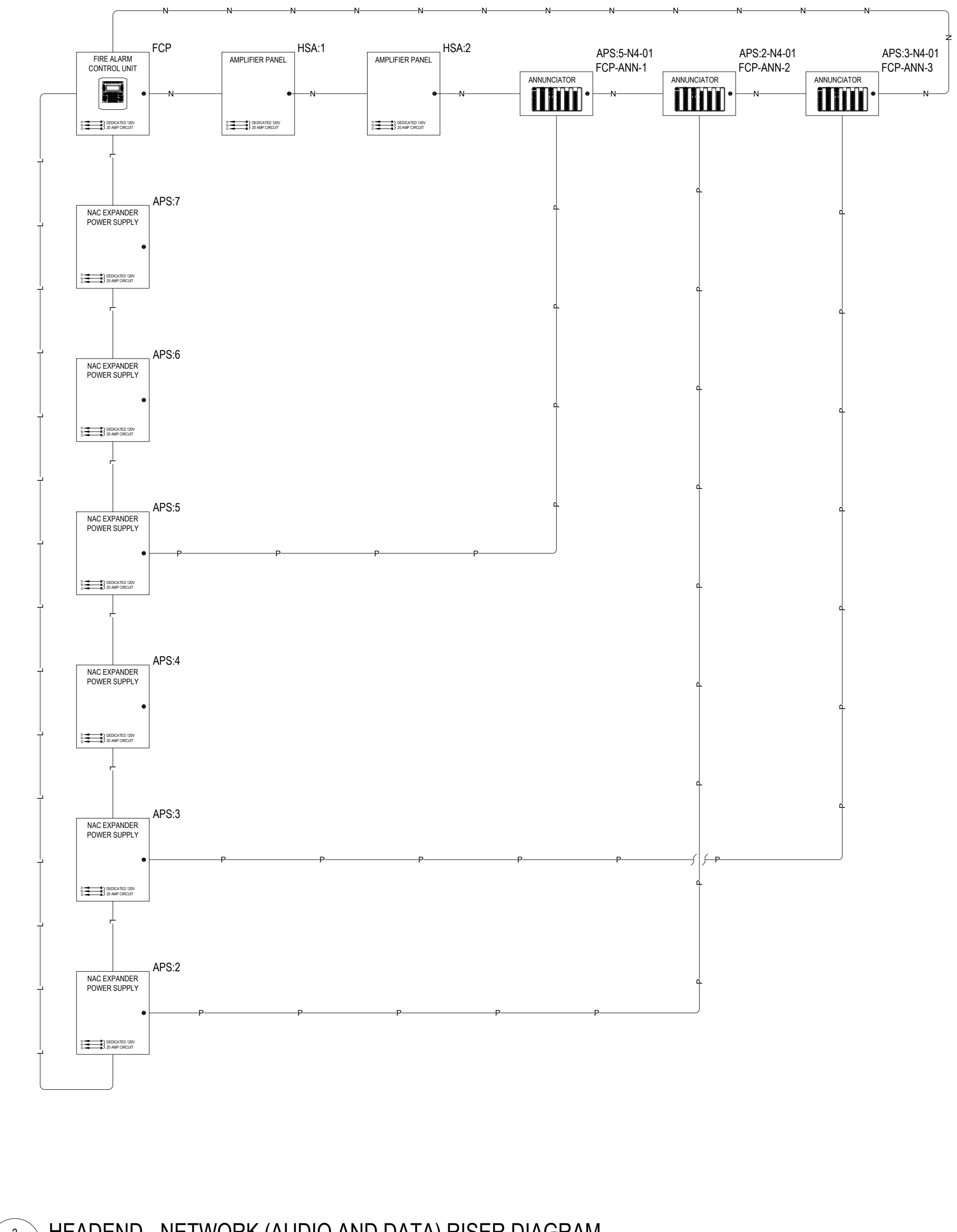
Bryan Moss
PPA#23-0928
AE# 2024-02-04D

SHEET TITLE
DEVICE ADDRESSES
HEADEND RISER

SHEET
FA6.1

DATE
01/29/2025

100% SHOP DRAWING FOR PERMIT/CONSTRUCTION



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

CIRCUIT SETTINGS			TOTALS		
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	D035	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	SIGA-MCT2 (MFC-A)	MECH RM 121 - FIRE PUMP LOSS OF POWER	M184	SIGA-MCT2 (MFC-A)	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	SIGA-MCT2 (MFC-A)	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	SIGA-CT2	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	SIGA-CT2	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	SIGA-CT2	MECH RM 121 - NORTH CONCOURSE & ARENA - FLOW	D042	SIGA-OSD W/SIGA-SB4 BASE	ELEVATOR 3 MAIN LOBBY SMOKE DETECTOR
M138	SIGA-CT2	MECH RM 121 - SOUTH CONCOURSE & ARENA - TAMPER	D043	SIGA-IM2	ISOLATOR MODULE
M139	SIGA-CT2	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	SIGA-CT2	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	SIGA-CT2	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	SIGA-CT2	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	SIGA-CT2	MECH RM 121 - PUMP TEST VALVE #2	D048	SIGA-OSD W/SIGA-SB4 BASE	VESTIBULE 178 SMOKE DETECTOR
M148	SIGA-CT2	MECH RM 121 - PUMP ISOLATION OS&Y #2	D049	SIGA-DDOS	SHOWER 108C DUCT DETECTOR
M149	SIGA-CT2	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	APSGA W/SIGA-AA30	TAPING ISSUE BOXES 114 - APS.2 AA30
M151	SIGA-CT2	MECH RM 121 - PUMP ISOLATION OS&Y #1	M193	SIGA-CT1	TAPING ISSUE BOXES 114 - APS.2 TROUBLE MONITOR
M152	SIGA-CT2	MECH RM 121 - PUMP TEST VALVE #1	M195	SIGA-CC1S	TAPING ISSUE BOXES 114 - APS.2 SENSE 1 NAC TRIGGER
M153	SIGA-CT2	MECH RM 121 - BACK FLOW OS&Y #1	D050	SIGA-OSD W/SIGA-SB4 BASE	TAPING ISSUE BOXES APS.2 SMOKE DETECTOR
M154	SIGA-CT2	MECH RM 121 - BACK FLOW OS&Y #2	D051	SIGA-OSD W/SIGA-SB4 BASE	ELEVATOR 2 LOWER LOBBY SMOKE DETECTOR
D005	SIGA-IM2	ISOLATOR MODULE	M196	SIGA-MCR (MFC-A)	MECH RM 114H - ELEV 1 PHASE 1 DESIGNATED LEVEL RECALL
D006	SIGA-DDOS	VISITING TEAM 123 - DUCT SMOKE DETECTOR	M197	SIGA-MCR (MFC-A)	MECH RM 114H - ELEV 1 PHASE 1 ALTERNATE LEVEL RECALL
D007	SIGA-OSD W/SIGA-SB4 BASE	REHABILITATION 138A S.E. SMOKE DETECTOR	M198	SIGA-MCR (MFC-A)	MECH RM 114H - ELEV 1 POWER SHUTDOWN
D008	SIGA-OSD W/SIGA-SB4 BASE	WEIGHT ROOM 138 S.E. SMOKE DETECTOR	M199	SIGA-MCR (MFC-A)	MECH RM 114H - ELEV 1 FIRE HAT (FUTURE USE)
M155	SIGA-CRH	WEIGHT ROOM / REHAB S.E. ROLL DOWN DOOR	M200	SIGA-MCT2 (MFC-A)	MECH RM 114H - ELEV 1 SHUNT CONTROL POWER MONITOR
D009	SIGA-OSD W/SIGA-SB4 BASE	WEIGHT ROOM 138 S.W. SMOKE DETECTOR	M201	SIGA-MCT2 (MFC-A)	SPARE (OTHER HALF OF MCT2)
D010	SIGA-OSD W/SIGA-SB4 BASE	REHABILITATION 138A S.W. SMOKE DETECTOR	D052	SIGA-HRD W/SIGA-SB4 BASE	ELEVATOR 2 - BOTTOM OF SHAFT HEAT DETECTOR
D011	SIGA-OSD W/SIGA-SB4 BASE	DATA 138D SMOKE DETECTOR	D053	SIGA-OSHD W/SIGA-SB4 BASE	MECH RM 114H MULTISENSOR SMOKE AND HEAT DETECTOR
M156	SIGA-CRH	DATA 138D GLASS ROLL DOWN DOOR	M202	SIGA-CRH	LAUNDRY 114I FSD CONTROL
D012	SIGA-OSD W/SIGA-SB4 BASE	WEIGHT ROOM / DATA GLASS 138 SMOKE DETECTOR	D054	SIGA-DDOS	STORAGE OFFICE 119 DUCT SMOKE DETECTOR
M157	SIGA-CRH	WEIGHT ROOM / REHAB S.W. ROLL DOWN DOOR	D055	SIGA-IM2	ISOLATOR MODULE
D013	SIGA-DDOS	WEIGHT ROOM 138 DUCT SMOKE DETECTOR	D056	SIGA-IM2	ISOLATOR MODULE
M158	SIGA-CR	BBFH / SHROYER GYM DOOR MAG RELAY	M203	SIGA-CT1	STORAGE 120B - BPS.1 TROUBLE MONITOR
D014	SIGA-OSD W/SIGA-SB4 BASE	BBFH / SHROYER GYM NORTH HALL SMOKE DETECTOR	M204	SIGA-CC1S	STORAGE 120B - BPS.1 SENSE 1 NAC TRIGGER
D015	SIGA-OSD W/SIGA-SB4 BASE	CORRIDOR 189 NORTH HALL SMOKE DETECTOR	D057	SIGA-IM2	ISOLATOR MODULE
D016	SIGA-OSD W/SIGA-SB4 BASE	CORRIDOR 189 SOUTH HALL SMOKE DETECTOR	D058	SIGA-DDOS	N.E. MECH RM 226 DUCT SMOKE DETECTOR
D017	SIGA-OSD W/SIGA-SB4 BASE	NORTH LOBBY TO SHROYER SMOKE DETECTOR	D059	SIGA-OSD W/SIGA-SB4 BASE	N.E. MECH RM 226 - APS.7 SMOKE DETECTOR
M159	SIGA-CR	NORTH LOBBY TO SHROYER DOOR MAG RELAY	M205	APSGA W/SIGA-AA30	N.E. MECH RM 226 - APS.7 AA30
M160	SIGA-CRH	WEIGHT ROOM WEST ENTRY ROLL DOWN DOOR	M206	SIGA-CT1	N.E. MECH RM 226 - APS.7 TROUBLE MONITOR
D018	SIGA-OSD W/SIGA-SB4 BASE	WEIGHT ROOM WEST ENTRY SMOKE DETECTOR	M208	SIGA-CC1S	N.E. MECH RM 226 - APS.7 SENSE 1 NAC TRIGGER
D019	SIGA-OSD W/SIGA-SB4 BASE	WEIGHT ROOM WEST ENTRY SMOKE DETECTOR	D060	SIGA-DDOS	N.W. MECH RM 236 DUCT SMOKE DETECTOR
D020	SIGA-OSD W/SIGA-SB4 BASE	NORTH LOBBY / WAITING 140 SMOKE DETECTOR	D061	SIGA-OSD W/SIGA-SB4 BASE	NORTH CONCOURSE ELEVATOR 1 LOBBY 256 SMOKE DETECTOR
M161	SIGA-CRH	NORTH LOBBY / WAITING 140 GLASS ROLL DOWN DOOR	D062	SIGA-OSHD W/SIGA-SB4 BASE	ELEV 1 TOP OF SHAFT MULTISENSOR SMOKE AND HEAT DETECTOR
M162	SIGA-CRH	TICKET WINDOW GLASS ROLL DOWN DOOR	D063	SIGA-OSD W/SIGA-SB4 BASE	MEDIA BOOTH 357 SMOKE DETECTOR
D021	SIGA-OSD W/SIGA-SB4 BASE	VESTIBULE 190 SMOKE DETECTOR	D064	SIGA-CRH	MEDIA BOOTH 355 & 356 - ARENA PA & SOUND SYSTEM SHUTDOWN
D022	SIGA-OSD W/SIGA-SB4 BASE	TICKET SALES 142 SMOKE DETECTOR	M209	SIGA-OSD W/SIGA-SB4 BASE	MEDIA BOOTH 355 & 356 SMOKE DETECTOR
D023	SIGA-OSD W/SIGA-SB4 BASE	WAITING 140 SMOKE DETECTOR	D065	SIGA-OSD W/SIGA-SB4 BASE	MEDIA BOOTH 354 SMOKE DETECTOR
D024	SIGA-OSD W/SIGA-SB4 BASE	RECEPTION 141 @ BREAK RM 143 SMOKE DETECTOR	D066	SIGA-DDOS	S.E. MECH RM 225 DUCT SMOKE DETECTOR
D025	SIGA-DDOS	SUPPLY ROOM 143A DUCT SMOKE DETECTOR	D067	SIGA-DDOS	S.W. MECH RM 201 DUCT SMOKE DETECTOR
D026	SIGA-OSD W/SIGA-SB4 BASE	OPEN OFFICE 145 @ OFFICE 144 SMOKE DETECTOR	D068	SIGA-OSD W/SIGA-SB4 BASE	S.W. MECH RM 201 - APS.3 SMOKE DETECTOR
D027	SIGA-OSD W/SIGA-SB4 BASE	OPEN OFFICE 145 @ OFFICE 147 & 148 SMOKE DETECTOR	M210	APSGA W/SIGA-AA30	S.W. MECH RM 201 - APS.3 AA30
D028	SIGA-OSD W/SIGA-SB4 BASE	OPEN OFFICE 145 @ OFFICE 149 & 150 SMOKE DETECTOR	M211	SIGA-CT1	S.W. MECH RM 201 - APS.3 TROUBLE MONITOR
D029	SIGA-OSD W/SIGA-SB4 BASE	OPEN OFFICE 160 @ OFFICE 151 & 154 SMOKE DETECTOR	M212	SIGA-CC1S	S.W. MECH RM 201 - APS.3 SENSE 1 NAC TRIGGER
D030	SIGA-OSD W/SIGA-SB4 BASE	OPEN OFFICE 160 @ OFFICE 156 SMOKE DETECTOR	M214	SIGA-CT1	PREP / CATERING 204A - KITCHEN HOOD ALARM
M163	SIGA-CRH	ATHLETIC ADMIN FSD DAMPER CONTROL	D069	SIGA-DDOS	SOUTH CONCOURSE 249 DUCT SMOKE DETECTOR #1
M164	SIGA-CR	ATHLETIC ADMIN DOOR MAG CONTROL	D070	SIGA-DDOS	SOUTH CONCOURSE 249 DUCT SMOKE DETECTOR #2
D031	SIGA-OSD W/SIGA-SB4 BASE	OPEN OFFICE 160 @ OFFICE 157 SMOKE DETECTOR	D071	SIGA-DDOS	SOUTH CONCOURSE 249 DUCT SMOKE DETECTOR #3
D032	SIGA-OSD W/SIGA-SB4 BASE	OPEN OFFICE 160 @ OFFICE 158 SMOKE DETECTOR	D072	SIGA-OSD W/SIGA-SB4 BASE	SOUTH CONCOURSE ELEVATOR 2 LOBBY 249 SMOKE DETECTOR
D033	SIGA-OSD W/SIGA-SB4 BASE	OPEN OFFICE 160 @ OFFICE 152 & 153 SMOKE DETECTOR	D073	SIGA-OSHD W/SIGA-SB4 BASE	ELEV 2 TOP OF SHAFT MULTISENSOR SMOKE AND HEAT DETECTOR
D034	SIGA-OSD W/SIGA-SB4 BASE	OPEN OFFICE 160 @ FILE 143C SMOKE DETECTOR	D074	SIGA-OSD W/SIGA-SB4 BASE	MEDIA BOOTH 307 SMOKE DETECTOR
M165	APSGA W/SIGA-AA30	MECH RM 135 - APS.4 AA30 #1	D075	SIGA-OSD W/SIGA-SB4 BASE	MEDIA BOOTH 305 & 306 SMOKE DETECTOR
M166	APSGA W/SIGA-AA30	MECH RM 135 - APS.4 AA30 #2	D076	SIGA-OSD W/SIGA-SB4 BASE	MEDIA BOOTH 304 SMOKE DETECTOR
M167	APSGA W/SIGA-AA30	MECH RM 135 - APS.4 TROUBLE MONITOR	D077	SIGA-OSD W/SIGA-SB4 BASE	ELEVATOR 3 LOWER LOBBY SMOKE DETECTOR
M168	APSGA W/SIGA-AA30	MECH RM 135 - APS.5 AA30	M215	SIGA-MCR (MFC-A)	MECH RM 001A - ELEV 1 PHASE 1 DESIGNATED LEVEL RECALL
M169	SIGA-CT1	MECH RM 135 - APS.5 TROUBLE MONITOR	M216	SIGA-MCR (MFC-A)	MECH RM 001A - ELEV 1 PHASE 1 ALTERNATE LEVEL RECALL
M170	SIGA-CC1S	MECH RM 135 - APS.4 SENSE 1 NAC TRIGGER	M217	SIGA-MCR (MFC-A)	MECH RM 001A - ELEV 1 POWER SHUTDOWN
M171	APSGA W/SIGA-AA30	MECH RM 135 - APS.5 AA30	M218	SIGA-MCR (MFC-A)	MECH RM 001A - ELEV 1 FIRE HAT (FUTURE USE)
M172	SIGA-CT1	MECH RM 135 - APS.5 TROUBLE MONITOR	M219	SIGA-MCR (MFC-A)	MECH RM 001A - ELEV 1 SHUNT CONTROL POWER MONITOR
M173	SIGA-CT1	MECH RM 135 - APS.5 SENSE 1 NAC TRIGGER	M220	SIGA-MCT2 (MFC-A)	SPARE (OTHER HALF OF MCT2)
M174	SIGA-CC1S	MECH RM 135 - APS.5 SENSE 1 NAC TRIGGER	D078	SIGA-HRD W/SIGA-SB4 BASE	ELEVATOR 3 - BOTTOM OF SHAFT HEAT DETECTOR
M175	APSGA W/SIGA-AA30	MECH RM 135 - APS.6 AA30	D079	SIGA-OSHD W/SIGA-SB4 BASE	MECH RM 001A MULTISENSOR SMOKE AND HEAT DETECTOR
M176	APSGA W/SIGA-AA30	MECH RM 135 - APS.6 AA30			
M177	SIGA-CT1	MECH RM 135 - APS.6 TROUBLE MONITOR			
M178	SIGA-CC1S	MECH RM 135 - APS.6 SENSE 1 NAC TRIGGER			

