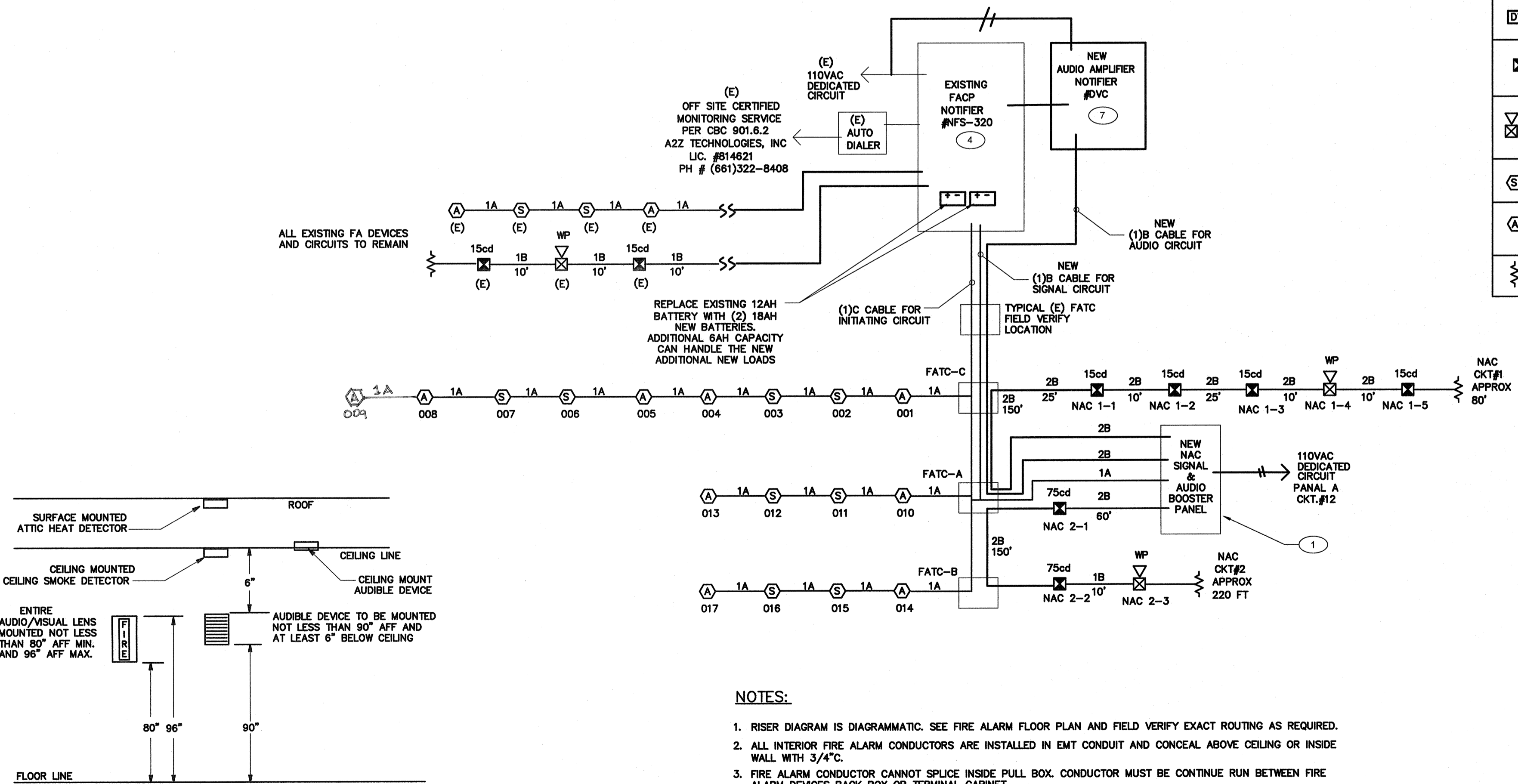


## FIRE ALARM PLAN

### 3 RELOCATABLE CLASSROOMS

SCALE : 1/8" = 1' - 0"



