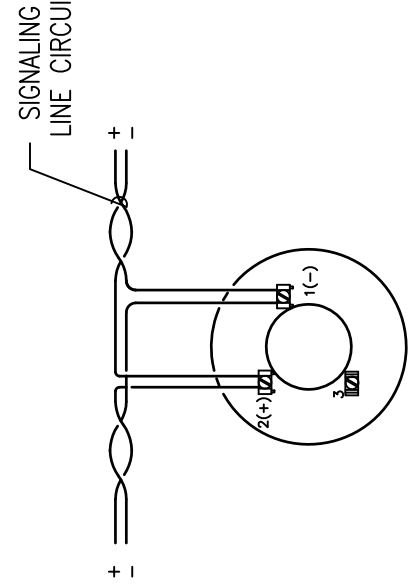
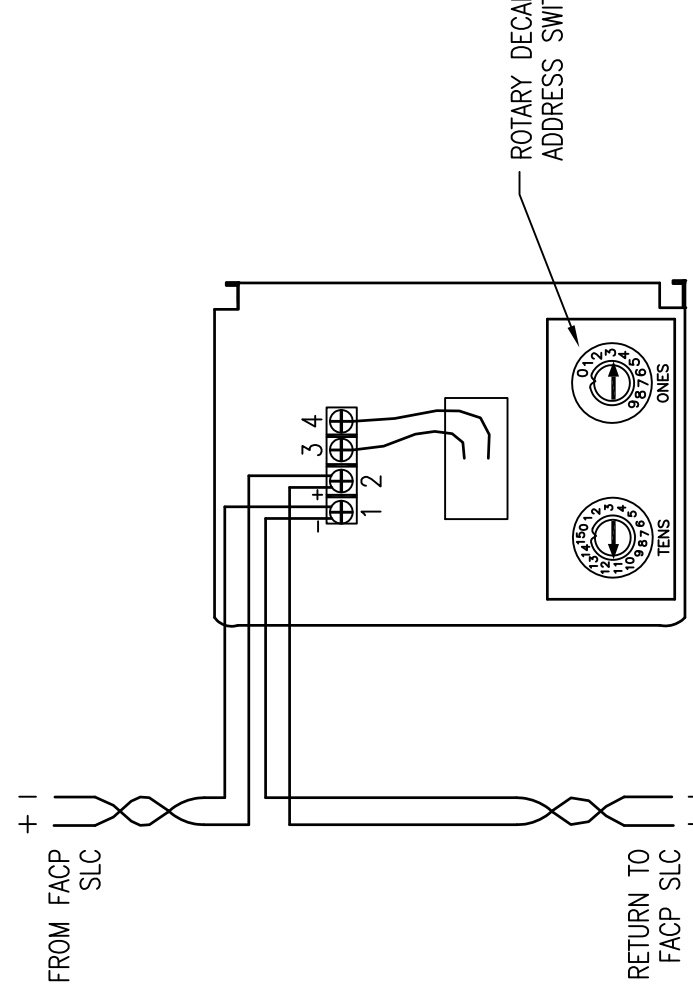


