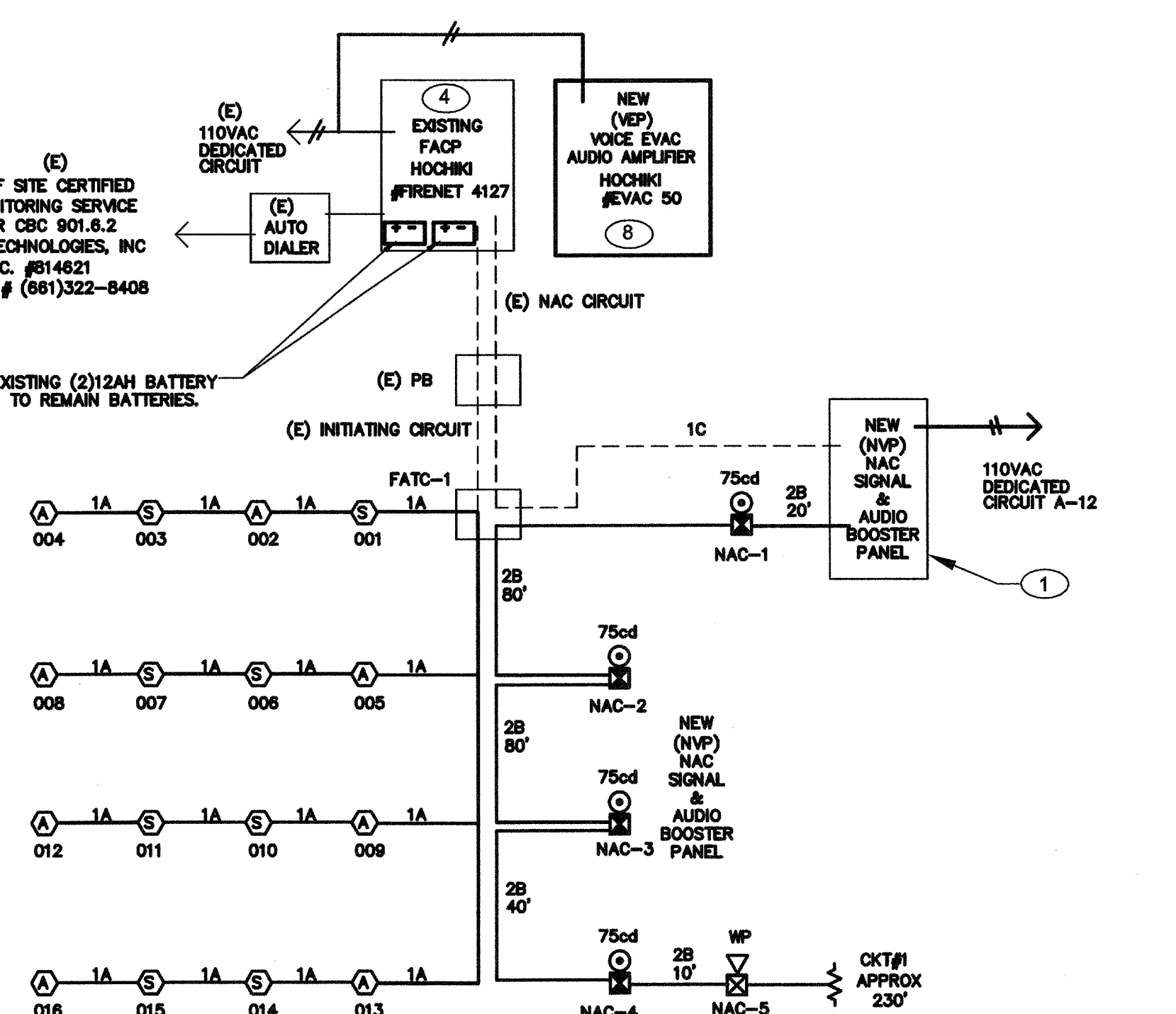


FIRE ALARM PLAN

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



- NOTES:**
- RISER DIAGRAM IS DIAGRAMMATIC. SEE FIRE ALARM FLOOR 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 CONTINUOUS RUN BETWEEN FIRE ALARM DEVICES BACK BOX OR TERMINAL CABINET.

