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Drawn By
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484-250-9916
Fire Alarm system Nicet 3
Cert # 154614

NICET CERTIFIED

convergint

Harbor Freight Lillington
129 W Cornelius Harnett BLVD
Lillington, NC 27549

Fire Alarm

REV 0.0

FA-00

06/27/2024

Notes/Matrix

NOTES

1) Occupancy type M (IBC), building has automatic sprinkler coverage.
2) Spot type coverage is required for FACU, NAC expander, Power Supplies. In the event Smoke detectors are not able to be used due to environment, spot type heat detectors shall be installed (NFPA 72 2019).
3) Smoke Detectors Shall be at least 36" away from any return or supply ventilation or fan.
4) All wire must installed no more then 6ft of separation secured to structure.
5) All devices are required to have a back box and be supported to structure.
6) All wire and devices must be secured in a manner that reduces stress on the wire and is attached to structure.
7) All Equipment must be protected by 120Vac surge protector installed no closer then 3 ft from the protected equipment.
8) Notification devices shall be installed at the lowest point of the ceiling.
9) Waterflows will activate alarm signal within 45-90 seconds.
10) Single path communication paths must be redundant and must send a poling path every 5 minutes, and must annunciator in the event there is trouble with the communicator.
11) All Fire alarm equipment must have 3 ft of working clearance in all directions, as per NFPA 70.
12) Wire shall be FPLP and installed in a manner in which to maintain survivability level 3. Which must be installed as per NFPA 70.
13) All pathways are required to be separate from any other and dedicated to fire alarm.
14) All Duct Detectors must be wire so the device is supervised by the addressable module.
15) All penetrations that pass through a wall shall be in a sleeve.
16) All penetrations that pass through a fire rated wall shall have a sleeve and be fire sealed 3 inches around the sleeve and the opening to the sleeve with a fire caulk that that is the same rating as the wall being penetrated.
17) Ceiling mounted horn/strobes must be within 15ft of any path of egress.

Symbols

	Ceiling mounted strobe
	Ceiling mounted Horn/strobe
##CD	Candela rating of notification devices
F	Pull Station
S	Smoke Detector
S	Duct Detector
T	Tamper
WF	Waterflow
KS	Key Switch
SRG	Surge Protector
FACU	Fire Alarm Control Unit

Order of operation

Normal Operation
1) Pull station, Smoke detector, Waterflow, Heat Detector Activates.
2) Panel Annunciates as well any remote annunciates and contact central station.
3) Central station Dispatches Fire Department
4) Audio/Visual activates and syncs.
5) Door releases is activated releasing maglocks.

Duct Detector:
1) Duct detector activates.
2) Panel annunciators as well as remote annuciators activates.
3) Supervisory Signal sent to central station.
4) Associated RTU shunts.

Input \ Output	Pre-Alarm	Alarm-signal	Audio/Visual Notification	Pre-Action	Fan shutdown	Door Release	Elevator Primary recall	Elevator Alternate recall	Elevator Fire hat	Elevator Shunt	Supervisory signal	HVAC Shunt	Trouble
WaterFlow		✓	✓		✓	✓							✓
Tamper											✓		✓
Heat		✓	✓	✓	✓	✓							✓
Smoke Detector		✓	✓		✓	✓							✓
Duct Detector											✓	✓	✓
Pull Station		✓	✓	✓	✓	✓							✓
Short Fault													✓
Battery fault													✓
Ground fault													✓
Short Fault													✓

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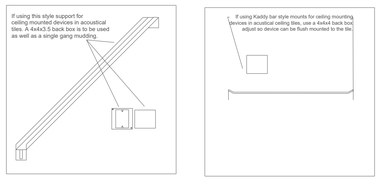
Instillation Specifications

