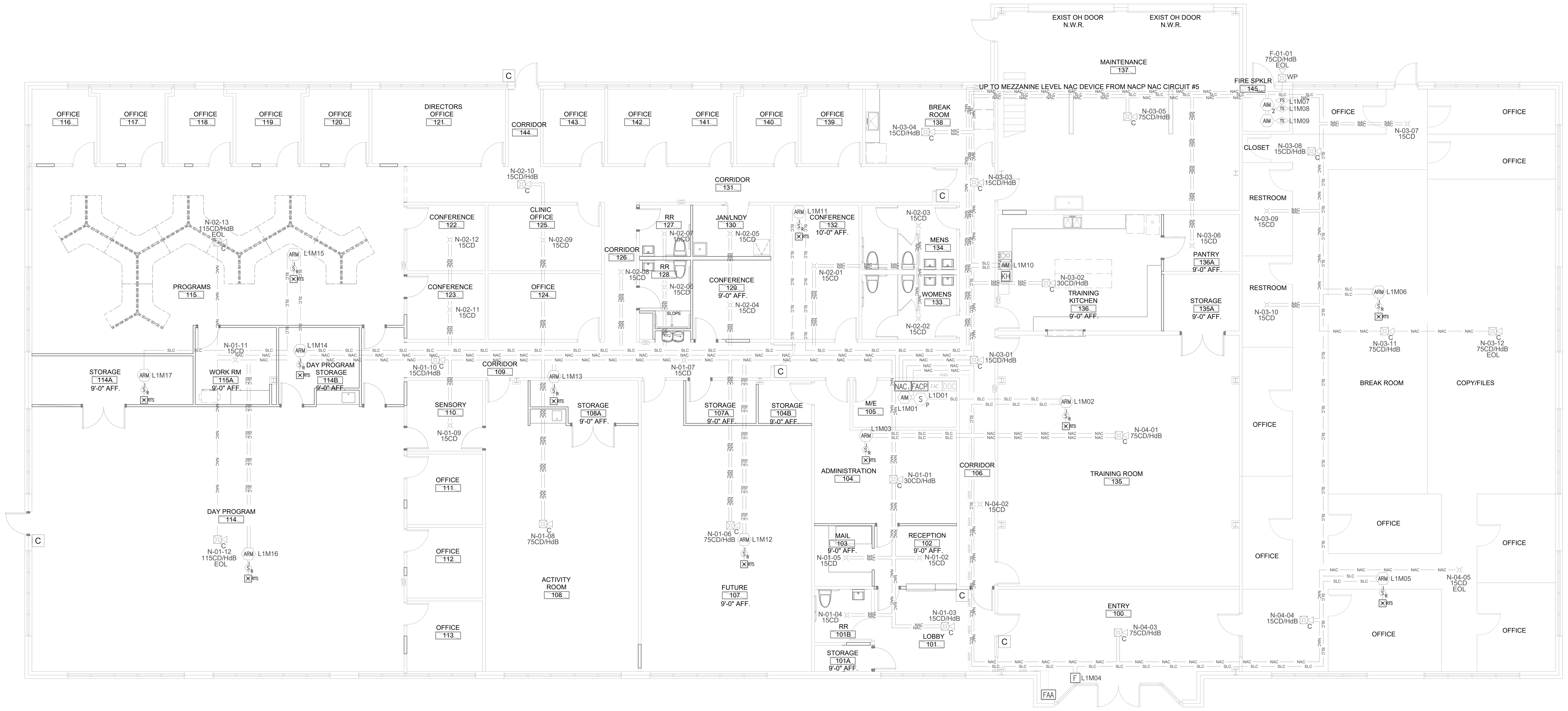
