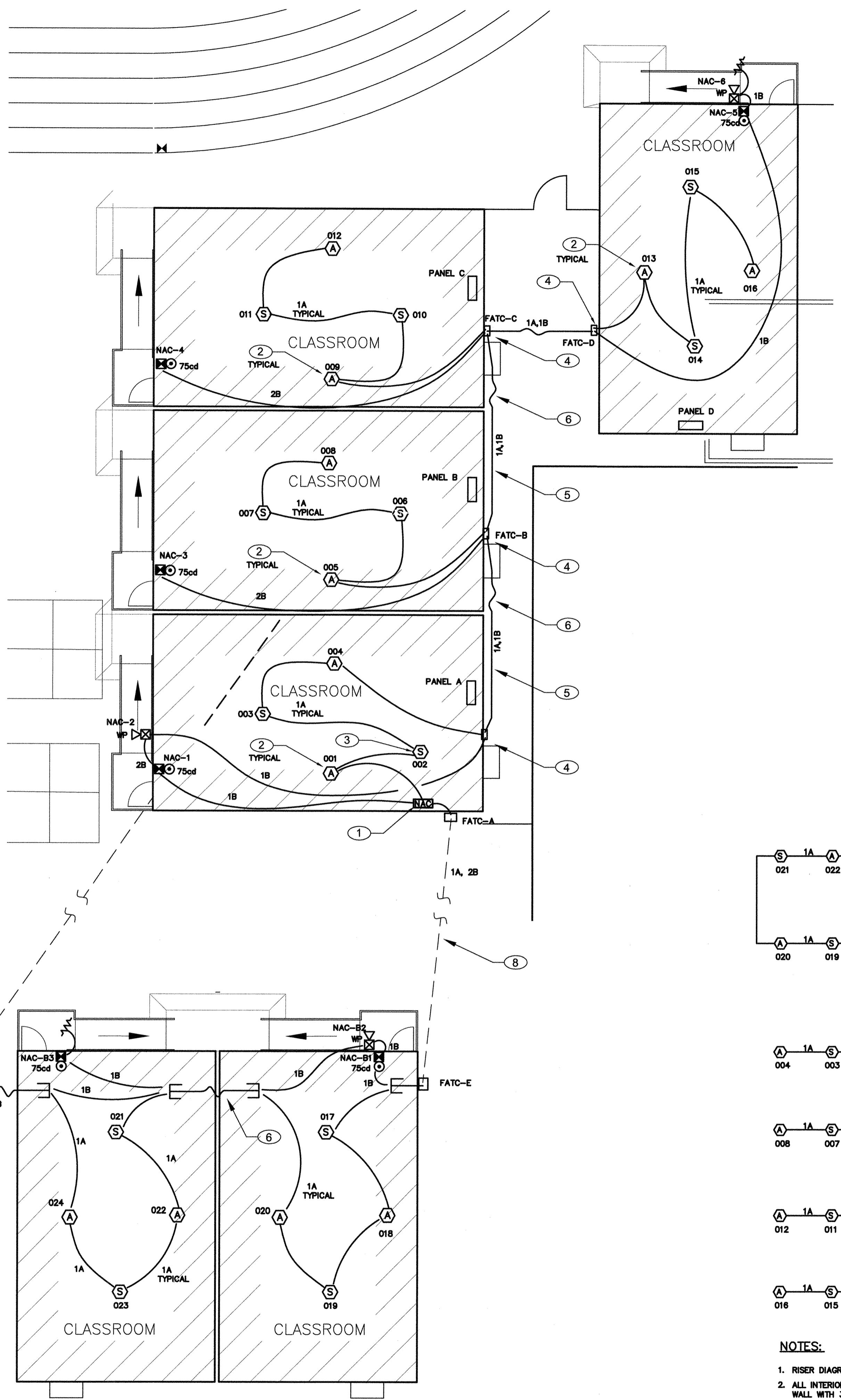


1" = 40'-0"
 1" = 30'-0"
 1" = 20'-0"
 1" = 1'-0"
 1/8" = 1'-0"
 1/4" = 1'-0"