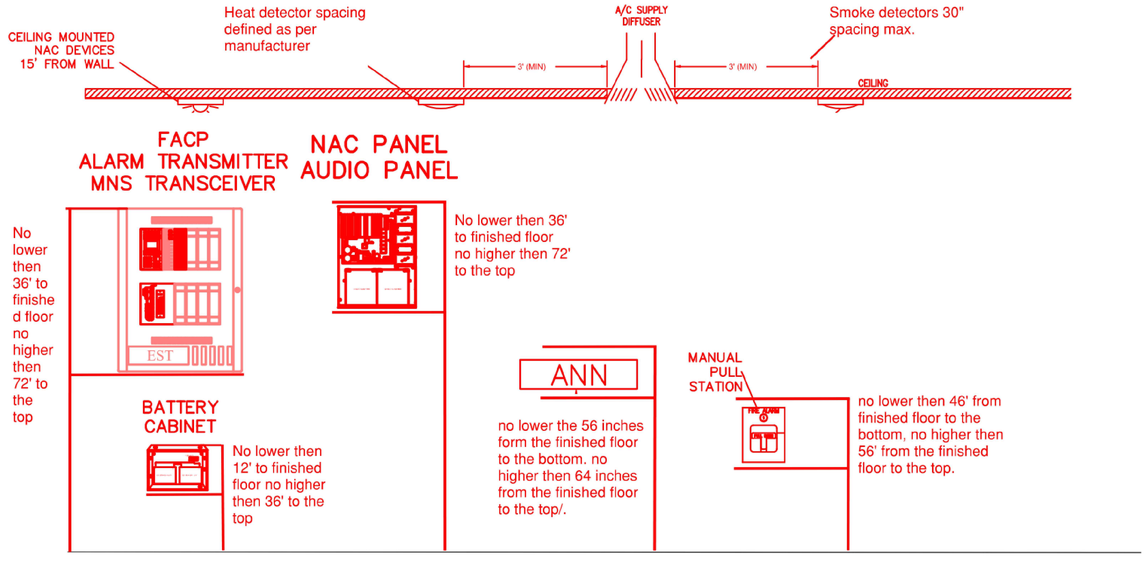
All devices shall be flush mounted to back box. to keep the fire rating of the wire and as per manufacture specs. this includes ceiling tiles. unless a UL listed trim plate is used between box and device.

Grid ceiling supports or T-bars



All wires shall be supported every 6 ft on horizontal and 2 ft verticals.
Supporting wire using raceways (with exception of a service loop), sprinkler pipe, all thread or other no unapproved pathway is illegal per code and not allowed.
If zip ties are used they must be both Plenum rated and fire rated. When tieing off structure made of steel with zip ties wire shall be zip tied to a zip tie that is attracted to the structure.

Grid wire can be used to support FA wire as long as it is dedicated to the fire alarm and nor part of the grid support system as well all grid wire use must have a permanently attached support including j-hooks or twisting in a ring.
bat wings are not allowed to be used to secure FA wire.



All FA equipment as FACU and BPS-APS or battery boxes shall be installed using toggle bolts with washers.
All wires are to be labeled and marked.

Wire Requirements	
	Nac 1 off panel, must be 14/2 FPLP
	Nac 2 off panel, must be 14/2 FPLP
	SLC off panel, must be 16/2 FPLP

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Riser Diagram/Battery calculation

Symbols

	Ceiling mounted strobe
	Ceiling mounted Horn/strobe
##CD	Candela rating of notification devices
F	Pull Station
S	Smoke Detector
S	Duct Detector
T	Tamper
WF	Waterflow
KS	Key Switch
SRG	Surge Protector
FACU	Fire Alarm Control Unit
M	Monitor Module

