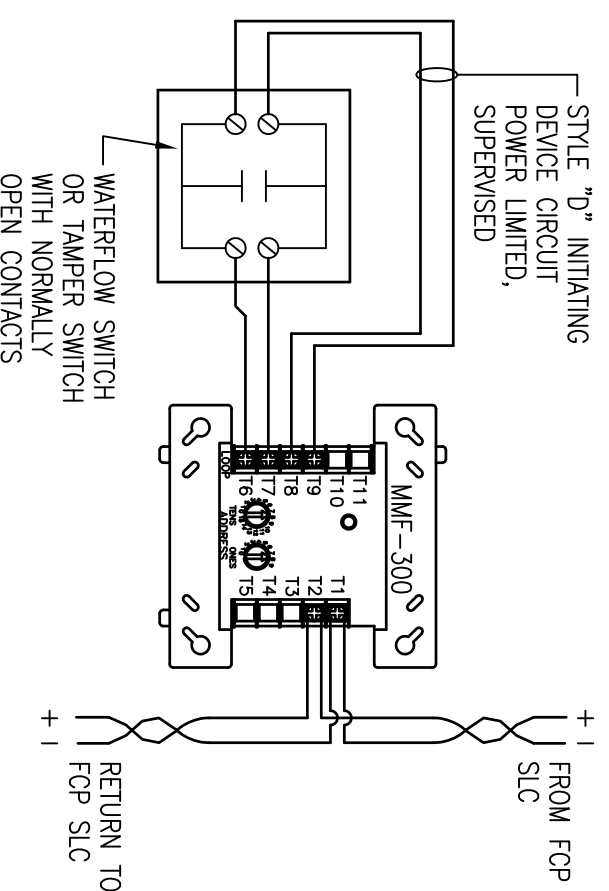
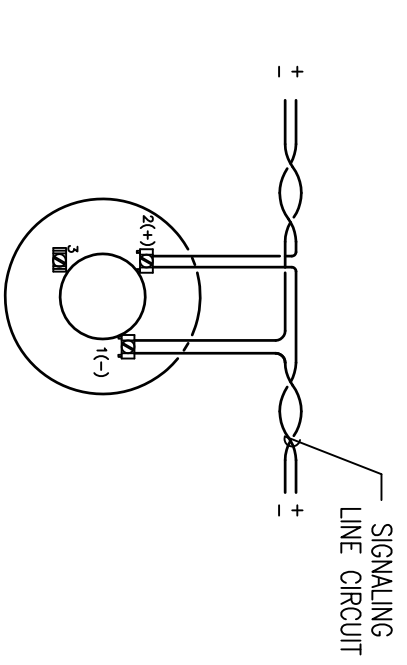


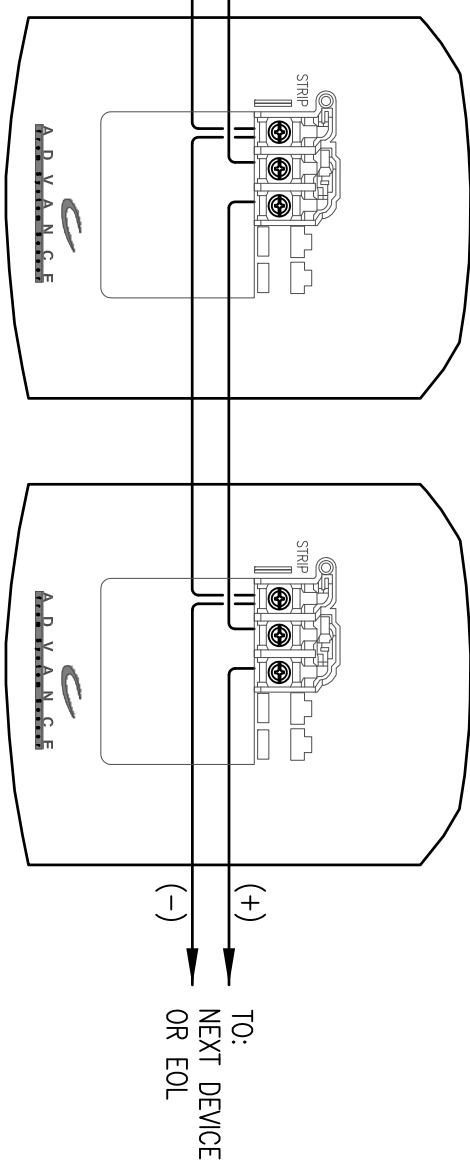
MANUAL PULL STATION WIRING DETAIL
SCHEMATIC: NO SCALE



