

**FIRE ALARM DEVICE MOUNTING HEIGHTS**  
SCALE: NOT TO SCALE

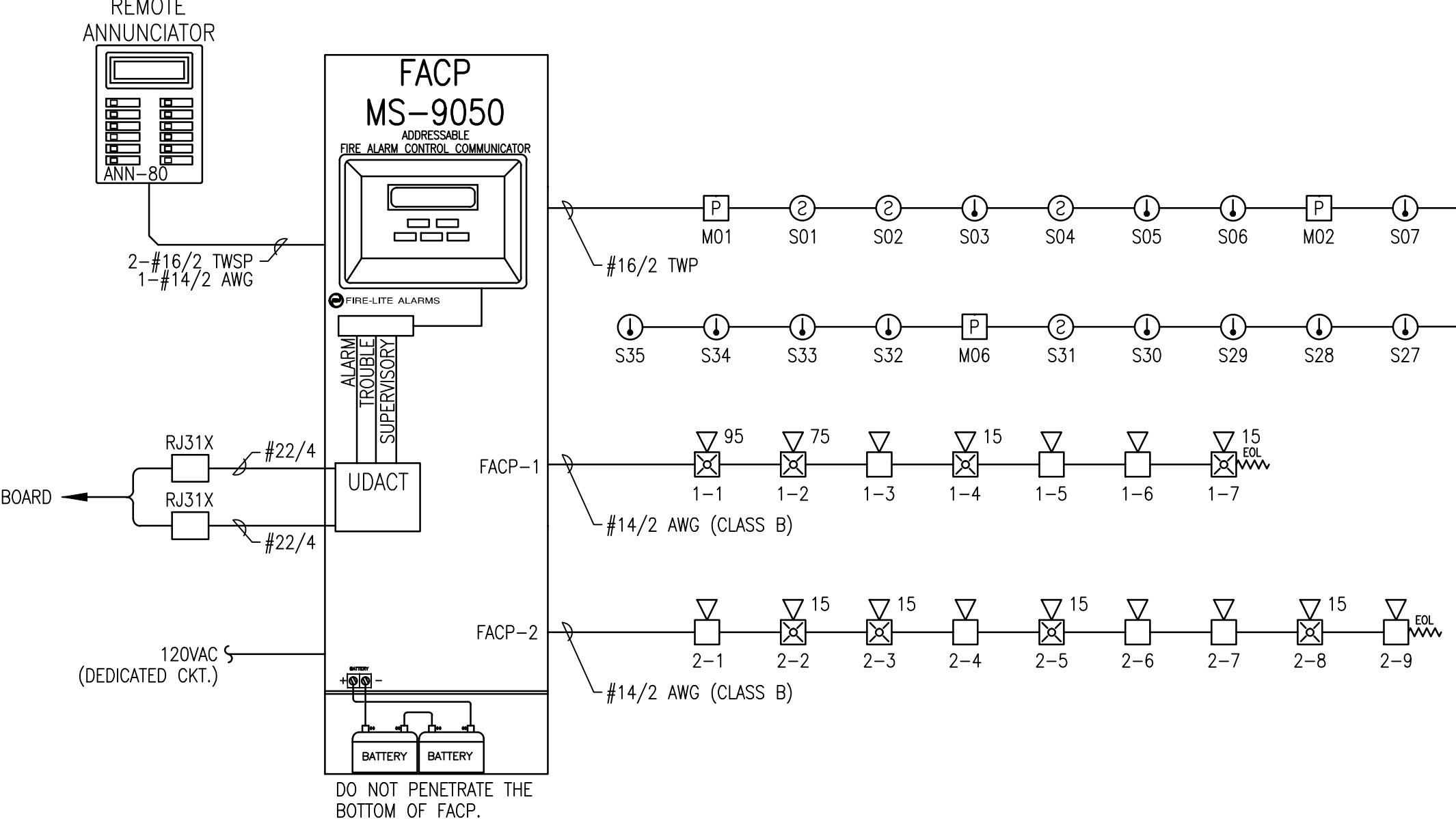
FIRE ALARM SYMBOL LEGEND		
SYMBOL	DESCRIPTION	MOUNTING
[FACP]	FIRE ALARM CONTROL PANEL	WALL-TOP @ 66"
[FSA]	FIRE ALARM ANNIUNCIATOR	WALL-TOP @ 66"
⊙	SMOKE DETECTOR	CEILING
Ⓛ	HEAT DETECTOR	CEILING
[P]	MANUAL PULL STATION	WALL @ 48"
Ⓜ	MINI HORN	WALL @ 10'-0"
[H/S]	HORN / STROBE	WALL 80"-96"

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

**GENERAL NOTES:**

- SCOPE OF WORK: THIS PROJECT SHALL INCLUDE THE INSTALLATION OF A NEW MANUAL FIRE ALARM SYSTEM WITH OCCUPANT NOTIFICATION THROUGH OUT.
- 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. 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.
- 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 907.6.5 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 RISER DIAGRAM**  
SCHEMATIC: NO SCALE