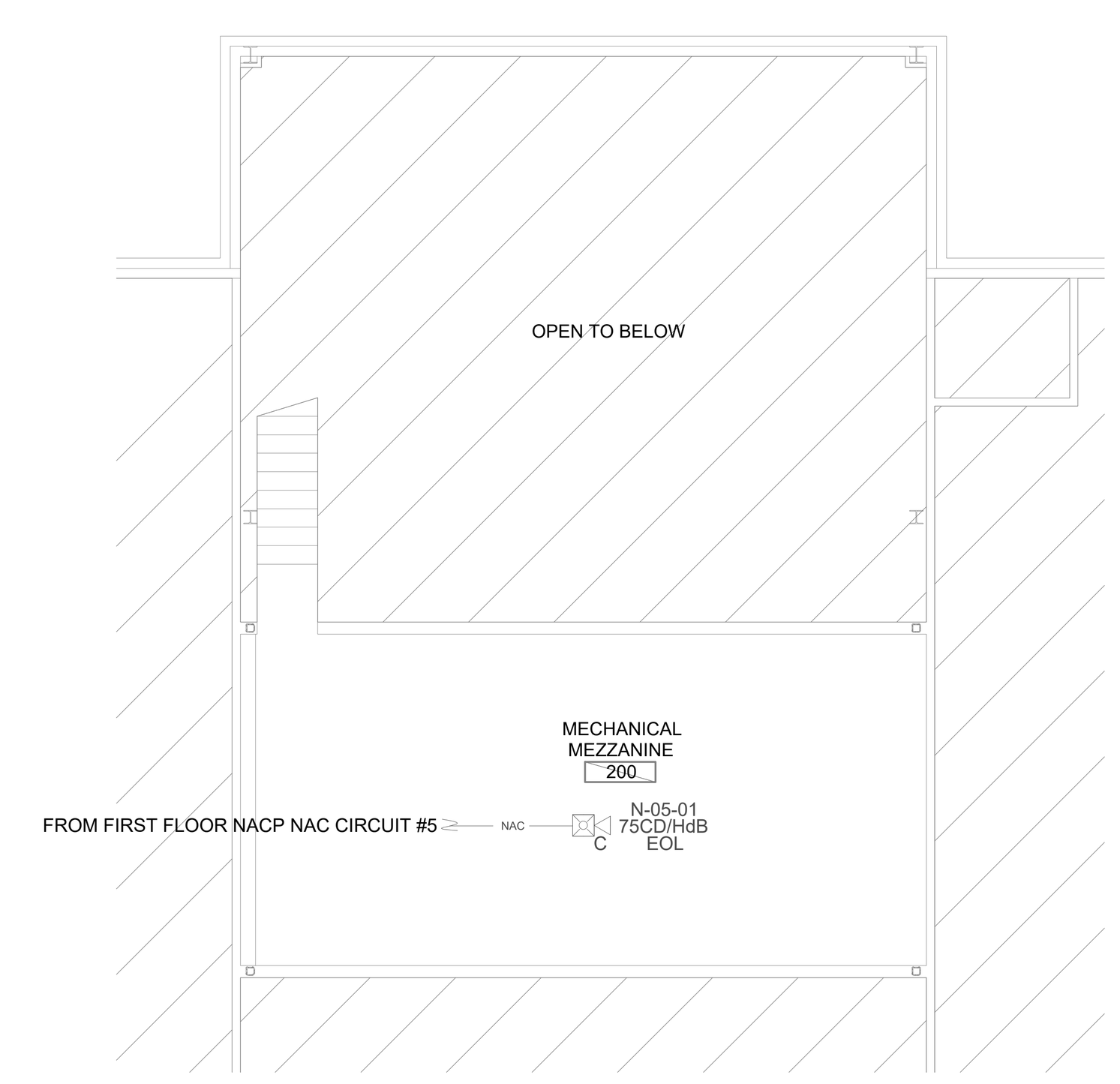


