

FCP Battery Calculation

6/22/2015

PROJECT NAME: 660 CONGRESS STREET
 Required Standby Time: 24 hours
 Required Alarm Time: 24 minutes

Regulated Load in Standby

Device Type	Number of Devices	Current (amps)	Total Current (amps)
MS-9050UD Main Circuit Board	1	0.12000	0.12000
ANN-80 Remote Annunciator	1	0.01500	0.01500
SD355ST Smoke Detector	17	0.00030	0.00510
MMF-301 Min Monitor Module	1	0.00038	0.00038
GRF-300 Relay Module	1	0.00027	0.00027
TOTAL STANDBY LOAD			0.14195

Regulated Load in ALARM

Device Type	Number of Devices	Current (amps)	Total Current (amps)
MS-9050UD Main Circuit Board	1	0.20000	0.20000
ANN-80 Remote Annunciator	1	0.04000	0.04000
Max Alarm Draw - All Addressable Devices	1	0.40000	0.40000
MAC-1 (See voltage drop calc for device quantity)	1	1.39900	1.39900
MAC-2	1	0.40800	0.40800
TOTAL ALARM LOAD			2.44700

Battery Requirements

Standby Load	0.14195	X	Required Standby Time in Hours	3.40668
Alarm Load	2.44700	X	Required Alarm Time in Hours	0.20392
Current (amps)	2.44700	X	0.08333	=
Total Ampere Hours (before derating factor)			3.61060	
Derating Factor			1.2	
TOTAL AMPERE HOURS REQUIRED				4.33272

BATTERIES TO BE PROVIDED (2 - 12V)

MAC Circuit Voltage Drop Calculation

Project Name	660 CONGRESS STREET	2/28/2015
Circuit Number	MAC-1	
Nominal System Voltage	20.4 volts	Wire Gauge
Minimum Device Voltage	16 volts	16
Distance from source to 1st device	15	Resistance Per 1000
Wire Gauge for balance of circuit		9.78
Max Output Current	1.6 amps	
Total Circuit Current	1.399 amps	

MAC Circuit Voltage Drop Calculation

Device	Distance previous device	Voltage at Device	Drop from source	Percent Drop
Device 1	0.069	20.19	0.21	1%
Device 2	0.079	19.96	0.44	2%
Device 3	0.069	19.80	0.60	3%
Device 4	0.079	19.74	0.66	3%
Device 5	0.079	19.44	0.96	5%
Device 6	0.176	19.17	1.23	6%
Device 7	0.069	19.05	1.33	7%
Device 8	0.212	18.74	1.66	8%
Device 9	0.176	18.41	1.89	10%
Device 10	0.176	18.38	2.02	10%
Device 11	0.069	18.37	2.03	10%
Device 12	0.069	18.37	2.03	10%
Device 13	0.079	18.37	2.03	10%
Totals		259		10%

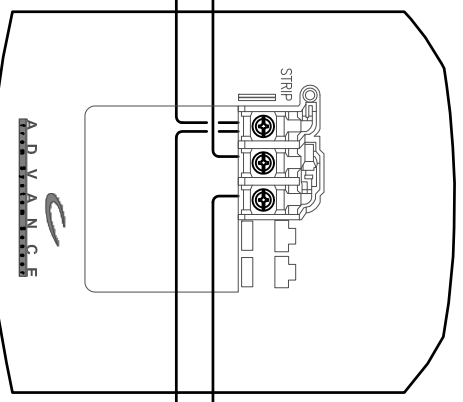
MAC Circuit Voltage Drop Calculation

Project Name	660 CONGRESS STREET	2/28/2015
Circuit Number	MAC-2	
Nominal System Voltage	20.4 volts	Wire Gauge
Minimum Device Voltage	16 volts	16
Distance from source to 1st device	25	Resistance Per 1000
Wire Gauge for balance of circuit		9.78
Max Output Current	0.9 amps	
Total Circuit Current	0.408 amps	

Circuit is within limits

Device	Distance previous device	Voltage at Device	Drop from source	Percent Drop
Device 1	0.069	20.30	0.10	0%
Device 2	0.069	20.25	0.15	1%
Device 3	0.069	20.18	0.22	1%
Device 4	0.069	20.16	0.24	1%
Device 5	0.069	20.13	0.27	1%
Device 6	0.069	20.12	0.28	1%
Totals		115		1%

FROM: (+)

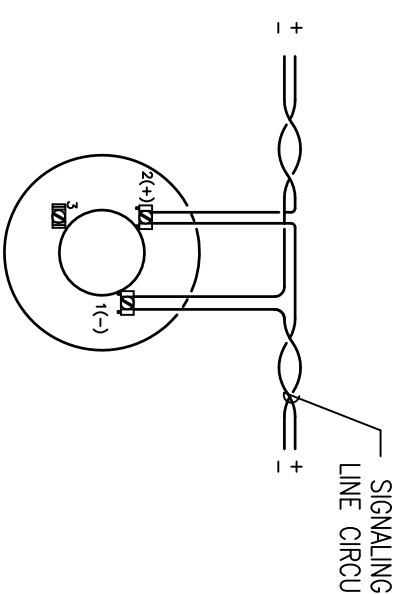


TO: (+) NEXT DEVICE OR EOL (-)