1 FACU - DEVICE ADDRESS SCHEDULE
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	DATE
1	MSU COMMENT	1/22/25

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

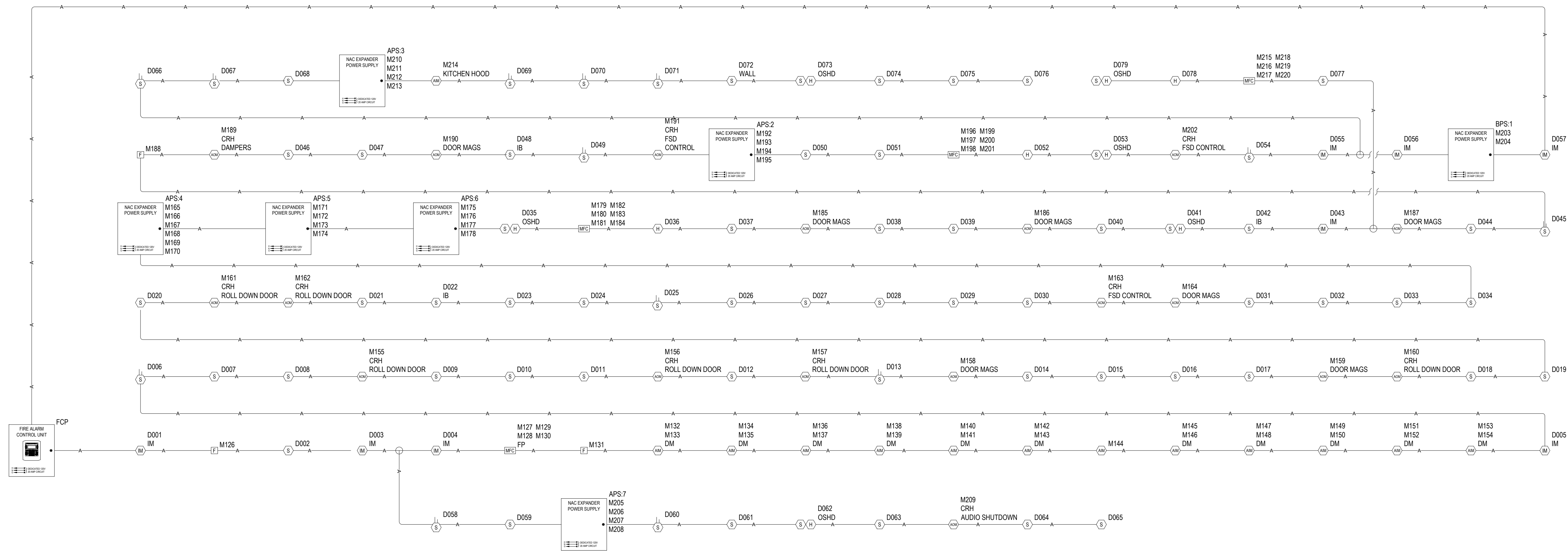
Bryan Moss

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

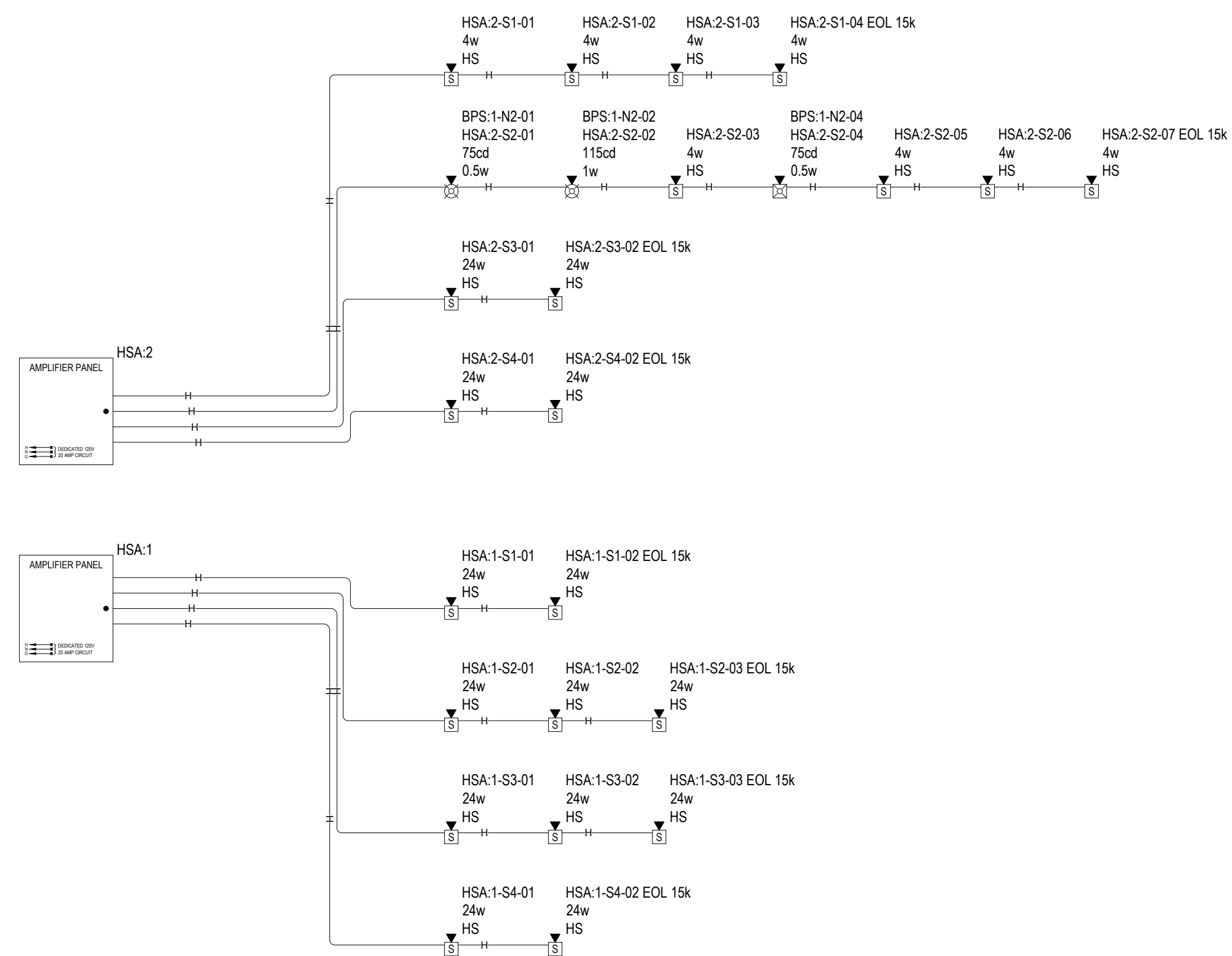
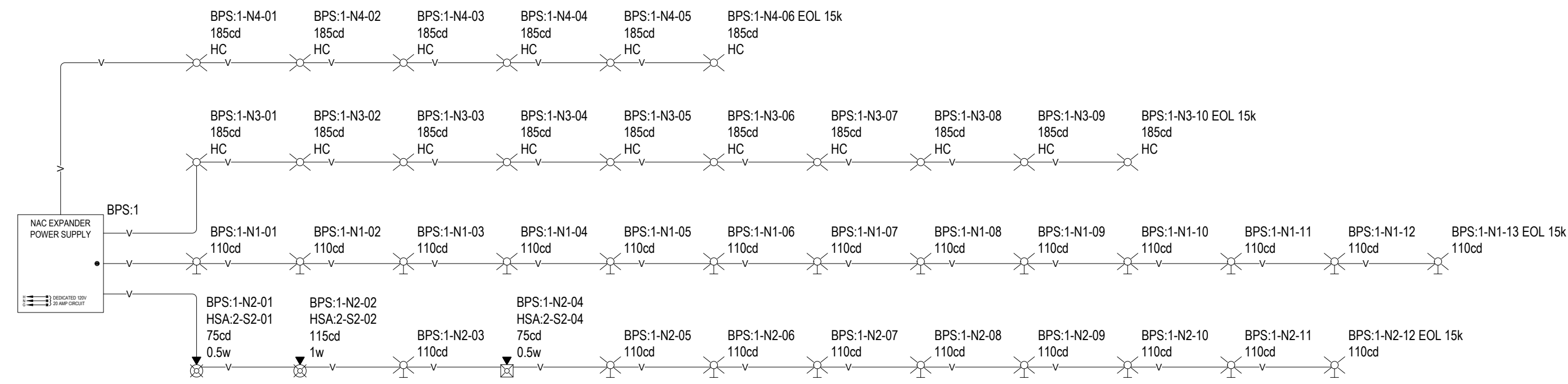
SHEET TITLE
 FIRE ALARM SLC
 RISER DIAGRAM