FIRST FLOOR FIRE ALARM SYSTEM PLAN

Scale: 1/8" = 1'.0"

CODE INFORMATION

OCCUPANCY CLASS	B - BUISNESS
OCCUPANCY LOAD	144 OCCUPANTS
CONSTRUCTION TYPE	II-B
CODE SUMMARY	IBC-2018, IPC-2018, IMC-2018, NEC-2017, IFC-2018, NFPA72-219,
SPRINKLER	FULLY SPRINKLED
SCOPE OF WORK	INSTALLATION OF A NEW FIRE ALARM SYSTEM WITH OCCUPANT NOTIFICATION.
NUMBER OF FLOORS	1 FLOOR WITH MEZZANINE
FIRST FLR AREA (SQ. FT.)	18,043 SQ. FT.
MEZZANINE FLR AREA (SQ. FT.)	583 SQ. FT.
TOTAL BUILDING AREA (SQ. FT.)	11,213 SQ. FT.



MECHANICAL MEZZANINE FLOOR FIRE ALARM SYSTEM PLAN

Scale: 1/8" = 1'.0"

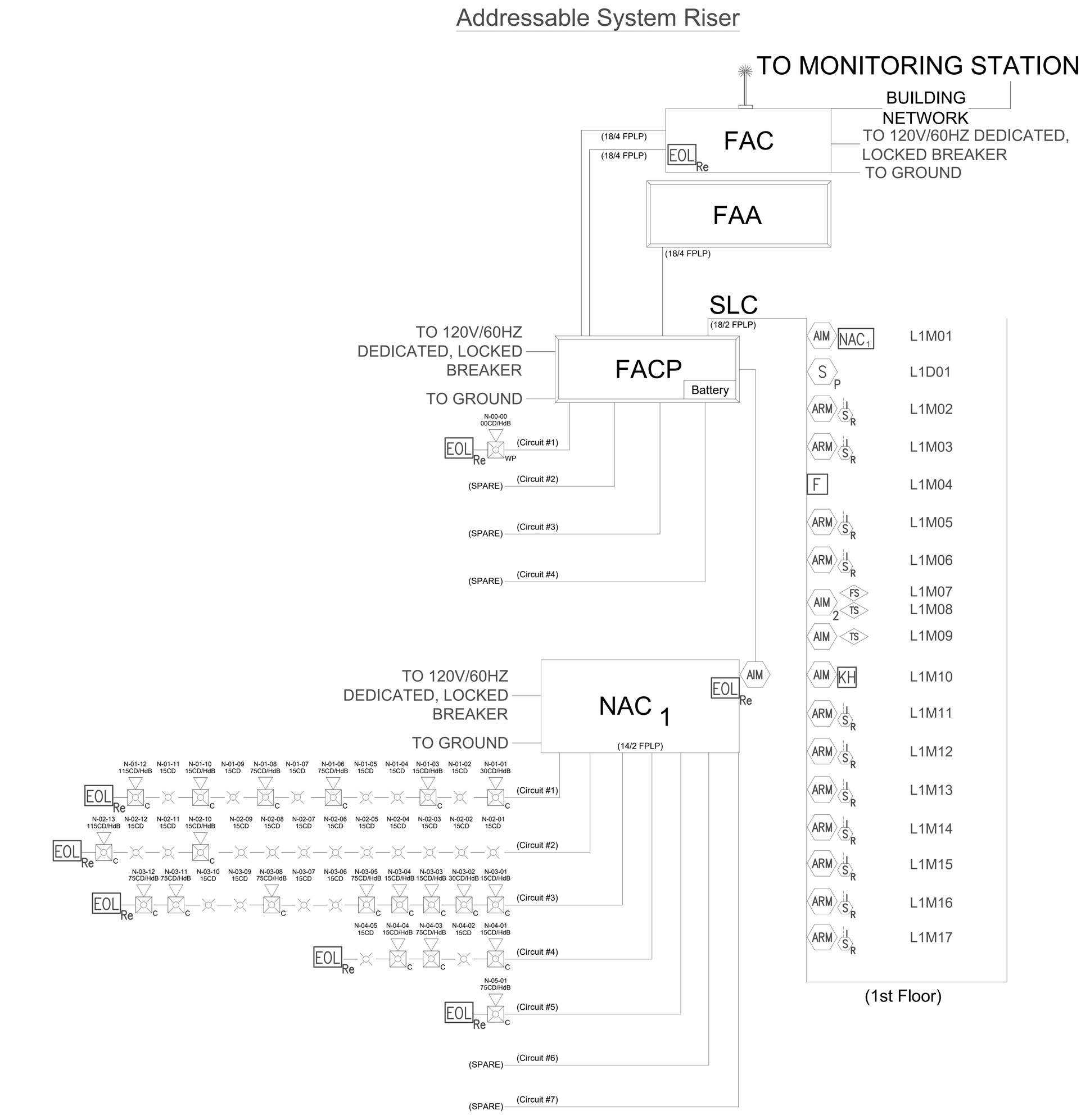
Fire Alarm Device Legend

Symbol	Qty	Description	Manufacturer/Part Number	Mounting Requirements
FACP	01	Fire Alarm Control Panel	SILENT KNIGHT 6808	Surface mounted enclosure provided Top 72" AFF conduit to ceiling
FAC	01	Commercial Fire Alarm Communicator	Honeywell HWF2-COM	Surface mounted enclosure provided Within 3' of FACP
FAA	01	Fire Alarm Annunciator Alpha Keypad	SILENT KNIGHT 6860	Single or double Gang, 4" square box 60" AFF conduit to ceiling
NAC	01	Notification Power Supply	SILENT KNIGHT HPF-PS10	Surface mounted enclosure provided Top 72" AFF conduit to ceiling
S P	01	Smoke Detector Photo Electric	SILENT KNIGHT SK-PHOTO-W	Single Gang, 4" Octagon or Square in the ceiling
F	01	Manual Pull Station	SILENT KNIGHT SK-PULL-DA	Single Gang, 4" Octagon or Square Wall Mounted 48" L of Backbox
AIM	03	Monitor Module	SILENT KNIGHT SK-MONITOR	Surface mounted enclosure provided Within 3' of Device
AIM 2	01	Dual Monitor Module	SILENT KNIGHT SK-MONITOR-2	Surface mounted enclosure provided Within 3' of Device
ARM	11	Relay Module	SILENT KNIGHT SK-RELAY	Surface mounted enclosure provided Within 3' of Device
FS	01	Water Flow Switch	Supplied by Sprinkler Contractor	Connection Only
TS	01	Sprinkler Valve Tamper Switch	Supplied by Sprinkler Contractor	Connection Only
S R	11	Duct Smoke Detector Photo Electric - Return	SILENT KNIGHT SK-PHOTO-R-W	Duct Mounted