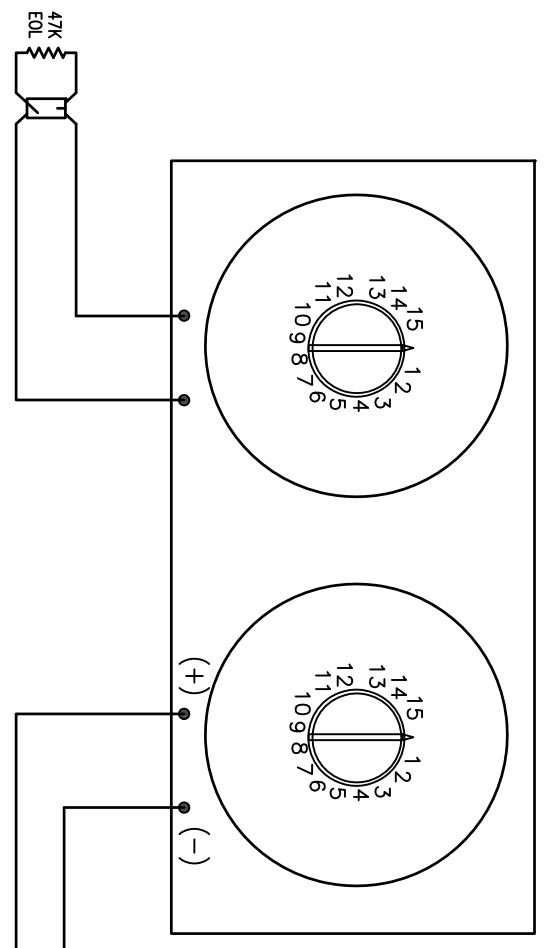
TYPICAL 2 WIRE STROBE WIRING DETAIL
 SCHEMATIC: NO SCALE

GENERAL NOTES:

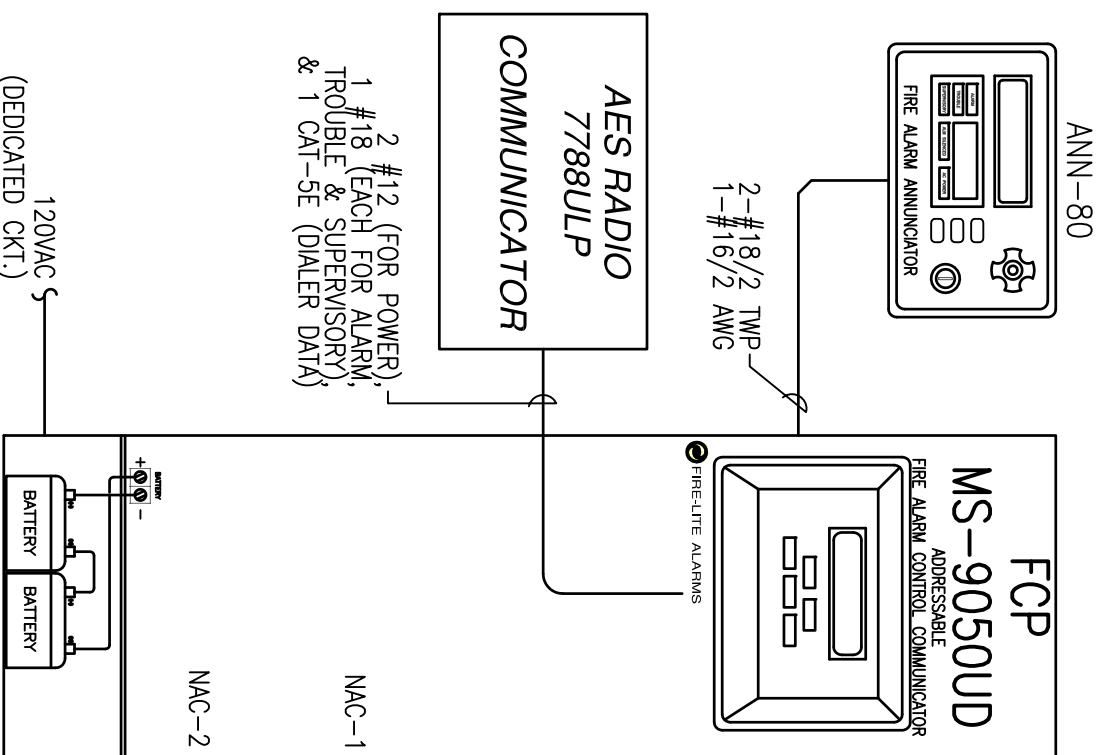
- THESE DRAWINGS ARE DIAGRAMMATIC. REFER TO THE ARCHITECTURAL DRAWINGS FOR EXACT DIMENSIONS.
- INSTALLATION SHALL COMPLY WITH NEC, NFPA 72 AND ALL OTHER APPLICABLE CODES AS REQUIRED BY THE LOCAL AUTHORITY HAVING JURISDICTION.
- WIRING DEPICTED ON THESE PLANS IS SCHEMATIC - ACTUAL WIRE LOCATIONS MAY DIFFER 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 CIRCUIT END OF LINE (WHEN WIRING CLASS "B"). THESE LABELS SHALL BE IN PLACE PRIOR TO START-UP AND TESTING.



