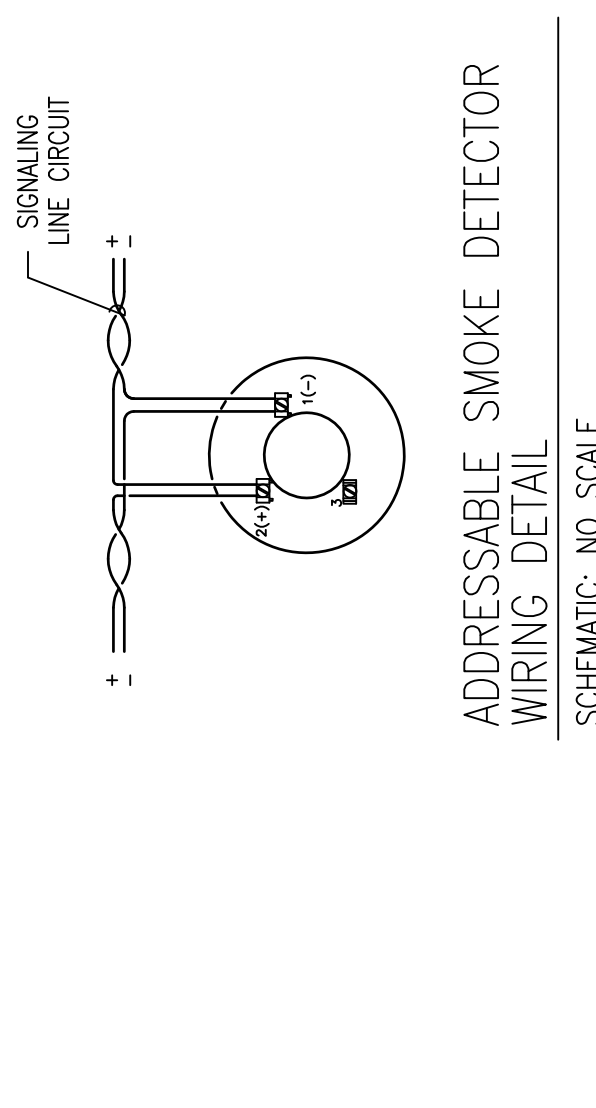


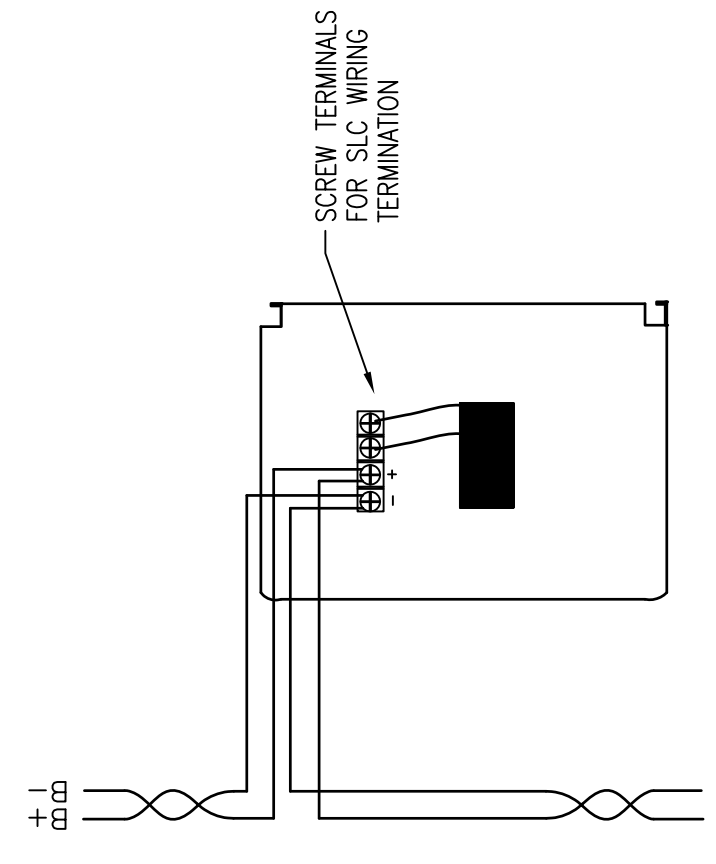
FACP Battery Calculation				5/24/2016
PROJECT NAME: 147 PEARL STREET		Required Standby Time: 24 Hours		
Required Alarm Time: 5 Minutes		Regulated Load in Standby		
Device Type	Number of Devices	Current (Amps)	Total Current (Amps)	
FACP - MS-9050UD MAIN CIRCUIT BOARD	1	0.12000	0.12000	
ANN-80 REMOTE ANNUNCIATOR	1	0.01500	0.01500	
SQ3557 SMOKE DETECTOR	6	0.00030	0.00180	
H3558 HEAT DETECTOR	10	0.00030	0.00300	
H3559 HEAT DETECTOR	15	0.00030	0.00450	
H355HT HEAT DETECTOR	1	0.00030	0.00030	
MMF-301 MINI MONITOR MODULE	2	0.00038	0.00075	
BG-12LX PULL STATION	1	0.00023	0.00023	
TOTAL STANDBY LOAD				0.14558
Regulated Load in ALARM				
Device Type	Number	Current (Amps)	Total Current (Amps)	
FACP - MS-9050UD MAIN CIRCUIT BOARD	1	0.00000	0.00000	
ANN-80 REMOTE ANNUNCIATOR	1	0.00000	0.00000	
SQ3557 SMOKE DETECTOR	6	0.00000	0.00000	
H3558 HEAT DETECTOR	10	0.00000	0.00000	
H3559 HEAT DETECTOR	15	0.00000	0.00000	
H355HT HEAT DETECTOR	1	0.00000	0.00000	
MMF-301 MINI MONITOR MODULE	2	0.00000	0.00000	
BG-12LX PULL STATION	1	0.00000	0.00000	
MAX ALARM DRAW - ALL ADDRESS DEVICES	1	0.40000	0.40000	
NAC-1 (See Voltage Drop Calculations)	1	0.60000	0.60000	
NAC-2 (See Voltage Drop Calculations)	1	0.57800	0.57800	
TOTAL ALARM LOAD				1.81800
