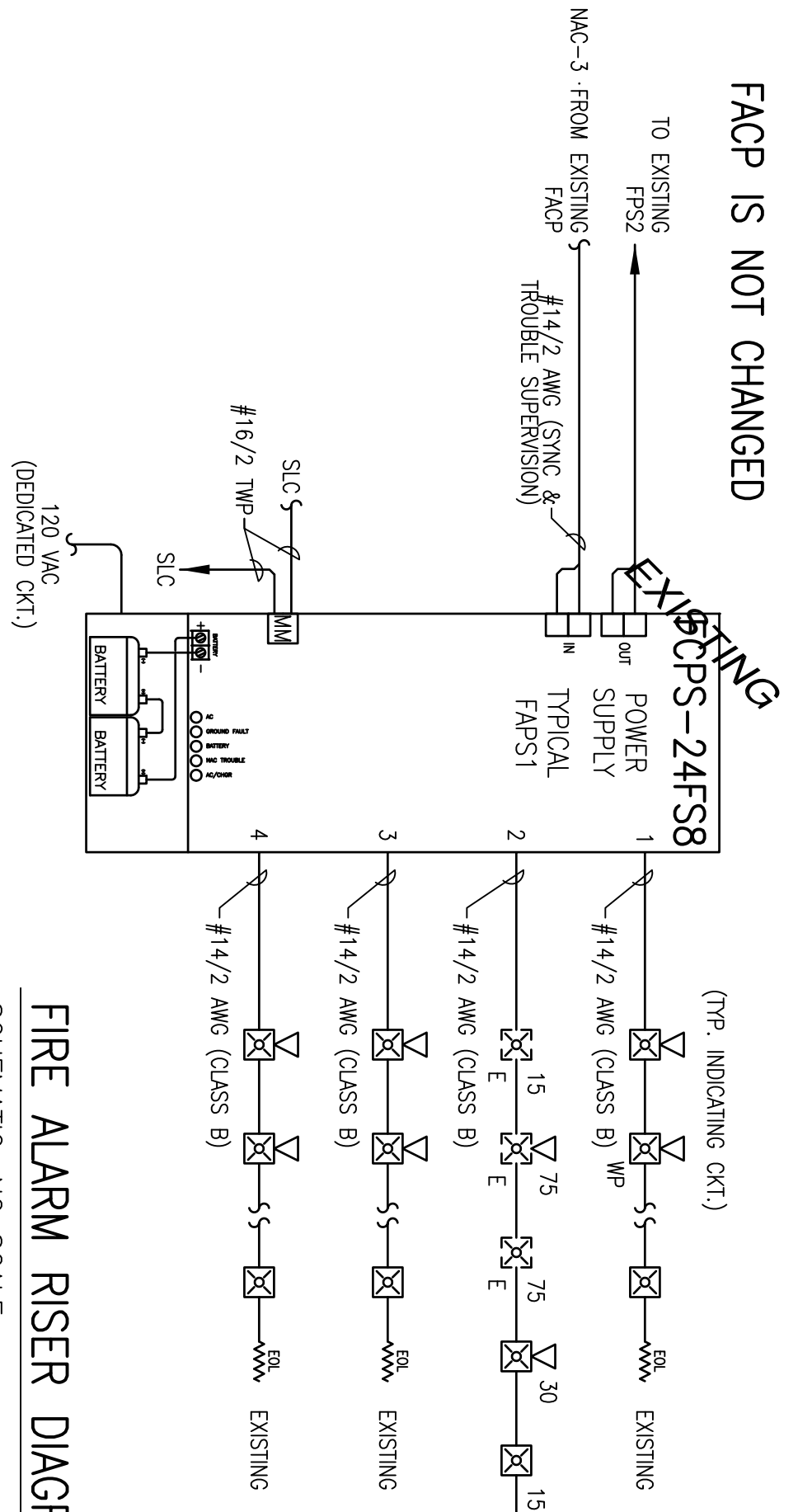


Existing FPS1 Battery Calculation				11/6/2015
PROJECT NAME: 10 FREE STREET - JB BROWN OFFICE TI				
Required Standby Time: 24 Hours				
Required Alarm Time: 5 Minutes				
AC Branch Current: 3.2 Amps @ 120V				
Regulated Load in Standby				
Device Type	Number of Devices	Current (Amps)	Total Current (Amps)	
EXISTING FPS1 - FCPs-24FS8 MANBOARD	1	0.08550	0.08550	
TOTAL STANDBY LOAD: 0.08550				
Regulated Load in Alarm				
Device Type	Number of Devices	Current (Amps)	Total Current (Amps)	
EXISTING FPS1 - FCPs-24FS8 MANBOARD	1	1.42500	1.42500	
FPS1-1 - Existing	1	1.46000	1.46000	
FPS1-2 (See Voltage Drop Calculations) Revised	1	1.61000	1.61000	
FPS1-3 - Existing	1	0.95300	0.95300	
FPS1-4 - Existing	1	0.95300	0.95300	
TOTAL ALARM LOAD: 5.99300				
Battery Requirements				
Standby Load	0.06500 X	Required Standby Time in Hours	1.56000	
Alarm Load	24.00000 X	Required Alarm Time in Hours	0.46608	
Current (Amps)	5.99300 X	0.08333 =	2.02608	
Total Ampere Hours (before derating factor)			1.2	
Derating Factor			X	
TOTAL AMPERE HOURS REQUIRED: 2.43130				
BATTERIES TO BE PROVIDED (2 - 12V) 7 AH				

