



IPA-60
Battery & Voltage Drop
Calculations

Project Name: Lakewood Business Center
Standby Hours: 24
Alarm Mins: 5
Efficiency Factor: 20%
SIC Type: Class B
NAC Source Voltage: 24

Model #: IPA-60
Panel ID: _____
Location: Sprinkler Room
Max Panel Current (amps): 1
User assumes all responsibility to ensure the quantities and current draw values in this worksheet are accurate prior to submit.

Qty	Addressable Fire Panel Part #	Description	Standby (amps) Each	Total	Alarm (amps) Each	Total
1	IPA-60	Analog Addressable FACP	0.130	0.130	0.232	0.232
Panel Standby:			0.130		Panel Alarm:	0.232

P-LINK (IS-485)						
	Standby	Alarm				
1	UD-2000 / UD-1000	DACF Card	0.016	0.016	0.023	0.023
	RA-6075/R	LCD Annunciator	0.020		0.025	
	RA-6100 (R/P)	Flash Mount LCD Annunciator	0.020		0.050	
	LED-16 (P)	Flash Mount LED Annunciator	0.025		0.025	
	LED-16 (P)*	LED Annunciator LED Power*	0.015		0.210	
	CA-6075	Class A Module	0.012		0.044	
	PSN-1000(E)	Power Expander	0.015		0.015	
	PAD100-SLCE-127	SLC Expander	0.060		0.060	
	NCHM-SLCE-127**	SLC Expander	0.060		0.060	
	IDC-6	Initiating Zone Expander	0.020		0.020	
	IDC-6	Initiating Zone Expander Power*	0.030		0.270	
	REL-5	Relay Expander	0.025		0.035	
	REL-5	Relay Expander Power*	0.010		0.155	
	DRV-50	LED Driver Module	0.025		0.025	
	DRV-50	LED Driver Module LED Power*	0.010		0.215	
	FCB-1000	Fire Communications Bridge	0.025		0.025	
	FB-1000	Fiber Interface Board	0.030		0.030	
	MC-1000	Multi-Connect Expander	0.010		0.010	
	SPG-1000	Serial Parallel Gateway	0.040		0.040	
	NCE-1000	Network Card Ethernet	0.050		0.050	
	NCF-1000	Network Card Fiber	0.095		0.095	

** REQUIRED IF USING NCHM PROTOCOL SLC DEVICES
[Maximum current draw on P-Link limited to 1 Amp] P-LINK Standby: 0.016 P-LINK Alarm: 0.023

*Only enter quantity if P-Link power is being used to power devices

SLC Devices						
	Standby	Alarm				
ARC / AIC / IPA Series - PAD100/200						
1	PAD-PD	Analog Photo Smoke	0.000300	0.000300	0.000300	0.000300
	PAD-PHD	Analog Photo Smoke/Heat	0.000300		0.000300	
	PAD-HD	Analog Fixed Temp Heat	0.000300		0.000300	
	PAD-CD	Analog Carbon Monoxide Detector	0.000300		0.000300	
	PAD-PHD	Analog Smoke/Carbon Monoxide Detector	0.000300		0.000300	
	PAD-PHD	Analog Smoke/Heat/Carbon Detector	0.000300		0.000300	
	PAD100-DRTS	Duct Remote Test Switch	0.010000		0.015000	
	PAD-DUCT	Addressable Duct Detector	0.000300		0.000300	
	PAD-DUCT*	Addressable Duct Detector w/Relay	0.000300		0.000300	
1	PAD100-PSA/PSDA	Addressable Pull Station Single/Dual Action	0.000200	0.000200	0.000200	0.000200
	PAD100-MM	Micro Input Module	0.000200		0.000200	
	PAD100-SIM	Single Input Module	0.000240		0.000240	
3	PAD100-SIM	Dual Input Module	0.000240	0.000720	0.000240	0.000720
	PAD100-RM	Relay Module	0.000240		0.000240	
	PAD100-ORM	One Relay One Input Module	0.000240		0.000240	
	PAD100-TM1	Two Relay Two Input Module	0.000240		0.000240	
	PAD100-SM*	Conventional Zone Module	0.000240		0.000240	
	PAD100-NAC*	Notification Appliance Circuit	0.000200		0.000200	
	PAD100-SM	Speaker Module	0.000200		0.000200	
	PAD100-IM	Initiator Module	0.000150		0.000150	
	PAD100-LED	LED Module	0.000240		0.000240	
	PAD100-LEDK	Addressable LED w/ Key Switch	0.000200		0.000200	
	PAD100-SB**	Addressable Sounder Base	0.000200		0.000200	
	PAD100-SB**	Addressable Low Frequency Sounder Base	0.000200		0.000200	
	PAD100-RB*	Addressable Relay Base	0.000200		0.000200	
	PAD100-IB	Addressable Isolator Base	0.000150		0.000150	
		SLC Loop Alarm LED Current	0.000000	0.000000	0.036000	0.036000
		SLC Standby:	0.001220		SLC Alarm:	0.037200

