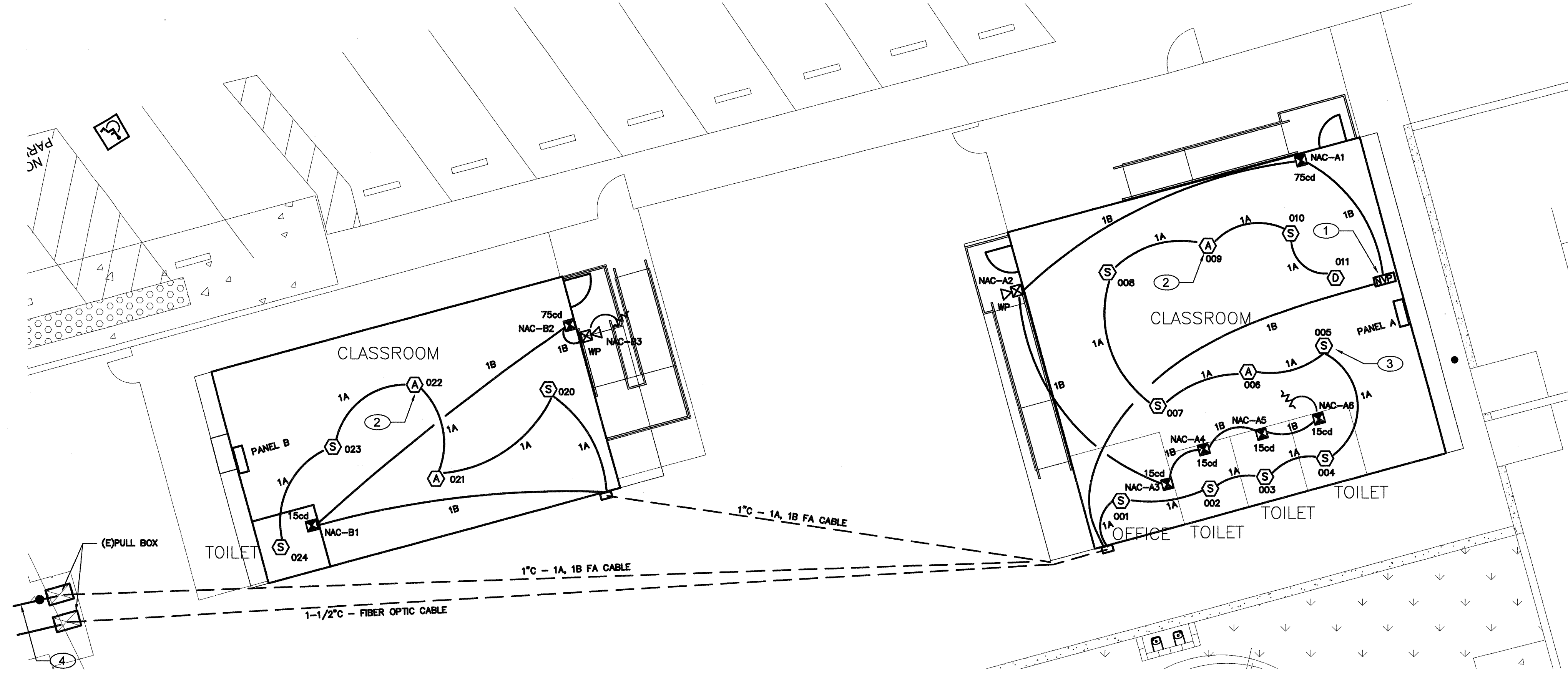


1" = 40'-0"  
1" = 30'-0"  
1" = 20'-0"  
1/8" = 1'-0"  
1/4" = 1'-0"