1 FIRE ALARM RISER DIAGRAM N.T.S.

FIRE ALARM SYMBOLS AND SCHEDULE

ITEM	DESCRIPTION	MODEL NUMBER	CSFM NUMBER	MOUNT	BACK BOX
FACP	EXISTING FACP (FOR REFERENCE ONLY)	HOCHIKI #FIRENET 4127	7165-0410:0159	+60"	EQUIPMENT CABINET
VEP	VOICE EVACUATION PANEL	HOCHIKI #EVAC 50	6911-0410:0176	+60"	EQUIPMENT CABINET
NVP	NAC SIGNAL & VOICE VAC BOOSTER PANEL	WHEELLOCK #SPB 50/4	6911-0785:0157	+60"	EQUIPMENT CABINET
S	SPEAKER STROBE	HOCHIKI #ISSPKWLP	7320-0410:0195	+80"	4"SQ X 2 1/2"D
OH	OUTDOOR HORN	HOCHIKI #HNE 24HR #HOC	7135-0410:0187 7300-0410:0189	+80"	4"SQ X 2 1/2"D
SD	ADDRESSABLE CEILING SMOKE DETECTOR WITH BASE	HOCHIKI #ALK-V #VBN-NSA-4	7272-0410:0173 7300-0410:0132	CEILING	4"SQ X 2 1/2"D
AD	ATTIC HEAT DETECTOR	HOCHIKI #HFE 180/HSC-XOOL #FRCE-4	7270-0410:0119 7300-0410:0150	ATTIC	4"SQ X 2 1/2"D
ER	END OF LINE RESISTOR	N/A	N/A	LAST DEVICE	4"SQ X 2 1/2"D

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 LULIS BY UNDERWRITERS OF FACTORY MUTUAL RESEARCH APPROVAL STANDARD 3011. SUPERVISION OF SYSTEM AND LEASED TELEPHONE LINES SHALL BE ARRANGED BY OWNER.

SEISMIC ANCHORAGE

- TO COMPLY WITH 2001 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.

VOLTAGE DROP CALCULATION

WORST CASE VOLTAGE DROP AT THE LAST DEVICE

VD = VOLTAGE DROP
I = TOTAL LOAD
L = DISTANCE TO THE LOAD
CM = CIRCULAR MILLS (CROSS SECTION OF 12 AWG = 6530)
V = VOLTAGE (240Vdc)
VD = $K \cdot I \cdot L \cdot CM$

SIGNAL CKT	AMPERES	APPROX LENGTH	RESISTIVITY DBM	WIRE AWG	AREA CM	VOLTS DROPPED	% VOLTS DROP
CKT. A	0.678A	230'	21.6	12	6530	0.516V	2.1%

SIGNAL CIRCUIT LOAD SUMMARY

OUTDOOR HORN	NAC	15cd	0.041A	AUDIO/VISUAL	15cd	0.025A	AUDIO/VISUAL	110cd	0.114A	AUDIO/VISUAL	110cd	0.157A	MINI HORN	0.025A	SYNC MODULE	0.035A	TOTAL AMP
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.678A	

FA CABLE SCHEDULE

TYPE	DESCRIPTION
A	INITIATING CIRCUIT CABLE 2#18 AWG SOLID COPPER PVC JACKET POWER LIMITED PPLR CABLE, FOR INDOOR VIA J-HOOK AND OUTDOOR VIA MIN. 3/4" CONDUIT INSTALLATION
B	NAC SIGNAL CIRCUIT CABLE 2#12 AWG SOLID COPPER PVC JACKET POWER LIMITED PPLR CABLE, FOR INDOOR VIA J-HOOK AND OUTDOOR VIA MIN. 1" CONDUIT INSTALLATION
C	INITIATING CIRCUIT CABLE 2#16 AWG SOLID COPPER PVC JACKET POWER LIMITED PPLR CABLE, FOR INDOOR VIA J-HOOK AND OUTDOOR VIA MIN. 1 1/2" CONDUIT INSTALLATION

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 2007 C.F.C. SECTION 210 (C.F.C. SECTIONS 1006.2.4.2.2.1.1 AND 1006.2.4.2.2.1.5)

BATTERY POWER CALCULATIONS

NEW DISTRIBUTED POWER MODULE A

DEVICE	NO. OF DEVICE	CURRENT PER DEVICE	STANDBY CURRENT	ALARM CURRENT
UNIT	1	0.120A	0.9A	0.120A
OUTDOOR HORN	1	---	0.050A	---
MINI HORN	0	---	0.025A	---
VISUAL 15cd	0	---	0.041A	---
AUDIO/VISUAL 15cd	0	---	0.025A	---
AUDIO/VISUAL 30cd	0	---	0.050A	---
AUDIO/VISUAL 75cd	4	---	0.157A	---
AUDIO/VISUAL 110cd	0	---	0.197A	---
SYNC MODULES	0	---	0.035A	---
SUB-TOTAL			0.120A	1.578A
24 HOUR STANDBY CURRENT				2.880AH
5 MINUTE ALARM CURRENT (0.083 HR)				0.131AH
SUBTOTAL				3.011AH
20% SAFETY FACTOR				0.602AH
TOTAL AMPS-HRS REQUIRED				3.613AH
PROVIDE BATTERY WITH (2) NEW 6AH 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 CABINET DOOR.