RTS	11	Remote indicator Test/Reset	SYSTEM SENSOR RTS151KEY	Wall or Column Mtd. 60" AFF or below the Ceiling of the connected device.
KH	01	Kitchen Hood / Ansul	Provide By Mechanical Contractor	Connection Only
C	20	Horn/Strobe, Ceiling Candela Indicated	SYSTEM SENSOR PC2WLED	Ceiling Mount, Not Higher than 30' AFF 4" Octagon or Square
	23	ADA/Strobe Candela Indicated	SYSTEM SENSOR SCWLED	Ceiling Mount, Not Higher than 30' AFF 4" Octagon or Square
WP	01	Horn/Strobe, Wall, Weather Proof Candela Indicated	SYSTEM SENSOR P2RK	Mount above the FDC, locate on site 4" Weather Proof Back Box
DOC	01	Document Cabinet Required per NFPA 72	Space Age Electronics FDB-ACE-11	Surface mounted enclosure provided Top 72" AFF

Fire Alarm Wire Legend

Wire Designations	Wire Types
SLC SLC SLC	Signal Line Circuit - 18/2 FPLP
NAC NAC NAC	Notifcation Appliance Circuit - 14/2 FPLP
ANN ANN ANN	Annunciator Circuit - 18/4 FPLP
RTS RTS RTS	Remote Test Switch Circuit - 18/4 FPLP

Addressable System Riser



Standby Battery Calculations
SILENT KNIGHT
6808

ARC of the Ozarks,
500 NE Colbern Road
Lee's Summit, MO 64086

Part Number	Description	Quantity	Standby Per Device	Current All Devices	Alarm Per Device	Current All Devices
6808	Addressable Fire Alarm Control Panel	1	0.190000	0.190000	0.250000	0.250000
6860	Remote Annunciator	1	0.025000	0.025000	0.050000	0.050000
SK-PHOTO-W	Photoelectric Smoke Detector, White	1	0.000200	0.000200	0.004500	0.004500
SK-PULL-DA	Addressable Dual Pull Station	1	0.000350	0.000350	0.000350	0.000350
SK-MONITOR	Addressable Monitor Module	3	0.000400	0.001200	0.005500	0.016500
SK-MONITOR-2	Dual Input Monitor Module	1	0.000750	0.000750	0.000750	0.000750
SK-RELAY	Relay Module	11	0.000255	0.002805	0.000255	0.002805
SK-PHOTO-R-W	Photoelectric Detector W/ remote Test Capability, use W	11	0.000000	0.000000	0.000000	0.000000
				0.000000		0.000000
				0.000000		0.000000
TAC-IDC	Total Alarm Current Max IDC		0.000000	0.000000	0.040000	0.000000
TAC-SLC	Total Alarm Current Max SLC		0.000000	0.000000	0.400000	0.000000
			Standby	0.220	Alarm	0.325
Total Aux current	Maximum Amps:	2.0000				