ADDRESSABLE SMOKE DETECTOR WIRING DETAIL
 SCHEMATIC: NO SCALE



MINI MONITOR MODULE WIRING DETAIL
 SCHEMATIC: NO SCALE



FIRE ALARM RISER DIAGRAM
 SCHEMATIC: NO SCALE

FIRE ALARM SYMBOL LEGEND

SYMBOL	DESCRIPTION	MOUNTING
[E2]	FIRE ALARM CONTROL PANEL	WALL-TOP @ 66"
[F5]	FIRE ALARM POWER SUPPLY	FIELD VERIFY
[FSA]	FIRE SYSTEM ANNUNCIATOR	WALL-TOP @ 66"
[R5]	REMOTE TEST STATION	FIELD VERIFY
[S]	SMOKE DETECTOR	CEILING
[S-]	DUCT SMOKE DETECTOR	BY OTHERS
[H]	HEAT DETECTOR	CEILING
[C]	CARBON MONOXIDE DETECTOR	CEILING
[CM]	ADDRESSABLE CONTROL MODULE	FIELD VERIFY
[M]	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
[M]	MAGNETIC DOOR HOLDER	FIELD VERIFY
[W]	WATER FLOW SWITCH	BY OTHERS
[V]	VALVE TAMPER SWITCH	BY OTHERS
[G]	GATE VALVE TAMPER SWITCH	BY OTHERS
[B]	BELL	FIELD VERIFY
[C]	CEILING MOUNT STROBE	FIELD VERIFY
[H]	CEILING MOUNT HORN / STROBE	FIELD VERIFY
[S]	CEILING MOUNT SPEAKER / STROBE	FIELD VERIFY
[H]	HORN	WALL @ 10'-0"
[H]	HORN / STROBE	WALL 80"-96"
[S]	SPEAKER / STROBE	WALL 80"-96"
[S]	SPEAKER	WALL @ 90"
[S]	STROBE	WALL 80"-96"

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
SMOKE DETECTORS	ACTIVATE ALARM INDICATOR
PULL STATIONS	ACTIVATE AUDIBLE ALARM
WATERFLOW SWITCHES	ACTIVATE SUPERVISORY INDICATOR
VALVE TAMPER SWITCHES	ACTIVATE AUDIBLE SUPERVISORY SIGNAL
GATE VALVE TAMPER SWITCHES	ACTIVATE TROUBLE INDICATOR
FIRE ALARM AC POWER FAIL	ACTIVATE AUDIBLE TROUBLE INDICATOR
FIRE ALARM LOW BATTERY	TRANSMIT ALARM SIGNAL
OPEN CIRCUIT	TRANSMIT SUPERVISORY SIGNAL
GROUND FAULT	TRANSMIT TROUBLE SIGNAL
MAC SHORT CIRCUIT	
LOSS OF AC TO BUILDING	

RESERVED FOR CITY STAMP

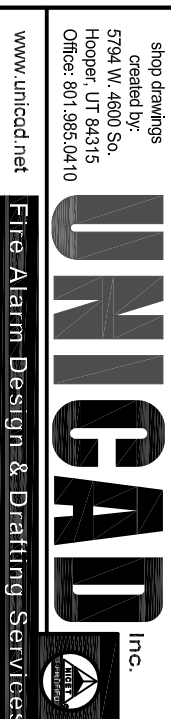
REVISION	DESCRIPTION	DATE
0	ISSUED FOR REVIEW & APPROVAL	2/19/2015
1	WIRE REVISION	2/26/2015
2	FLOOR PLAN, SPRINKLR/GATE VALVE REVS	6/22/2015



SEACOAST SECURITY

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MIXED USE BUILDING
660 CONGRESS STREET
PORTLAND, MAINE 04101
CALCS, DETAILS, LEGEND, MATRIX, NOTES, RISER



FA-1

DESIGN	JFB UNIGAD JOB #14578
CHECKED	WYNNE B. HAYS NCEIT IV 90496
DATE	2/19/2015
SCALE	NONE