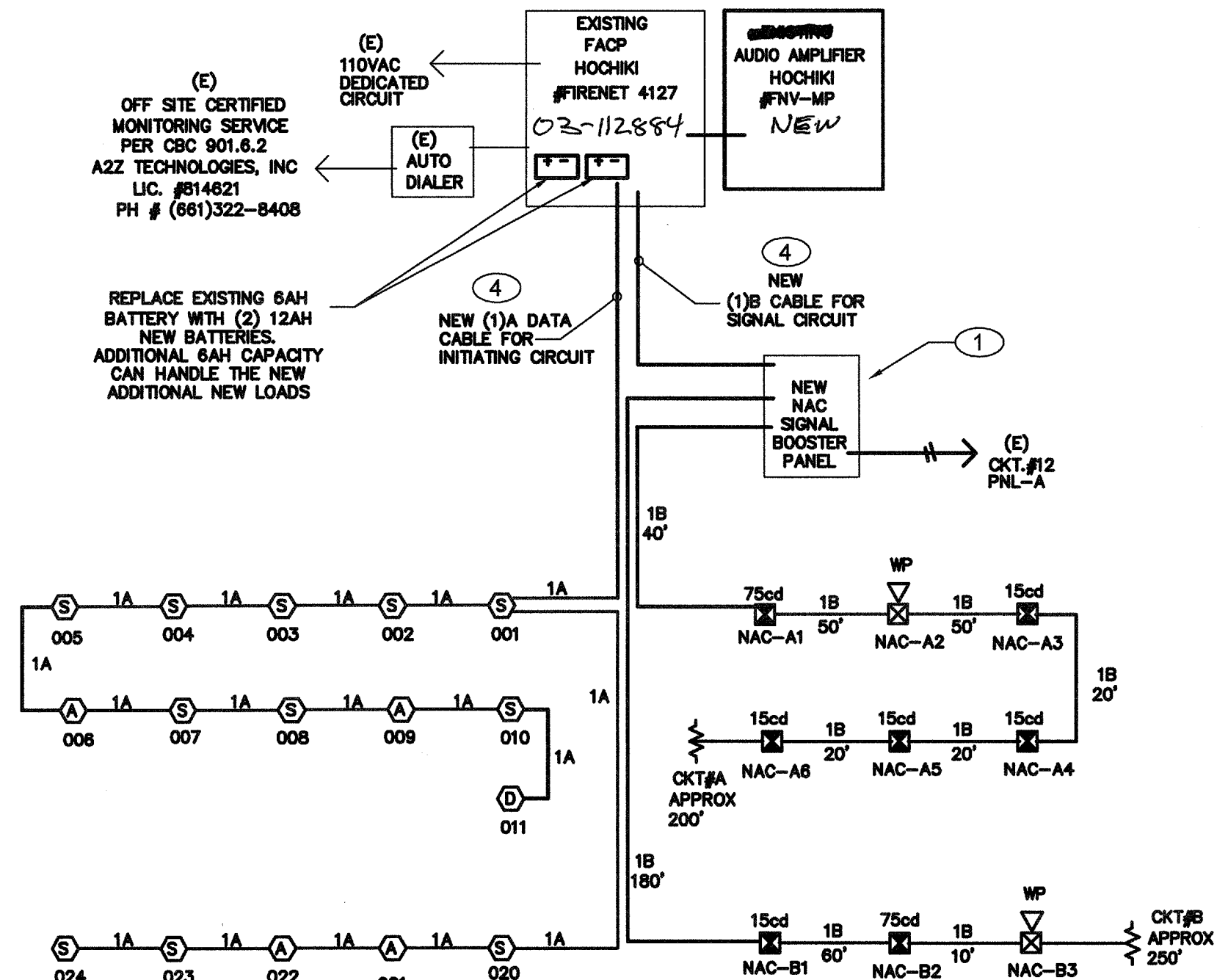


## FIRE ALARM PLAN

### 3 RELOCATABLE CLASSROOMS

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

ITEM	DESCRIPTION	MODEL NUMBER	CSFM NUMBER	MOUNT	BACK BOX
[FACP]	EXISTING FACP (FOR REFERENCE ONLY)	HOCHIKI #FIRENET 4127	7185-0410:0159	+80"	EQUIPMENT CABINET
[VEP]	NEW VOICE EVACUATION PANEL	HOCHIKI #EVAX 50	6911-0410:0176	+80"	EQUIPMENT CABINET
[NVP]	NEW NAC SIGNAL & VOICE VAC BOOSTER PANEL SIGNAL EXPANDER	WHEELOCK #SPB 90/4	6911-0785:0157	+80"	EQUIPMENT CABINET
[S]	SPEAKER STROBE 15cd 30cd 75cd 110cd TEMPORAL CODE 3	HOCHIKI #HSSPKWLP	7320-0410:0195	+80"	4"SQ X 2 1/2"
[WP]	NEW WEATHER PROOF BOX WITH WEATHER PROOF BOX	HOCHIKI #WPK 100/4	7320-1053	+80"	4"SQ X 2 1/2"
[S]	ADDRESSABLE CEILING SMOKE DETECTOR WITH BASE	HOCHIKI #ALK-V #TBN-NSA-4	7272-0410:0173 7300-0410:0132	CEILING	4"SQ X 2 1/2"
[A]	ATTIC HEAT DETECTOR 180°F TEMP WITH BASE AND MONITOR MODULE	HOCHIKI #DFE 180/HSC-XXXL #FROME-4	7270-0410:0119 7300-0410:0150	ATTIC	4"SQ X 2 1/2"
[D]	DUCT SMOKE DETECTOR WITH HOUSING AND MONITOR MODULE	SYSTEM SENSOR #D4120 #FROME-4	3242-1853:0207 7300-0410:0150	HVAC DUCT	4"SQ X 2 1/2"
[R]	END OF LINE RESISTOR	N/A	N/A	LAST DEVICE	4"SQ X 2 1/2"