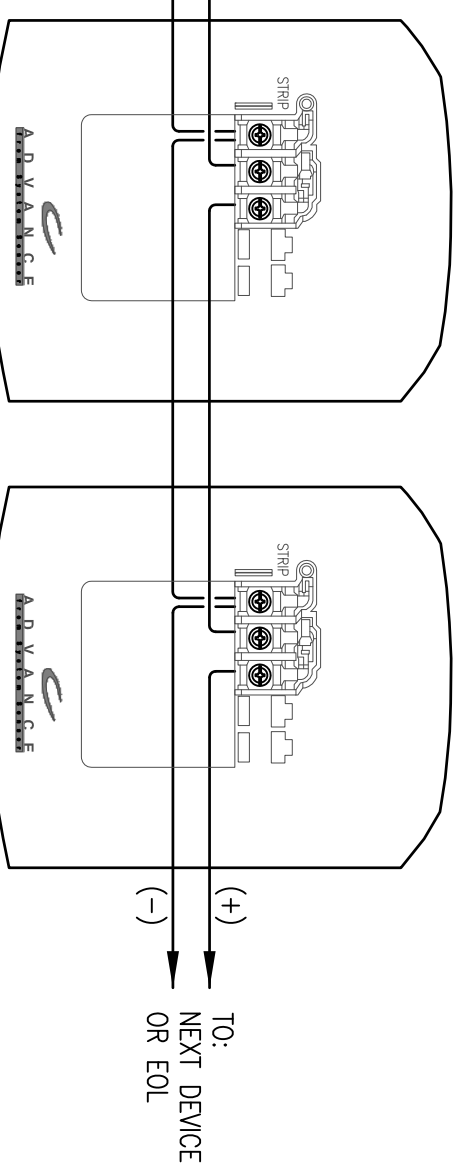
Point to Point NAC Voltage Drop Calculation				11/6/2015	
Project Name: 10 FREE STREET - JB BROWN OFFICE TI					
Circuit Number: FFS1-2					
Nominal System Voltage: 20.4 volts					
Minimum Device Voltage: 16.0 volts					
Distance from source to 1st device: 23 feet					
Wire Gauge for balance of circuit: 14					
Wire Gauge for balance of circuit: 14					
Max Output Current: 2.000 amps					
Total Circuit Current: 1.460 amps					
End of Line Voltage: 18.67 volts					
Circuit is within limits					
Device	Current	Distance previous device	Voltage at source	Drop	Percent Drop
Device 1	0.066	25	20.18	0.224	1.10%
Device 2	0.176	35	19.88	0.524	2.57%
Device 3	0.158	48	19.52	0.883	4.33%
Device 4	0.107	35	19.29	1.110	5.44%
Device 5	0.086	23	19.15	1.245	6.10%
Device 6	0.086	6	19.12	1.278	6.28%
Device 7	0.107	15	19.05	1.353	6.63%
Device 8	0.176	47	18.93	1.472	7.24%
Device 9	0.176	31	18.76	1.615	7.92%
Device 10	0.107	29	18.73	1.666	8.16%
Device 11	0.176	60	18.67	1.730	8.48%
Device 12	0.176	60	18.67	1.730	8.48%
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)).					