SHEET
FA6.2

DATE
 01/29/2025



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



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
1	MSU COMMENT	1/22/25

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

Bryan Moss

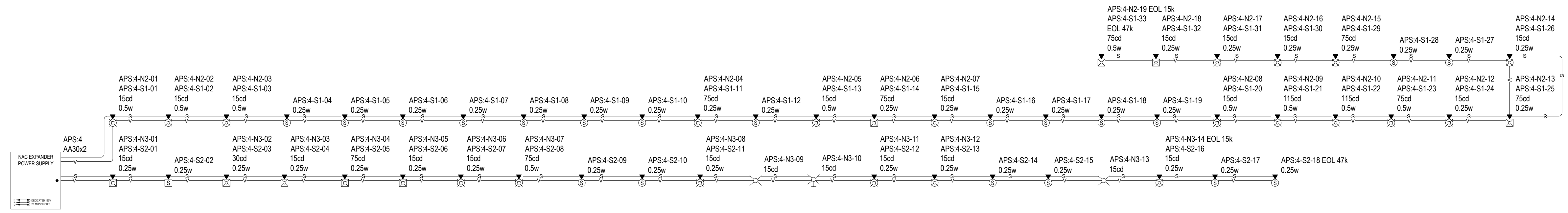
PPA#23-0928
AE# 2024-02-04D

SHEET TITLE
FA HEADEND
NOTIFICATION RISER

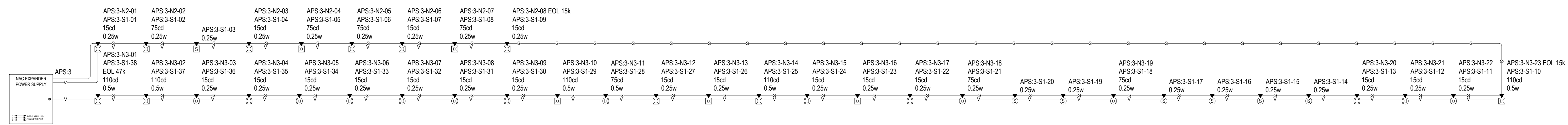
SHEET
FA6.3

DATE
01/29/2025

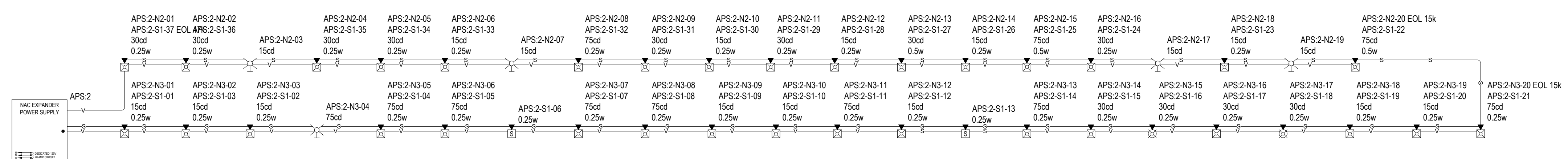
100% SHOP DRAWING FOR PERMIT/CONSTRUCTION



1 APS:4 - NOTIFICATION RISER DIAGRAM
FA6.4 N.T.S



2 APS:3 - NOTIFICATION RISER DIAGRAM
FA6.4 N.T.S



3 APS:2 - NOTIFICATION RISER DIAGRAM
FA6.4 N.T.S



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

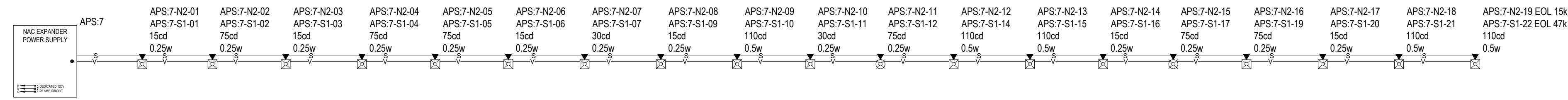


DRAWN BY: BSM		
REVIEWED BY: BSM		
REV.	DESCRIPTION	DATE
1	MSU COMMENT	1/22/25

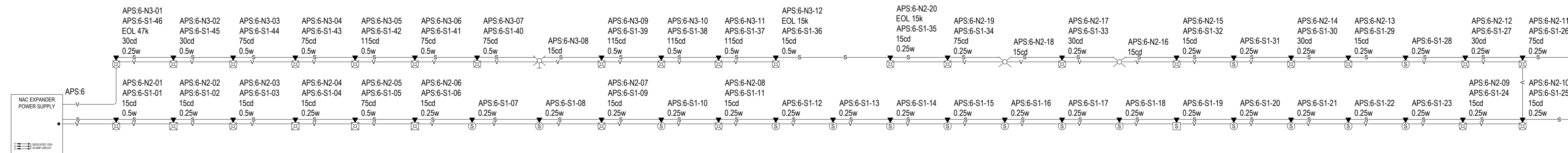
Bryan Moss, SET
Apex Fire Alarm Design
NICET 110772
Fire Alarm Systems, Level IV
State of Montana DLJ
FPL-IEL-000888

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

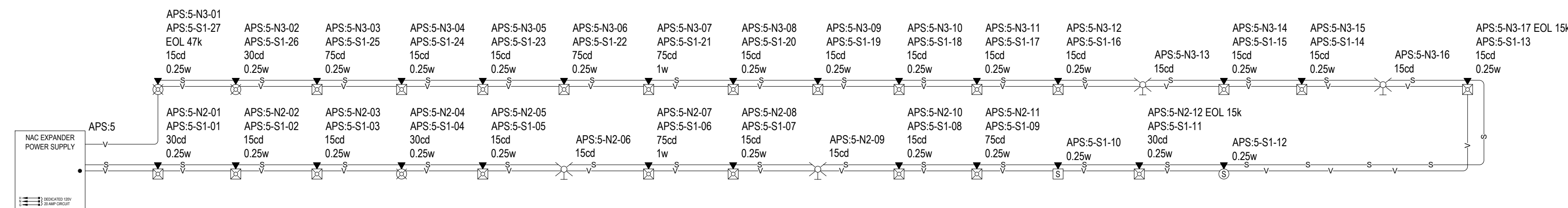
SHEET TITLE
FA APS
NOTIFICATION RISER
SHEET
FA6.4
DATE
01/29/2025



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
1	MSU COMMENT	1/22/25

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

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

SHEET TITLE
FA APS
NOTIFICATION RISER

SHEET
FA6.5

DATE
01/29/2025

100% SHOP DRAWING FOR PERMIT/CONSTRUCTION



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
1	MSU COMMENT	1/22/25

Bryan Moss, SET
 Apex Fire Alarm Design
 NICET 10772
 Fire Alarm Systems, Level IV
 State of Montana DL
 FPL-IEL-000888

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

SHEET TITLE
FIRE ALARM NAC CALCS
SHEET
FA7.1
DATE
01/29/2025

CURRENT SUMMARY					POWER SUMMARY						
MAX. CIRCUIT CURRENT (A):	3.50	TOTAL CIRCUIT CURRENT (A):	0.238	STARTING CALC. VOLTAGE:	20.40	MAX. VOLTAGE DROP:	0.29	MIN. OPERATIONAL VOLTAGE:	16	END OF LINE VOLTAGE:	20.11
SPARE CIRCUIT CURRENT (A):				3.26	TOTAL CIRCUIT LENGTH (FT):		238	WIRE RESISTANCE (DIKFT):			2.60
SPARE CIRCUIT CURRENT %:				93.20 %	TOTAL CIRCUIT RESISTANCE (DI):		1.24	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 (DI)	VOLTAGE DROP FROM PREVIOUS			
FCP-N1-01	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 %

CURRENT SUMMARY					POWER SUMMARY						
MAX. CIRCUIT CURRENT (A):	3	TOTAL CIRCUIT CURRENT (A):	0.364	STARTING CALC. VOLTAGE:	19.70	MAX. VOLTAGE DROP:	1.02	MIN. OPERATIONAL VOLTAGE:	16	END OF LINE VOLTAGE:	18.68
SPARE CIRCUIT CURRENT (A):				2.64	TOTAL CIRCUIT LENGTH (FT):		866	WIRE RESISTANCE (DIKFT):			3.07
SPARE CIRCUIT CURRENT %:				87.87 %	TOTAL CIRCUIT RESISTANCE (DI):		5.32	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 (DI)	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 %

CURRENT SUMMARY					POWER SUMMARY						
MAX. CIRCUIT CURRENT (A):	3	TOTAL CIRCUIT CURRENT (A):	0.35	STARTING CALC. VOLTAGE:	19.70	MAX. VOLTAGE DROP:	0.670	MIN. OPERATIONAL VOLTAGE:	16	END OF LINE VOLTAGE:	19.03
SPARE CIRCUIT CURRENT (A):				2.65	TOTAL CIRCUIT LENGTH (FT):		663	WIRE RESISTANCE (DIKFT):			3.07
SPARE CIRCUIT CURRENT %:				88.33 %	TOTAL CIRCUIT RESISTANCE (DI):		4.07	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 (DI)	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 %

CURRENT SUMMARY					POWER SUMMARY						
MAX. CIRCUIT CURRENT (A):	3	TOTAL CIRCUIT CURRENT (A):	0.530	STARTING CALC. VOLTAGE:	19.70	MAX. VOLTAGE DROP:	1.58	MIN. OPERATIONAL VOLTAGE:	16	END OF LINE VOLTAGE:	18.12
SPARE CIRCUIT CURRENT (A):				2.47	TOTAL CIRCUIT LENGTH (FT):		869	WIRE RESISTANCE (DIKFT):			3.07
SPARE CIRCUIT CURRENT %:				82.33 %	TOTAL CIRCUIT RESISTANCE (DI):		5.33	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 (DI)	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 %

CURRENT SUMMARY					POWER SUMMARY						
MAX. CIRCUIT CURRENT (A):	3	TOTAL CIRCUIT CURRENT (A):	0.318	STARTING CALC. VOLTAGE:	19.70	MAX. VOLTAGE DROP:	1.09	MIN. OPERATIONAL VOLTAGE:	16	END OF LINE VOLTAGE:	18.61
SPARE CIRCUIT CURRENT (A):				2.68	TOTAL CIRCUIT LENGTH (FT):		1019	WIRE RESISTANCE (DIKFT):			3.07
SPARE CIRCUIT CURRENT %:				89.40 %	TOTAL CIRCUIT RESISTANCE (DI):		6.26	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 (DI)	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 %

CURRENT SUMMARY					POWER SUMMARY						
MAX. CIRCUIT CURRENT (A):	3	TOTAL CIRCUIT CURRENT (A):	0.560	STARTING CALC. VOLTAGE:	19.70	MAX. VOLTAGE DROP:	1.01	MIN. OPERATIONAL VOLTAGE:	16	END OF LINE VOLTAGE:	18.69
SPARE CIRCUIT CURRENT (A):				2.44	TOTAL CIRCUIT LENGTH (FT):		529	WIRE RESISTANCE (DIKFT):			3.07
SPARE CIRCUIT CURRENT %:				81.33 %	TOTAL CIRCUIT RESISTANCE (DI):		3.25	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 (DI)	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 %

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

CURRENT SUMMARY					POWER SUMMARY						
MAX. CIRCUIT CURRENT (A):	3	TOTAL CIRCUIT CURRENT (A):	0.5740	STARTING CALC. VOLTAGE:	19.70	MAX. VOLTAGE DROP:	1.51	MIN. OPERATIONAL VOLTAGE:	16	END OF LINE VOLTAGE:	18.19
SPARE CIRCUIT CURRENT (A):				2.43	TOTAL CIRCUIT LENGTH (FT):		739	WIRE RESISTANCE (DIKFT):			3.07
SPARE CIRCUIT CURRENT %:				80.87 %	TOTAL CIRCUIT RESISTANCE (DI):		4.54	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 (DI)	VOLTAGE DROP FROM PREVIOUS			
APS-2-N3-01	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	15CD	0.028	0.5740	30	0.186119	0.11	19.59	0.11	0.54 %