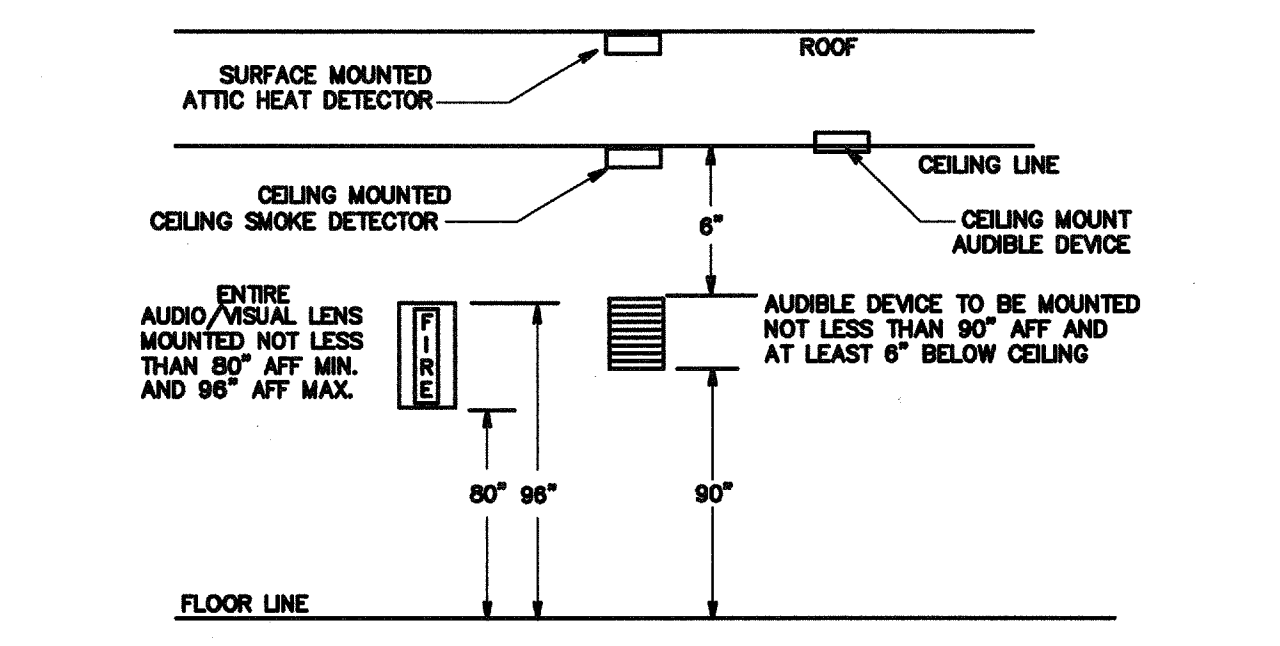


**NOTES:**

- RISER DIAGRAM IS DIAGRAMMATIC. SEE FIRE ALARM PLAN AND FIELD VERIFY EXACT ROUTING AS REQUIRED.
- ALL INTERIOR FIRE ALARM CONDUCTORS ARE INSTALLED IN EMT CONDUIT AND CONCEAL ABOVE CEILING OR INSIDE WALL WITH 3/4" C.
- FIRE ALARM CONDUCTOR CANNOT SPLICE INSIDE PULL BOX. CONDUCTOR MUST BE CONTINUE RUN BETWEEN FIRE ALARM DEVICES BACK BOX OR TERMINAL CABINET.

FIRE ALARM RISER DIAGRAM

N.T.S.



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

### BATTERY POWER CALCULATIONS

#### NEW NAC SIGNAL & AUDIO BOOSTER PANEL

DEVICE	NO. OF DEVICES	CURRENT PER DEVICE	STANDBY CURRENT	ALARM CURRENT
UNIT	1	0.120A	9A	0.120A
OUTDOOR HORN	2	---	0.050A	---
VISUAL 15cd	0	---	0.041A	---
AUDIO/VISUAL 15cd	5	---	0.093A	---
AUDIO/VISUAL 30cd	0	---	0.114A	---
AUDIO/VISUAL 75cd	2	---	0.157A	---
SYNC MODULES	0	---	0.035A	---
1/4 W SPEAKER	8	---	0.010A	---
<b>SUB-TOTAL</b>			<b>0.120A</b>	<b>9.990A</b>

24 HOUR STANDBY CURRENT: 2.880AH  
15 MINUTE LED CURRENT (0.25 HR): 2.480AH  
SUBTOTAL: 5.370AH

20% SAFETY FACTOR: 1.074AH  
TOTAL AMPS-HRS REQUIRED: 6.444AH  
PROVIDE (2) 7AH BATTERY

DURING THE FINAL TESTING, MEASURE EXACT STANDBY AND ALARM CURRENT, VOLTAGE DROP FOR EACH SIGNAL CIRCUITS. SEND OWNER AND ENGINEER ONE COPY RECORD FOR REVIEW, AND PLASTIC LAMINATED ONE COPY INSIDE FACP CABINET DOOR.

### BATTERY POWER CALCULATIONS

#### EXISTING FIRE ALARM CONTROL PANEL

#### NEW INITIATING DEVICES SUMMARY

DEVICE	NO. OF DEVICES	CURRENT PER DEVICE	STANDBY CURRENT	LED CURRENT
NEW SMOKE DETECTOR	12	0.0003A	0.0085A	0.0036A
NEW HEAT DETECTOR	4	0.0003A	0.0085A	0.028A
<b>SUB-TOTAL</b>			<b>0.0048A</b>	<b>0.104A</b>

