

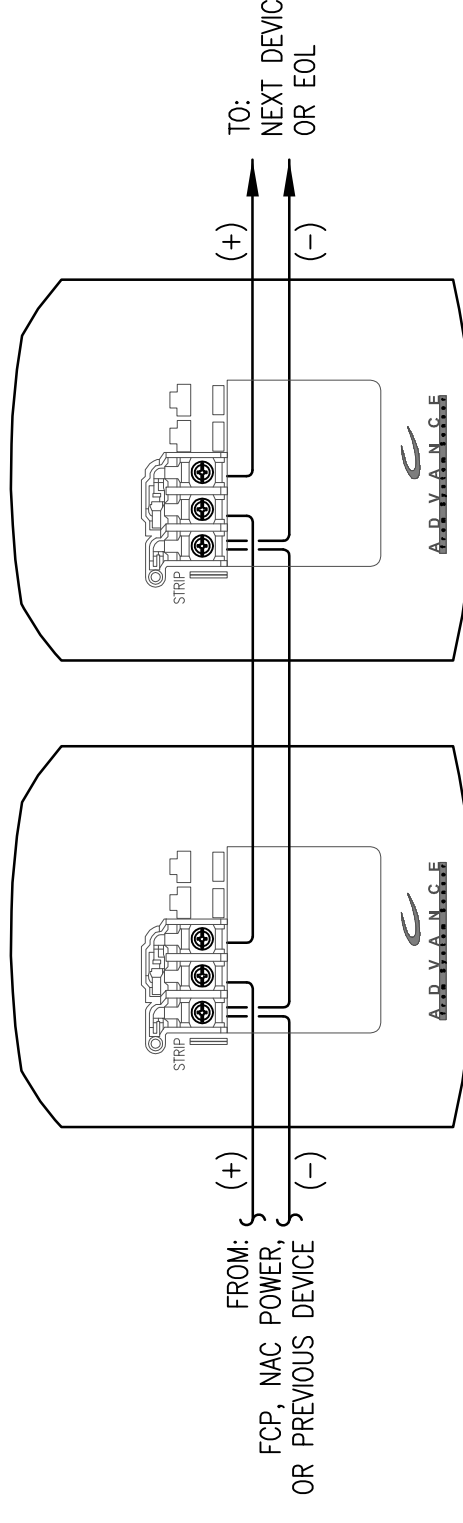
| FCP Battery Calculation | | 1/18/2014 | |
|--|-------------------|---------------------------------|---|
| PROJECT NAME: 106 HIGH STREET | | Required Standby Time: 24 Hours | |
| Required Alarm Time: 5 Minutes | | | |
| Regulated Load in Standby | | | |
| Device Type | Number of Devices | Current (Amps) | Total Current (Amps) |
| MS-25 Main Circuit Board | 1 | 0.13500 | = 0.13500 |
| HFS-3 Smoke Detector | 1 | 0.00027 | = 0.00027 |
| HFS-MM Monitor Module | 1 | 0.00038 | = 0.00038 |
| ES-12LX Pull Station | 7 | 0.26200 | = 1.83400 |
| TOTAL STANDBY LOAD = 0.13940 | | | |
| Regulated Load in ALARM | | | |
| Device Type | Number of Devices | Current (Amps) | Total Current (Amps) |
| MS-25 Main Circuit Board | 1 | 0.22000 | = 0.22000 |
| HFS-P Smoke Detector | 1 | 0.00027 | = 0.00027 |
| HFS-MM Monitor Module | 4 | 0.00038 | = 0.00152 |
| ES-12LX Pull Station | 7 | 0.91000 | = 6.37000 |
| MAC-1 (See voltage drop calc for device quantity) | 1 | 0.67000 | = 0.67000 |
| TOTAL ALARM LOAD = 1.98540 | | | |
| Battery Requirements | | | |
| Standby Load Current (Amps) | 0.13940 | X | Required Standby Time in Hours = 3,345.48 |
| Alarm Load Current (Amps) | 1.98540 | X | Required Alarm Time in Hours = 0.16545 |
| Total Ampere Hours (before derating factor) = 3,510.93 | | | |
| Derating Factor = 1.2 | | | |
| TOTAL AMPERE HOURS REQUIRED = 4,213.12 | | | |
| BATTERIES TO BE PROVIDED (2 - 12V) | | | |
| = 7 AH | | | |

| | | | |
|---|-----------------|----------------------------|--|
| MAC Circuit Voltage Drop Calculation | | 1/18/2014 | |
| Project Name | 106 HIGH STREET | | |
| Circuit Number | MAC-1 | | |
| Nominal System Voltage | 20.4 volts | | |
| Minimum Device Voltage | 16 volts | | |
| Distance from source to 1st device | 14 | Resistance Per 1000 = 6.14 | |
| Wire Gauge for balance of circuit | 14 | 6.14 | |
| Max Output Current | 1.25 amps | | |
| Total Circuit Current | 1.091 amps | | |