Signal Circuits

Circuit	Device	Quantity	Alarm Per Device	Current All Devices
Circuit 1	P2RK (75cd)	1	0.168	0.168
				0.000
				0.000
				0.000
				0.000
				0.000
Total 1	Maximum Amps:	2.5000		0.168
Circuit 2				0.000
				0.000
				0.000
				0.000
				0.000
				0.000
Total 2	Maximum Amps:	2.5000		0.000
Circuit 3				0.000
				0.000
				0.000
				0.000
				0.000
				0.000
Total 3	Maximum Amps:	2.5000		0.000
Circuit 4				0.000
				0.000
				0.000
				0.000
				0.000
				0.000
Total 4	Maximum Amps:	2.5000		0.000
			Notification Circuits Alarm	0.168
Totals	Maximum Amps:	6	Total Alarm Amp	0.493

		Circuit 1	Circuit 2	Circuit 3	Circuit 4
Max Wire Run Distance For AWG	14	3732			
Actual Wire run Distance		150			
Voltage Drop for 14 AWG wire		0.161			

Voltage Drop = 2 * Wire Run Distance * 3.07 Ohms Per 1000 ft 14 AWG * Total Current for Circuit / 1000

Standby Hours	24
Standby Battery Draw	0.220
Standby Amp Hrs	5.287

Alarm Minutes	5
Alarm Current	0.818
Alarm Current by Minutes	0.068

Battery Size Required with Alarm Time Minutes and 25% Reserve	6.694
Batteries Size Supplied	7 Amp Hours

Current Draws for Fire Communicator
HWF2-COM

Device	Device Standby Current	Device Alarm Current	Quantity	Total Standby Draw	Total Alarm Draw
HWF2-COM	0.23	0.95	1	0.23	0.95
				0	0
				0	0
				0	0
				0	0

Wire Size	Alarm Min
18	15

Total Battery Calculation Standby:	5.520
Alarm Current Min:	0.237
Standby Hours	24
Alarm Current:	0.950
Battery size Required:	6.908
Batteries Supplied (AH):	7

Voltage drop Calculations & Current Draws for NACP #1
HPF-PS10

		Circuit #1		Circuit #2		Circuit #3		Circuit #4		Circuit #5		Circuit #6		Circuit #7	
Device	Current Draw	Quantity	Total Current	Quantity	Total Current	Quantity	Total Current	Quantity	Total Current	Quantity	Total Current	Quantity	Total Current	Quantity	Total Current
PC2WLED (115cd)	0.120	1	0.12	1	0.12		0		0		0		0		0
PC2WLED (75cd)	0.087	2	0.174		0	3	0.261	2	0.174	1	0.087		0		0
PC2WLED (30cd)	0.038	1	0.038		0	1	0.038		0		0		0		0
PC2WLED (15cd)	0.035	2	0.07	1	0.035	4	0.14	1	0.035		0		0		0
			0		0		0		0		0		0		0
SCWLED (15cd)	0.018	6	0.108	11	0.198	4	0.072	2	0.036		0		0		0
			0		0		0		0		0		0		0
P2RK (75cd)	0.168		0		0		0		0		0		0		0
			0		0		0		0		0		0		0
			0		0		0		0		0		0		0
			0		0		0		0		0		0		0
			0		0		0		0		0		0		0
Current for Circuit			0.51		0.353		0.511		0.245		0.087		0		0
Wire Length Ft for Circuit			450		450		400		250		150				
Max Wire Run Distance For AWG			1229		1776		1227		2559		7206				
Actual Voltage Drop For Circuit			1.464		1.013		1.304		0.391		0.083				
MAX Volt Drop for Circuit			4.400		4.400		4.400		4.400		4.400		4.400		4.400