Battery Requirements				
Standby Load Current (Amps)	0.14558	X	24.00000	Required Standby Time in Hours
Alarm Load Current (Amps)	1.81800	X	0.08333	Required Alarm Time in Hours
Total Ampere Hours (before derating factor)				3.64542
Derating Factor				1.2
BATTERIES TO BE PROVIDED (2 - 12V)				4,37450
				7 AH

Point to Point NAC Voltage Drop Calculation				5/24/2016
Project Name: 147 PEARL STREET		Circuit Number: NAC-1		
Nominal System Voltage	20.4 volts	Resistance Per 1000 Gauge	16	
Minimum Device Voltage	16.0 volts	Wire Gauge for source to 1st device	16	
Distance from source to 1st device	35 feet	Wire Gauge for balance of circuit	16	
Max Output Current	1.25 amps			
Total Circuit Current	0.600 amps			
End of Line Voltage	19.84 volts			
Circuit is within limits				
Device	Current	Distance previous device	Voltage at Device	Drop Percent
Device 1	0.176	20.19	19.66	1.01%
Device 2	0.107	20.18	19.56	1.07%
Device 3	0.107	20.01	19.45	1.88%
Device 4	0.017	19.83	19.44	2.25%
Device 5	0.176	19.83	19.27	3.32%
Device 6	0.176	19.84	19.10	2.78%
Totals	0.600	187		
Notes: Wire resistance is doubled in the calculations for two wires (Positive and Negative). The voltage calculated to the last device must not be lower than the manufacturer's listed minimum operating voltage (IE: rated operating voltage 16-33 VDC (24 VDC nominal)).				