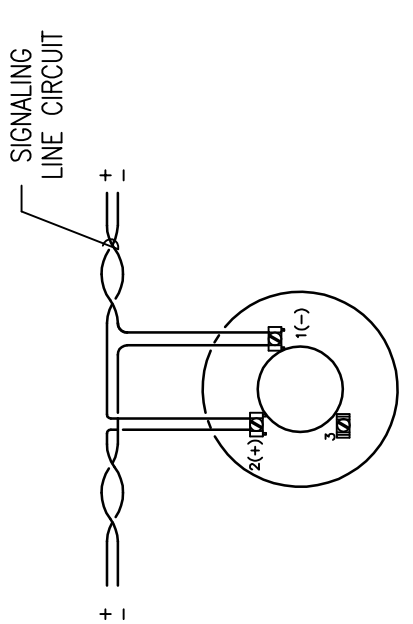
| Device | Current | Distance previous device | Voltage at Device | Drop from source | Percent Drop |
|----------|---------|--------------------------|-------------------|------------------|--------------|
| Device 1 | 0.107 | | 19.93 | 0.47 | 2% |
| Device 2 | 0.272 | 31 | 19.74 | 0.66 | 3% |
| Device 3 | 0.069 | 42 | 19.54 | 0.86 | 4% |
| Device 4 | 0.069 | 17 | 19.34 | 0.86 | 4% |
| Device 5 | 0.079 | 19 | 19.15 | 0.88 | 4% |
| Device 6 | 0.068 | 23 | 18.96 | 1.04 | 5% |
| Device 7 | 0.176 | 5 | 18.35 | 1.05 | 5% |
| Device 8 | 0.176 | 5 | 18.35 | 1.07 | 5% |
| Device 9 | 0.107 | 254 | 18.33 | 1.07 | 5% |
| Totals | 1.091 | | | | |

| | | | |
|---|-----------------|----------------------------|--|
| MAC Circuit Voltage Drop Calculation | | 1/18/2014 | |
| Project Name | 106 HIGH STREET | | |
| Circuit Number | MAC-2 | | |
| Nominal System Voltage | 20.4 volts | | |
| Minimum Device Voltage | 16 volts | | |
| Distance from source to 1st device | 20 | Resistance Per 1000 = 6.14 | |
| Wire Gauge for balance of circuit | 20 | 6.14 | |
| Max Output Current | 0.70 amps | | |
| Total Circuit Current | 0.670 amps | | |

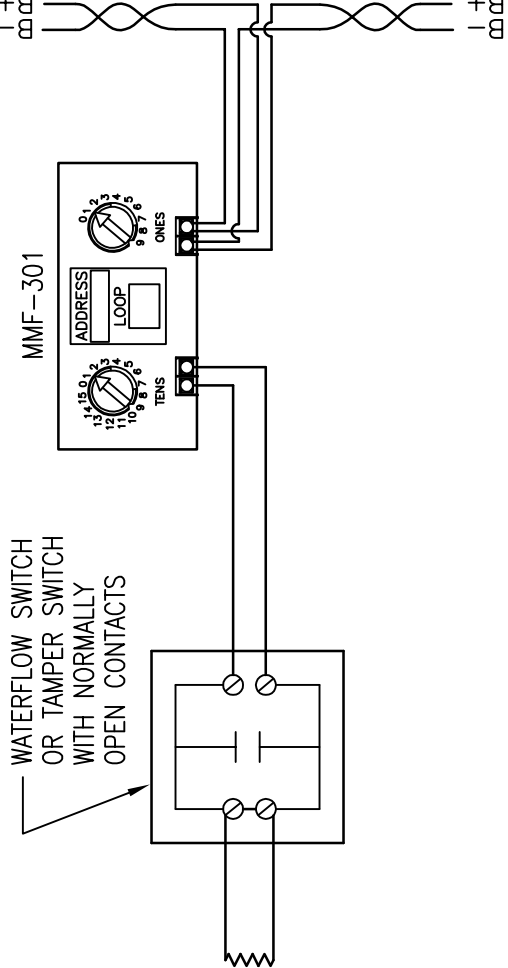
| Device | Current | Distance previous device | Voltage at Device | Drop from source | Percent Drop |
|----------|---------|--------------------------|-------------------|------------------|--------------|
| Device 1 | 0.066 | | 20.32 | 0.08 | 0% |
| Device 2 | 0.176 | 16 | 20.26 | 0.14 | 1% |
| Device 3 | 0.176 | 24 | 20.20 | 0.20 | 1% |
| Device 4 | 0.094 | 17 | 20.17 | 0.23 | 1% |
| Device 5 | 0.079 | 36 | 20.13 | 0.27 | 1% |
| Device 6 | 0.079 | 11 | 20.13 | 0.27 | 1% |
| Totals | 0.670 | 124 | | | |