2 TYPICAL FIRE ALARM DEVICES MT'D DETAIL  
N.T.S.

## FIRE ALARM SEQUENCE OF OPERATIONS

| MANUAL PULL STATION | SMOKE DETECTORS           | HEAT DETECTORS            | DUCT DETECTOR  | FIRE SPRINKLER WATERFLOW SWITCH | FIRE SPRINKLER TAMPER SWITCH | POST INDICATOR VALVE | WIRING CONDITIONS | SIGNALING LINE CIRCUIT (SLC) | INITIATING DEVICE CIRCUIT (IDC) | NOTIFICATION APPLIANCE CIRCUIT (NAC) | LOSS OF 120VAC POWER | SIGNAL SILENCE | RESET FACP |
|---------------------|---------------------------|---------------------------|----------------|---------------------------------|------------------------------|----------------------|-------------------|------------------------------|---------------------------------|--------------------------------------|----------------------|----------------|------------|
|                     | ALL (EXCEPT LISTED BELOW) | ALL (EXCEPT LISTED BELOW) |                |                                 |                              |                      |                   |                              |                                 |                                      |                      |                |            |
|                     | PRIMARY FLOOR LOBBY       | ELEVATOR MACHINE ROOM     | ELEVATOR SHAFT |                                 |                              |                      |                   |                              |                                 |                                      |                      |                |            |
|                     |                           |                           |                |                                 |                              |                      |                   |                              |                                 |                                      |                      |                |            |
|                     |                           |                           |                |                                 |                              |                      |                   |                              |                                 |                                      |                      |                |            |
|                     |                           |                           |                |                                 |                              |                      |                   |                              |                                 |                                      |                      |                |            |
|                     |                           |                           |                |                                 |                              |                      |                   |                              |                                 |                                      |                      |                |            |
|                     |                           |                           |                |                                 |                              |                      |                   |                              |                                 |                                      |                      |                |            |
|                     |                           |                           |                |                                 |                              |                      |                   |                              |                                 |                                      |                      |                |            |
|                     |                           |                           |                |                                 |                              |                      |                   |                              |                                 |                                      |                      |                |            |
|                     |                           |                           |                |                                 |                              |                      |                   |                              |                                 |                                      |                      |                |            |
|                     |                           |                           |                |                                 |                              |                      |                   |                              |                                 |                                      |                      |                |            |

1 FIRE ALARM RISER DIAGRAM  
N.T.S.

### BATTERY POWER CALCULATIONS

#### NEW INITIATING DEVICES SUMMARY (FACP)

| DEVICE                          | NO. OF DEVICES | CURRENT PER DEVICE<br>STANDBY | CURRENT PER DEVICE<br>LED | STANDBY CURRENT | LED CURRENT |
|---------------------------------|----------------|-------------------------------|---------------------------|-----------------|-------------|
| SMOKE DETECTOR                  | 8              | 0.0003A                       | 0.0065A                   | 0.0024A         | 0.052A      |
| HEAT DETECTOR                   | 8              | 0.0003A                       | 0.0065A                   | 0.0024A         | 0.052A      |
| SUB-TOTAL                       |                |                               |                           | 0.0028A         | 0.104A      |
| 24 HOUR STANDBY CURRENT         |                |                               |                           |                 | 0.067AH     |
| 5 MINUTE LED CURRENT (0.083 HR) |                |                               |                           |                 | 0.0044AH    |
| TOTAL NEW AMPS-HRS REQUIRED     |                |                               |                           |                 | 0.071AH     |
| 20% SAFETY FACTOR               |                |                               |                           |                 | 0.014AH     |
| TOTAL NEW AMPS-HRS REQUIRED     |                |                               |                           |                 | 0.085AH     |

