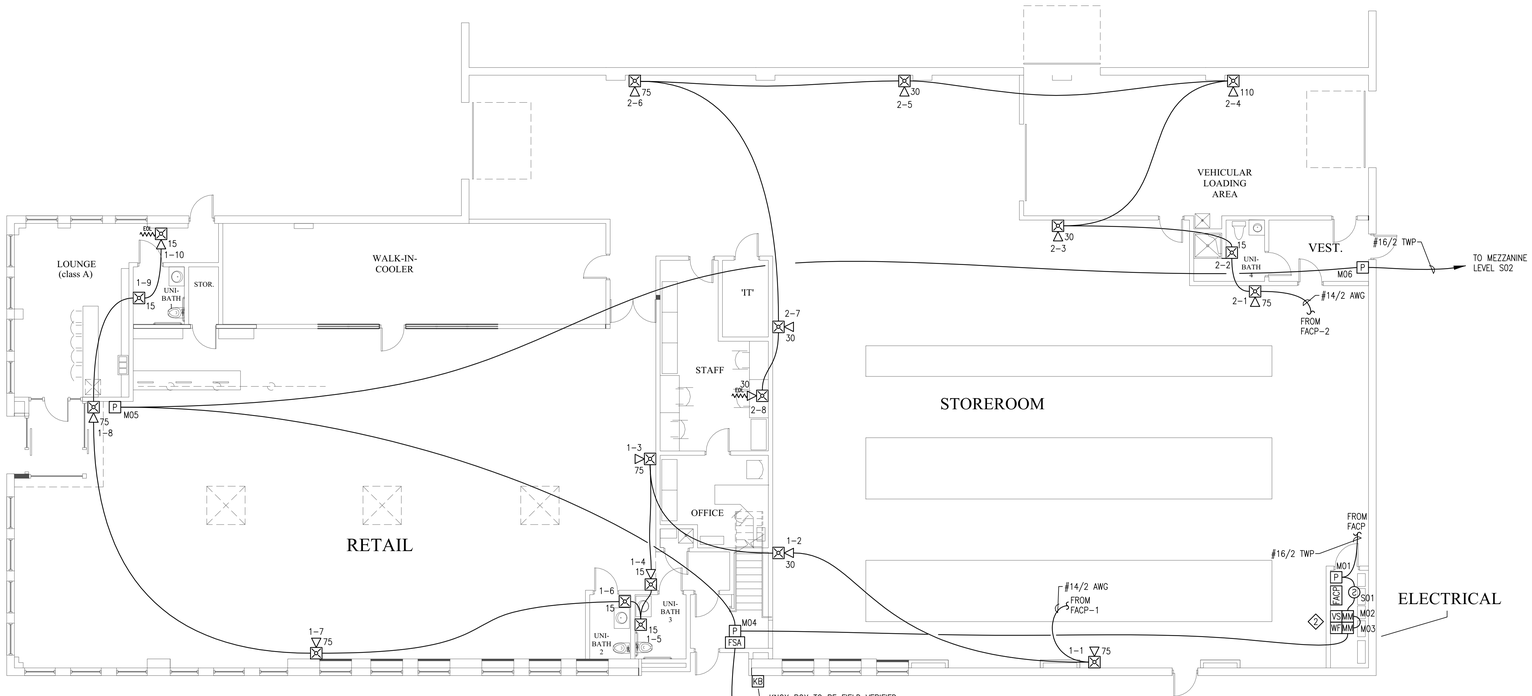
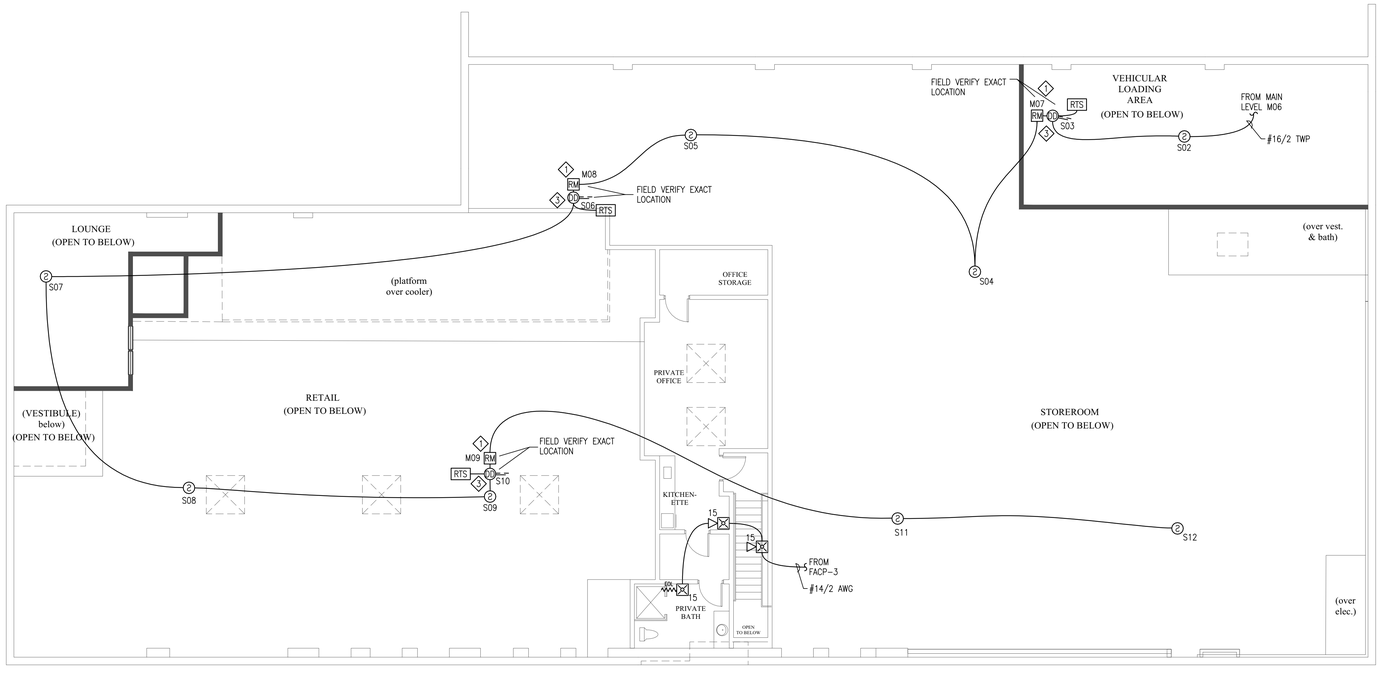