24 HOUR STANDBY CURRENT: 0.115AH  
15 MINUTE LED CURRENT (0.25 HR): 0.028AH  
SUBTOTAL: 0.141AH

20% SAFETY FACTOR: 0.028AH  
TOTAL NEW AMPS-HRS REQUIRED: 0.169AH

PROVIDE ADDITIONAL 8AH BATTERY CAPACITY AND REPLACE EXISTING FACP 6AH BATTERY WITH NEW 12AH BATTERIES

### VOLTAGE DROP CALCULATION

#### WORST CASE VOLTAGE DROP AT THE LAST DEVICE

SIGNAL NO.	CTY	AMPERES	APPROX LENGTH	RESISTIVITY OHM	WIRE AWG	AREA CM	VOLTS DROPPED	% VOLTS DROP
OKT. 1	0	4	0	1	0	0	0.579A	OKT. A 0.579A 200' 21.6 12 6530 0.363V 1.6%
OKT. 1	0	1	0	1	0	0	0.300A	OKT. A 0.300A 250' 21.6 12 6530 0.249V 1.0%

### SIGNAL CIRCUIT LOAD SUMMARY

OUTDOOR HORN	NSAL	AUDIO/VISUAL	AUDIO/VISUAL	AUDIO/VISUAL	AUDIO/VISUAL	SYNC MODULE	1/4 W SPEAKER	TOTAL
0.050A	0.041A	0.093A	0.114A	0.157A	0.157A	0.035A	0.028A	0.579A

### FIRE ALARM SEQUENCE OF OPERATIONS

MANUAL PULL STATION	SMOKE DETECTORS	HEAT DETECTORS	DUCT DETECTOR	FIRE SPRINKLER WATERFLOW SWITCH	POST INDICATOR VALVE	SIGNALING LINE CIRCUIT (SLC)	INITIATING DEVICE CIRCUIT (IDC)	NOTIFICATION APPLIANCE CIRCUIT (NAC)
ALL (EXCEPT LISTED BELOW)	ALL (EXCEPT LISTED BELOW)	ALL (EXCEPT LISTED BELOW)	ALL (EXCEPT LISTED BELOW)	ALL (EXCEPT LISTED BELOW)	ALL (EXCEPT LISTED BELOW)	ALL (EXCEPT LISTED BELOW)	ALL (EXCEPT LISTED BELOW)	ALL (EXCEPT LISTED BELOW)

### FA CABLE SCHEDULE

TYPE	DESCRIPTION
A	INITIATING CIRCUIT CABLE 2#16 AWG SOLID COPPER PVC JACKET POWER LIMITED FPLR CABLE, FOR INDOOR AND OUTDOOR VIA MIN. 3/4" CONDUIT INSTALLATION. WEST PENN #0990 OR EQUAL. CSFM# 7161-0859:0101
B	NAC SIGNAL CIRCUIT CABLE 2#12 AWG SOLID COPPER PVC JACKET POWER LIMITED FPLR CABLE, AND 2#22 TWIST SHIELD SPEAKER CABLE. MIN. 3/4" CONDUIT INSTALLATION. WEST PENN #A227 OR EQUAL. CSFM# 7161-0859:0101

### 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 1006.2.4.2.2.1.1 AND 1006.2.4.2.2.1.5)

## SHEET NOTES

- FURNISH AND INSTALL NEW FIRE ALARM NAC SIGNAL AND VOICE VAC BOOSTER PANEL. SURFACE MOUNT ON WALL. PROVIDE 110V POWER CONNECTION FROM PANEL. A CIRCUIT #A-12. FIELD VERIFY EXACT LOCATION.
- LOCATE HEAT DETECTOR IN ATTIC AND SURFACE MOUNT ON THE BOTTOM OF RAFTER. DETECTOR COVERAGE WILL BE DERATED 50% ACROSS THE RAFTER. FIELD VERIFY LOCATION WITH GENERAL CONTRACTOR AND PROVIDE ATTIC HEAT DETECTOR IN EACH BAY OF STRUCTURAL.
- CEILING SMOKE DETECTOR 5 FEET FROM NEW NAC SIGNAL EXPANDER PANEL.
- PULL BACK NEW FA CABLE TO EXISTING FACP VIA EXISTING CONDUITS RACEWAY PER PLANS.