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

CURRENT SUMMARY					POWER SUMMARY						
MAX. CIRCUIT CURRENT (A):	3	TOTAL CIRCUIT CURRENT (A):	0.224	STARTING CALC. VOLTAGE:	19.70	MAX. VOLTAGE DROP:	0.19	MIN. OPERATIONAL VOLTAGE:	16	END OF LINE VOLTAGE:	19.51
SPARE CIRCUIT CURRENT (A):				2.78	TOTAL CIRCUIT LENGTH (FT):		246	WIRE RESISTANCE (DIKFT):			3.07
SPARE CIRCUIT CURRENT %:				92.53 %	TOTAL CIRCUIT RESISTANCE (DI):		1.51	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 (DI)	VOLTAGE DROP FROM PREVIOUS			
APS-3-N2-01	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	15CD	0.028	0.224	11	0.065058	0.01	19.69	0.01	0.07 %

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

DEVICE LABEL	PART NO	DESCRIPTION	CANDELAS	ALARM CURRENT (A)	REMAINING ALARM CURRENT (A)	DISTANCE FROM PREVIOUS	RESISTANCE FROM PREVIOUS (DI)	VOLTAGE DROP FROM PREVIOUS			
APS-3-N2-02	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	15CD	0.028	0.196	1	0.004801	0	19.69	0.02	0.08 %

AP3-3 N3 POINT-TO-POINT REPORT				CURRENT SUMMARY				POWER SUMMARY			
				MAX. CIRCUIT CURRENT (A):	3	TOTAL CIRCUIT CURRENT (A):	0.7490 <th>STARTING CALC. VOLTAGE:</th> <td>19.70<th>MAX. VOLTAGE DROP:</th><td>1.82</td></td>	STARTING CALC. VOLTAGE:	19.70 <th>MAX. VOLTAGE DROP:</th> <td>1.82</td>	MAX. VOLTAGE DROP:	1.82
						SPARE CIRCUIT CURRENT (A):	2.25 <th></th> <td></td> <th>VOLTAGE DROP %:</th> <td>9.26 %</td>			VOLTAGE DROP %:	9.26 %
						SPARE CIRCUIT CURRENT %:	75.03 % <th>MIN. OPERATIONAL VOLTAGE:</th> <td>16<th>END OF LINE VOLTAGE:</th><td>17.88</td></td>	MIN. OPERATIONAL VOLTAGE:	16 <th>END OF LINE VOLTAGE:</th> <td>17.88</td>	END OF LINE VOLTAGE:	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 (D/KFT):	3.07 <th>TOTAL CIRCUIT LENGTH (FT):</th> <td>751</td>	TOTAL CIRCUIT LENGTH (FT):	751
DISTANCE MEASURED USING DRAWN SEGMENT LENGTHS WITH 30.00 % ADDITIONAL LENGTH CALCULATED								TOTAL CIRCUIT RESISTANCE (D):			4.61
DEVICE LABEL	PART NO	DESCRIPTION	CANDELAS	ALARM CURRENT (A)	REMAINING ALARM CURRENT (A)	DISTANCE FROM PREVIOUS	RESISTANCE FROM PREVIOUS (D)	VOLTAGE DROP FROM PREVIOUS			
AP3-3-N3-01	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	110CD	0.028	0.7490	37	0.227529	0.17	19.53	0.17	0.87 %
AP3-3-N3-02	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	110CD	0.028	0.7210	61	0.374866	0.27	19.26	0.44	2.24 %
AP3-3-N3-03	G4SVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.6930	17	0.10595	0.07	19.19	0.510	2.61 %
AP3-3-N3-04	G4SVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.6580	26	0.156979	0.1	19.08	0.620	3.13 %
AP3-3-N3-05	G4SVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.6230	19	0.116431	0.07	19.01	0.690	3.50 %
AP3-3-N3-06	G4SVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.5880	42	0.25904	0.15	18.86	0.840	4.28 %
AP3-3-N3-07	G4SVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.5530	36	0.221388	0.12	18.74	0.960	4.90 %
AP3-3-N3-08	G4SVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.5180	17	0.116851	0.06	18.67	1.03	5.20 %
AP3-3-N3-09	G4SVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.483	29	0.180309	0.09	18.59	1.11	5.65 %
AP3-3-N3-10	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	110CD	0.028	0.448	60	0.366799	0.16	18.42	1.28	6.48 %
AP3-3-N3-11	G4SVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.42	20	0.125753	0.05	18.37	1.33	6.75 %
AP3-3-N3-12	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	15CD	0.028	0.385	42	0.254888	0.1	18.27	1.43	7.25 %
AP3-3-N3-13	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	15CD	0.028	0.357	29	0.17792	0.06	18.21	1.49	7.57 %
AP3-3-N3-14	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	110CD	0.028	0.329	19	0.117603	0.04	18.17	1.53	7.77 %
AP3-3-N3-15	G4SVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.028	0.301	9	0.054002	0.02	18.15	1.55	7.85 %
AP3-3-N3-16	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	15CD	0.035	0.266	28	0.173963	0.05	18.11	1.59	8.08 %
AP3-3-N3-17	G4SVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.238	37	0.229373	0.05	18.05	1.65	8.36 %
AP3-3-N3-18	G4SVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	75CD	0.035	0.203	17	0.102232	0.02	18.03	1.67	8.47 %
AP3-3-N3-19	G4SVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.168	68	0.419811	0.07	17.96	1.74	8.83 %
AP3-3-N3-20	G4SVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.133	82	0.504	0.07	17.89	1.81	9.16 %
AP3-3-N3-21	G4SVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.098	10	0.060876	0.01	17.89	1.81	9.20 %
AP3-3-N3-22	G4SVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.063	25	0.152042	0.01	17.88	1.82	9.24 %
AP3-3-N3-23	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	110CD	0.028	0.028	18	0.113138	0	17.88	1.82	9.26 %

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

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

AP3-4 N2 POINT-TO-POINT REPORT				CURRENT SUMMARY				POWER SUMMARY			
				MAX. CIRCUIT CURRENT (A):	3	TOTAL CIRCUIT CURRENT (A):	0.6370 <th>STARTING CALC. VOLTAGE:</th> <td>19.70<th>MAX. VOLTAGE DROP:</th><td>1.85</td></td>	STARTING CALC. VOLTAGE:	19.70 <th>MAX. VOLTAGE DROP:</th> <td>1.85</td>	MAX. VOLTAGE DROP:	1.85
						SPARE CIRCUIT CURRENT (A):	2.36 <th></th> <td></td> <th>VOLTAGE DROP %:</th> <td>9.39 %</td>			VOLTAGE DROP %:	9.39 %
						SPARE CIRCUIT CURRENT %:	78.77 % <th>MIN. OPERATIONAL VOLTAGE:</th> <td>16<th>END OF LINE VOLTAGE:</th><td>17.85</td></td>	MIN. OPERATIONAL VOLTAGE:	16 <th>END OF LINE VOLTAGE:</th> <td>17.85</td>	END OF LINE VOLTAGE:	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 (D/KFT):	3.07 <th>TOTAL CIRCUIT LENGTH (FT):</th> <td>775</td>	TOTAL CIRCUIT LENGTH (FT):	775
DISTANCE MEASURED USING DRAWN SEGMENT LENGTHS WITH 30.00 % ADDITIONAL LENGTH CALCULATED								TOTAL CIRCUIT RESISTANCE (D):			4.76
DEVICE LABEL	PART NO	DESCRIPTION	CANDELAS	ALARM CURRENT (A)	REMAINING ALARM CURRENT (A)	DISTANCE FROM PREVIOUS	RESISTANCE FROM PREVIOUS (D)	VOLTAGE DROP FROM PREVIOUS			
AP3-4-N2-01	G4SVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.6370	103	0.630	0.4	19.30	0.4	2.04 %
AP3-4-N2-02	G4SVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.6020	43	0.264408	0.16	19.14	0.560	2.85 %
AP3-4-N2-03	G4SVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.5670	41	0.254565	0.14	19	0.70	3.58 %
AP3-4-N2-04	G4SVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	75CD	0.035	0.5320	74	0.451846	0.24	18.75	0.950	4.80 %
AP3-4-N2-05	G4SVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.497	55	0.33513	0.17	18.59	1.11	5.64 %
AP3-4-N2-06	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	75CD	0.028	0.462	47	0.28614	0.13	18.46	1.24	6.32 %
AP3-4-N2-07	G4SVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.434	25	0.153173	0.07	18.39	1.31	6.65 %
AP3-4-N2-08	G4SVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.399	27	0.166038	0.07	18.32	1.38	6.99 %
AP3-4-N2-09	G4SVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	115CD	0.035	0.364	59	0.363943	0.13	18.19	1.51	7.66 %
AP3-4-N2-10	G4SVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.329	23	0.140566	0.05	18.14	1.56	7.90 %
AP3-4-N2-11	G4SVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	75CD	0.035	0.294	48	0.295919	0.09	18.06	1.64	8.34 %
AP3-4-N2-12	G4SVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.259	34	0.209363	0.05	18	1.70	8.61 %
AP3-4-N2-13	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	75CD	0.028	0.224	13	0.081987	0.02	17.98	1.72	8.71 %
AP3-4-N2-14	G4SVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.196	25	0.150761	0.03	17.96	1.74	8.86 %
AP3-4-N2-15	G4SVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	75CD	0.035	0.161	75	0.458829	0.07	17.88	1.82	9.23 %
AP3-4-N2-16	G4SVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.126	7	0.043088	0.01	17.88	1.82	9.26 %
AP3-4-N2-17	G4SVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.091	18	0.11331	0.01	17.87	1.83	9.31 %
AP3-4-N2-18	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	15CD	0.028	0.056	35	0.212067	0.01	17.85	1.85	9.37 %
AP3-4-N2-19	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	75CD	0.028	0.028	24	0.150341	0	17.85	1.85	9.39 %

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

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

AP3-4 N3 POINT-TO-POINT REPORT				CURRENT SUMMARY				POWER SUMMARY			
				MAX. CIRCUIT CURRENT (A):	3	TOTAL CIRCUIT CURRENT (A):	0.448 <th>STARTING CALC. VOLTAGE:</th> <td>19.70<th>MAX. VOLTAGE DROP:</th><td>3.19</td></td>	STARTING CALC. VOLTAGE:	19.70 <th>MAX. VOLTAGE DROP:</th> <td>3.19</td>	MAX. VOLTAGE DROP:	3.19
						SPARE CIRCUIT CURRENT (A):	2.55 <th></th> <td></td> <th>VOLTAGE DROP %:</th> <td>16.21 %</td>			VOLTAGE DROP %:	16.21 %
						SPARE CIRCUIT CURRENT %:	85.07 % <th>MIN. OPERATIONAL VOLTAGE:</th> <td>16<th>END OF LINE VOLTAGE:</th><td>16.51</td></td>	MIN. OPERATIONAL VOLTAGE:	16 <th>END OF LINE VOLTAGE:</th> <td>16.51</td>	END OF LINE VOLTAGE:	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 (D/KFT):	3.07 <th>TOTAL CIRCUIT LENGTH (FT):</th> <td>1335</td>	TOTAL CIRCUIT LENGTH (FT):	1335
DISTANCE MEASURED USING DRAWN SEGMENT LENGTHS WITH 30.00 % ADDITIONAL LENGTH CALCULATED								TOTAL CIRCUIT RESISTANCE (D):			8.20
DEVICE LABEL	PART NO	DESCRIPTION	CANDELAS	ALARM CURRENT (A)	REMAINING ALARM CURRENT (A)	DISTANCE FROM PREVIOUS	RESISTANCE FROM PREVIOUS (D)	VOLTAGE DROP FROM PREVIOUS			
AP3-4-N3-01	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	15CD	0.028	0.448	928	5.70	2.55	17.15	2.55	12.96 %
AP3-4-N3-02	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	30CD	0.028	0.42	64	0.39051	0.16	16.98	2.72	13.79 %
AP3-4-N3-03	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	15CD	0.028	0.392	21	0.130679	0.05	16.93	2.77	14.05 %
AP3-4-N3-04	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	75CD	0.028	0.364	37	0.225507	0.08	16.85	2.85	14.47 %
AP3-4-N3-05	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	15CD	0.028	0.336	41	0.248961	0.08	16.77	2.93	14.89 %
AP3-4-N3-06	G4SVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.308	37	0.22626	0.07	16.70	3	15.25 %
AP3-4-N3-07	G4SVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	75CD	0.035	0.273	20	0.124845	0.03	16.66	3.04	15.42 %
AP3-4-N3-08	G4SVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.238	41	0.25206	0.06	16.60	3.10	15.72 %
AP3-4-N3-09	G4SVWA	STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.203	31	0.18792	0.04	16.56	3.14	15.92 %
AP3-4-N3-10	G4SVWA	STROBE, WALL, WHITE, ALERT	15CD	0.028	0.168	3	0.018491	0	16.56	3.14	15.93 %
AP3-4-N3-11	G4SVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.14	17	0.106079	0.01	16.55	3.15	16.01 %
AP3-4-N3-12	G4SVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.105	20	0.12477	0.01	16.53	3.17	16.08 %
AP3-4-N3-13	G4SVWA	STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.077	52	0.319843	0.02	16.51	3.19	16.19 %
AP3-4-N3-14	G4SVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	15CD	0.035	0.035	23	0.141452	0	16.51	3.19	16.21 %