MAIN LEVEL
FIRE ALARM PLAN
SCALE: 1/8"=1'-0"



MEZZANINE LEVEL
FIRE ALARM PLAN
SCALE: 1/8"=1'-0"

REVISION	DESCRIPTION	DATE
0	ISSUED FOR REVIEW & APPROVAL	8/15/2017

Approved for Code Compliance
Fire Marshal's Office
Date: 10/03/17

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ALTA VISTA
495 FOREST AVE
PORTLAND, ME 04101
FIRE ALARM PLAN

DRAWN	CWS UNICAD JOB #17472
CHECKED	BRADY B. HAWS NICET III 138751
DATE	8/15/2017
REVISION	0
SCALE	1/8"=1'-0"

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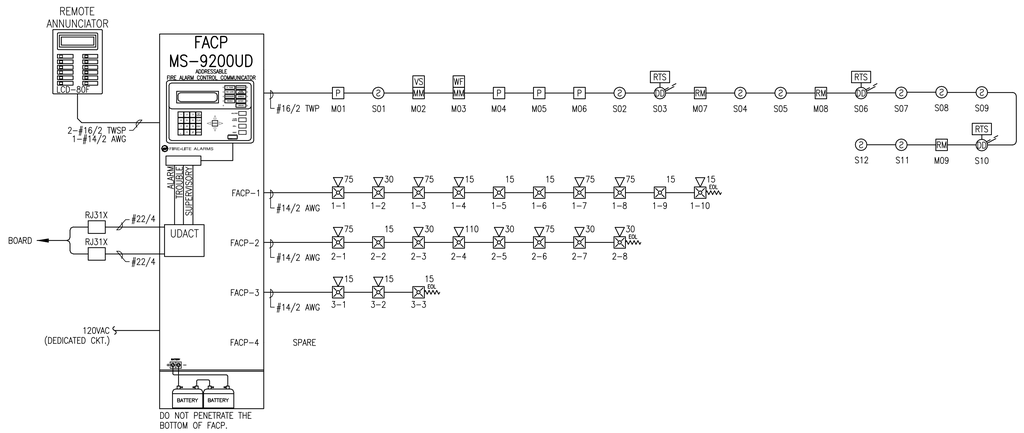
Fire Alarm Design & Drafting Services