### 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

- APPLICABLE STANDARD 2013 NFPA 72
- INSTALLATION OF THE SYSTEMS SHALL NOT BE STARTED UNTIL DETAILED DESIGN DOCUMENTS AND SPECIFICATION, INCLUDING STATE FIRE MARSHAL LISTING NUMBERS FOR EACH COMPONENT OF THE SYSTEM HAS BEEN APPROVED BY ISA.
- COMPLETION OF THE INSTALLATION OF THE SYSTEM, A SATISFACTORY TEST OF THE ENTIRE SYSTEM SHALL BE MADE IN THE PRESENCE OF A CSA PROJECT INSPECTOR.
- A STAMPED SET OF APPROVED FIRE ALARM DESIGN DOCUMENTS SHALL BE ON THE JOB SITE AND USED FOR INSTALLATION.
- ANY DISCREPANCIES BETWEEN THE DRAWINGS AND THE CODE OR RECOGNIZED STANDARDS SHALL BE BROUGHT TO THE ATTENTION OF CSA AND THE ARCHITECT/ENGINEER OF THE PROJECT.
- CSA, ARCHITECT/ENGINEER AND OWNER SHALL BE NOTIFIED A MINIMUM OF 48 HOURS PRIOR TO THE FINAL INSPECTION AND/OR TESTING.
- PENETRATIONS THROUGH RATED ASSEMBLIES, REQUIRING OPENING PROTECTION SHALL BE PROVIDED WITH A PENETRATION FIRE STOP SYSTEM AS IDENTIFIED IN CBC CHAPTER 7, UL OR OTHER LAB TESTING CRITERIA. APPROVED TYPE OF MATERIALS SHALL BE IDENTIFIED WITHIN THE SPECIFICATION WITHIN THE FIRE ALARM SECTION.
- WALL MOUNTED VISUAL NOTIFICATION DEVICES SHALL HAVE THEIR BOTTOMS MOUNTED AT 80" MINIMUM AND 96" MAXIMUM FROM FINISHED FLOOR.
- WALL MOUNTED AUDIBLE NOTIFICATION DEVICES SHALL HAVE THEIR TOPS MOUNTED AT 90" MINIMUM AND 100" MAXIMUM FROM FINISHED FLOOR AND NO CLOSER THEN 6" TO A HORIZONTAL STRUCTURE.
- AUDIBLE DEVICES SHALL PROVIDE A SOUND PRESSURE LEVEL OF 15 DECIBELS (Dba) ABOVE THE AVERAGE AMBIENT SOUND LEVEL OR 5 Dba ABOVE THE MAXIMUM SOUND LEVEL, HAVING A DURATION OF AT LEAST 90 SECONDS, WHICHEVER IS GREATER, IN EVERY OCCUPIABLE SPACE WITHIN THE BUILDING.
- AUDIBLE DEVICES SHALL BE SYNCHRONIZED TEMPORAL CODE 3
- THE CONTRACTOR SHALL ADJUST/INSTALL ALL DEVICES TO MAXIMIZE PERFORMANCE AND TO MINIMIZE FALSE ALARMS.
- VISUAL DEVICES SHOULD NOT EXCEED 2 FLASHES PER SECOND, AND SHOULD NOT BE SLOWER THAN 1 FLASH EVERY SECOND. THE DEVICE SHALL HAVE A PULSING LIGHT SOURCE NOT LESS THAN 18 CANDELLA. VISUAL DEVICES WITHIN 55' FROM EACH OTHER SHALL BE SYNCHRONIZED.
- UNDERGROUND AND EXTERIOR CONDUITS TO HAVE WATER TIGHT FITTINGS AND WIRE TO BE APPROVAL FOR WET LOCATIONS.
- ALL FIRE ALARM WIRING SHALL BE FLP OR FPLP (FIRE POWER LIMITED OR FIRE POWER LIMITED PLENUM) AS REQUIRED FOR APPLICATION. WIRING IN CONDUIT ABOVE GROUND MAY BE THHN OR THWN.