PROVIDE ADDITIONAL 6AH BATTERY CAPACITY AND REPLACE EXISTING FACP 12AH BATTERY WITH NEW 18AH BATTERIES

### FA CABLE SCHEDULE

| TYPE | DESCRIPTION  |
|------|--|
| A    | INITIATING CIRCUIT CABLE 2#16 AWG SOLID COPPER PVC JACKET POWER LIMITED PFLR CABLE, FOR INDOOR VIA J-HOOK AND OUTDOOR VIA MIN. 3/4" CONDUIT INSTALLATION. WEST PENN #D990 OR EQUAL. CSFM# 7161-0859:0101 |
| B    | NAC SIGNAL CIRCUIT CABLE 2#12 AWG SOLID COPPER PVC JACKET POWER LIMITED PFLR CABLE, FOR INDOOR VIA J-HOOK AND OUTDOOR VIA MIN. 1" CONDUIT INSTALLATION. WEST PENN #A0227 OR EQUAL. CSFM# 7161-0859:0101  |

### SIGNAL CIRCUIT LOAD SUMMARY

| OUTDOOR HORN CLOSURE | NSUAL | NSUAL | NSUAL | NSUAL | NSUAL | NSUAL | NSUAL | NSUAL | NSUAL | NSUAL  | NSUAL | TOTAL |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|-------|-------|
| OKT. #1              | 1     | 0     | 4     | 0     | 0     | 0     | 0     | 0     | 0     | 0.422A |       |       |
| OKT. #2              | 1     | 0     | 0     | 0     | 2     | 0     | 0     | 0     | 0     | 0.364A |       |       |

### BATTERY POWER CALCULATIONS

#### NEW NAC SIGNAL & AUDIO BOOSTER PANEL

| DEVICE                            | NO. OF DEVICES | CURRENT PER DEVICE<br>STANDBY | CURRENT PER DEVICE<br>ALARM | STANDBY CURRENT | ALARM CURRENT |
|-----------------------------------|----------------|-------------------------------|-----------------------------|-----------------|---------------|
| UNIT                              | 1              | 0.120A                        | 9A                          | 0.120A          | 9A            |
| OUTDOOR HORN                      | 2              | ---                           | 0.050A                      | ---             | 0.100A        |
| MINI HORN                         | 0              | ---                           | 0.025A                      | ---             | 0.000A        |
| AUDIO/VISUAL 15cd                 | 4              | ---                           | 0.093A                      | ---             | 0.372A        |
| AUDIO/VISUAL 30cd                 | 0              | ---                           | 0.114A                      | ---             | 0.000A        |
| AUDIO/VISUAL 75cd                 | 2              | ---                           | 0.157A                      | ---             | 0.314A        |
| AUDIO/VISUAL 110cd                | 0              | ---                           | 0.197A                      | ---             | 0.000A        |
| SYNC MODULES                      | 0              | ---                           | 0.035A                      | ---             | 0.000A        |
| 1/4" W SPEAKER                    | 8              | ---                           | 0.010A                      | ---             | 0.080A        |
| SUB-TOTAL                         |                |                               |                             | 0.120A          | 9.866A        |
| 24 HOUR STANDBY CURRENT           |                |                               |                             |                 | 2.880AH       |
| 5 MINUTE ALARM CURRENT (0.083 HR) |                |                               |                             |                 | 0.819AH       |
| TOTAL NEW AMPS-HRS REQUIRED       |                |                               |                             |                 | 0.740AH       |
| 20% SAFETY FACTOR                 |                |                               |                             |                 | 0.439AH       |

PROVIDE BATTERY WITH (2) NEW 6AH BATTERY

### VOLTAGE DROP CALCULATION

WORST CASE VOLTAGE DROP AT THE LAST DEVICE

| SIGNAL CKT. | N.D.   | AMPERES | APPROX LENGTH | RESISTIVITY OHM | WIRE AWG | AREA CM | VOLTS DROPPED | % VOLTS DROP |
|-------------|--------|---------|---------------|-----------------|----------|---------|---------------|--------------|
| OKT. A      | 0.422A | 80'     | 21.6          | 12              | 6530     | 0.112V  | 0.5%          |              |
| OKT. A      | 0.364A | 220'    | 21.6          | 12              | 6530     | 0.265V  | 1.1%          |              |