* Requires Aux Power (Configure below)
** See the installation manual for special considerations when installing IM, IB, AIB, SC devices on Class B loops.

** Requires Aux Sounder Base Power (Configure below)

NAC Circuits (See NAC Configuration below)					
Ckt	Use	Description	Standby (amps) Total	Alarm (amps) Total	
1	Notification		0.000000	0.110000	
2	Notification		0.000000	0.000000	
NAC Standby:			0.000000	NAC Alarm:	0.110000

I/O Circuits (See I/O Configuration below)					
Ckt	Use	Description	Standby (amps) Total	Alarm (amps) Total	
1			0.000000	0.000000	
2			0.000000	0.000000	
I/O Standby:			0.000000	I/O Alarm:	0.000000

Battery Calculation Summary			
	Standby (amps)	Alarm (amps)	
Panel Current:	0.130000	0.220000	
P-Link Current:	0.016000	0.023000	
SLC Device Current:	0.001220	0.037200	
NAC Circuit Current:	0.000000	0.110000	
I/O Circuit Current:	0.000000	0.000000	
Total Standby:	0.147220	Total Alarm:	0.390200
Device Addresses Used:	50	Alarm Mins:	5
Device Addresses Available:	50	AH Required:	0.04
		Efficiency Factor:	3.58
		Required Battery Amp-hours:	4.30
		Battery Amp-hours Provided:	7ah