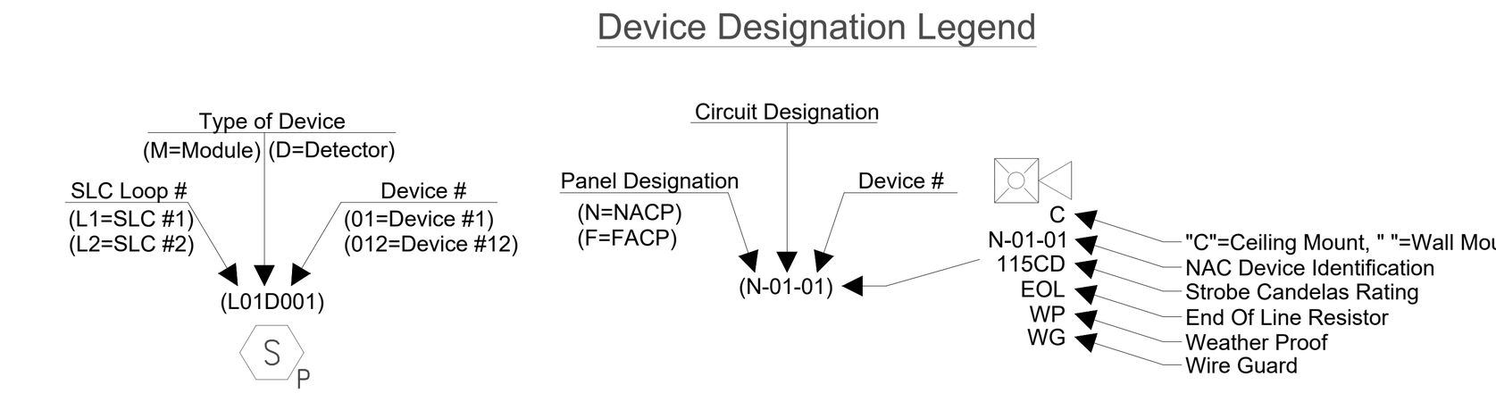
Device	Device Standby Current	Device Alarm Current	Quantity	Total Standby Draw	Total Alarm Draw	Max Circuit Amps	Wire Size	Alarm Min	Max Panel Amps
HPF-PS10	0.178	0.232	1	0.178	0.232	3	14	5	10
				0	0				
				0	0				
				0	0				
				0	0				

Power Supply Min Voltage	20.400
Device Min Operating Voltage	16.000
Total Battery Calculation Standby:	4.272
Alarm Current Min:	0.161
Standby Hours	24
Alarm Current:	1.938
Battery size Required:	5.541
Batteries Supplied (AH):	7