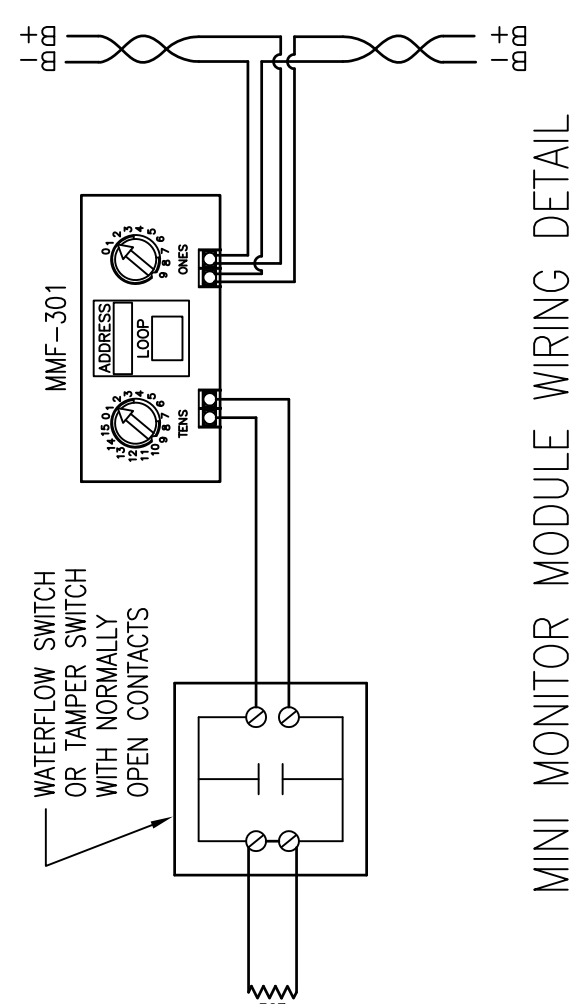
FACP Battery Calculation				1/6/2017
PROJECT NAME: 58 CHESTNUT STREET				
Required Standby Time: 24 Hours				
Required Alarm Time: 3 Minutes				
Regulated Load in Standby				Total Current (Amps)
Device Type	Number of Devices	Current (Amps)	Current (Amps)	
FACP - MS9050UD MAIN CIRCUIT BOARD	1	0.17000	X	0.17000
REMOTE ANNUNCIATOR - ANN-80	19	0.00039	X	0.00751
SMOKE DETECTOR - SD465	11	0.00039	X	0.00429
HEAT DETECTOR - H55	2	0.00023	X	0.00046
PULL STATION - BC-12LX	1	0.00000	X	0.00000
MONITOR MODULE - MMF-300	1	0.00000	X	0.00000
TOTAL STANDBY LOAD				0.14446
Regulated Load in ALARM				Total Current (Amps)
Device Type	Number of Devices	Current (Amps)	Current (Amps)	
FACP - MS9050UD MAIN CIRCUIT BOARD	1	0.20000	X	0.20000
REMOTE ANNUNCIATOR - ANN-80	1	0.04000	X	0.04000
MAX ALARM DRAW - ALL ADDRESS DEVICES	1	0.40000	X	0.40000
NAC-1 (See Voltage Drop Calculations)	1	0.84900	X	0.84900
NAC-2 (See Voltage Drop Calculations)	1	1.11100	X	1.11100
NAC-3 (See Voltage Drop Calculations)	1	0.00000	X	0.00000
NAC-4 (See Voltage Drop Calculations)	1	0.00000	X	0.00000
TOTAL ALARM LOAD				2.60000
Battery Requirements				Required Standby Time in Hours
Standby Load Current (Amps)	0.14446	X	24.00000	= 3.46704
Alarm Load Current (Amps)	2.60000	X	0.08533	= 0.21657
Derating Factor				= 4.62045
TOTAL AMPERE HOURS REQUIRED				7.4H
BATTERIES TO BE PROVIDED (2 - 12V)				



ADDRESSABLE DETECTOR WIRING DETAIL
SCHEMATIC: NO SCALE



MANUAL PULL STATION WIRING DETAIL
SCHEMATIC: NO SCALE



MINI MONITOR MODULE WIRING DETAIL
SCHEMATIC: NO SCALE

Point to Point NAC Voltage Drop Calculation				1/6/2017
PROJECT NAME: 58 CHESTNUT STREET				
Circuit Number: NAC-1				
Nominal System Voltage: 20.4 volts				
Minimum Device Voltage: 16.0 volts				
Distance from source to 1st device: 10 feet				
Wire Gauge for balance of circuit: 14				
Wire Gauge for balance of circuit: 14				
Max Output Current: 1.50 amps				
Total Circuit Current: 0.849 amps				
End of Line Voltage: 20.09 volts				
Circuit is within limits				
Device	Distance previous device	Voltage at device	Drop from source	
Device 1	0.00	20.35	0.052	
Device 2	0.079	20.35	0.296	
Device 3	0.079	20.35	0.296	
Device 4	0.079	20.22	0.726	
Device 5	0.079	20.19	0.888	
Device 6	0.079	20.12	1.058	
Device 7	0.079	20.12	1.298	
Device 8	0.107	20.09	1.368	
Totals	0.849	146	1.500	
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 (E: rated operating voltage, 16-33 VDC (24 VDC nominal)).				