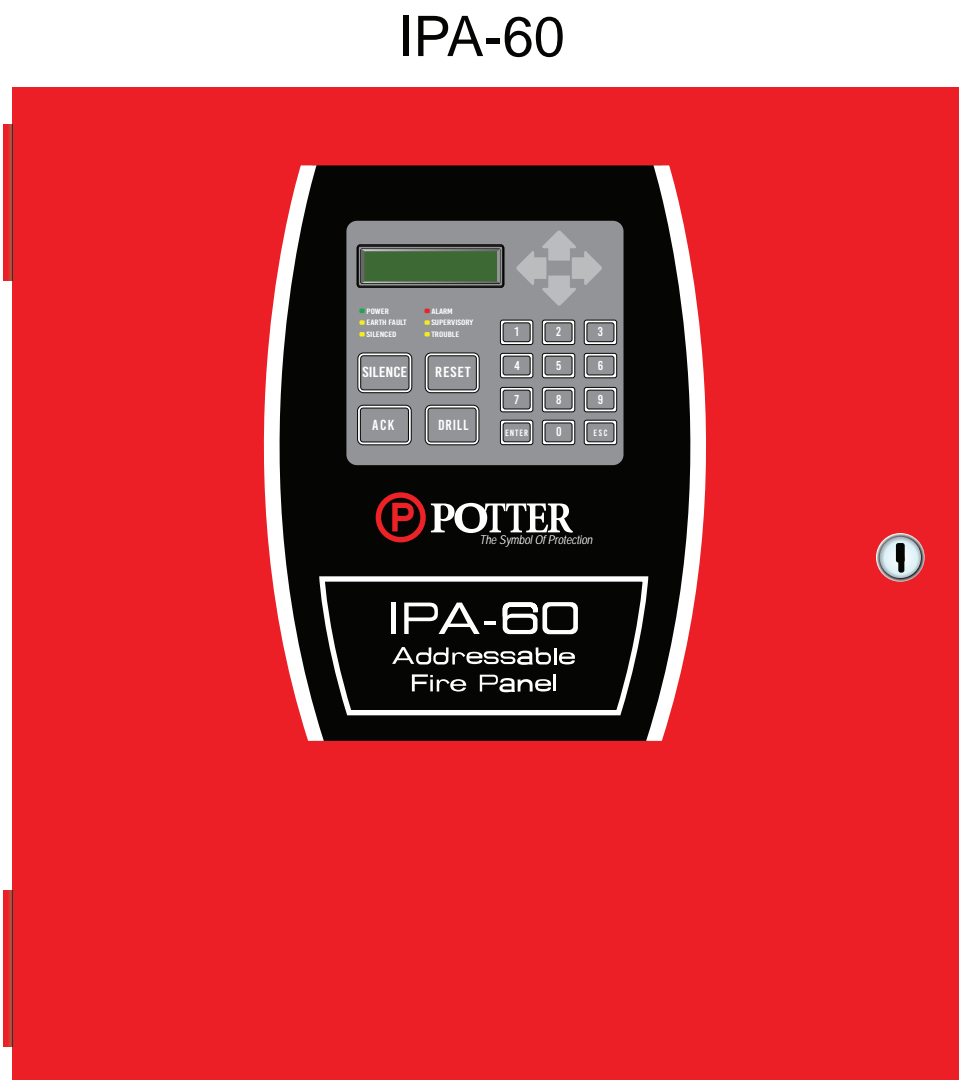
NAC Circuit Configuration & Voltage Drop

NAC1			
Usage	Notification	Description	
Wire Type	Ohm/1000ft	Length 1-Way	Actual Ohms
#18 Solid	0.157	30	0.110
Max Load (amps)	0.110	Volts @ FDL	23.98
Min. Volts Req'd			16

NAC2			
Usage	Notification	Description	
Wire Type	Ohm/1000ft	Length 1-Way	Actual Ohms
#18 Solid	0.157	30	0.110
Max Load (amps)	0.110	Volts @ FDL	23.98
Min. Volts Req'd			16

NAC1			
Qty	Lookup Type	Circuit Devices	Description
1	User Defined	System Sensor P2RL (1500d)	
Total Standby:			0.000000
Total Alarm:			0.110000

NAC2			
Qty	Lookup Type	Circuit Devices	Description
1	User Defined	System Sensor P2RK (1500d)	
Total Standby:			0.000000
Total Alarm:			0.231000