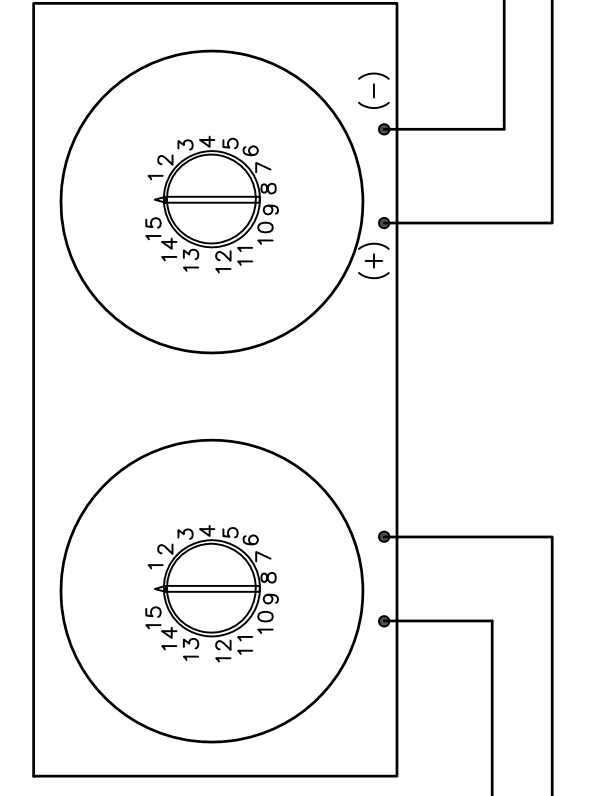
Point to Point NAC Voltage Drop Calculation				5/24/2016
Project Name: 147 PEARL STREET		Circuit Number: NAC-2		
Nominal System Voltage	20.4 volts	Resistance Per 1000 Gauge	16	
Minimum Device Voltage	16.0 volts	Wire Gauge for source to 1st device	16	
Distance from source to 1st device	100 feet	Wire Gauge for balance of circuit	16	
Max Output Current	1.25 amps			
Total Circuit Current	0.578 amps			
End of Line Voltage	18.75 volts			
Circuit is within limits				
Device	Current	Distance previous device	Voltage at Device	Drop Percent
Device 1	0.107	100	19.83	2.77%
Device 2	0.017	32	19.66	3.63%
Device 3	0.017	23	19.56	4.13%
Device 4	0.017	38	19.39	4.93%
Device 5	0.017	40	19.23	5.73%
Device 6	0.017	54	19.02	6.78%
Device 7	0.176	28	18.89	7.41%
Device 8	0.017	28	18.83	7.68%
Device 9	0.176	18.76	18.64	8.06%
Device 10	0.017	11	18.75	8.07%
Totals	0.578	400		
Notes: Wire resistance is doubled in the calculations for two wires (Positive and Negative). The voltage calculated to the last device must not be lower than the manufacturer's listed minimum operating voltage (IE: rated operating voltage 16-33 VDC (24 VDC nominal)).				