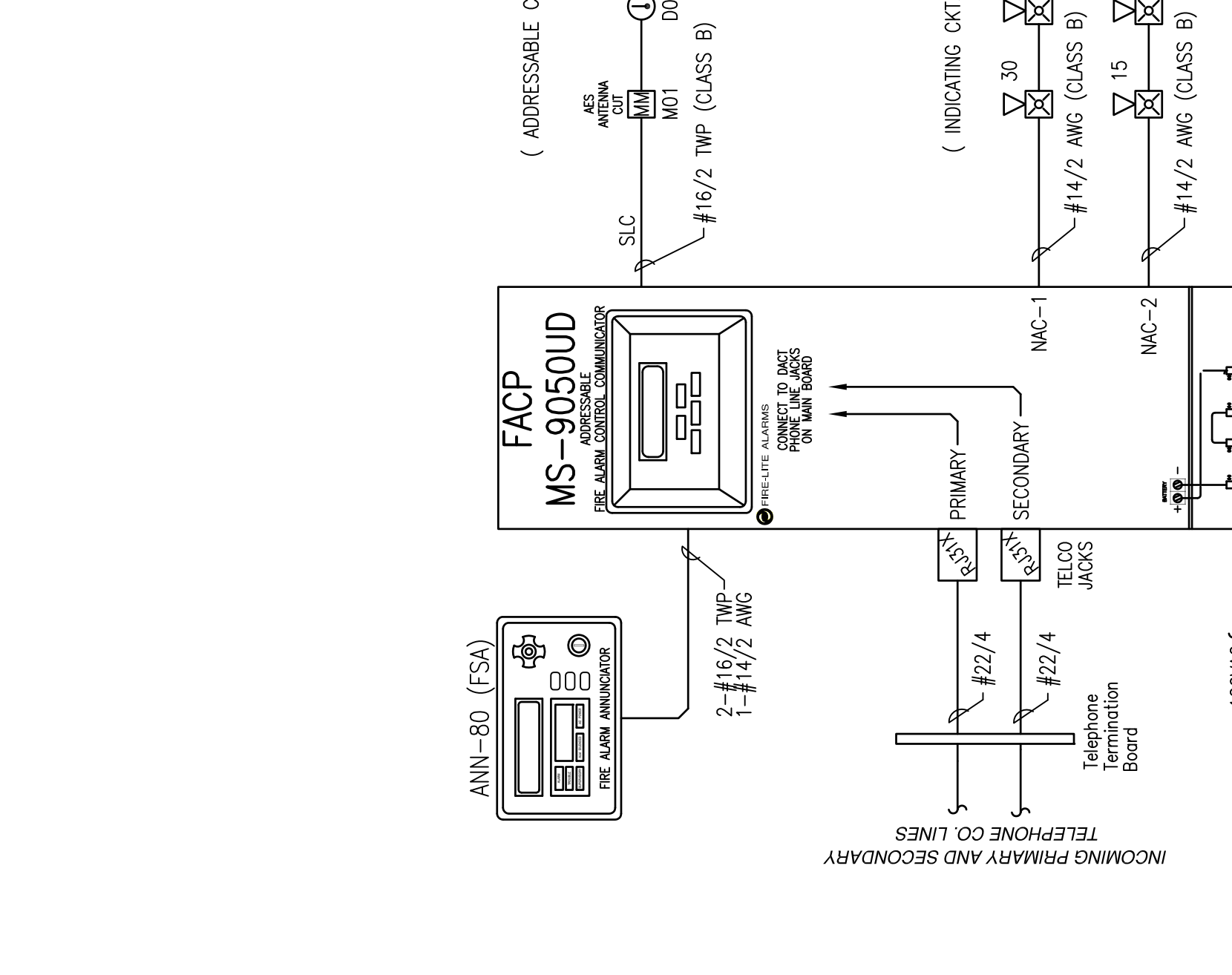
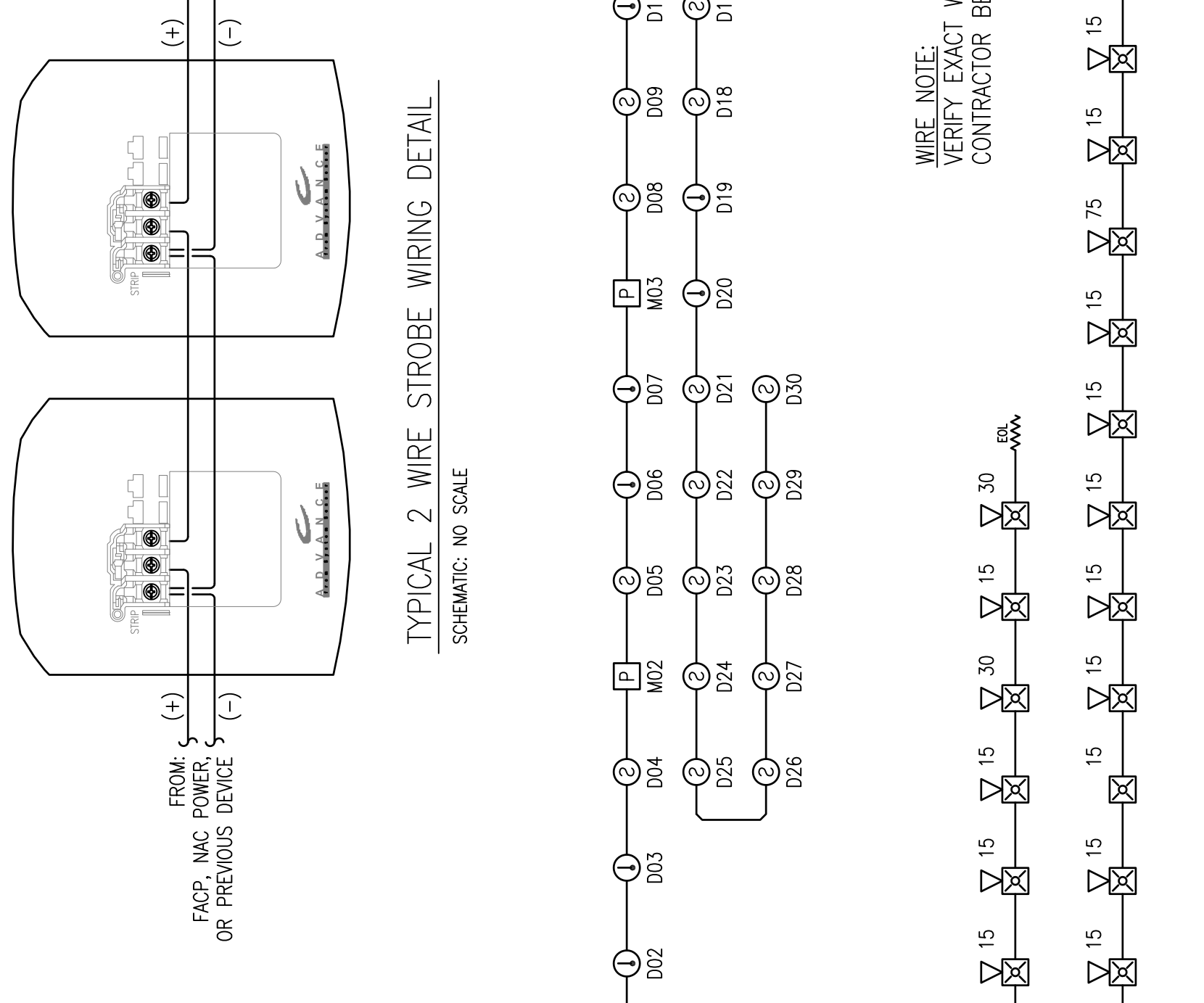
Point to Point NAC Voltage Drop Calculation				1/6/2017
PROJECT NAME: 58 CHESTNUT STREET				
Circuit Number: NAC-2				
Nominal System Voltage: 20.4 volts				
Minimum Device Voltage: 16.0 volts				
Distance from source to 1st device: 20 feet				
Wire Gauge for balance of circuit: 14				
Wire Gauge for balance of circuit: 14				
Max Output Current: 1.50 amps				
Total Circuit Current: 1.111 amps				
End of Line Voltage: 19.47 volts				
Circuit is within limits				
Device	Distance previous device	Voltage at device	Drop from source	
Device 1	0.079	20.20	0.205	
Device 2	0.079	20.12	1.002	
Device 3	0.079	19.97	0.281	
Device 4	0.079	19.86	0.433	
Device 5	0.066	19.78	0.540	
Device 6	0.079	19.78	2.658	
Device 7	0.079	19.75	3.038	
Device 8	0.079	19.67	3.218	
Device 9	0.079	19.61	3.588	
Device 10	0.079	19.58	3.858	
Device 11	0.079	19.50	4.004	
Device 12	0.079	19.50	4.384	
Device 13	0.079	19.47	4.552	
Totals	1.111	234	4.552	
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 (E: rated operating voltage, 16-33 VDC (24 VDC nominal)).				