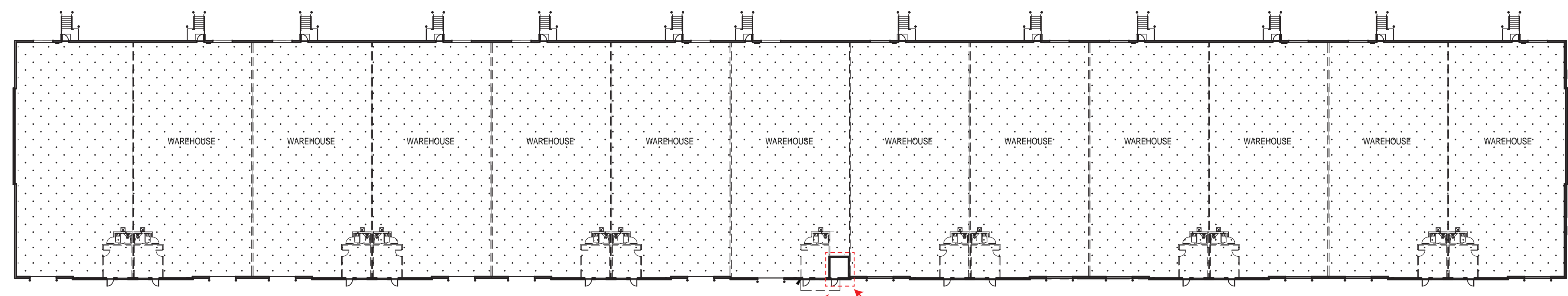
Fire Alarm General Notes

1. Wall [] [] mounted visual notification devices will be mounted so that the entire lens is not less than 80" and not greater than 96" AFF.
2. Wall signal devices [] [] can be mounted on 4"x4"x2" with or without mud ring, 4"x4"x1.5" with or without mud ring, or 1-Gang box or a low voltage ring. Ceiling signal devices can be mounted on 4"x4"x2" box or 3-1/2" octagon box.
3. Strobes shall be synchronized by floor and area.
4. All horns and horn strobes will be 15dba above ambient noise.
5. Pull stations [] will be mounted within 5' of the exit on each floor. The operable lever will not be less than 42" and not more than 48" AFF. Pull stations can be mounted on 4"x4"x2" box with or without mud ring, 4"x4"x1.5" with or without mud ring, or 1-Gang box. DO NOT USE LOW VOLTAGE RING TO MOUNT PULL STATIONS.
6. All modules will be mounted in 4"x4"x2" boxes.
7. All wiring shall be run according to code and if not in conduit it will be held high above finished ceiling and properly secured and supported.
8. All fire alarm wiring below 7 feet will be in conduit.
9. All devices will be clearly labeled.
10. All junction boxes related to fire alarm require a RED cover.
11. Open ceiling wiring shall be run in conduit if support is not available.
12. Smoke detectors will be mounted no less than 36 inches from any air diffuser.
13. General Alarm will sound when any device is in alarm.
14. Ceiling mounted detectors can be mounted on 3-1/2 in. Octagon box, 4"x4"x2" with or without mud ring, 4"x4"x1.5" with or without mud ring, or 1-Gang box. IF it is a hard ceiling a low voltage ring can be used.
15. The SLC devices [] [] will be wired together and wired back to the Fire Alarm Control Panel.
16. ALL CONDUIT STUBS WILL HAVE INSULATORS AND KNOCK OUTS WILL HAVE BUSHINGS INCLUDING WIREMOLD.

BUILDING IS 100% SPRINKLED

This system designed and installed according to NFPA 72 2018-IBC 2018 & IFC 2016 SECTION 907

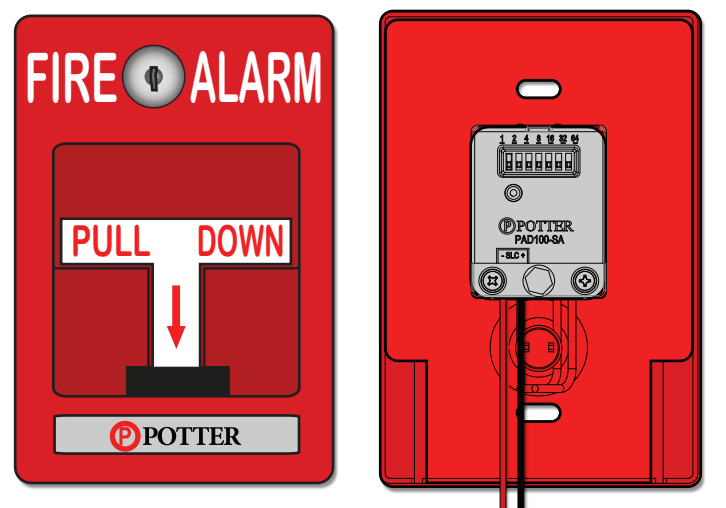
CONSTRUCTION TYPE: II-B
OCCUPANCY TYPE: S1
LEVELS: 1
TOTAL SQUARE FOOTAGE: 78,345