ADDRESSABLE SMOKE DETECTOR WIRING DETAIL
SCHEMATIC: NO SCALE



MANUAL PULL STATION WIRING DETAIL
SCHEMATIC: NO SCALE



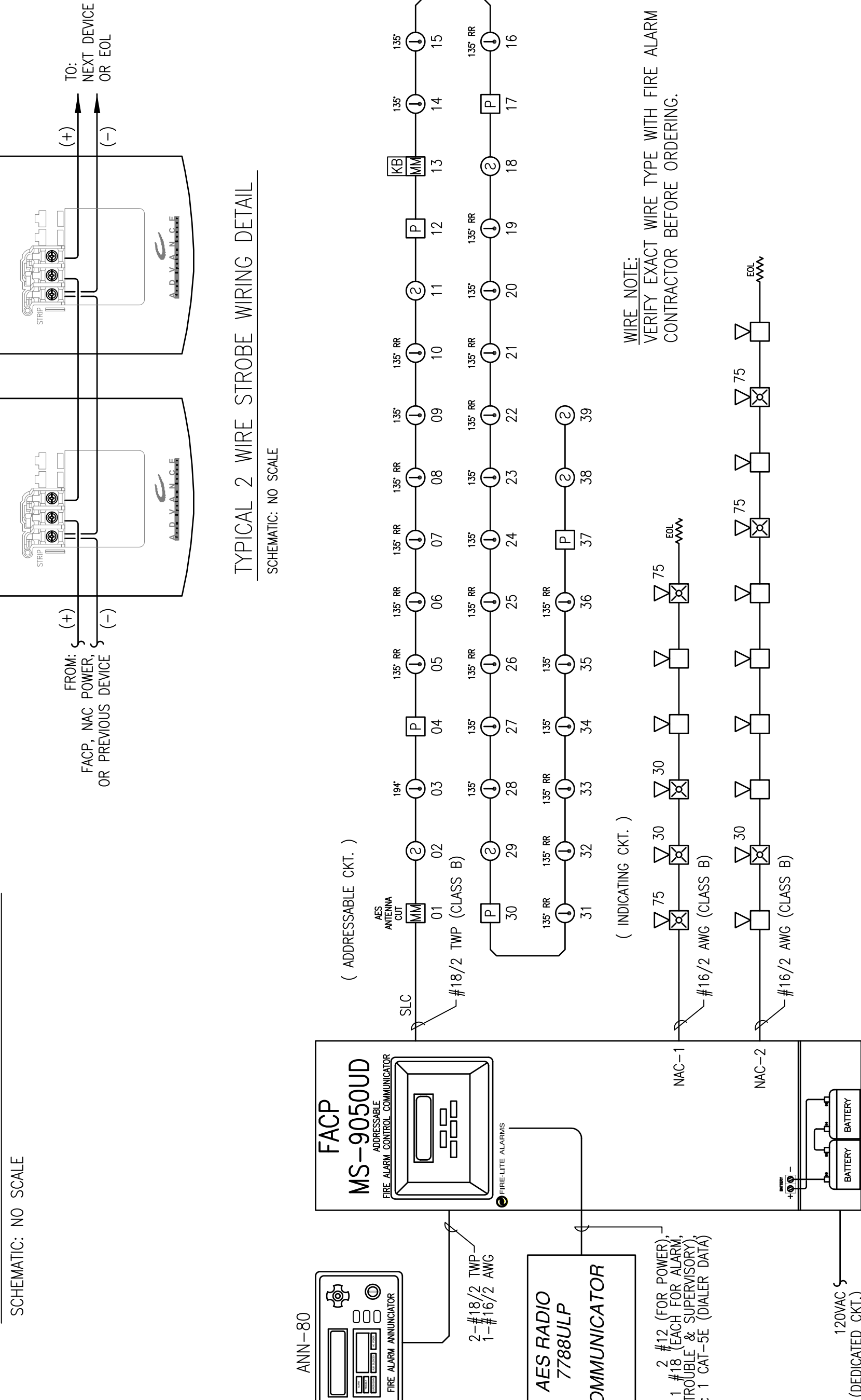
MINI MONITOR MODULE WIRING DETAIL
SCHEMATIC: NO SCALE