WATERFLOW / TAMPER WIRING DETAIL
SCHEMATIC: NO SCALE



ADDRESSABLE SMOKE DETECTOR WIRING DETAIL
SCHEMATIC: NO SCALE



TYPICAL 2 WIRE STROBE WIRING DETAIL
SCHEMATIC: NO SCALE

FACP Battery Calculation

PROJECT NAME: 49 MERRILL STREET
Required Standby Time: 24 Hours
Required Alarm Time: 5 Minutes

Device Type	Number of Devices	Current (Amps)	Total Current (Amps)
MS-9050UD Main Circuit Board	1	0.20000	0.20000
AMN-80 Remote Annunciator	1	0.01500	0.01500
SD355 Smoke Detector	1	0.00030	0.00030
NMF-300 Monitor Module	2	0.00040	0.00080
BE-12LX Pull Station	2	0.00023	0.00046
Max. Alarm Draw - All Addressable Devices	1	0.00000	0.00000
TOTAL STANDBY LOAD			0.13656

Device Type	Number of Devices	Current (Amps)	Total Current (Amps)
MS-9050UD Main Circuit Board	1	0.20000	0.20000
AMN-80 Remote Annunciator	1	0.04000	0.04000
MAC-1 (See Voltage Drop Calculations)	1	0.40000	0.40000
MAC-2 (See Voltage Drop Calculations)	1	0.95500	0.95500
TOTAL ALARM LOAD			2.69300

Battery Requirements

Standby Load	Current (Amps)	Required Standby Time in Hours
0.13656 X	24.00000	3.27744
2.69300 X	0.08333	0.22442
		3.50186
TOTAL AMPERE HOURS REQUIRED		4.20223
BATTERIES TO BE PROVIDED (2 - 12V)		7 AH

Point to Point NAC Voltage Drop Calculation 12/18/2015

Project Name	49 MERRILL STREET
Circuit Number	NAC-1
Nominal System Voltage	20.4 volts
Minimum Device Voltage	16.0 volts
Distance from source to 1st device	5 feet
Wire Gauge for balance of circuit	14
Resistance Per 1000 feet	3.07

Circuit is within limits

Device	Current	Distance previous device	Voltage at Drop from source	Percent Drop
Device 1	0.079	5	20.37	0.14%
Device 2	0.066	12	20.31	0.49%
Device 3	0.107	13	20.12	1.03%
Device 4	0.107	31	19.98	1.49%
Device 5	0.066	25	19.90	2.07%
Device 6	0.212	7	19.88	2.46%
Device 7	0.107	19	19.85	2.55%
Device 8	0.066	10	19.84	2.69%
Device 9	0.066	24	19.83	2.78%
Totals	0.955	178		

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 (i.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 THE 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 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"
FES	FIRE ALARM POWER SUPPLY	FIELD VERIFY
FSA	FIRE SYSTEM ANNUNCIATOR	WALL-TOP @ 66"
FSD	FIRE/SMOKE DAMPER	BY OTHERS
SD	SMOKE DETECTOR	CEILING
SD-	DUCT SMOKE DETECTOR	BY OTHERS
HD	HEAT DETECTOR	CEILING
AM	ADDRESSABLE CONTROL MODULE	FIELD VERIFY
AM	ADDRESSABLE MONITOR MODULE	FIELD VERIFY
P	MANUAL PULL STATION	WALL @ 48"
ER	CONTROL RELAY (MULTI-VOLTAGE)	FIELD VERIFY
RM	ADDRESSABLE RELAY MODULE	FIELD VERIFY
KB	KNOX BOX	FIELD VERIFY
WS	WATER FLOW SWITCH	BY OTHERS
TS	VALVE TAMPER SWITCH	BY OTHERS
LF	LOW FREQUENCY HORN	WALL @ 10'-0"
HD	HORN / STROBE	WALL 80"-96"
SD	SPEAKER / STROBE	WALL 80"-96"
SP	SPEAKER	WALL @ 90"
SD	STROBE	WALL 80"-96"