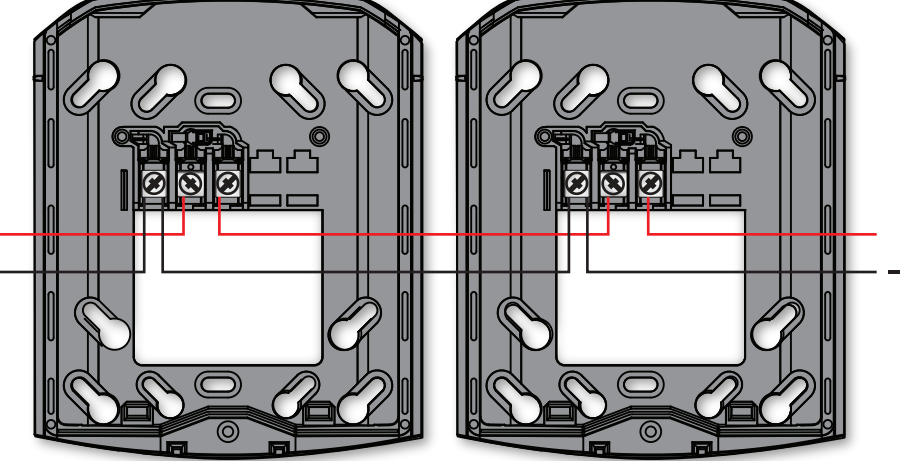
PAD 300-PD



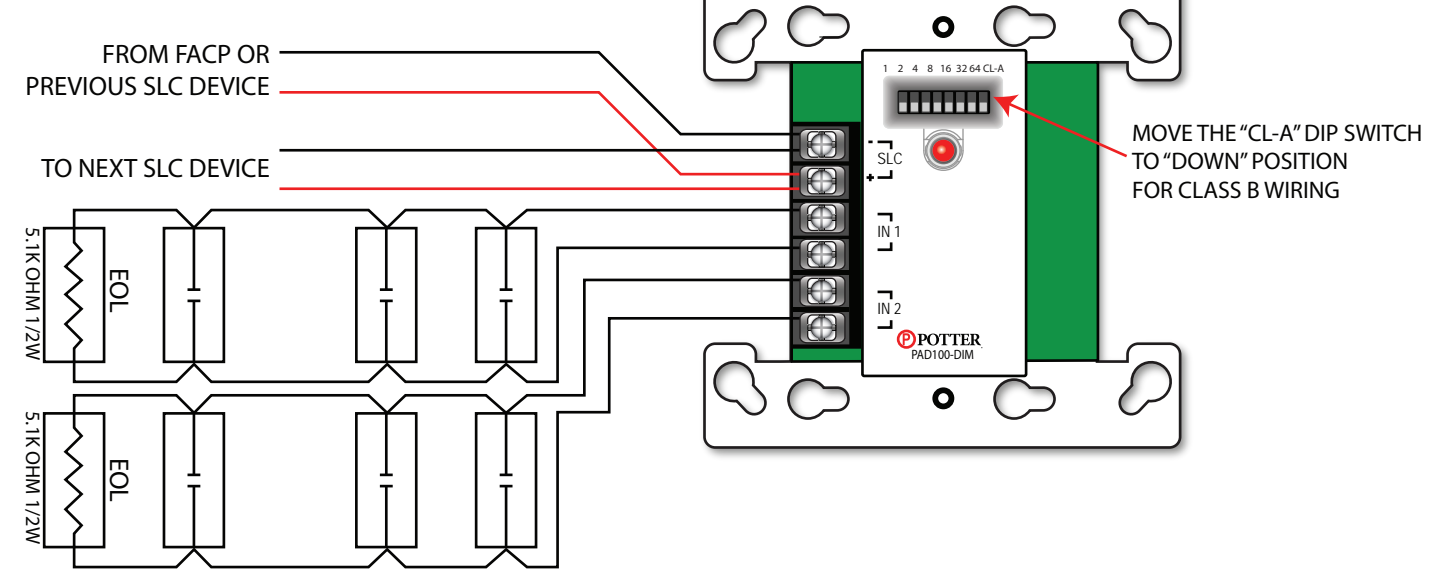
PAD 100-PSDA



SYSTEM SENSOR P2RL/SRL



PAD 100-DIM



Fire Alarm Solutions
3150 MERCIER SUITE 520
KANSAS CITY, MO 64111
816-753-4660
Description:
New fire alarm system
These drawings are the intellectual property and actual property of Fire Alarm Solutions and or Kenyco Industries, Inc. It is submitted in confidence and is not to be disclosed or used without our expressed written consent.