- PER CEC STANDARDS, ALL WIRING IS TO BE PULLED THROUGH EACH JUNCTION BOX AND CONNECTED DIRECTLY TO EACH FIRE DEVICE. DO NOT SPLICE THE WIRE. ALL BOXES TO BE SIZED PER CEC.
- SMOKE DETECTORS SHALL NOT BE ANY CLOSER THAN 1" FROM FIRE SPRINKLERS OR 3' FROM ANY SUPPLY DIFFUSER. IN AREA OF CONSTRUCTION OR POSSIBLE DAMAGE/CONTAMINATION ON NEWLY INSTALLED FIRE ALARM DEVICES SHALL BE COVERED UNTIL THAT AREA IS READY TO BE TURNED OVER TO THE OWNER.
- ALL FIRE ALARM CIRCUITS SHALL BE IN CONDUIT, SURFACE RACEWAY OR OPEN RUN ABOVE CEILING, UNDER FLOORS AND IN WALLS IN A NEAT AND PROTECTED MANNER AS INDICATED ON DESIGN DOCUMENTS. EXPOSED CIRCUITS ARE ONLY PERMITTED WHEN NOTED AS EXPOSED ON DESIGN DOCUMENTS.
- FIRE ALARM PANEL, REMOTES, AND COMPONENTS SHALL BE SECURED TO MOUNTING SURFACES PER MANUFACTURERS SPECIFICATIONS. NO SINGLE DEVICE SHALL EXCEED THE WEIGHT OF 30 LBS. WITHOUT SPECIAL MOUNTING DETAILS.
- A DEDICATED BRANCH CIRCUIT SHALL BE PROVIDED FOR FIRE ALARM EQUIPMENT. THIS CIRCUIT SHALL BE ENERGIZED FROM THE COMMON USE AREA PANEL AND SHALL HAVE NO OTHER OUTLETS. THE BREAKER SHALL HAVE A RED LOCKING DEVICE TO BLOCK THE HANDLE IN THE "ON" POSITION. THE CIRCUIT BREAKER SHALL BE LABELED "FIRE ALARM CIRCUIT CONTROL". CIRCUIT ID TO BE LABELED AT FIRE PANEL/EXTENDERS.
- THE INSTALLING CONTRACTOR SHALL PROVIDE A RECORD OF COMPLETION PER NFPA 72, FIGURE 10.18.2.1.1.
- CONTROL PANELS, REMOTE ANNUNCIATORS SHALL BE INSTALLED WITH THEIR BOTTOMS MOUNTED AT 48"
- THE INSTALLING CONTRACTOR SHALL PROVIDE SYSTEM PROGRAMMING FOR SUPERVISORY MONITORING PER CBC SECTION 901.6.2.
- SUPERVISORY MONITORING SHALL BE TESTED AND VERIFIED AS SENDER CORRECT SIGNALS IN CONJUNCTION WITH FINAL ACCEPTANCE TEST.
- OWNER SHALL BE RESPONSIBLE FOR ESTABLISHING A FIRE SYSTEM MONITORING CONTRACT OR PROVISIONS.

### 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 UJFX OR UJUS BY UNDERWRITERS OF FACTORY MUTUAL RESEARCH. APPROVED STANDARD 3011. SUPERVISION OF SYSTEM AND LEASED TELEPHONE LINES SHALL BY ARRANGED BY OWNER.

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### FIRE ALARM PLAN

FREMONT ELEMENTARY SCHOOL  
2 RELOCATABLE CLASSROOMS  
BAKERSFIELD CITY SCHOOL DISTRICT  
607 TEXAS STREET, BAKERSFIELD, CA

Project Name & Address:  
Project No.:  
Scale:  
Date:  
Designer: J CHONG  
DR: J CHONG  
PC: C/M

Agency Approval Stamp:

Stamp(s):

Job No: **5176**  
Sheet No: **E-3**