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

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

AP3-5 N2 POINT-TO-POINT REPORT				CURRENT SUMMARY				POWER SUMMARY			
				MAX. CIRCUIT CURRENT (A):	3	TOTAL CIRCUIT CURRENT (A):	0.343 <th>STARTING CALC. VOLTAGE:</th> <td>19.70<th>MAX. VOLTAGE DROP:</th><td>0.560</td></td>	STARTING CALC. VOLTAGE:	19.70 <th>MAX. VOLTAGE DROP:</th> <td>0.560</td>	MAX. VOLTAGE DROP:	0.560
						SPARE CIRCUIT CURRENT (A):	2.66 <th></th> <td></td> <th>VOLTAGE DROP %:</th> <td>2.82 %</td>			VOLTAGE DROP %:	2.82 %
						SPARE CIRCUIT CURRENT %:	88.57 % <th>MIN. OPERATIONAL VOLTAGE:</th> <td>16<th>END OF LINE VOLTAGE:</th><td>19.14</td></td>	MIN. OPERATIONAL VOLTAGE:	16 <th>END OF LINE VOLTAGE:</th> <td>19.14</td>	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 (D/KFT):	3.07 <th>TOTAL CIRCUIT LENGTH (FT):</th> <td>479</td>	TOTAL CIRCUIT LENGTH (FT):	479
DISTANCE MEASURED USING DRAWN SEGMENT LENGTHS WITH 30.00 % ADDITIONAL LENGTH CALCULATED								TOTAL CIRCUIT RESISTANCE (D):			2.94
DEVICE LABEL	PART NO	DESCRIPTION	CANDELAS	ALARM CURRENT (A)	REMAINING ALARM CURRENT (A)	DISTANCE FROM PREVIOUS	RESISTANCE FROM PREVIOUS (D)	VOLTAGE DROP FROM PREVIOUS			
AP3-5-N2-01	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	30CD	0.028	0.343	104	0.637	0.22	19.48	0.22	1.11 %
AP3-5-N2-02	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	15CD	0.028	0.315	43	0.266997	0.08	19.40	0.3	1.54 %
AP3-5-N2-03	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	15CD	0.028	0.287	0	0.002661	0	19.40	0.3	1.54 %
AP3-5-N2-04	G4SVWA	SPEAKER/STROBE, CEILING, WHITE, ALERT	30CD	0.035	0.259	30	0.185836	0.05	19.35	0.35	1.78 %
AP3-5-N2-05	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	15CD	0.028	0.224	25	0.155494	0.03	19.31	0.39	1.96 %
AP3-5-N2-06	G4SVWA	STROBE, WALL, WHITE, ALERT	15CD	0.028	0.196	18	0.11309	0.02	19.29	0.41	2.07 %
AP3-5-N2-07	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	75CD	0.028	0.168	48	0.297666	0.05	19.24	0.46	2.33 %
AP3-5-N2-08	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	15CD	0.028	0.14	51	0.318022	0.04	19.20	0.5	2.55 %
AP3-5-N2-09	G4SVWA	STROBE, WALL, WHITE, ALERT	15CD	0.028	0.112	10	0.081514	0.01	19.19	0.510	2.58 %
AP3-5-N2-10	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	15CD	0.028	0.084	51	0.310951	0.03	19.16	0.540	2.72 %
AP3-5-N2-11	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	75CD	0.028	0.056	25	0.150959	0.01	19.16	0.540	2.76 %
AP3-5-N2-12	G4SVWA	SPEAKER/STROBE, WALL, WHITE, ALERT	30CD	0.028	0.028	73	0.447286	0.01	19.14	0.560	2.82 %

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

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

AP3-5 N3 POINT-TO-POINT REPORT				CURRENT SUMMARY				POWER SUMMARY			
				MAX. CIRCUIT CURRENT (A):	3	TOTAL CIRCUIT CURRENT (A):	0.49 <th>STARTING CALC. VOLTAGE:</th> <td>19.70<th>MAX. VOLTAGE DROP:</th><td>1.08</td></td>	STARTING CALC. VOLTAGE:	19.70 <th>MAX. VOLTAGE DROP:</th> <td>1.08</td>	MAX. VOLTAGE DROP:	1.08
						SPARE CIRCUIT CURRENT (A):	2.51 <th></th> <td></td> <th>VOLTAGE DROP %:</th> <td>5.50 %</td>			VOLTAGE DROP %:	5.50 %
						SPARE CIRCUIT CURRENT %:	83.67 % <th>MIN. OPERATIONAL VOLTAGE:</th> <td>16<th>END OF LINE VOLTAGE:</th><td>18.62</td></td>	MIN. OPERATIONAL VOLTAGE:	16 <th>END OF LINE VOLTAGE:</th> <td>18.62</td>	END OF LINE VOLTAGE:	18.62
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 (D/KFT):	3.07 <th>TOTAL CIRCUIT LENGTH (FT):</th> <td>577</td>	TOTAL CIRCUIT LENGTH (FT):	577
DISTANCE MEASURED USING DRAWN SEGMENT LENGTHS WITH 30.00 % ADDITIONAL LENGTH CALCULATED								TOTAL CIRCUIT RESISTANCE (D):			3.54
DEVICE LABEL	PART NO	DESCRIPTION	CANDELAS	ALARM CURRENT (A)	REMAINING ALARM CURRENT (A)	DISTANCE FROM PREVIOUS	RESISTANCE FROM PREVIOUS (D)	VOLTAGE DROP FROM PREVIOUS			
AP											

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	MIN. OPERATIONAL VOLTAGE:	16	VOLTAGE DROP %:	5.30 %
						SPARE CIRCUIT CURRENT %:	81.80 %	WIRE RESISTANCE (D/KFT):	3.07	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								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 (D)	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	0.560	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	G4SVWA	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	G4SVWA	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 %

CALCULATION METHODS:
 RESISTANCE FROM PREVIOUS (D) = WIRE RESISTANCE (D/KFT) X 2 X DIST. FROM PREVIOUS (FT)
 VOLTAGE DROP FROM PREVIOUS = RESISTANCE FROM PREVIOUS (D) 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 (D/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 W/SIGA-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 %
APS:3 (APS6A W/SIGA-AA30)	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 W/SIGA-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 W/SIGA-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 W/SIGA-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 W/SIGA-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	462	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 (D/KFT) X 2 X DIST. FROM PREVIOUS (FT)
 VOLTAGE DROP FROM PREVIOUS = RESISTANCE FROM PREVIOUS (D) 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
1	MSU COMMENT	1/22/25


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


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

SHEET TITLE
FIRE ALARM NAC
CALCS CONT.
SHEET
FA7.3
DATE
01/29/2025

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	0.05	0.05	0.095	0.095
	1	3-SSDC2	Signature Single Driver Controller (LRM)	0.144	0.144	0.204	0.204
	1	3-2A23A	20 Watt Zoned Amplifier, Class A, 25 or 70Vrms	0.062	0.062	1.12	1.12
	1	4-2424S	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-LCDAUDTEL	Separate LCD for Mic/F	0.04	0.04	0.093	0.093
	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
	1	4-NET-TP	Twisted Pair SFP network controller	0.032	0.032	0.032	0.032
			TOTAL DEVICE QTY		TOTAL STANDBY (A)		TOTAL ALARM (A)
				0	0	0	0
				CALCULATED AS MAX LOAD IN 3-SSDC2 ABOVE		CALCULATED AS MAX LOAD IN 3-SSDC2 ABOVE	
				138	1.25	0.238	0.238
				1			
				TOTAL STANDBY (A)	0.740	TOTAL ALARM (A)	2.34
					REQUIRED STANDBY TIME = 24 HOURS		
					REQUIRED ALARM TIME = 15 MINUTES		
				SECONDARY STANDBY LOAD (A)	0.740	SECONDARY ALARM LOAD (A)	17.76
				2.34	0.25	18.35	0.590
				STANDBY AND ALARM SUBTOTAL (AMP HOURS)		18.35	
				DERATING FACTOR		1.25	
				SECONDARY LOAD REQUIREMENTS (AMP HOURS)		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)							
PANEL COMPONENTS	QTY	PART NO.	DESCRIPTION	STANDBY CURRENT (AMPS)		SECONDARY ALARM CURRENT (AMPS)	
				CURRENT DRAW (A)	TOTAL (A)	CURRENT DRAW (A)	TOTAL
	1	4-2424S	24 Indicator 24 Control Display Module	0.009	0.009	0.009	0.009
	1	4-ANNAUDTEL	Annunciator Audio Telephone Interface Module (Required for Master Only)	0.098	0.098	0.098	0.098
	1	4-ANNKCPU	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)
				0	0	0	0
				TOTAL STANDBY (A)	0.344	TOTAL ALARM (A)	0.427

PANEL HSA:1 (3-RCC21R W3-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-PPSM	Primary Power Supply 120V	0	0	0	0
			TOTAL DEVICE QTY		TOTAL STANDBY (A)		TOTAL ALARM (A)
				2	0	0	0
				3	0	0	0
				3	0	0	0
				2	0	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	SECONDARY ALARM LOAD (A)	8.16
				22.16	0.25	13.70	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 W3-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-PPSM	Primary Power Supply 120V	0	0	0	0
			TOTAL DEVICE QTY		TOTAL STANDBY (A)		TOTAL ALARM (A)
				4	0	0	0
				7	0	0	0
				2	0	0	0
				2	0	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	SECONDARY ALARM LOAD (A)	8.16
				22.16	0.25	13.70	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)	
				CURRENT DRAW (A)	TOTAL (A)	CURRENT DRAW (A)	TOTAL
	1	BPS10A Mainboard	Mainboard for BPS10A assembly	0.07	0.07	0.27	0.27
			TOTAL DEVICE QTY		TOTAL STANDBY (A)		TOTAL ALARM (A)
				13	0	0.368	0.368
				12	0	0.35	0.35
				10	0	0.530	0.530
				6	0	0.318	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	SECONDARY ALARM LOAD (A)	1.68
				1.83	0.25	2.14	0.46
				STANDBY AND ALARM SUBTOTAL (AMP HOURS)		2.14	
				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 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)
				20	0	0.560	0.560
				20	0	0.5740	0.5740
				1	0.344	0.427	0.427
				37	0	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)	0.416	SECONDARY ALARM LOAD (A)	9.98
				3.38	0.25	10.83	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 WISIGA-AA30) 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	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)
				8	0	0.224	0.224
				23	0	0.7490	0.7490
				1	0.344	0.427	0.427
				38	0	0	0
				TOTAL STANDBY (A)	0.416	TOTAL ALARM (A)	3.22
					REQUIRED STANDBY TIME = 24 HOURS		
					REQUIRED ALARM TIME = 15 MINUTES		
				SECONDARY STANDBY LOAD (A)	0.416	SECONDARY ALARM LOAD (A)	9.98
				3.22	0.25	0.810	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 APS-4 (APS10A WISIGA-AA30) 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	APS10A Mainboard	Mainboard for APS10A assembly	0.07	0.07	0.27	0.27
	2	SIGA-AA30	30 Watt Intelligent Audio Amplifier	0.002	0.004	1.55	3.10
			TOTAL DEVICE QTY		TOTAL STANDBY (A)		TOTAL ALARM (A)
				19	0	0.6370	0.6370
				14	0	0.448	0.448
				28	0.42	0	0
				33	0	0	0
				18	0	0	0
				TOTAL STANDBY (A)	0.494	TOTAL ALARM (A)	4.46
					REQUIRED STANDBY TIME = 24 HOURS		
					REQUIRED ALARM TIME = 15 MINUTES		
				SECONDARY STANDBY LOAD (A)	0.494	SECONDARY ALARM LOAD (A)	11.86
				4.46	0.25	1.11	1.11
				STANDBY AND ALARM SUBTOTAL (AMP HOURS)		12.97	
				DERATING FACTOR		1.25	
				SECONDARY LOAD REQUIREMENTS (AMP HOURS)		16.21	

PROVIDE (2) 12V 18AH BATTERIES

PANEL APS-5 (APS6A WISIGA-AA30) 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	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)
				12	0	0.343	0.343
				17	0	0.49	0.49
				1	0.344	0.427	0.427
				27	0	0	0
				TOTAL STANDBY (A)	0.416	TOTAL ALARM (A)	3.08
					REQUIRED STANDBY TIME = 24 HOURS		
					REQUIRED ALARM TIME = 15 MINUTES		