Date:	3/03/2025		
Job:	LAKEWOOD BUSINESS CENTER		
Drawing:	1.0	Sheet	1 of 2
Scale:	1/8inch = 1foot		

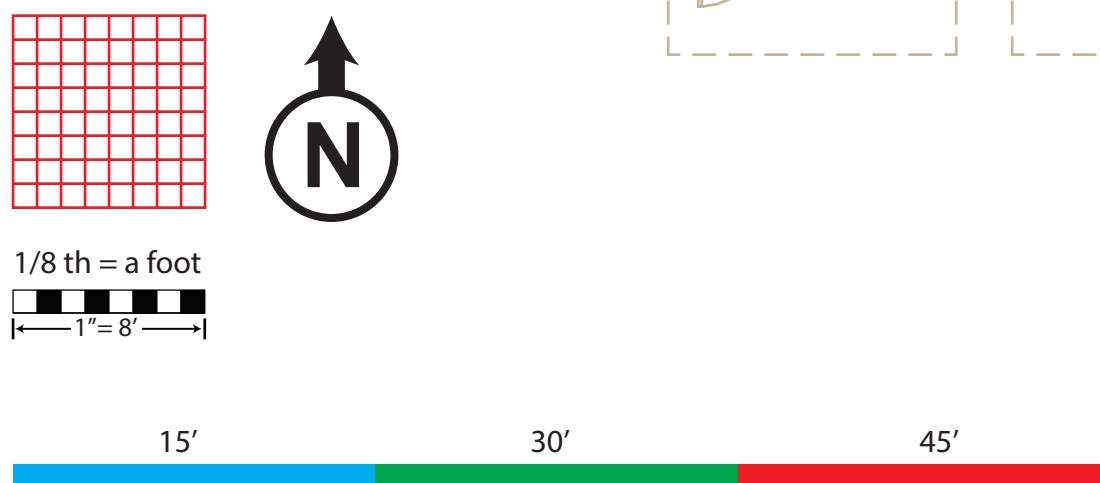
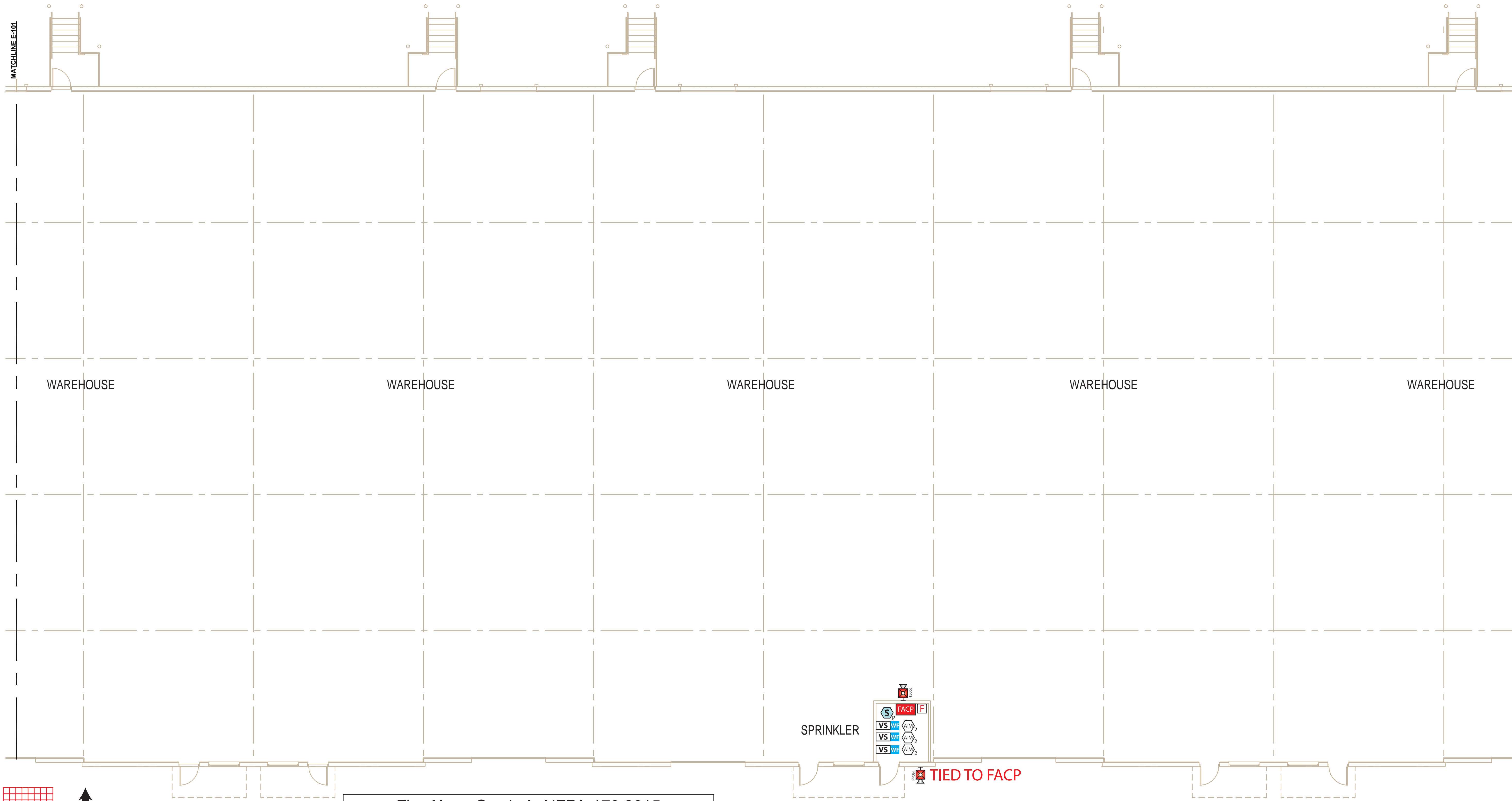
GREGORY P. GLADFELTER PE
10233 MILLSTONE DRIVE, #4112
LENEXA, KS 66220
Gregory Gladfelter, the designer, design preparator, or drafter, shall not be held responsible for the design of fire alarm devices contained herein, generally indicated in bold type.