- GENERAL NOTES:**
- THESE DRAWINGS ARE DIAGRAMMATIC. REFER TO THE ARCHITECTURAL DRAWINGS FOR EXACT DIMENSIONS.
 - INSTALLATION SHALL COMPLY WITH NEC, NFPA 72 AND ALL OTHER APPLICABLE CODES AS REQUIRED BY THE LOCAL AUTHORITY HAVING JURISDICTION.
 - WIRING DEPICTED ON THESE PLANS IS SCHEMATIC - ACTUAL WIRE LOCATIONS MAY DIFFER FROM THESE PLANS. WIRING SHALL BE PERFORMED AS ACTUAL BUILDING CONSTRUCTION CONDITIONS ALLOW AND TO MINIMIZE PENETRATIONS THROUGH AREA SEPARATION WALLS AND FIRE WALLS. THE USE OF A RACEWAY IS PERMITTED AS LONG AS NO 110V OR HIGHER VOLTAGE CABLES ARE IN THE SAME RACEWAY.
 - FIRE RATINGS SHALL BE MAINTAINED FOR ALL PENETRATIONS THROUGH FIRE-RATED CONSTRUCTION.
 - POWER FOR ALL FIRE ALARM PANELS AND FIRE ALARM POWER SUPPLIES MUST BE PROVIDED BY A DEDICATED AC BRANCH CIRCUIT.
 - POWER-LIMITED AND NONPOWER-LIMITED CIRCUIT WIRING MUST REMAIN SEPARATED IN CABINET. ALL NONPOWER-LIMITED CIRCUIT WIRING MUST REMAIN AT LEAST 0.25" AWAY FROM ANY NONPOWER-LIMITED CIRCUIT WIRING. FURTHERMORE, ALL POWER-LIMITED AND NONPOWER-LIMITED CIRCUIT WIRING MUST ENTER AND EXIT THE CABINET THROUGH DIFFERENT KNOCK OUTS AND/OR SEPARATE CONDUITS.
 - WHEN UTILIZING CLASS "A" CIRCUITS, SEPARATE OUTGOING AND RETURN CONDUCTORS OF CLASS "A" CIRCUITS BY A MINIMUM OF 12" WHERE RUN VERTICALLY AND 48" WHERE RUN HORIZONTALLY.
 - WHEN UTILIZING SHIELDED CABLE TIE SHIELDS THROUGH AND INSULATE AT EACH JUNCTION BOX. INSULATE AND TAPE BACK AT END.
 - ALL FIRE ALARM CABLING SHALL BE ACCEPTABLE TO THE FIRE ALARM EQUIPMENT MANUFACTURER FOR THE INTENDED PURPOSE.
 - SMOKE DETECTORS SHALL NOT BE INSTALLED UNTIL AFTER CONSTRUCTION CLEAN-UP IS COMPLETED AND FINAL.
 - LOCATE SMOKE DETECTORS A MINIMUM OF THREE (3) FEET FROM MECHANICAL DIFFUSERS. WALL-MOUNTED SMOKE DETECTORS SHALL BE LOCATED A MINIMUM OF 4" AND A MAXIMUM OF 12" FROM CEILING. CEILING-MOUNTED SMOKE DETECTORS SHALL BE MOUNTED ON CEILINGS AND NOT ON THE BOTTOMS OF BEAMS OR JOISTS.
 - PROVIDE SYNCHRONIZATION OF ALL VISUAL NOTIFICATION APPLIANCE CIRCUITS. PROVIDE ALL REQUIRED SYNC MODULES. PROVIDE A MULTI-SYNC MODE SLAVE CONNECTION BETWEEN ALL SYNC MODULES.
 - VERIFY ALL FIELD SELECTABLE AUDIBILITY SETTINGS OF NOTIFICATION APPLIANCES WITH FIRE ALARM CONTRACTOR.
 - UPON COMPLETION OF THE FIRE ALARM SYSTEM INSTALLATION AND PROGRAMMING, THE INSTALLING CONTRACTOR SHALL PERFORM FINAL TESTING OF THE ENTIRE SYSTEM, PER ALL APPLICABLE CODES, AND SHALL COORDINATE AND PERFORM A FINAL FIRE ALARM SYSTEM INSPECTION.
 - PROVIDE OFF-SITE MONITORING AS REQUIRED BY THE INTERNATIONAL FIRE CODE, SECTION 907.15 AND THE LOCAL AUTHORITY HAVING JURISDICTION.
 - INSTALLING CONTRACTOR SHALL, PHYSICALLY, LABEL ALL INITIATING DEVICES AND NOTIFICATION APPLIANCE CIRCUIT END OF LINE (WHEN WIRING CLASS "B"). THESE LABELS SHALL BE IN PLACE PRIOR TO START-UP AND TESTING.