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
AFF	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
C	RACEWAY/CONDUIT	NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
CB	CIRCUIT BREAKER	NFD	NON-FUSED DISCONNECT
CC	COLOR RENDERING TEMPERATURE	NL	NIGHT LIGHT, UN-SWITCHED 24/7 OPERATION
CCTV	CLOSED CIRCUIT TELEVISION	NIC	NOT IN CONTRACT
CKT	CIRCUIT	NO	NORMALLY OPEN
CLG	CEILING	#	NUMBER
C.O.	RACEWAY/CONDUIT ONLY, WITH PULL STRING	OAE	OR APPROVED EQUAL
COD	CENTER OF DEVICE	OC	ON CENTER
CNTRL	CONTROL	OCPD	OVERCURRENT PROTECTIVE DEVICE
CU	COPPER	OH	OVERHEAD
(D)	EXISTING TO BE DEMOLISHED	P	POLE
DISC	DISCONNECT	PB	PUSHBUTTON
DIST	DISTRIBUTION	PC	PLUMBING CONTRACTOR
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
FVNR	FULL VOLTAGE NON-REVERSING	SW	SWITCH
FVR	FULL VOLTAGE REVERSING	SWBD	SWITCHBOARD
GEC	GROUND ELECTRODE CONDUCTOR	SWGR	SWITCHGEAR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER	TELEPHONE BOARD	TELEPHONE BOARD
GFI	GROUND FAULT INTERRUPTER	TC	TIME CLOCK
GFP	GROUND FAULT PROTECTION	TD	TIME DELAY
GND	GROUND	TEL	TELEPHONE
GRC	GALVANIZED RIGID CONDUIT	TR	TAMPER RESISTANT
HID	HIGH INTENSITY DISCHARGE	TSP	TWISTED SHIELDED PAIR
HOA	HAND-OFF-AUTOMATIC	TTB	TELEPHONE TERMINAL BOARD
HP	HORSEPOWER	TYP	TYPICAL
HPS	HIGH PRESSURE SODIUM	UG	UNDERGROUND
HTR	HEATER	UH	UNIT HEATER
HVAC	HEATING, VENTILATION & AIR CONDITIONING	UNO	UNLESS NOTED OTHERWISE
HZ	HERTZ	V	VOLT
J-BOX	JUNCTION BOX	VA	VOLT-AMPERES
KVA	KILOVOLT-AMPERES	VFD	VARIABLE FREQUENCY DRIVE
KW	KILOWATTS	W	WATTS
LCP	LIGHTING CONTROL PANEL	WAO	WORK AREA OUTLET
LPW	LUMENS PER WATT	WP	WEATHERPROOF
LTG	LUMENS	WPI	WEATHERPROOF WHILE-IN-USE
LM	LUMENS	WR	WEATHER RESISTANT
LV	LOW VOLTAGE	W/O	WITHOUT
MAG	MAGNETIC STARTER	XFMR	TRANSFORMER
		Y	WYE-CONNECTED
		Δ	DELTA-CONNECTED
		∅	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, SD5A 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)
	CONTACTOR 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)
	SIMPLEX RECEPTACLE - CEILING MOUNT, WALL MOUNT (+18", UNO)		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 RAOO 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.
	DUPLEX RECEPTACLE - CEILING MOUNT, WALL MOUNT (+18", UNO)		JUNCTION BOX
	QUADRUPLEX RECEPTACLE - CEILING MOUNT, WALL MOUNT (+18", UNO)		DROP-DOWN RECEPTACLE
	ABOVE COUNTER RECEPTACLE - MOUNT AT +4" ABOVE BACKSPLASH		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
	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. CFB4300R, 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.		SURFACE MOUNTED RACEWAY
	FLOOR BOX WITH ADDITIONAL C.O. FOR DATA. FURNISH (1) 1-1/4" DEDICATED CONDUIT FROM EACH DATA COMPARTMENT, COMPLETE WITH PULL STRINGS OVER TO AND UP WALL INTO ACCESSIBLE CEILING SPACE, UNO.		RACEWAY CONCEALED IN WALL, FLOOR, OR CEILING IN FINISHED SPACES, EXPOSED IN UNFINISHED SPACES
			RACEWAY BELOW FLOOR OR BELOW GRADE
			RACEWAY STUB-OUT WITH CAPPED END
			RACEWAY STUB-OUT WITH BUSHED END
			GROUNDING BUS

ABBREVIATIONS AND SYMBOLS GENERAL NOTES

- THE ABBREVIATIONS ON THIS SHEET COMPRISE A STANDARD LIST; NOT ALL ABBREVIATIONS APPEAR ON THIS PROJECT.
- THE SYMBOLS ON THIS SHEET COMPRISE A STANDARD LIST; NOT ALL SYMBOLS APPEAR ON THIS PROJECT.
- 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

- 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.
- 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.
- 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.
- 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.
- PROVIDE A DEDICATED NEUTRAL CONDUCTOR FOR EACH 120V BRANCH CIRCUIT.

ELECTRICAL PROJECT DEMO NOTES

- 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.
- 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.
- 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.
- 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.
- 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.
- 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

- THE EXISTING CMU WALLS ASSOCIATED WITH THIS PROJECT MAY CONTAIN ASBESTOS MATERIALS IN THE FORM OF VERMICULITE INSULATION. SEE THE PRE-RENOVATION ASBESTOS INSPECTION REPORT IDENTIFYING THE EXISTING CMU WALLS POTENTIALLY CONTAINING VERMICULITE INSULATION. CONDUIT ROUTING IS SHOWN IN APPROXIMATE LOCATION AND GENERAL ROUTING FOR BIDDING PURPOSES. THE CONTRACTOR SHALL FIELD VERIFY EXACT LOCATION AND QUANTITY OF PENETRATIONS IN ASSUMED ASBESTOS-CONTAINING CMU WALLS. THE CONTRACTOR SHALL FOLLOW SPECIFICATION SECTION 028200 FOR REMEDIATION REQUIREMENTS.

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

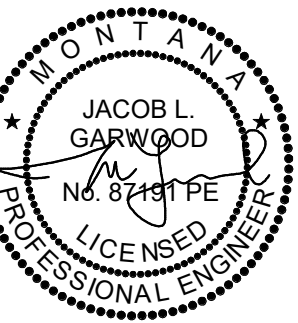
MONTANA STATE UNIVERSITY
BOZEMAN

Morrison
Maierle
engineers - surveyors - planners - scientists

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

01/29/2025



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:

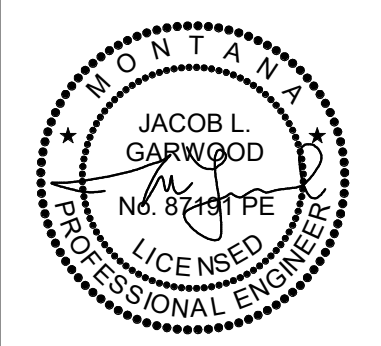
1. PROVIDE CIRCUIT CONSISTING OF #12'S IN 3/4" C FOR EDWARDS NAC PANELS. COORDINATE EXACT LOCATION WITH FIRE ALARM CONTRACTOR.
2. PROVIDE NEW 20A-1P BREAKER IN EXISTING GE A-SERIES PANEL TO SERVE NEW EDWARDS NAC PANEL. NEW BREAKER SHALL HAVE RED MARKING, LOCKABLE, AND BE IDENTIFIED AS "FIRE ALARM CIRCUIT".



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



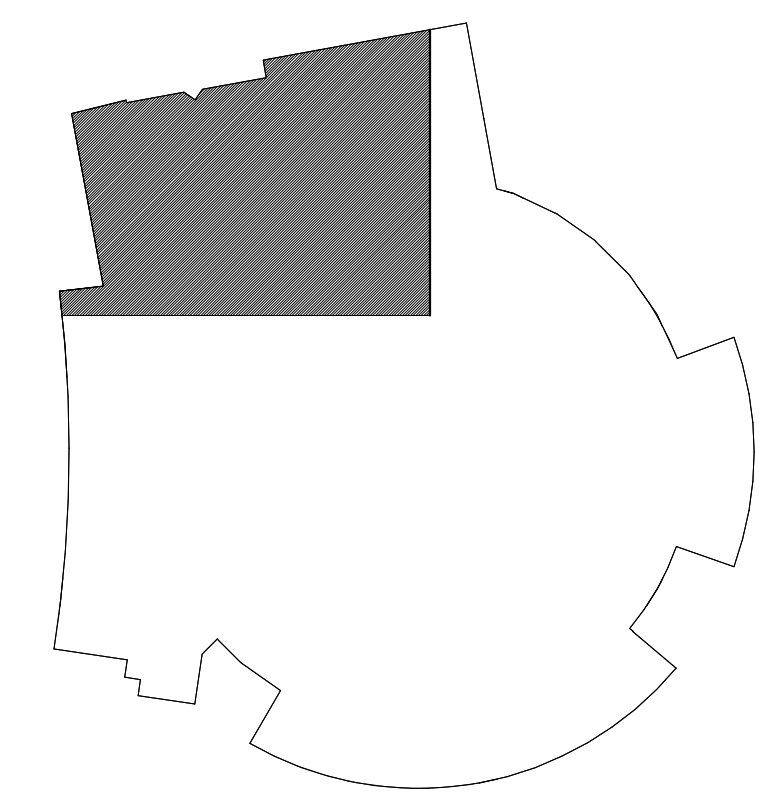
PPA#23-0928
AE#2024-02-04D

MMI PROJ #: 0747.083

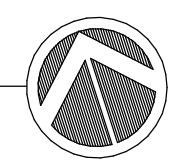
SHEET TITLE
MAIN LEVEL - NORTH
POWER

SHEET
E1.1

DATE
01/29/2025



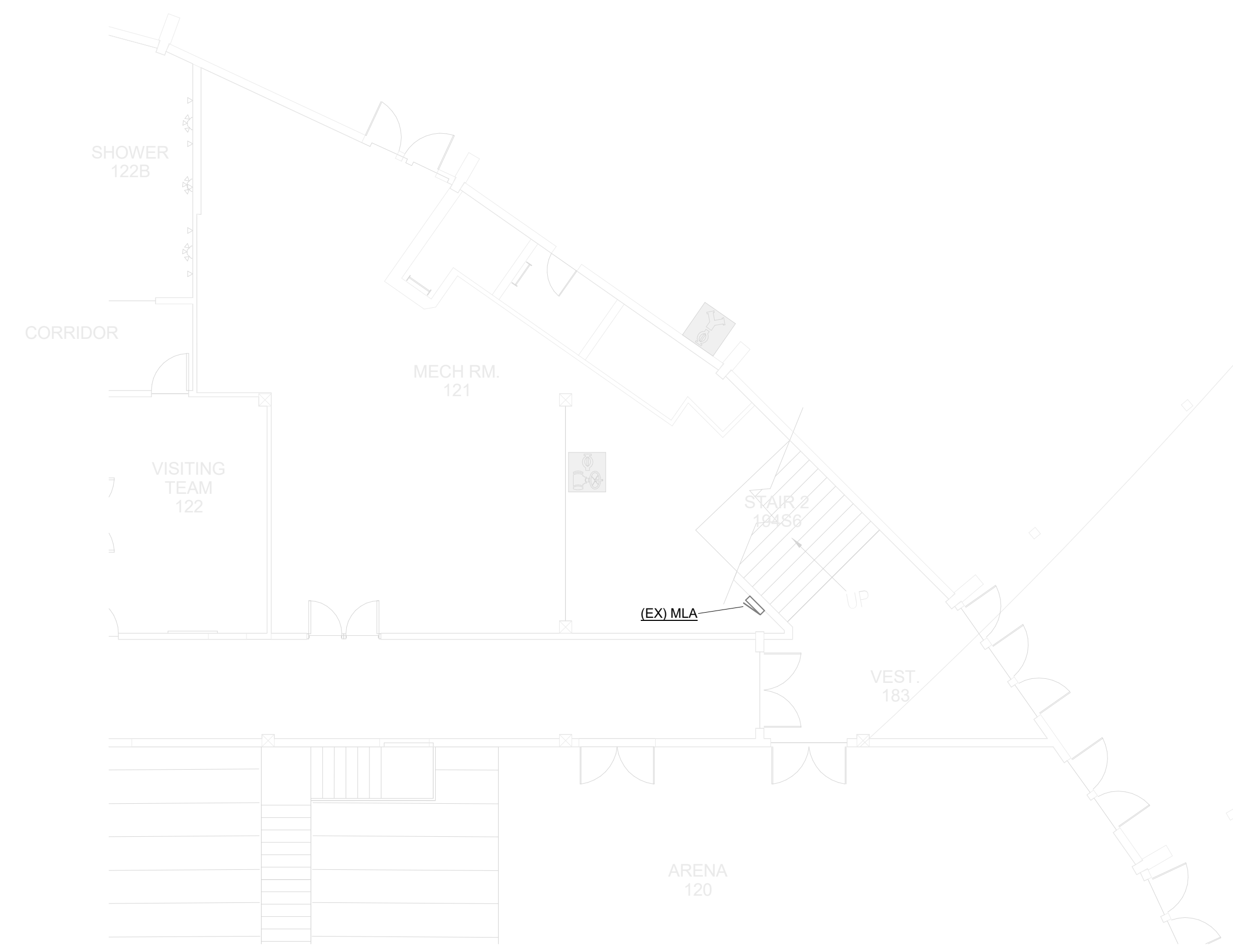
KEY PLAN
NO SCALE



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



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



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

KEY NOTES:

- 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).
- SEE E5.0 FOR RISER DIAGRAM AND PANEL SCHEDULE.
- EACH AMPLIFIER CABINET CONTAINS 4 POWER SUPPLIES. PROVIDE CONNECTION TO ALL POWER SUPPLIES IN CABINET WITH NOTED CIRCUIT.