FA-1



FIRE ALARM RISER DIAGRAM

SCHEMATIC: NO SCALE

FIRE ALARM SYMBOL LEGEND

NOTE: ALL SYMBOLS MAY NOT BE USED ON THIS PROJECT

SYMBOL	DESCRIPTION	MOUNTING
FACP	FIRE ALARM CONTROL PANEL	WALL-TOP @ 66"
FSA	FIRE SYSTEM ANNUNCIATOR	WALL-TOP @ 66"
RTS	REMOTE TEST SWITCH	WALL-TOP @ 66"
S	SMOKE DETECTOR	CEILING
D	DUCT DETECTOR	FIELD VERIFY
RM	ADDRESSABLE RELAY MODULE	FIELD VERIFY
MM	ADDRESSABLE MONITOR MODULE	FIELD VERIFY
P	MANUAL PULL STATION	WALL @ 48"
KB	KNOX BOX	WALL @ 48"
WF	WATER FLOW SWITCH	BY OTHERS
VS	VALVE SUPERVISORY SWITCH	BY OTHERS
	HORN / STROBE	WALL 80"-96"
	STROBE	WALL 80"-96"

ABBREVIATION	DESCRIPTION
E	EXISTING
G	WITH GUARD
P	PENDANT MOUNT
R	RESIDENTIAL (110V)
S	SOUNDER BASE
WP	WEATHER PROOF
EOL	END OF LINE RESISTOR
EOLR	END OF LINE RELAY
AWG	AMERICAN WIRE GAUGE
TWP	TWISTED PAIR
TWSP	TWISTED SHIELDED PAIR
FPLP	FIRE POWER LIMITED PLENUM
FPLR	FIRE POWER LIMITED RISER
NAC	NOTIFICATION APPLIANCE CIRCUIT
SLC	SIGNALING LINE CIRCUIT

SPEAKER WATTAGE (W) 75 — STROBE CANDELA 30

DEVICE ADDRESS
L1D001 OR D01
(L = DENOTES LOOP #)
(D or M - DENOTES DETECTOR OR MODULE #)

1-#16/2 TWP
WIRE TYPE ABBREVIATED
CONDUCTOR COUNT
WIRE SIZE
OF CABLES (IF OMITTED ONLY 1 CABLE NEEDED)

GENERAL NOTES:

1. SCOPE OF WORK: THIS PROJECT SHALL INCLUDE THE INSTALLATION OF A NEW ADDRESSABLE FIRE ALARM SYSTEM WITH OCCUPANT NOTIFICATION THROUGHOUT.
2. THESE DRAWINGS ARE DIAGRAMMATIC. REFER TO THE ARCHITECTURAL DRAWINGS FOR EXACT DIMENSIONS.
3. INSTALLATION SHALL COMPLY WITH NEC, NFPA 72 AND ALL OTHER APPLICABLE CODES AS REQUIRED BY THE LOCAL AUTHORITY HAVING JURISDICTION.
4. 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.
5. FIRE RATINGS SHALL BE MAINTAINED FOR ALL PENETRATIONS THROUGH FIRE-RATED CONSTRUCTION.
6. POWER FOR ALL FIRE ALARM PANELS AND FIRE ALARM POWER SUPPLIES MUST BE PROVIDED BY A DEDICATED AC BRANCH CIRCUIT. THE LOCATION OF THE BRANCH CIRCUIT BREAKER SHALL BE PERMANENTLY IDENTIFIED AT THE CONTROL UNIT AND SHALL HAVE A RED MARKING IN ACCORDANCE WITH NFPA 72.
7. POWER-LIMITED AND NONPOWER-LIMITED CIRCUIT WIRING MUST REMAIN SEPARATED IN CABINET. ALL POWER-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.
8. 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.
9. WHEN UTILIZING SHIELDED CABLE TIE SHIELDS THROUGH AND INSULATE AT EACH JUNCTION BOX. INSULATE AND TAPE BACK AT END.
10. ALL FIRE ALARM CABLING SHALL BE ACCEPTABLE TO THE FIRE ALARM EQUIPMENT MANUFACTURER FOR THE INTENDED PURPOSE.
11. SMOKE DETECTORS SHALL NOT BE INSTALLED UNTIL AFTER CONSTRUCTION CLEAN-UP IS COMPLETED AND FINAL.
12. 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.
13. PROVIDE SYNCHRONIZATION OF ALL VISUAL NOTIFICATION APPLIANCE CIRCUITS. PROVIDE ALL REQUIRED SYNC MODULES. PROVIDE A MULTI-SYNC MODE SLAVE CONNECTION BETWEEN ALL SYNC MODULES.
14. VERIFY ALL FIELD SELECTABLE AUDIBILITY SETTINGS OF NOTIFICATION APPLIANCES WITH FIRE ALARM CONTRACTOR.
15. 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.
16. PROVIDE OFF-SITE MONITORING AS REQUIRED BY THE INTERNATIONAL FIRE CODE, SECTION 907.6.5 AND THE LOCAL AUTHORITY HAVING JURISDICTION.
17. 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.

FACP Battery Calculation

8/16/2017

PROJECT NAME: ALTA VISTA
Required Standby Time: 24 Hours
Required Alarm Time: 5 Minutes

AC Branch Current

AC Branch Current: Amps @ 120V

Regulated Load in Standby

Device Type	Number of Devices		Current (Amps)		Total Current (Amps)
FACP MAINBOARD	1	X	0.14500	=	0.14500
SMOKE DETECTOR	9	X	0.00030	=	0.00270
DUCT DETECTOR	3	X	0.00030	=	0.00090
REMOTE TEST SWITCH	3	X	0.01200	=	0.03600
MONITOR MODULE	2	X	0.00040	=	0.00080
RELAY MODULE	3	X	0.00025	=	0.00075
PULL STATION	4	X	0.00030	=	0.00120
ANNUNCIATOR	1	X	0.01500	=	0.01500
TOTAL STANDBY LOAD					0.20235

Regulated Load in ALARM

Device Type	Number of Devices		Current (Amps)		Total Current (Amps)
FACP MAINBOARD	1	X	0.27500	=	0.27500
MAX. ALARM FOR ADDRESSABLE DEVICES	1	X	0.40000	=	0.40000
ANNUNCIATOR	1	X	0.04000	=	0.04000
FACP-1 (See Voltage Drop Calculations)	1	X	0.79500	=	0.79500
FACP-2 (See Voltage Drop Calculations)	1	X	0.74300	=	0.74300
FACP-3 (See Voltage Drop Calculations)	1	X	0.15100	=	0.15100
FACP-4 (See Voltage Drop Calculations)	1	X	0.00000	=	0.00000
TOTAL ALARM LOAD					2.40400

Battery Requirements

			Required Standby Time in Hours		
Standby Load Current (Amps)	0.20235	X	24.00000	=	4.85640
			Required Alarm Time in Hours		
Alarm Load Current (Amps)	2.40400	X	0.08333	=	0.20033
Total Ampere Hours (before derating factor)					5.05673
Derating Factor				X	1.2
TOTAL AMPERE HOURS REQUIRED				=	6.06808
BATTERIES TO BE PROVIDED (2 – 12v)					7 AH