### FIRE ALARM SYMBOLS AND SCHEDULE

| ITEM | DESCRIPTION   | MODEL NUMBER            | CSFM NUMBER    | MOUNT       | BACK BOX          |
|------|---|-------------------------|----------------|-------------|-------------------|
| FACP | (E) FACP FOR REFERENCE ONLY   | NOTIFIER #NFS-320       | 7165-0028:0243 | +60"        | EQUIPMENT CABINET |
| NAC  | NAC SIGNAL AND AUDIO BOOSTER PANEL  | WHELOCK #SPB-80/4       | 6911-0785:0157 | +60"        | EQUIPMENT CABINET |
| DVC  | DIGITAL VOICE COMMAND CENTER INTERCONNECT WITH (E) FACP IN ADMIN OFFICE     | NOTIFIER #DVC-EM        | 7165-0028:0243 | +60"        | EQUIPMENT CABINET |
| WP   | SPEAKER STROBE WITH EVACUATION SPEAKER 15cd 30cd 75cd 110cd TEMPORAL CODE 3 | NOTIFIER #SPSV WR       | 7320-1653:0201 | +80"        | 4"SQ X 2 1/2"     |
| WP   | OUTDOOR EVACUATION SPEAKER WITH WEATHERPROOF BOX TEMPORAL CODE 3            | NOTIFIER #SPRK MWBB     | 7320-1653:0201 | +90"        | 4"SQ X 2 1/2"     |
| S    | ADDRESSABLE CEILING SMOKE DETECTOR WITH BASE                                | NOTIFIER #FSP-851/B710P | 7272-0028:0206 | CEILING     | 4"SQ X 2 1/2"     |
| A    | ATTIC HEAT DETECTOR 190°F TEMP WITH BASE                                    | NOTIFIER #FT-851H/B710P | 7270-0028:0196 | ATTIC       | 4"SQ X 2 1/2"     |
| R    | END OF LINE RESISTOR  | N/A                     | N/A            | LAST DEVICE | 4"SQ X 2 1/2"     |

- ### SEISMIC ANCHORAGE
- TO COMPLY WITH 2013 CBC, TITLE 24, SECTION #1632A.
  - WHERE ANCHORAGE DETAILS ARE NOT SHOWN ON THE DRAWINGS, THE FIELD INSTALLATION SHALL BE SUBJECT TO THE APPROVAL OF THE ELECTRICAL ENGINEER AND THE FIELD ENGINEER OF THE DIVISION OF THE STATE ARCHITECT.

- ### COMPLETE AUTOMATIC FIRE ALARM PLAN SUBMITTAL
- THE FIRE ALARM SYSTEM SHOWN ON THESE PLANS HAS BEEN SUBMITTED AND APPROVED BY DIVISION OF THE STATE ARCHITECT. ANY SUBSTITUTION OF THE FIRE ALARM SYSTEM SHALL BE RESUBMITTED TO THE ARCHITECT FOR REVIEW AND APPROVAL. THE CONTRACTOR SHALL PAY ANY ADDITIONAL FEES THAT ARE INCURRED DUE TO THIS SUBSTITUTION.
  - THE AUTOMATIC FIRE ALARM SYSTEM SHALL COVER ALL ROOMS AND AREAS AND UPON ACTIVATION OF AN INITIATING DEVICE ALERT ALL OCCUPANTS AND TRANSMIT THE ALARM, SUPERVISORY, AND TROUBLE SIGNALS TO AN APPROVED SUPERVISING STATION. (EXCEPTION: SMOKE DETECTORS ARE NOT REQUIRED IN NON-ACCESSIBLE AREAS AS DEFINED IN EMERGENCY EXPRESS TERMS OF PROPOSED S.F.M. AMENDMENTS TO 2013 C.F.C. SECTION 210 (C.F.C. SECTIONS 1006.2.4.2.2.1 AND 1006.2.4.2.2.1.5)