**POWER PLAN
GENERAL NOTES**

- 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.
- 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.



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

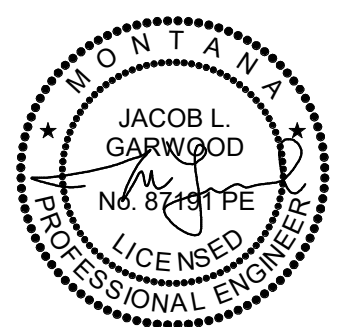
MONTANA STATE UNIVERSITY
BOZEMAN



100% SHOP DRAWING FOR PERMIT/CONSTRUCTION

DRAWN BY: **PMH**
REVIEWED BY: **JLG**

REV.	DESCRIPTION	DATE



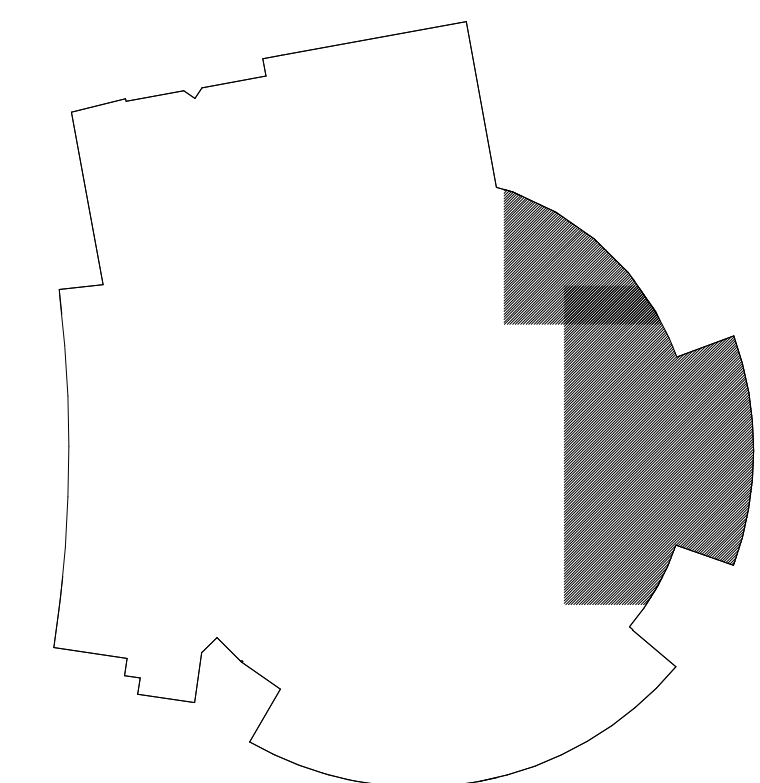
PPA#23-0928
AE#2024-02-04D

MMI PROJ #: 0747.083

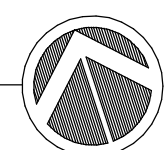
SHEET TITLE
MAIN LEVEL - NORTH
EAST POWER

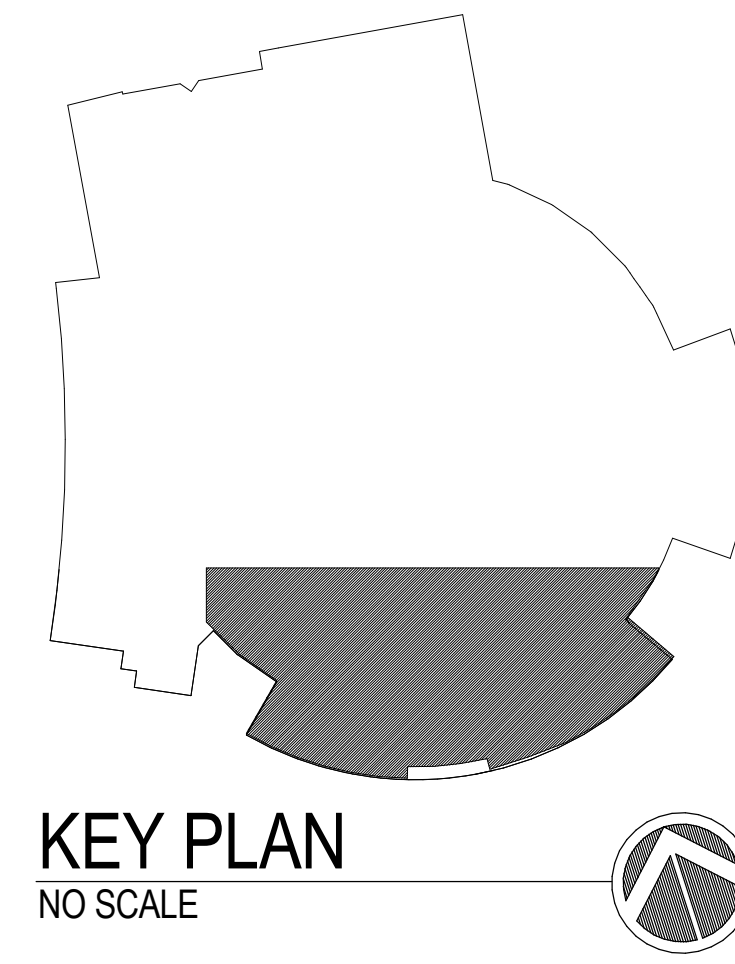
SHEET
E1.2

DATE
01/29/2025



KEY PLAN
NO SCALE





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.



1 **MAIN LEVEL - SOUTH POWER**
1/8" = 1'-0"

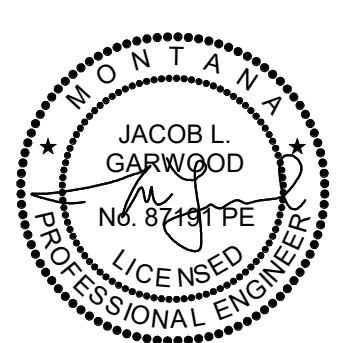


100% SHOP DRAWING FOR PERMIT/CONSTRUCTION
**(BRICK BREEDEN) FIELDHOUSE
FIRE ALARM REPLACEMENT**
MONTANA STATE UNIVERSITY
BOZEMAN



DRAWN BY: **PMH**
REVIEWED BY: **JLG**

REV.	DESCRIPTION	DATE



PPA#23-0928

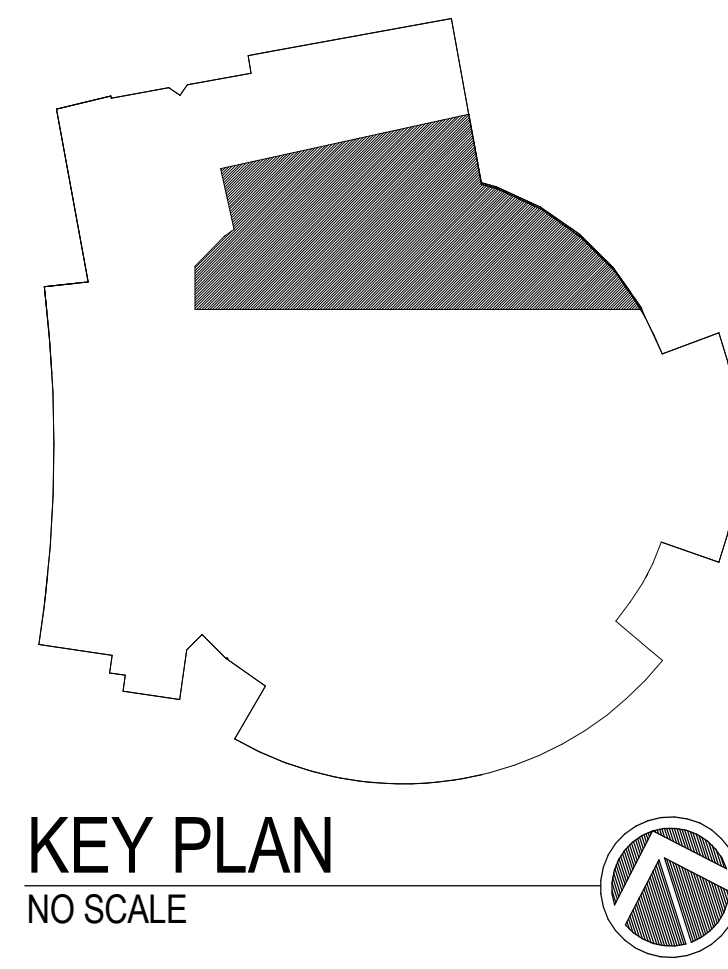
AE#2024-02-04D

MMI PROJ #: 0747.083

SHEET TITLE
MAIN LEVEL - SOUTH
POWER

SHEET
E1.4

DATE
01/29/2025



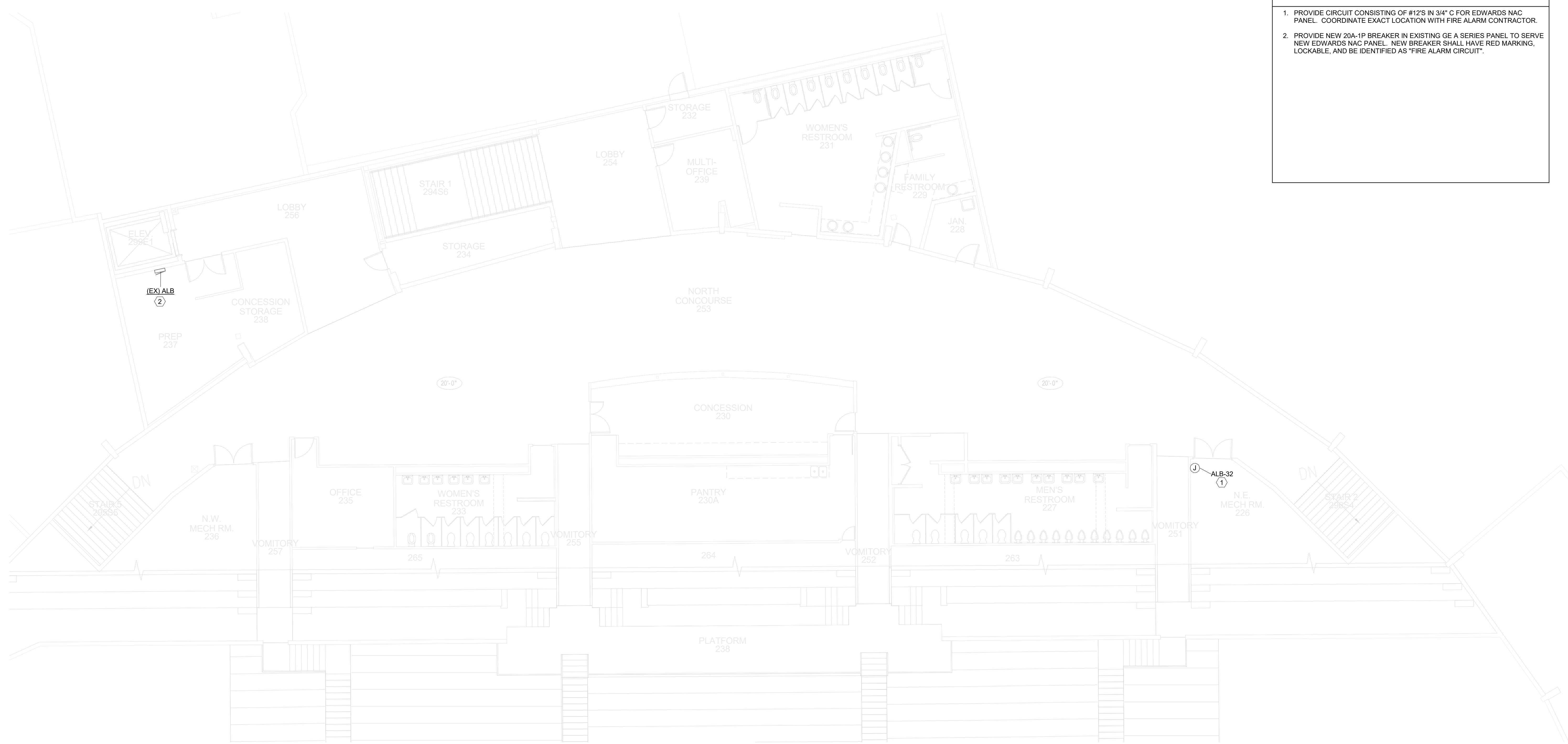
KEY PLAN
NO SCALE

**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".



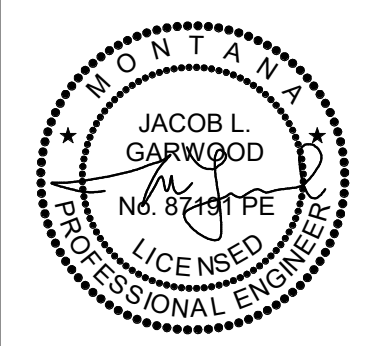
1 CONCOURSE - NORTH POWER
1/8" = 1'-0"