Point to Point NAC Voltage Drop Calculation

8/15/2017

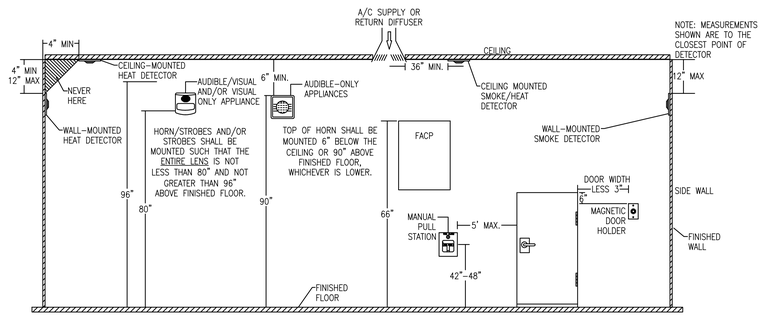
Project Name: ALTA VISTA
Circuit Number: FACP-2

			Wire Gauge	Resistance Per 1000
Nominal System Voltage	20.4	volts		
Minimum Device Voltage	16.0	volts		
Distance from source to 1st device	60	feet	14	3.07
Wire Gauge for balance of circuit			14	3.07
Max Output Current	3.00	amps		
Total Circuit Current	0.795	amps		
End of Line Voltage	19.39	volts		

Circuit is within limits

	Device Current	Distance previous device	Voltage at Device	Drop from source	Percent Drop
Device 1	0.121	60	20.11	0.293	1.44%
Device 2	0.074	55	19.88	0.520	2.55%
Device 3	0.121	35	19.75	0.649	3.18%
Device 4	0.054	25	19.68	0.723	3.54%
Device 5	0.043	15	19.64	0.762	3.74%
Device 6	0.043	20	19.59	0.809	3.97%
Device 7	0.121	50	19.49	0.913	4.48%
Device 8	0.121	60	19.41	0.993	4.87%
Device 9	0.043	25	19.39	1.008	4.94%
Device 10	0.054	20	19.39	1.015	4.98%
Totals	0.795	365			

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 manufactures listed minimum operating voltage (IE: rated operating voltage 16–33 VDC (24 VDC nominal)).



FIRE ALARM DEVICE MOUNTING HEIGHTS

SCALE: NOT TO SCALE

Point to Point NAC Voltage Drop Calculation

8/15/2017

Project Name: ALTA VISTA
Circuit Number: FACP-2

			Wire Gauge	Resistance Per 1000
Nominal System Voltage	20.4	volts		
Minimum Device Voltage	16.0	volts		
Distance from source to 1st device	70	feet	14	3.07
Wire Gauge for balance of circuit			14	3.07
Max Output Current	3.00	amps		
Total Circuit Current	0.743	amps		
End of Line Voltage	19.52	volts		

Circuit is within limits

	Device Current	Distance previous device	Voltage at Device	Drop from source	Percent Drop
Device 1	0.121	70	20.08	0.319	1.57%
Device 2	0.043	20	20.00	0.396	1.94%
Device 3	0.074	35	19.88	0.520	2.55%
Device 4	0.162	40	19.76	0.644	3.16%
Device 5	0.074	50	19.65	0.749	3.67%
Device 6	0.121	45	19.58	0.824	4.04%
Device 7	0.074	50	19.53	0.869	4.26%
Device 8	0.074	20	19.52	0.878	4.31%
Totals	0.743	330			

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 manufactures listed minimum operating voltage (IE: rated operating voltage 16–33 VDC (24 VDC nominal)).

Point to Point NAC Voltage Drop Calculation

8/15/2017

Project Name: ALTA VISTA
Circuit Number: FACP-3

			Wire Gauge	Resistance Per 1000
Nominal System Voltage	20.4	volts		
Minimum Device Voltage	16.0	volts		
Distance from source to 1st device	100	feet	14	3.07
Wire Gauge for balance of circuit			14	3.07
Max Output Current	3.00	amps		
Total Circuit Current	0.151	amps		
End of Line Voltage	20.29	volts		

Circuit is within limits

	Device Current	Distance previous device	Voltage at Device	Drop from source	Percent Drop
Device 1	0.054	100	20.31	0.093	0.45%
Device 2	0.054	15	20.30	0.102	0.50%
Device 3	0.043	20	20.29	0.107	0.52%
Totals	0.151	135			

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 manufactures listed minimum operating voltage (IE: rated operating voltage 16–33 VDC (24 VDC nominal)).