BATTERY POWER CALCULATIONS

EXISTING FIRE ALARM CONTROL PANEL (FACP)

DEVICE	NO. OF DEVICE	CURRENT PER DEVICE	STANDBY CURRENT	LED CURRENT
EXISTING UNIT	1	---	0.175A	0.5A
SMOKE DETECTOR	8	0.0003A	0.0085A	0.0024A
HEAT DETECTOR	8	0.0003A	0.0085A	0.0024A
SUB-TOTAL			0.1798A	0.604A
24 HOUR STANDBY CURRENT				4.315AH
5 MINUTE LED CURRENT (0.083 HR)				0.050AH
SUBTOTAL				4.365AH
20% SAFETY FACTOR				0.873AH
TOTAL NEW AMPS-HRS REQUIRED				5.238AH
EXISTING FACP (2)12AH BATTERIES TO REMAIN				

SHEET NOTES

- PROVIDE NEW (NVP) FIRE ALARM SIGNAL AND AUDIO BOOSTER PANEL PER RISER DIAGRAM. PROVIDE 110V POWER CONNECTION AND DEDICATED CIRCUIT FROM PANEL A CIRCUIT 12. SEE FA RISER DIAGRAM FOR DETAIL.
- 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 STRUCTURE.
- EXISTING SIGNAL PULL BOX WITH TRAFFIC COVER. FIELD VERIFY LOCATION.
- (3) FIRE ALARM CONTROL PANEL WITH 110V POWER DEDICATED CIRCUIT FROM PANEL R-13. SEE DSA APP#03-11398 FA DRAWINGS. UPDATE (3) FIRE ZONE MAP, MEASURE ACTUAL LOAD CURRENT AND VOLTAGE DROP FOR EACH NAC SIGNAL CIRCUITS, AND STANDBY CURRENT AND ALARM CURRENT. SEND THE REPORT TO OWNER AND ENGINEER FOR REVIEW, AND PLASTIC LAMINATED ONE COPY INSIDE CABINET DOOR. SEE FA RISER DIAGRAM FOR DETAIL.
- PROVIDE NEW 6"x6"x4" STEEL TO SURFACE MOUNTED ON EXTERIOR WALL AT +24" AFF WITH 1" STUB INTO BUILDING CEILING CAVITY WITH LB FITTING. PROVIDE TERMINAL STRIP INSIDE TO FOR CONDUCTOR TERMINATION. NO WIRE NUTS ALLOWED. CORE DRILL AND SEAL EXTERIOR WALL AS REQUIRED.
- EXISTING UNDERGROUND CONDUITS RACEWAY, PULL IN NEW FA CABLE PER PLANS. FIELD VERIFY LOCATION.
- LOCATE CEILING SMOKE DETECTOR 5 FEET FROM NEW (NVP) NAC SIGNAL AND AUDIO BOOSTER EXPANDER PANEL. FIELD VERIFY LOCATION.
- PROVIDE NEW (VEP) FIRE ALARM DIGITAL VOICE COMMAND CENTER AND INTER CONNECT TO EXISTING FIRE ALARM CONTROL PANEL AND SURFACE MOUNT NEXT TO (3) FACP. FIELD VERIFY EXACT LOCATION. PROVIDE 110V POWER CONNECTION TO EXISTING FACP DEDICATED CIRCUIT. FIELD VERIFY LOCATION.
- PROVIDED 3/4" WEATHERPROOF FLEX CONDUIT RACEWAY BETWEEN BUILDING. FIELD VERIFY LOCATION.

F.A SYSTEM SCOPE OF WORK

- PROVIDE AUTOMATIC FIRE ALARM SYSTEM FOR THE ADDITIONAL 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 PULLBOXES. 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 FROM THE AUDIBLE APPLIANCE. AN AVERAGE SOUND LEVEL GREATER THAN 115 dBA REQUIRES THE USE OF A VISIBLE SIGNAL APPLIANCE. 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 AS 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 (NFPA 72, 1999 EDITION)
- THE FIRE ALARM SYSTEM SHALL CONFORM TO CALIFORNIA ELECTRICAL CODE AND ARTICLE 91. INSTALLATION OF THE SYSTEM SHALL NOT BEGUN 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 ALL 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 LEVEL 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.

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