## SHEET NOTES

- PROVIDE NEW FIRE ALARM SIGNAL AND AUDIO BOOSTER PANEL AND CONNECT TO (E) FACP PER RISER DIAGRAM. PROVIDE 110V POWER CONNECTION AND DEDICATED CIRCUIT FROM PANEL A-24. PROVIDE FIRE ZONE MAP, MEASURE ACTUAL LOAD CURRENT AND VOLTAGE DROP FOR EACH NAC SIGNAL CIRCUIT, AND STANDBY CURRENT, AND RECORD CURRENT. SEND THE REPORT TO OWNER AND ENGINEER FOR REVIEW, AND PLASTIC LAMINATED ONE COPY INSIDE CABINET DOOR. SEE FA RISER DIAGRAM FOR DETAIL.
- LOCATE HEAT DETECTOR IN ATTIC AND SURFACE MOUNT ON THE BOTTOM OF BATTERY DETECTOR COVERAGE WILL BE DESIGNATED SIZE ABOVE THE RAFTER. FIELD VERIFY LOCATION WITH GENERAL CONTRACTOR AND PROVIDE ATTIC HEAT DETECTOR IN EACH BAY OF STRUCTURAL.
- EXISTING CEILING SMOKE DETECTOR 5 FEET FROM EXISTING NAC SIGNAL EXPANDER PANEL. SEE DSA APPROV#03-115601 FA DRAWINGS.
- NEW FATC ON BUILDING EXTERIOR WALL WITH 3/4" STUB INTO BUILDING ATTIC CMVY. EXTEND NEW FA CONDUIT AND WIRING TO NEW BUILDINGS PER PLANS.
- NEW 3/4" FA CONDUIT AND WIRING SURFACE MOUNTED ON EXTERIOR WALL PER PLANS.
- PROVIDED 3/4" WEATHERPROOF FLEX CONDUIT BETWEEN BUILDING.
- PROVIDE NEW FIRE ALARM DIGITAL VOICE COMMAND CENTER AND INTERCONNECT TO EXISTING FIRE ALARM CONTROL PANEL AND SURFACE MOUNT NEXT TO (E) FACP. FIELD VERIFY EXACT LOCATION. PROVIDE 110V POWER CONNECTION TO EXISTING FACP DEDICATED CIRCUIT. FIELD VERIFY LOCATION.

### F.A SYSTEM SCOPE OF WORK

- PROVIDE AUTOMATIC FIRE ALARM SYSTEM WITH VOICE EVACUATION SPEAKERS FOR THE NEW CLASSROOM BUILDINGS PER PLANS.
- EXISTING FACP IS 24VDC ADDRESSABLE AND CLASS B WIRING SYSTEM. AND WITH OFF SITE MONITORING SERVICE VIA AUTO DUAL LINE DIALER AND TELEPHONE LINES.
- DURING THE FINAL TESTING, MEASURE ALL FIRE ALARM CURRENTS, VOLTAGE DROP FOR EACH SIGNAL CIRCUITS. SEND OWNER AND ENGINEER ONE COPY RECORD FOR REVIEW AND PLASTIC LAMINATED ONE COPY INSIDE FACP CABINET DOOR.
- COMPLETE FIRE ALARM DRAWING SUBMITTAL IS PROVIDED.