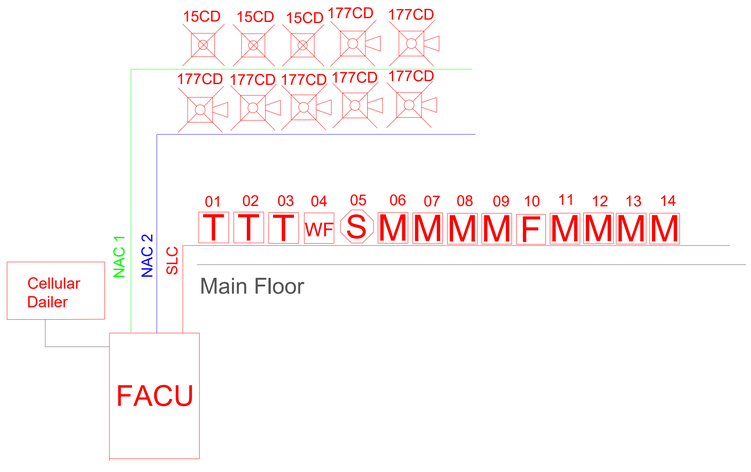
Panel Battery calculations

FIRE-LITE ALARMS by Honeywell — **ES-50X Battery Calculation**

Calculation in Total Sheet

		Required Standby Time in Hours			
		24 Hours			
Total Standby Current	**0.1861 Amps**	x	24	=	4.466 AH
		Required Alarm Time in Minutes			
		5 Minutes			
Total Alarm Load	**1.9570 Amps**	x	0.084	=	0.164 AH
				Total Current Load	**4.630 AH**
		Multiply by the Derating Factor		1.2 =	x 1.20
				Total Ampere Hours Required	**5.56 AH**

Recommended Batteries:	**BAT-1270 - 7AH Batteries**



Panel NAC 1 Voltage drop

Nominal System Voltage		19.7		
Minimum Device Voltage		16		
Starting voltage w/ load factor (0.59)	19.444			
Total Circuit Current	0.434		Wire Gauge	Ohm's Per 1000
Distance from source to 1st device		40	14	3.07
Wire Gauge for balance of circuit			14	3.07

Enter current in amps. .150 = 150 ma		Distance from previous device	Voltage		
Device Number	Device Current		At Device	Drop from source	Percent Drop
Device 1	0.018	40	19.34	0.107	0.54%
Device 2	0.018	20	19.29	0.158	0.80%
Device 3	0.018	20	19.24	0.207	1.05%
Device 4	0.190	40	19.14	0.300	1.52%
Device 5	0.190	60	19.07	0.370	1.88%
Totals	0.434	180	End of Line Voltage		**0.06**

Point to Point Method			End of Line Method			Load Centering Method		
CIRCUIT IS WITHIN LIMITS			CIRCUIT IS WITHIN LIMITS			CIRCUIT IS WITHIN LIMITS		
Totals		Voltage Drop	Totals		Voltage Drop	Totals		Voltage Drop
Current	Distance		Current	Distance		Current	Distance	
0.434	180	**0.63**	0.434	180	**0.480**	0.434	180	**0.240**
End of Line Voltage		**19.07**	End of Line Voltage		**18.96**	End of Line Voltage		**19.20**
Percent Drop		3.18%	Percent Drop		2.43%	Percent Drop		1.22%

End of Line and Load Centering Methods use only the wire guage for the first device to source
Standard Wire Resistance in Ohms per 1000 feet.
18=7.77 16=4.89 14=3.07 12=1.93
18-12 Awg = Solid Conductors

Panel NAC 2 Voltage drop

Nominal System Voltage		19.7		
Minimum Device Voltage		16		
Starting voltage w/ load factor (0.59)	19.14			
Total Circuit Current	0.950		Wire Gauge	Ohm's Per 1000
Distance from source to 1st device		40	14	3.07
Wire Gauge for balance of circuit			14	3.07

Enter current in amps. .150 = 150 ma		Distance from previous device	Voltage		
Device Number	Device Current		At Device	Drop from source	Percent Drop
Device 1	0.190	40	18.91	0.233	1.18%
Device 2	0.190	60	18.63	0.513	2.61%
Device 3	0.190	60	18.42	0.723	3.67%
Device 4	0.190	60	18.28	0.863	4.38%
Device 5	0.190	60	18.21	0.933	4.74%
Totals	0.950	280	End of Line Voltage		**0.17**

Point to Point Method			End of Line Method			Load Centering Method		
CIRCUIT IS WITHIN LIMITS			CIRCUIT IS WITHIN LIMITS			CIRCUIT IS WITHIN LIMITS		
Totals		Voltage Drop	Totals		Voltage Drop	Totals		Voltage Drop
Current	Distance		Current	Distance		Current	Distance	
0.950	280	**1.49**	0.950	280	**1.633**	0.950	280	**0.817**
End of Line Voltage		**18.21**	End of Line Voltage		**17.51**	End of Line Voltage		**18.32**
Percent Drop		7.58%	Percent Drop		8.29%	Percent Drop		4.15%