**(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

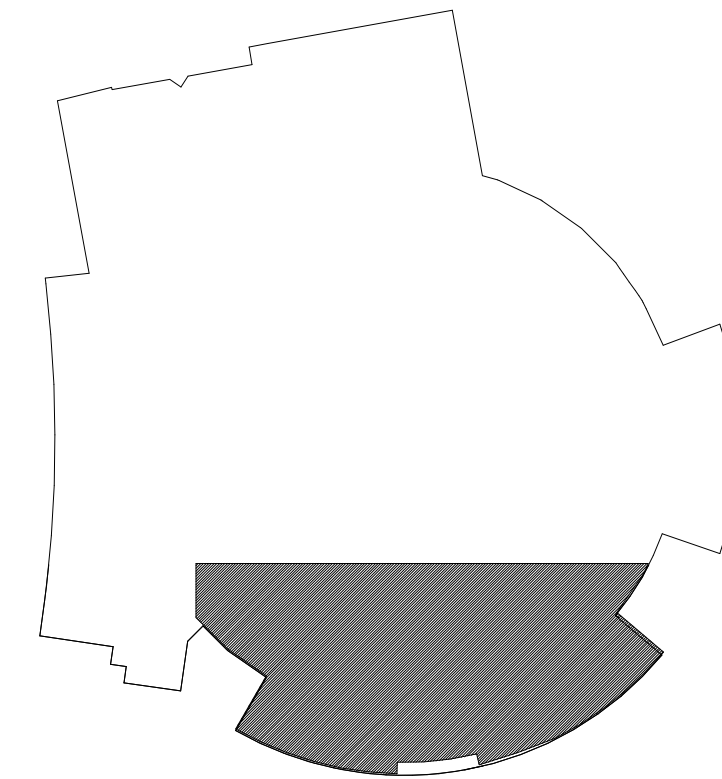
MMI PROJ #: 0747.083

SHEET TITLE
CONCOURSE - NORTH
POWER

SHEET
E2.1

DATE
01/29/2025

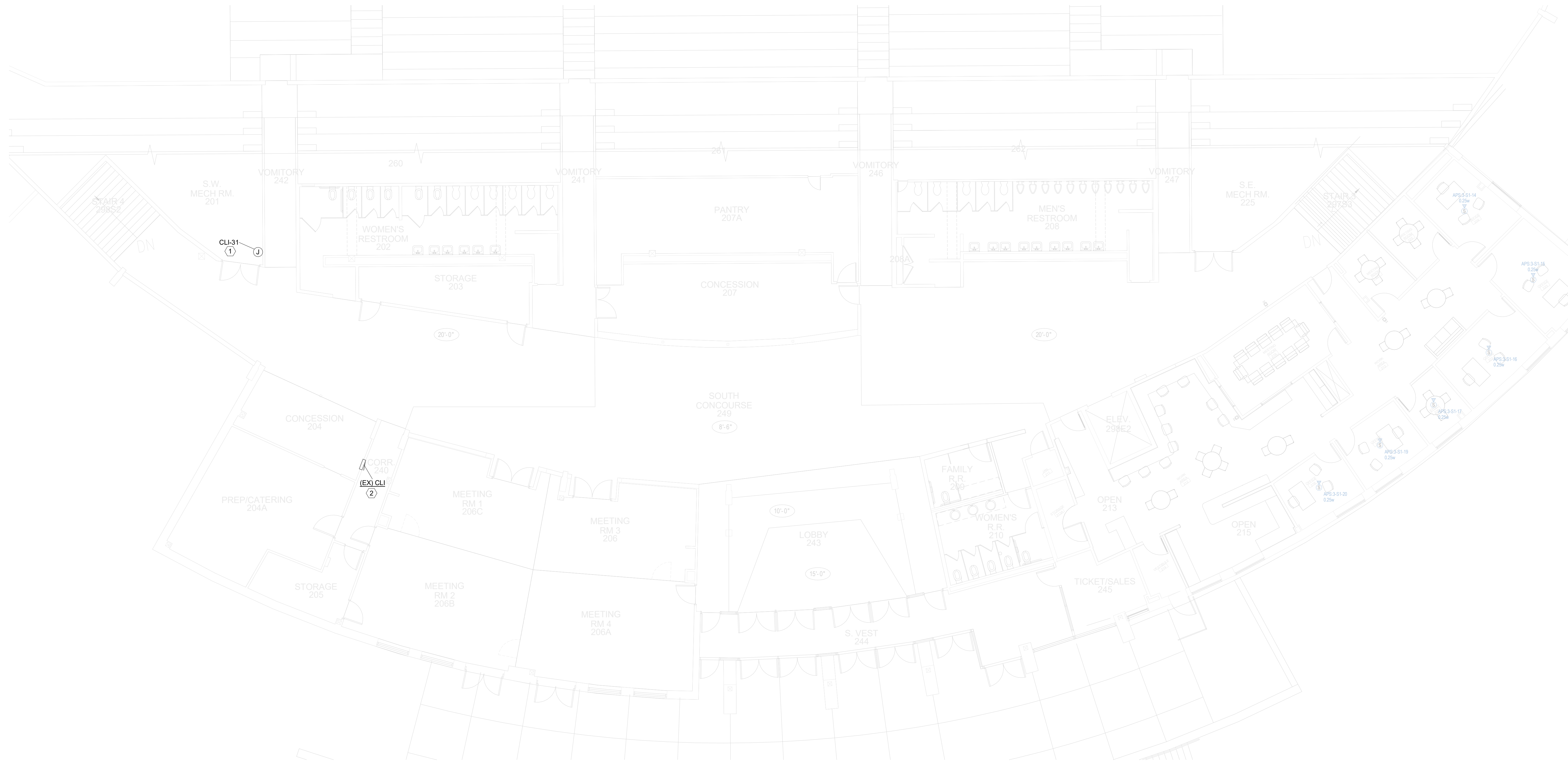
100% SHOP DRAWING FOR PERMIT/CONSTRUCTION



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.



1 CONCOURSE - NORTH POWER
1/8" = 1'-0"

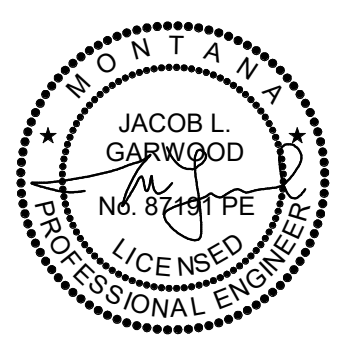


100% SHOP DRAWING FOR PERMIT/CONSTRUCTION
(BRICK BREEDEN) FIELDHOUSE
FIRE ALARM REPLACEMENT
MONTANA STATE UNIVERSITY
BOZEMAN



DRAWN BY: **PMH**
REVIEWED BY: **JLG**

REV.	DESCRIPTION	DATE



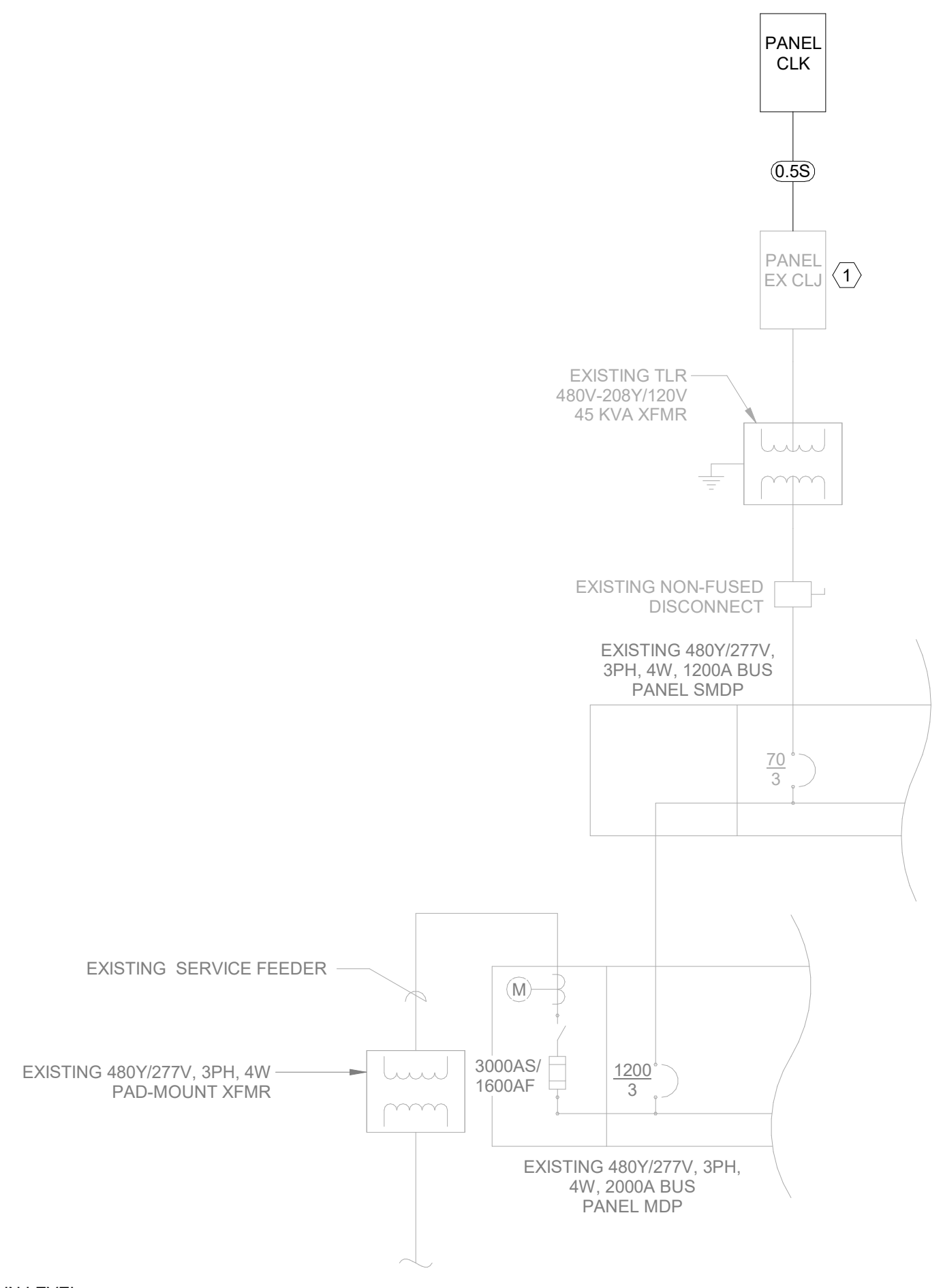
PPA#23-0928
AE#2024-02-04D

MMI PROJ #: 0747.083

SHEET TITLE
CONCOURSE - SOUTH
POWER

SHEET
E2.2

DATE
01/29/2025



FEEDER SCHEDULE - COPPER

SCHEDULE IS BASED ON 75 DEGREE C. COPPER CONDUCTORS IN NEC 310.16 TABLE.

FEEDER NUMBER	AMPS	WIRE QTY PER CONDUIT	SETS IN PARALLEL	75 DEG COPPER			
				CONDUIT	PHASE QTY AND AWG	NEUTRAL AWG	GROUND AWG
0.5S	50	3W	1	1"	2#8	1#8	1#10

KEY NOTES:

1. SEE SHEET E1.4 FOR EXISTING PANEL CLJ LOCATION. PROVIDE NEW 50A, 2-POLE BREAKER TO FEED NEW PANELBOARD. EXISTING PANEL CLJ IS A EATON PRL1X.

1 ONE LINE DIAGRAM
N.T.S.

Branch Panel: CLK											
Location: Storage 120B				Volts: 120/208 Single				A.F.C.: 10,000			
Supply From: CLJ				Phases: 1				Mains Type: MLO			
Mounting: Surface				Wires: 3				Mains Rating: 100 A			
Enclosure: Type 1											
Notes:											
CKT	Circuit Description	Load Classification	Trip	Poles	B	C	Poles	Trip	Load Classification	Circuit Description	CKT
1	FA CU	Power	20 A	1	360	0	1	20 A	--	SPARE	2
3	FA NAC	Power	20 A	1		580	0	1	20 A	--	SPARE
5	FA AMP	Power	20 A	1	768	0	1	20 A	--	SPARE	4
7	FA AMP	Power	20 A	1		768	0	1	20 A	--	SPARE
9	SPARE	--	20 A	1	0	0	1	20 A	--	SPARE	6
11	SPARE	--	20 A	1		0	0	1	20 A	--	SPARE
13	SPARE	--	20 A	1	0	0	1	20 A	--	SPARE	8
15	SPARE	--	20 A	1		0	0	1	20 A	--	SPARE
17	SPARE	--	20 A	1	0	0	1	20 A	--	SPARE	10
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.											

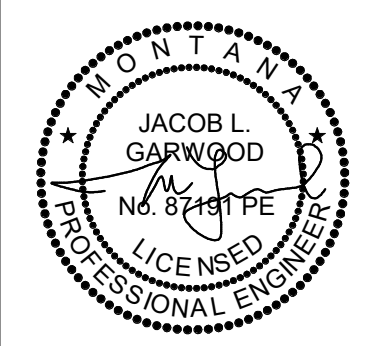


**(BRICK BREEDEN) FIELDHOUSE
FIRE ALARM REPLACEMENT**

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 DETAILS

SHEET
E5.0

DATE
01/29/2025

100% SHOP DRAWING FOR PERMIT/CONSTRUCTION