- 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 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.
 - 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.

FIRE ALARM SYMBOL LEGEND		
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"
FSD	FIRE/SMOKE DAMPER	BY OTHERS
C	SMOKE DETECTOR	CEILING
Ⓢ	DUCT SMOKE DETECTOR	BY OTHERS
Ⓣ	HEAT DETECTOR	CEILING
DM	ADDRESSABLE CONTROL MODULE	FIELD VERIFY
MM	ADDRESSABLE MONITOR MODULE	FIELD VERIFY
EP	MANUAL PULL STATION	WALL @ 48"
ER	CONTROL RELAY (MULTI-VOLTAGE)	FIELD VERIFY
RM	ADDRESSABLE RELAY MODULE	FIELD VERIFY
Ⓜ	MAGNETIC DOOR HOLDER	FIELD VERIFY
B	BELL	BY OTHERS
Ⓡ	CEILING MOUNT STROBE	FIELD VERIFY
Ⓡ	CEILING MOUNT HORN / STROBE	FIELD VERIFY
Ⓡ	CEILING MOUNT SPEAKER / STROBE	FIELD VERIFY
Ⓡ	HORN / STROBE	WALL @ 10'-0"
Ⓡ	SPEAKER / STROBE	WALL 80"-96"
Ⓡ	SPEAKER	WALL @ 90"
Ⓡ	STROBE	WALL 80"-96"

ABBREVIATION	DESCRIPTION
E	EXISTING
G	WITH GUARD
P	PENDENT MOUNT
R	RESIDENTIAL (T10)
S	SOUNDER BASE
WP	WEATHER PROOF
EOL	END OF LINE RESISTOR
Ⓜ	AMERICAN WIRE GAUGE
Ⓜ	WIRE TIE APPROXIMATE CONDUCTOR COUNT
Ⓜ	THIRD SHIELDED PAIR
FPLR	FIRE POWER LIMITED PLENUM
FPLR	FIRE POWER LIMITED RISER

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



FIRE ALARM RISER DIAGRAM
SCHEMATIC: NO SCALE

OPERATIONS MATRIX											
	FIRE ALARM OUTPUT	ACTIVATE ALARM INDICATOR	ACTIVATE AUDIBLE ALARM	ACTIVATE TROUBLE INDICATOR	ACTIVATE AUDIBLE TROUBLE INDICATOR	TRANSMIT ALARM SIGNAL	TRANSMIT TROUBLE SIGNAL	ACTIVATE AUDIBLE TROUBLE INDICATOR	ACTIVATE AUDIBLE TROUBLE INDICATOR	ACTIVATE TROUBLE INDICATOR	ACTIVATE TROUBLE INDICATOR
SMOKE DETECTORS	•	•	•	•	•	•	•	•	•	•	•
HEAT DETECTORS	•	•	•	•	•	•	•	•	•	•	•
PULL STATIONS	•	•	•	•	•	•	•	•	•	•	•
FIRE ALARM AC POWER FAIL	•	•	•	•	•	•	•	•	•	•	•
FIRE ALARM LOW BATTERY	•	•	•	•	•	•	•	•	•	•	•
OPEN CIRCUIT	•	•	•	•	•	•	•	•	•	•	•
GROUND FAULT	•	•	•	•	•	•	•	•	•	•	•
NAC SHORT CIRCUIT	•	•	•	•	•	•	•	•	•	•	•
LOSS OF AC TO BUILDING	•	•	•	•	•	•	•	•	•	•	•

RESERVED FOR CITY STAMP

REVISION	DESCRIPTION	DATE
0	ISSUED FOR REVIEW & APPROVAL	1/9/2017

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58 CHESTNUT STREET
 PORTLAND, MAINE 04101
 CALCS, DETAILS, LEGEND, MATRIX, NOTES

DRAWN	JPB UNICAD JOB #17008
CHECKED	WAYNE B. HAWES NICTET # 90496
DATE	1/9/2017
REVISION	0
SCALE	NONE

UNICAD Inc.
 Fire Alarm Design & Drafting Services