End of Line and Load Centering Methods use only the wire guage for the first device to source
Standard Wire Resistance in Ohms per 1000 feet.
18=7.77 16=4.89 14=3.07 12=1.93
18-12 Awg = Solid Conductors

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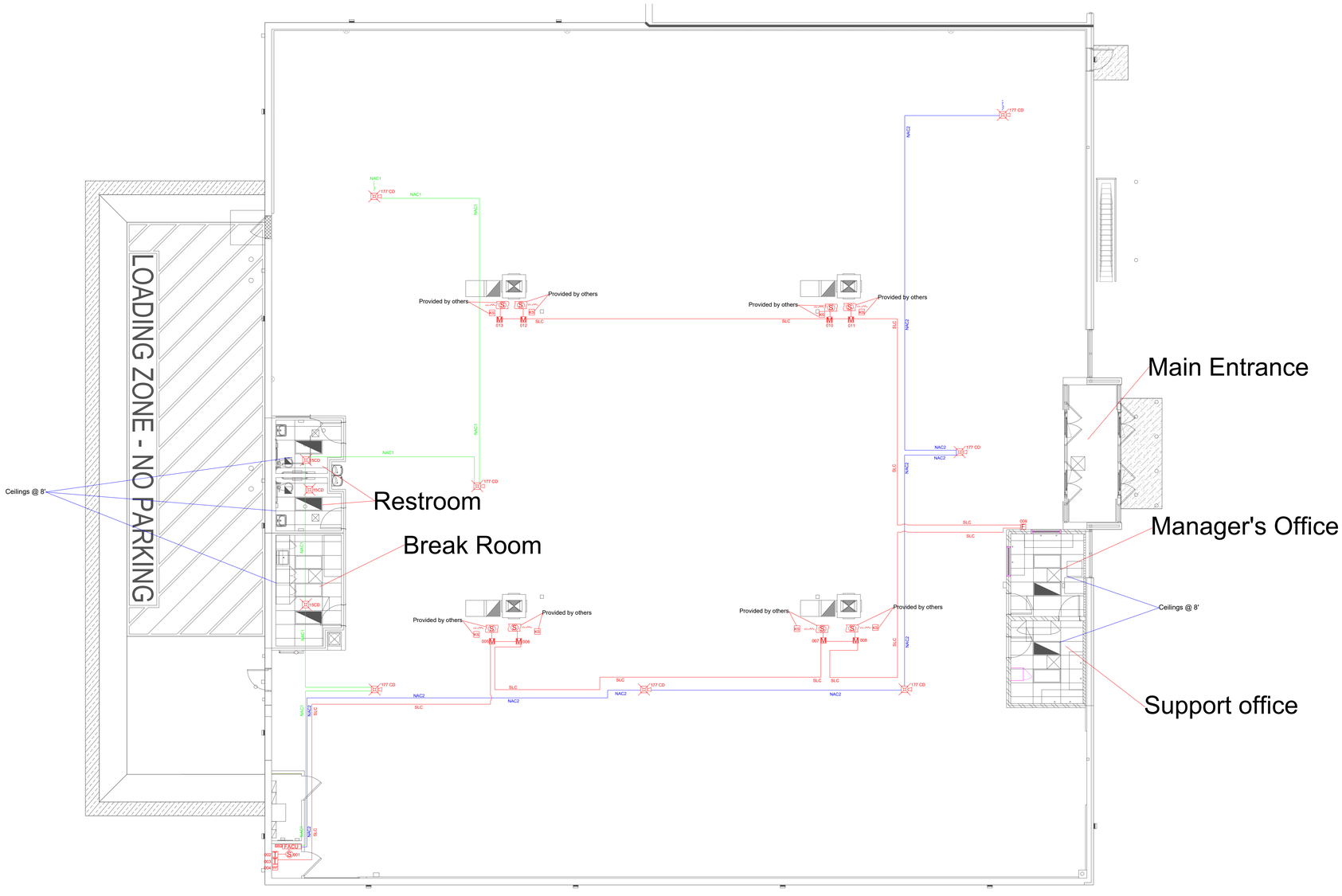
Floor Plan



Scale: 3/32= 1'0"
FA Deck @ 18'2 5/8"

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