FIRE ALARM RISER DIAGRAM
SCHEMATIC: NO SCALE

GENERAL NOTES:

- THESE DRAWINGS ARE DIAGRAMATIC. 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 SCHEMATIC 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 CIRCUIT END OF LINE (WHEN WIRING CLASS "B"). THESE LABELS SHALL BE IN PLACE PRIOR TO START-UP AND TESTING.



TYPICAL 2 WIRE STROBE WIRING DETAIL
SCHEMATIC: NO SCALE

FIRE ALARM SYMBOL LEGEND

SYMBOL	DESCRIPTION	MOUNTING
FCP	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
SD	SMOKE DETECTOR	CEILING
SD	SMOKE DETECTOR	BY OTHERS
①	HEAT DETECTOR	CEILING
CM	ADDRESSABLE CONTROL MODULE	FIELD VERIFY
MM	ADDRESSABLE MONITOR MODULE	FIELD VERIFY
P	MANUAL PULL STATION	WALL @ 48"
R	CONTROL RELAY (MULTI-VOLTAGE)	FIELD VERIFY
RM	ADDRESSABLE RELAY MODULE	FIELD VERIFY
KB	KNOX BOX	FIELD VERIFY
WFS	WATER FLOW SWITCH	BY OTHERS
WTS	WATER TAMPER SWITCH	BY OTHERS
B	BELL	BY OTHERS
CM	CEILING MOUNT STROBE	FIELD VERIFY
CM	CEILING MOUNT HORN / STROBE	FIELD VERIFY
CM	CEILING MOUNT SPEAKER / STROBE	FIELD VERIFY
CM	MINI HORN	WALL @ 10'-0"
CM	HORN / STROBE	WALL 80'-96"
CM	SPEAKER / STROBE	WALL 80'-96"
CM	SPEAKER	WALL @ 90"
CM	STROBE	WALL 80'-96"

APPLICABLE CODES:

MAINE UNIFORM ENERGY & BUILDING CODE
PORTLAND CNT CODE, CHAPTER 10, FIRE PREVENTION & PROTECTION
NFPA 1, FIRE CODE, & NFPA 701, LIFE SAFETY CODE

OPERATIONS MATRIX

OPERATIONS	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 ALTERNATE ELEVATOR RECALL	ACTIVATE PRIMARY RECALL	ACTIVATE ELEVATOR SHUNT
SMOKE DETECTORS	●	●	●	●										
HEAT DETECTORS	●	●	●	●										
PULL STATIONS	●	●	●	●										
PRIMARY RECALL FLR, ELEV LOBBY SMOKE DET	●	●	●	●								●		
ALTERNATE RECALL FLR, ELEV LOBBY SMOKE DET	●	●	●	●								●		
TOP OF ELEV SHAFT SMOKE DET	●	●	●	●								●		
ELEVATOR EQUIPMENT ROOM SMOKE DET	●	●	●	●								●		
ELEVATOR EQUIPMENT ROOM HEAT DET	●	●	●	●								●		
TOP OF ELEV SHAFT HEAT DET	●	●	●	●								●		
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	●	●	●	●								●		

RESERVED FOR CITY STAMP

CUNNINGHAM
Security Systems

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REVISION	DESCRIPTION	DATE
0	ISSUED FOR REVIEW & APPROVAL	11/6/2015

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CALCS, DETAILS, LEGEND, MATRIX, NOTES

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Drawn by: JPB
Checked by: WYB
Date: 11/6/2015

SCALE: NONE

FA-1