Point to Point NAC Voltage Drop Calculation				8/14/2017	
Project Name	45 PARK STREET				
Circuit Number	FACP-1				
Nominal System Voltage	20.4 volts	Wire Gauge	14	Resistance Per 1000	3.07
Minimum Device Voltage	16.0 volts	Distance from source to 1st device	65 feet	Wire Gauge for balance of circuit	14
Max Output Current	3.00 amps	Total Circuit Current	0.422 amps	End of Line Voltage	20.08 volts
<b>Circuit is within limits</b>					
Device	Current	Distance previous device	Voltage at Device	Drop from source	Percent Drop
Device 1	0.142	65	20.23	0.168	0.83%
Device 2	0.121	15	20.21	0.194	0.95%
Device 3	0.017	40	20.17	0.233	1.14%
Device 4	0.054	40	20.13	0.268	1.31%
Device 5	0.017	50	20.10	0.295	1.45%
Device 6	0.017	35	20.09	0.310	1.52%
Device 7	0.054	25	20.08	0.319	1.56%
Totals	0.422	270			

Point to Point NAC Voltage Drop Calculation				8/14/2017	
Project Name	45 PARK STREET				
Circuit Number	FACP-2				
Nominal System Voltage	20.4 volts	Wire Gauge	14	Resistance Per 1000	3.07
Minimum Device Voltage	16.0 volts	Distance from source to 1st device	85 feet	Wire Gauge for balance of circuit	14
Max Output Current	3.00 amps	Total Circuit Current	0.301 amps	End of Line Voltage	20.08 volts
<b>Circuit is within limits</b>					
Device	Current	Distance previous device	Voltage at Device	Drop from source	Percent Drop
Device 1	0.017	85	20.24	0.157	0.77%
Device 2	0.054	20	20.21	0.192	0.94%
Device 3	0.054	20	20.18	0.220	1.08%
Device 4	0.017	30	20.15	0.253	1.24%
Device 5	0.054	25	20.12	0.277	1.36%
Device 6	0.017	30	20.10	0.296	1.45%
Device 7	0.017	25	20.09	0.310	1.52%
Device 8	0.054	25	20.08	0.321	1.57%
Device 9	0.017	20	20.08	0.323	1.58%
Totals	0.301	280			

FACP Battery Calculation				8/15/2017	
PROJECT NAME:	45 PARK STREET				
Required Standby Time:	24 Hours				
Required Alarm Time:	5 Minutes				
<b>AC Branch Current</b>					
AC Branch Current:	Amps @ 120V				
<b>Regulated Load in Standby</b>					
Device Type	Number of Devices	Current (Amps)	Total Current (Amps)		
FACP MAINBOARD	1	X 0.12000	=	0.12000	
SMOKE DETECTOR	8	X 0.00030	=	0.00240	
HEAT DETECTOR	27	X 0.00030	=	0.00810	
PULL STATION	6	X 0.00023	=	0.00138	
ANNUNCIATOR	1	X 0.01500	=	0.01500	
TOTAL STANDBY LOAD				0.14688	
<b>Regulated Load in ALARM</b>					
Device Type	Number of Devices	Current (Amps)	Total Current (Amps)		
FACP MAINBOARD	1	X 0.20000	=	0.20000	
MAX ADDRESSABLE ALARM DRAW	1	X 0.40000	=	0.40000	
ANNUNCIATOR	1	X 0.02000	=	0.02000	
FACP-1 (See Voltage Drop Calculations)	1	X 0.42200	=	0.42200	
FACP-2 (See Voltage Drop Calculations)	1	X 0.30100	=	0.30100	
TOTAL ALARM LOAD				1.34300	
<b>Battery Requirements</b>					
Standby Load Current (Amps)	0.14688	Required Standby Time in Hours	24.00000	=	3.52512
Alarm Load Current (Amps)	1.34300	Required Alarm Time in Hours	0.08333	=	0.11192
Total Ampere Hours (before derating factor)	3.63704				
Derating Factor	X 1.2				
TOTAL AMPERE HOURS REQUIRED				= 4.36444	
BATTERIES TO BE PROVIDED (2 - 12V)				7 AH	

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 NOTIFICATION APPLIANCES
FIRE ALARM INPUT							
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							

REVISION	DESCRIPTION	DATE
0	ISSUED FOR REVIEW & APPROVAL	8/14/2017

RESERVED FOR CITY STAMP

CUNNINGHAM

Security Systems

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49 PARK STREET  
PORTLAND, ME

NOTES, DETAILS, RISER DIAGRAM & CALCS

DRAWN	CWS UNICAD JOB #17538
CHECKED	BRADY B. HAWES NICET III 138751
DATE	8/14/2017
REVISION	0
SCALE	1/8"=1'-0"