### FIRE ALARM NOTES

- THE SYSTEMS SHALL CONFORM TO CALIFORNIA ELECTRICAL CODES ARTICLE 760, CALIFORNIA FIRE CODE ARTICLE 10 AND CALIFORNIA BUILDING CODE, SECTION 305.9.
- FIRE ALARM CIRCUITS SHALL BE RUN IN EMT CONDUIT PER SPECIFICATIONS.
- UPON COMPLETION OF THE INSTALLATION OF THE FIRE ALARM SYSTEM, A SATISFACTORY TEST OF THE ENTIRE SYSTEM SHALL BE MADE IN THE PRESENCE OF THE ENFORCING AGENCY.
- NO SPLICE SHALL BE PERMITTED IN PULLBOXTES. ALL WIRE SHALL BE RUN CONTINUOUS BETWEEN TERMINAL CABINETS.
- ALL PENETRATIONS IN FIRE-RATED ASSEMBLIES SHALL BE SEALED IN COMPLIANCE WITH CHAPTER 7, C.B.C. AUDIBLE SIGNALS INTENDED FOR OPERATION IN THE PRIVATE MODE SHALL HAVE A SOUND LEVEL OF NOT LESS THAN 45 dBA AT 10 FT OR MORE THAN 130dBA AT THE MINIMUM HEARING DISTANCE FORM THE AUDIBLE APPLIANCE. AN AVERAGE SOUND LEVEL GREATER THAN 115 dBA REQUIRES THE USE OF A VISIBLE SIGNAL APPLIANCES. IF AUDIBILITY LEVEL DOES NOT MEET THE REQUIREMENT AT THE TIME OF TESTING, NEW AUDIBLES AND REVISED PLANS WILL BE REQUIRED.
- NEW FIRE ALARM AUDIBLES SHALL BE TAMPO CODE 3.
- A CERTIFICATE OF COMPLETION SHALL BE PROVIDED TO THE OWNER PER NFPA 72 AND THE CALIFORNIA FIRE CODE.
- AN APPROVED FIRE ALARM SYSTEM SHALL BE INSTALLED TO SET FORTH IN THE CALIFORNIA FIRE CODE IN GROUP, DIVISION 1, 2, AND 2.1 OCCUPANCIES. (303.9, CBC)
- THE ALARM SYSTEM SHALL BE INSTALLED, TESTED, AND MAINTAINED IN ACCORDANCE WITH THE STATE FIRE MARSHAL'S REGULATIONS.
- THE FIRE ALARM SYSTEM SHALL CONFORM TO CALIFORNIA ELECTRICAL CODE AND ARTICLE 91. INSTALLATION OF THE SYSTEM SHALL NOT BEGIN UNTIL DETAILED PLANS AND SPECIFICATIONS, INCLUDING SPM LISTING NUMBERS FOR EACH COMPONENT HAVE BEEN APPROVED BY DSA. UPON COMPLETION OF THE INSTALLATION, A TEST OF THE ENTIRE SYSTEM SHALL BE MADE IN THE PRESENCE OF THE INSPECTOR OF RECORD.
- ALARM INDICATING DEVICES OF A FIRE ALARM SYSTEM INTENDED TO ALERT OCCUPANTS SHALL CAUSE A LEVEL OF AUDIBILITY OF NOT LESS THAN 15 dBA ABOVE THE AVERAGE AMBIENT NOISE MEASURE @ 10' BUT/NOT LESS THAN 110dBA IN TOTAL THROUGHOUT. AMBIENT NOISE LEVELS MEANS THE LEVEL WHICH CAN NORMALLY BE EXPECTED WHEN THE FACILITY, BUILDING, ROOM OR AREA IS FUNCTIONING UNDER NORMAL OPERATING OR WORKING CONDITIONS.
- THE ALARMS SYSTEM SHALL ACTIVATE A MEANS OF WARNING THE HEARING IMPAIRED. FLASHING VISUAL WARNINGS SHALL HAVE A FLASH RATE NOT EXCEEDING TWO FLASHES PER SECOND (2 HZ) NOR BE LESS THAN ONE FLASH EVERY SECOND (1 HZ). STROBE SIGNALING DEVICES FOR THE HEARING IMPAIRED SHALL BE STATE FIRE MARSHAL APPROVED AND LISTED.

### F.A. MONITORING NOTES

- THE AUTOMATIC FIRE ALARM SYSTEMS SHALL TRANSMIT THE ALARM, SUPERVISORY AND TROUBLE SIGNALS TO AN APPROVED SUPERVISING STATION AS REQUIRED BY NFPA 72 AND AMENDED EITHER ULFX OR ULJUS BY UNDERWRITERS OF FACTORY MUTUAL RESEARCH AND APPROVAL STANDARD 3011. SUPERVISION OF SYSTEM AND LEASED TELEPHONE LINES SHALL BY ARRANGED BY OWNER.

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Revision: \_\_\_\_\_  
Revision Description: \_\_\_\_\_

### FIRE ALARM PLAN

Project Name & Address:  
**WAYSIDE ELEMENTARY SCHOOL  
2 RELOCATABLE CLASSROOMS**  
BAKERSFIELD CITY SCHOOL DISTRICT  
1000 MING AVE., BAKERSFIELD, CA

Issue Date: 00/00/14  
Date: 05/27/14  
Designer: J. CHONG  
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PC: C.J.M.

Agency Approval Stamp: \_\_\_\_\_