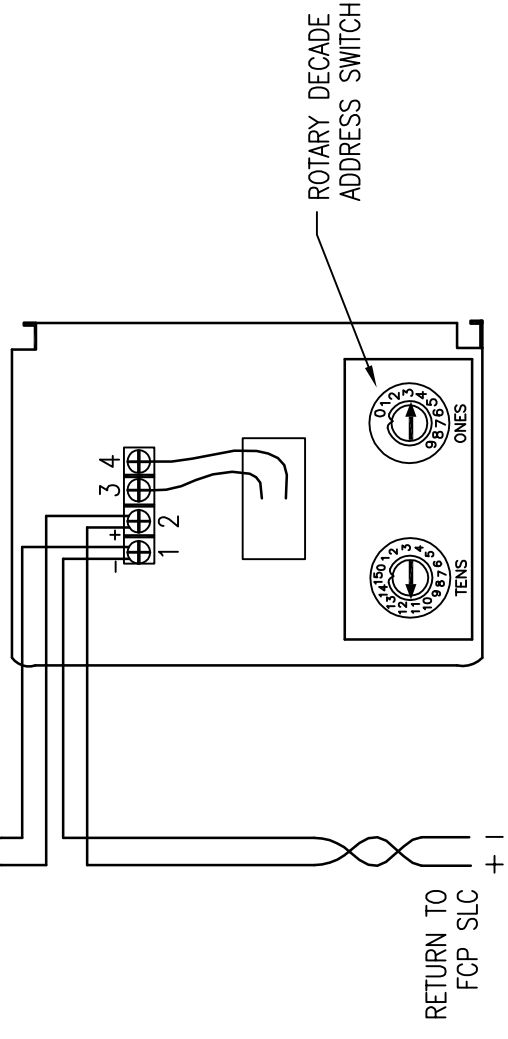
TYPICAL 2 WIRE STROBE WIRING DETAIL
SCHEMATIC: NO SCALE



ADDRESSABLE SMOKE DETECTOR WIRING DETAIL
SCHEMATIC: NO SCALE



WATERFLOW / TAMPER WIRING DETAIL
SCHEMATIC: NO SCALE



MANUAL PULL STATION WIRING DETAIL
SCHEMATIC: NO SCALE

GENERAL NOTES:

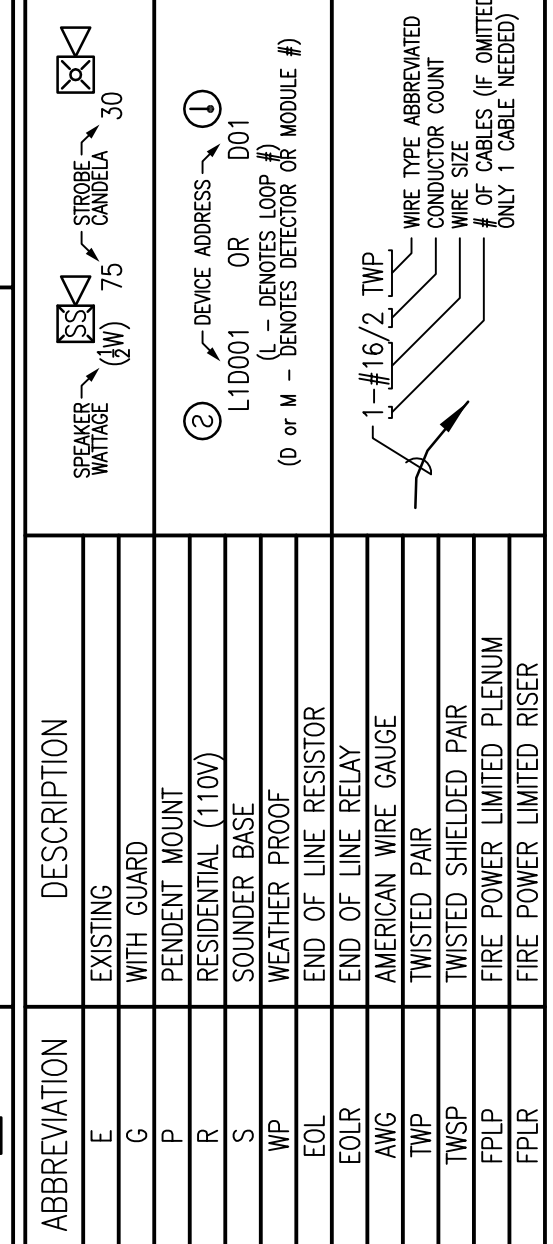
- THESE DRAWINGS ARE DIAGRAMMATIC. REFER TO THE ARCHITECTURAL DRAWINGS FOR EXACT DIMENSIONS.
- INSTALLATION SHALL COMPLY WITH NEC, NFPA 72 AND ALL OTHER APPLICABLE CODES AS REQUIRED BY THE LOCAL AUTHORITY HAVING JURISDICTION.
- WIRING DEPICTED ON THESE PLANS IS SCHEMATIC - ACTUAL WIRE LOCATIONS MAY DIFFER 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 FACEWAY IS PERMITTED AS LONG AS NO 110V OR HIGHER VOLTAGE CABLES ARE IN THE SAME FACEWAY.
- 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.

APPLICABLE CODES:

MAINE UNIFORM ENERGY & BUILDING CODE
 PORTLAND CITY CODE, CHAPTER 10, FIRE PREVENTION & PROTECTION
 NFPA 1, FIRE CODE, & NFPA 101, LIFE SAFETY CODE