SHEET NOTES:

1. ADDRESSABLE RELAY MODULE(S) PROVIDED FOR FAN SHUT DOWN. TIE TO INDICATED UNIT FAN CONTROLLER. INSTALLING CONTRACTOR SHALL FIELD VERIFY EXACT MOUNTING, CIRCUITING, AND PROGRAMMING REQUIREMENTS. FIELD VERIFY POWER SOURCE. USE MULTI-VOLTAGE CONTROL RELAY(S) IF REQUIRED. FIELD VERIFY EXACT QUANTITY AND LOCATION(S) WITH MECHANICAL DIVISION.
2. ADDRESSABLE MONITOR MODULE(S) PROVIDED TO MONITOR ALL WATER FLOW, PRESSURE SWITCHES, TAMPER SWITCHES AND POST INDICATING VALVES ASSOCIATED WITH THE FIRE SPRINKLER SYSTEM. INSTALLING CONTRACTOR SHALL FIELD VERIFY EXACT MOUNTING, CIRCUITING AND PROGRAMMING REQUIREMENTS. FIELD VERIFY EXACT QUANTITY AND LOCATION(S).
3. DUCT SMOKE DETECTORS PROVIDED FOR THE RETURN AIR PATH AT ALL AIR HANDLING UNITS HAVING A CAPACITY GREATER THAN 2,000 CFM AND FOR THE SUPPLY AIR PATH AT ALL AIR HANDLING UNITS HAVING A CAPACITY GREATER THAN 15,000 CFM. INSTALLING CONTRACTOR SHALL FIELD VERIFY EXACT MOUNTING, CIRCUITING AND PROGRAMMING REQUIREMENTS. PROVIDE FOR SHUT DOWN OF THE ASSOCIATED UNIT FAN(S). FIELD VERIFY UNIT POWER SOURCE. USE MULTI-VOLTAGE CONTROL RELAY(S) IF REQUIRED. FIELD VERIFY EXACT QUANTITY AND LOCATION(S) WITH MECHANICAL DIVISION. PROVIDE REMOTE ALARM/SUPERVISORY INDICATION IN A LOCATION ACCEPTABLE TO THE LOCAL AHJ WHEN IN-DUCT SMOKE DETECTOR INDICATOR IS NOT VISIBLE TO RESPONDING PERSONNEL.

OPERATIONS MATRIX

FIRE ALARM INPUT	FIRE ALARM OUTPUT: ACTIVATE ALARM INDICATOR	ACTIVATE AUDIBLE ALARM	ACTIVATE SUPERVISORY INDICATOR	ACTIVATE AUDIBLE SUPERVISORY SIGNAL	ACTIVATE TROUBLE INDICATOR	ACTIVATE AUDIBLE TROUBLE INDICATOR	TRANSMIT ALARM SIGNAL	TRANSMIT SUPERVISORY SIGNAL	TRANSMIT TROUBLE SIGNAL	ACTIVATE NOTIFICATION APPLIANCES	SHUTDOWN AIR HANDLERS IN EXCESS OF 2,000 CFM
SMOKE DETECTORS	●	●					●			●	●
DUCT DETECTORS			●	●				●			●
PULL STATIONS	●	●					●			●	●
WATERFLOW SWITCHES	●	●					●			●	●
VALVE SUPERVISORY SWITCHES			●	●				●			
FIRE ALARM AC POWER FAIL					●	●			●		
FIRE ALARM LOW BATTERY					●	●			●		
OPEN CIRCUIT					●	●			●		
GROUND FAULT					●	●			●		
NAC SHORT CIRCUIT					●	●			●		
LOSS OF AC TO BUILDING					●	●			●		

REVISION	DESCRIPTION	DATE
0	ISSUED FOR REVIEW & APPROVAL	8/15/2017

Approved as Submitted
Approved as Noted
Revise and Resubmit
Rejected
Date: 10/03/17

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PORTLAND, ME 04101
NOTES, DETAILS, CALCS & FIRE ALARM RISER DIAGRAM

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