Professional Engineer Seal for Gregory P. Gladfelter, State of Missouri, License Number E-2000150421, dated 02/28/2025.

AHU SEAL

LAKEWOOD BUSINESS CENTER
LOT 1- SHELL
N.E. Maguire Blvd.
Lee's Summit, MO
64064

FIRE ALARM PLAN
SPRINKLER MONITORING
FA 1.0



Fire Alarm Symbols NFPA-170 2015			
Item	Description	Item	Description
	Fire Alarm Control Panel		Pull Station
	Photoelectric Smoke Detector		Valve Supervisory Switch (Tamper)
	Alarm Horn/Strobe Wall Mount		Flow Detector/switch
	Dual Addressable Input Monitor Module		

Fire Alarm Solutions
 3150 MERCIER SUITE 520
 KANSAS CITY, MO 64111
 816-753-4660

Description:
 New fire alarm system

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Date:	3/03/2025		
Job:	LAKEWOOD BUSINESS CENTER		
Drawing:	1.1	Sheet	2 of 2
Scale:	1/8inch = 1foot		

GREGORY P. GLADFELTER PE
 10233 MILLSTONE DRIVE, #4112
 LENEXA, KS 66220

Gregory Gladfelter, the designer, design preparer, drafter, checker, or other person who prepared these drawings, shall be responsible for the accuracy of the design of fire alarm devices contained herein, generally indicated in bold type.

↑ AHJ SEAL ↓

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LAKEWOOD
 BUSINESS CENTER
 LOT 1- SHELL
 NE Maguire Blvd.
 Lee's Summit, MO
 64064

FIRE ALARM PLAN
 SPRINKLER
 MONITORING

FA 1.1