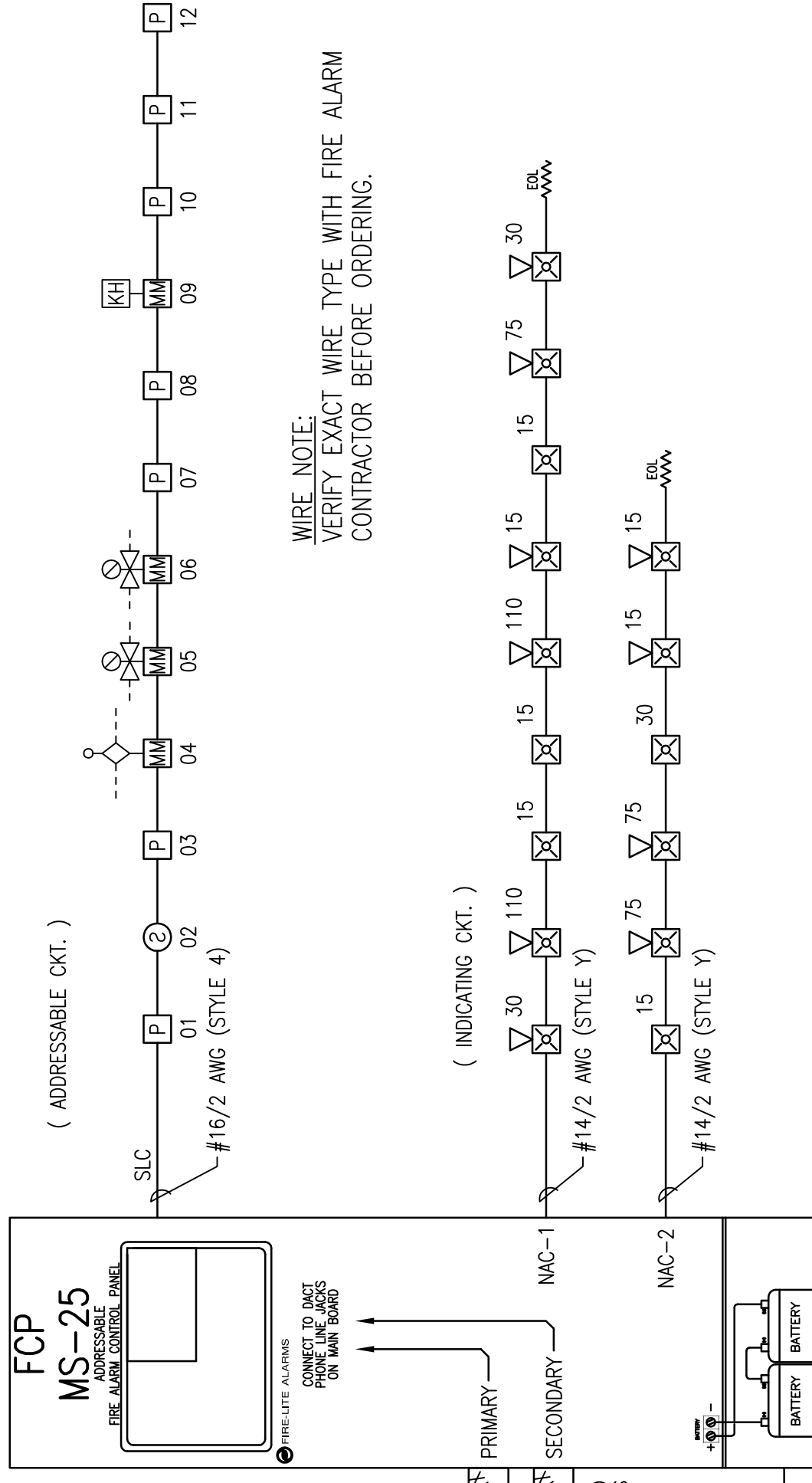
FIRE ALARM SYMBOL LEGEND

| SYMBOL | DESCRIPTION | MOUNTING |
|--------|--------------------------------|----------------|
| FCP | FIRE ALARM CONTROL PANEL | WALL-TOP @ 66" |
| FPS | FIRE ALARM POWER SUPPLY | FIELD VERIFY |
| ESA | FIRE SYSTEM ANNUNCIATOR | WALL-TOP @ 66" |
| RTS | REMOTE TEST STATION | FIELD VERIFY |
| CD | SMOKE DETECTOR | CEILING |
| SD | DUCT SMOKE DETECTOR | BY OTHERS |
| HD | HEAT DETECTOR | CEILING |
| CM | CARBON MONOXIDE DETECTOR | CEILING |
| CM | ADDRESSABLE CONTROL MODULE | FIELD VERIFY |
| MM | ADDRESSABLE MONITOR MODULE | FIELD VERIFY |
| LP | MANUAL PULL STATION | WALL @ 48" |
| R | CONTROL RELAY (MULTI-VOLTAGE) | FIELD VERIFY |
| RM | ADDRESSABLE RELAY MODULE | FIELD VERIFY |
| KB | KNOX BOX | FIELD VERIFY |
| MD | MAGNETIC DOOR HOLDER | FIELD VERIFY |
| WF | WATER FLOW SWITCH | BY OTHERS |
| VS | VALVE TAMPER SWITCH | BY OTHERS |
| B | BELL | BY OTHERS |
| CS | CEILING MOUNT STROBE | FIELD VERIFY |
| CS | CEILING MOUNT HORN / STROBE | FIELD VERIFY |
| CS | CEILING MOUNT SPEAKER / STROBE | FIELD VERIFY |
| H | HORN / STROBE | WALL @ 10'-0" |
| H | HORN / STROBE | WALL 80"-96" |
| S | SPEAKER / STROBE | WALL 80"-96" |
| S | SPEAKER | WALL @ 90" |
| STR | STROBE | WALL 80"-96" |



OPERATIONS MATRIX

| | 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 |
|--------------------------|--------------------------|------------------------|--------------------------------|-------------------------------------|----------------------------|------------------------------------|-----------------------|-----------------------------|-------------------------|
| FIRE ALARM INPUT | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| SMOKE DETECTORS | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| PULL STATIONS | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| WATERFLOW SWITCHES | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| VALVE TAMPER SWITCHES | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| KITCHEN HOOD | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| FIRE ALARM AC POWER FAIL | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| FIRE ALARM LOW BATTERY | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| OPEN CIRCUIT | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| GROUND FAULT | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| IMC SHORT CIRCUIT | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| LOSS OF AC TO BUILDING | ● | ● | ● | ● | ● | ● | ● | ● | ● |



FIRE ALARM RISER DIAGRAM
SCHEMATIC: NO SCALE

RESERVED FOR CITY STAMP

| | | | |
|-------------|---|------------------------------|-----------|
| REVISION | 0 | ISSUED FOR REVIEW & APPROVAL | 1/20/2014 |
| DESCRIPTION | | | |