SYMBOL	DESCRIPTION	MOUNTING
FACP	FIRE ALARM CONTROL PANEL	WALL-TOP @ 66"
FPS	FIRE ALARM POWER SUPPLY	FIELD VERIFY
FSA	FIRE SYSTEM ANNUNCIATOR	WALL-TOP @ 66"
RIS	REMOTE TEST STATION	FIELD VERIFY
SD	SMOKE DETECTOR	CEILING
SW	WIRELESS SMOKE DETECTOR	CEILING
SDM	DIJIT SMOKE DETECTOR	BY OTHERS
H	HEAT DETECTOR	CEILING
CO	CARBON MONOXIDE DETECTOR	CEILING
CM	ADDRESSABLE CONTROL MODULE	FIELD VERIFY
AM	ADDRESSABLE MONITOR MODULE	FIELD VERIFY
M	ADDRESSABLE MINI MONITOR MODULE	FIELD VERIFY
P	MANUAL PULL STATION	WALL @ 48"
R	CONTROL RELAY (MULTI-VOLTAGE)	FIELD VERIFY
RM	ADDRESSABLE RELAY MODULE	FIELD VERIFY
WG	WIRELESS GATEWAY	FIELD VERIFY
KB	KNOX BOX	FIELD VERIFY
MD	MAGNETIC DOOR HOLDER	FIELD VERIFY
WS	WATER FLOW SWITCH	BY OTHERS
VT	VALVE TAMPER SWITCH	BY OTHERS
GS	GATE VALVE TAMPER SWITCH	BY OTHERS
CM	CEILING MOUNT SMOKE	FIELD VERIFY
CM	CEILING MOUNT HORN / STROBE	FIELD VERIFY
CS	CEILING MOUNT SPEAKER / STROBE	FIELD VERIFY
H	HORN	WALL @ 10'-0"
SH	SPEAKER / STROBE	WALL 80"-96"
ST	STROBE	WALL 80"-96"

APPLICABLE CODES:
MAINE UNIFORM ENERGY & BUILDING CODE
PORTLAND CITY CODE, CHAPTER 10, FIRE PREVENTION & PROTECTION
NFPA 1, FIRE CODE, & NFPA 101, LIFE SAFETY CODE

OPERATIONS MATRIX	ACTIVATE ALARM INDICATOR	ACTIVATE ALARM	ACTIVATE TROUBLE INDICATOR	ACTIVATE TROUBLE SUPERVISORY SIGNAL	ACTIVATE ALARM SUPERVISORY SIGNAL	TRANSMIT TROUBLE SIGNAL
FIRE ALARM INPUT	●	●	●	●	●	●
SMOKE DETECTORS	●	●	●	●	●	●
HEAT DETECTORS	●	●	●	●	●	●
PULL STATIONS	●	●	●	●	●	●
KNOX BOX	●	●	●	●	●	●
FIRE ALARM AC POWER FAIL	●	●	●	●	●	●
FIRE ALARM LOW BATTERY	●	●	●	●	●	●
OPEN CIRCUIT	●	●	●	●	●	●
GROUND FAULT	●	●	●	●	●	●
NAC SHORT CIRCUIT	●	●	●	●	●	●
LOSS OF AC TO BUILDING	●	●	●	●	●	●



FIRE ALARM RISER DIAGRAM
SCHEMATIC: NO SCALE

REVISION	DESCRIPTION	DATE
0	ISSUED FOR REVIEW & APPROVAL	5/25/2016

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147 PEARL STREET
PORTLAND, MAINE 04101
CALCS, DETAILS, LEGEND, MATRIX, NOTES, RISER

JPB UNICAD JOB #16370
CHECKED WAYNE B. HAWS
DATE 5/25/2016
REVISION 0
SCALE NONE

UNICAD Inc.
Fire Alarm Design & Drafting Services
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