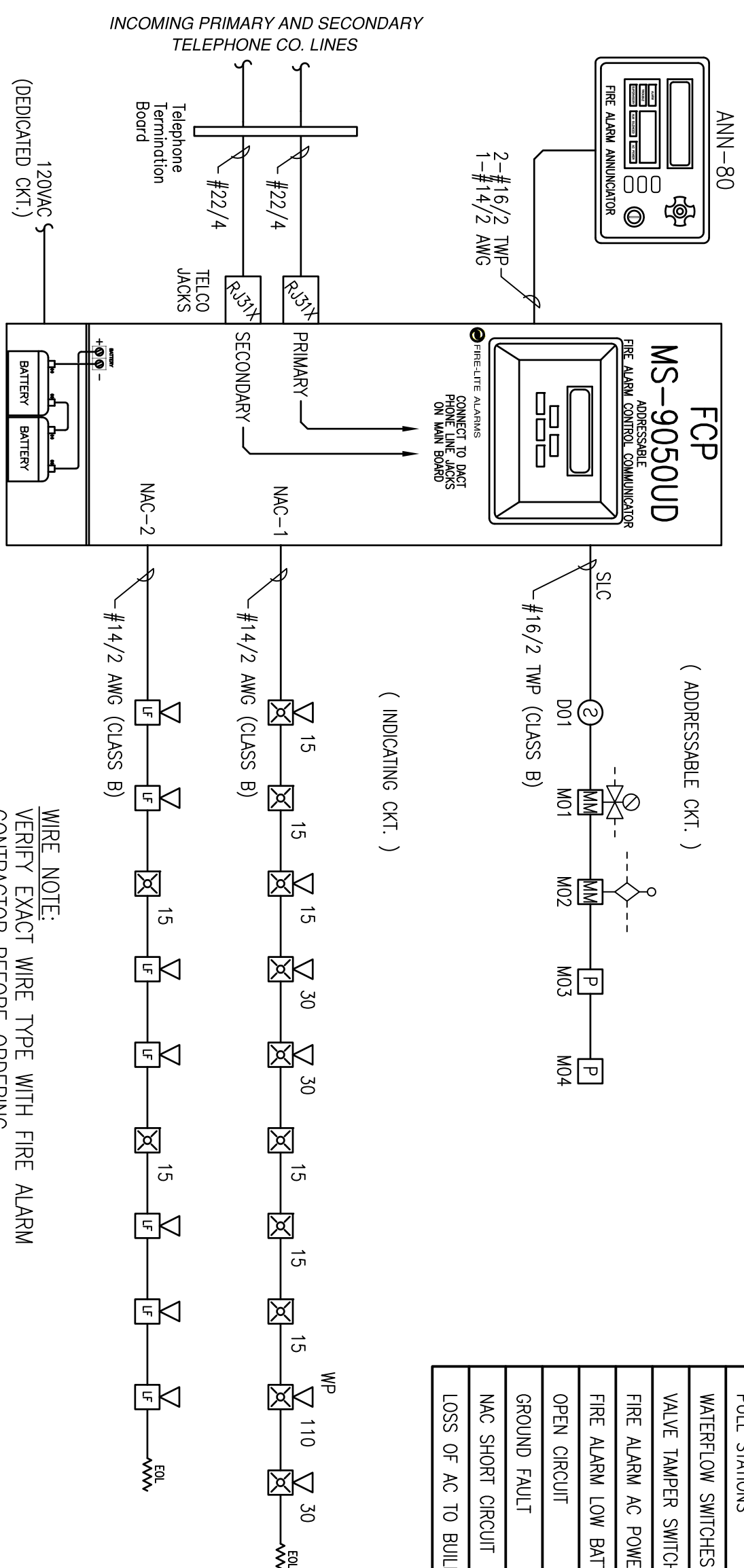
ABBREVIATION	DESCRIPTION	INSTALLATION
E	EXISTING	
G	WITH GUARD	
P	PENDENT MOUNT	
R	RESIDENTIAL (110V)	
S	SOUNDER BASE	
WP	WEATHER PROOF	
WR	END OF LINE RESISTOR	
ELR	END OF LINE RELAY	
AWG	AMERICAN WIRE GAUGE	
TWP	TWISTED SHIELDED PAIR	
TWSP	TWISTED SHIELDED PAIR WITH SIGNAL COMMON	
FPLP	FIRE POWER LIMITED PLENUM	
FPRP	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

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
SMOKE DETECTORS	●	●	●	●							
PULL STATIONS	●	●	●	●							
WATERFLOW SWITCHES	●	●	●	●							
VALVE TAMPER SWITCHES	●	●	●	●							
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	12/18/2015

CUNNINGHAM

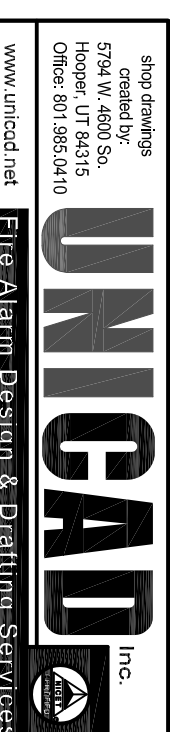
Security Systems

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98 WASHINGTON AVENUE

PORTLAND, MAINE 04101

CALCS, DETAILS, LEGEND, MATRIX, NOTES, RISER



FA-1

DATE: 12/18/2015

CHECKED: WYNNE B. HAYS

DESIGN: UNIGAD JOB #158880

SCALE: NONE

REVISION: 0