FIRE ALARM MATRIX WITH OCCUPANT NOTIFICATION

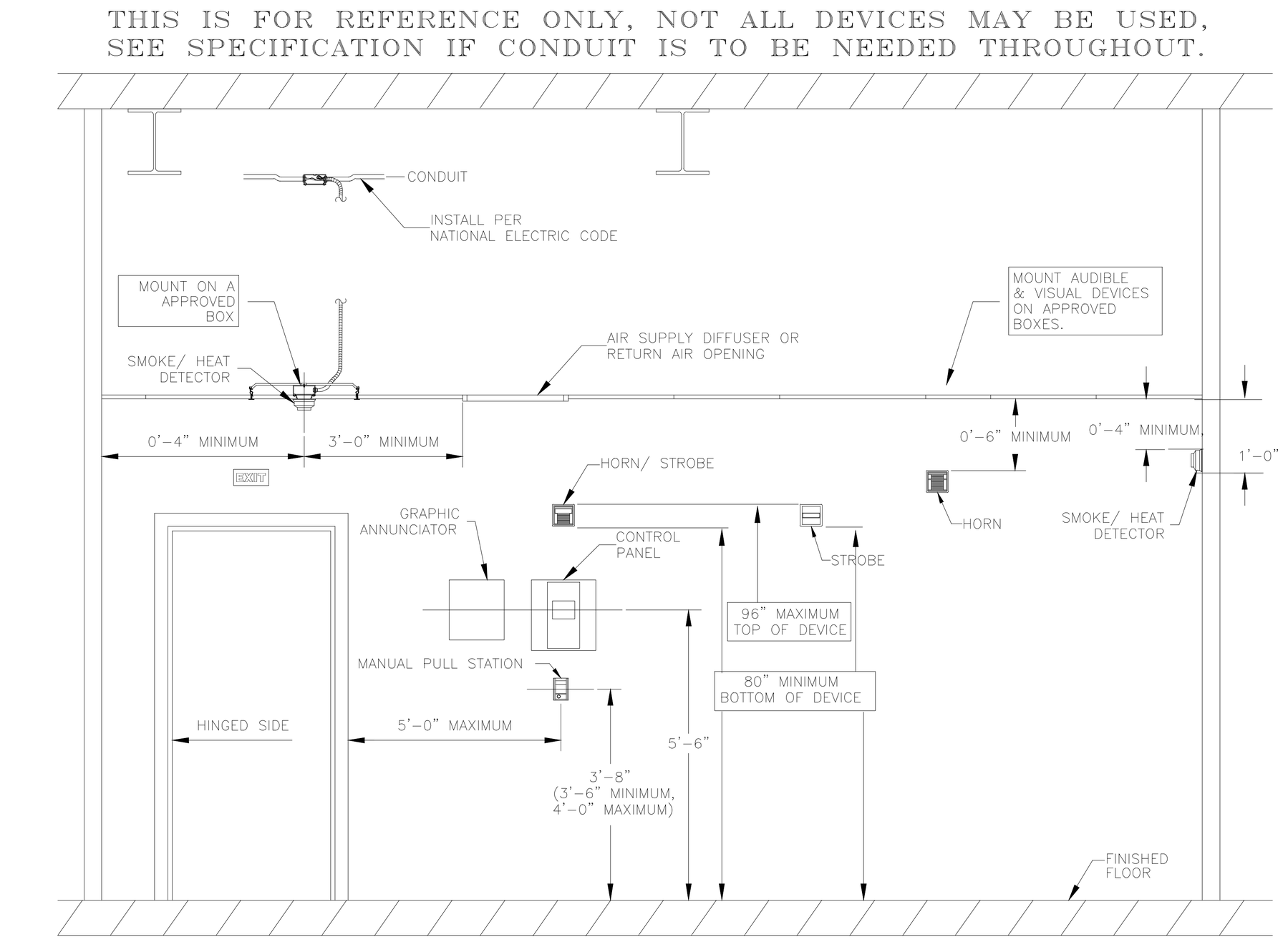
	ANNUNCIATES ALARM SIGNAL AT CONTROL PANEL AND REMOTE ANNUNCIATOR	ANNUNCIATES SUPERVISORY SIGNAL AT CONTROL PANEL AND REMOTE ANNUNCIATOR	ANNUNCIATES TROUBLE SIGNAL AT CONTROL PANEL AND REMOTE ANNUNCIATOR	TRANSMITS ALARM SIGNAL TO CENTRAL STATION	TRANSMITS SUPERVISORY SIGNAL TO CENTRAL STATION	TRANSMITS TROUBLE SIGNAL TO CENTRAL STATION	ACTIVATES INTERIOR HORN/STROBES	ACTIVATES EXTERIOR HORN/STROBE/BELL ABOVE FDC	SHUTDOWN RTU
SPRINKLER SYSTEM									
- WATERFLOW SWITCH	●			●			●	●	
- VALVE TAMPER SWITCH		●			●				
SMOKE DETECTOR	●			●			●		
MANUAL PULL STATION	●			●			●		
DUCT DETECTOR		●			●				●
ANSUL SYSTEM	●			●			●		
POWER SUPPLY - TROUBLE			●			●			
COMMUNICATOR - COMMUNICATION FAIL			●						
COMMUNICATOR - TROUBLE			●			●			
ABNORMAL CONTROL, CIRCUIT OR DEVICE			●			●			
LOSS OF POWER			●			●			

Device Designation Legend



NFPA 72 AND ADA DEVICE INSTALLATION REQUIREMENTS

THIS IS FOR REFERENCE ONLY, NOT ALL DEVICES MAY BE USED, SEE SPECIFICATION IF CONDUIT IS TO BE NEEDED THROUGHOUT.



PLAN TYPE:

FIRE ALARM SYSTEM DEVICE LOCATIONS

BC ENGINEERS INCORPORATED
5720 Reeder Shawnee, Ks. 66203 (913)262-1772

ARCHWAY SYSTEMS
17020 E. 40 Hwy. Ste 1
Independence, MO 64055
Office: (816) 709-3358

FEDERAL PROTECTION
2500 N AIRPORT COMMERCE AVE.
SPRINGFIELD, MO 65803
800-299-5400

ARC OF THE OZARKS
500 NE COLBERN RD.
LEE'S SUMMIT, MO 64086

4/16/2024

STATE OF MISSOURI DARIN T. SEIDEL NUMBER PE-2009030047 REGISTERED PROFESSIONAL ENGINEER

NO	REVISION	DATE

DATE: 04/16/2024

LAYOUT BY:
DANIEL HEBBLETHWAITE, ET
NICET #107102

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

MISSOURI PE COA #2009003629