FIRE ALARM SYMBOLS AND SCHEDULE

ITEM	DESCRIPTION	MODEL NUMBER	CSFM NUMBER	MOUNT	BACK BOX
—	EXISTING FACP (FOR REFERENCE ONLY)	HOCHIKI #FIRENET 4127	7165-0410:0159	+60"	EQUIPMENT CABINET
—	VOICE EVACUATION PANEL	HOCHIKI #EVAK 50	6911-0410:0170	+60"	EQUIPMENT CABINET
—	NAC SIGNAL & VOICE VAC BOOSTER PANEL SIGNAL EXPENDER	WHEELOCK #SPB 80/A	6911-0785:0157	+60"	EQUIPMENT CABINET
—	SPEAKER STROBE	HOCHIKI #HSPKWL	7320-0410:0195	+80"	4"SQ X 2 1/2"D
—	OUTDOOR SPEAKER	NOTIFIER #SPRK	7320-1652:0201	+90"	4"SQ X 2 1/2"D
—	ADDRESSABLE CEILING SMOKE DETECTOR WITH BASE	HOCHIKI #ALK-V /YBN-NSA-4	7272-0410:0173	CEILING	4"SQ X 2 1/2"D
—	ATTIC HEAT DETECTOR 190°F TEMP WITH BASE AND MONITOR MODULE	HOCHIKI #HTE 190/HSC-XXXL #FRCE-4	7270-0410:0119 7300-0410:0150	ATTIC	4"SQ X 2 1/2"D
—	FIRE ALARM CABLE POWER LIMITED	WEST PENN AQ SERIES	7161-0859:0101		
—	END OF LINE RESISTOR	N/A	N/A	LAST DEVICE	4"SQ X 2 1/2"D

BATTERY POWER CALCULATIONS

NEW NAC SIGNAL & AUDIO BOOSTER PANEL

DEVICE	NO. OF DEVICE	CURRENT PER DEVICE		STANDBY CURRENT	ALARM CURRENT
		STANDBY	ALARM		
UNIT	1	0.120A	9A	0.120A	9A
OUTDOOR SPEAKER	3	---	0.050A	---	0.150A
MINI HORN	0	---	0.025A	---	0.000A
VISUAL 15cd	0	---	0.041A	---	0.000A
SPEAKER/STROBE 15cd	0	---	0.078A	---	0.000A
SPEAKER/STROBE 30cd	0	---	0.096A	---	0.000A
SPEAKER/STROBE 75cd	6	---	0.180A	---	1.080A
SPEAKER/STROBE 110cd	0	---	0.224A	---	0.000A
SYNC MODULES	0	---	0.045A	---	0.000A
SUB-TOTAL				0.120A	10.230A
24 HOUR STANDBY CURRENT				2.680AH	
15 MINUTE ALARM CURRENT (0.25 HR)				2.558AH	
SUBTOTAL				5.438AH	
20% SAFETY FACTOR				1.088AH	
TOTAL AMPS-HRS REQUIRED				6.526AH	
PROVIDE BATTERY WITH (2) NEW 7AH BATTERY					

BATTERY POWER CALCULATIONS

EXISTING FACP

DEVICE	NO. OF DEVICE	CURRENT PER DEVICE		STANDBY CURRENT	LED CURRENT
		FIELD MEASURE	LED		
EXISTING	12	0.0003A	0.0065A	0.0036A	0.078A
SMOKE DETECTOR	12	0.0003A	0.0065A	0.0036A	0.078A
SUB-TOTAL				0.3072A	3.656A
24 HOUR STANDBY CURRENT				7.373AH	
15 MINUTE ALARM CURRENT (0.25 HR)				0.814AH	
SUBTOTAL				8.287AH	
20% SAFETY FACTOR				1.657AH	
TOTAL NEW AMPS-HRS REQUIRED				10.044AH	
REPLACE EXISTING BATTERY WITH (2)18AH BATTERIES					

VOLTAGE DROP CALCULATION

WORST CASE VOLTAGE DROP AT THE LAST DEVICE

VD = VOLTAGE DROP
 I = TOTAL LOAD
 K = 21.6
 L = DISTANCE TO THE LOAD
 CM = CIRCULAR MILLS (CROSS SECTION OF 12 AWG = 6530)
 V = VOLTAGE (24Vdc)
 VD = $K \cdot I \cdot L \cdot \sqrt{CM}$

SIGNAL CKT NDL	AMPERES	APPROX LENGTH	RESISTIVITY DMM	WIRE AWG	AREA CM	VOLTS DROPPED	% VOLTS DROP
CKT 1	0.82A	470'	21.6	12	6530	1.275V	5.3%
CKT 2	0.410A	210'	21.6	12	6530	0.285V	1.2%

SIGNAL CIRCUIT LOAD SUMMARY

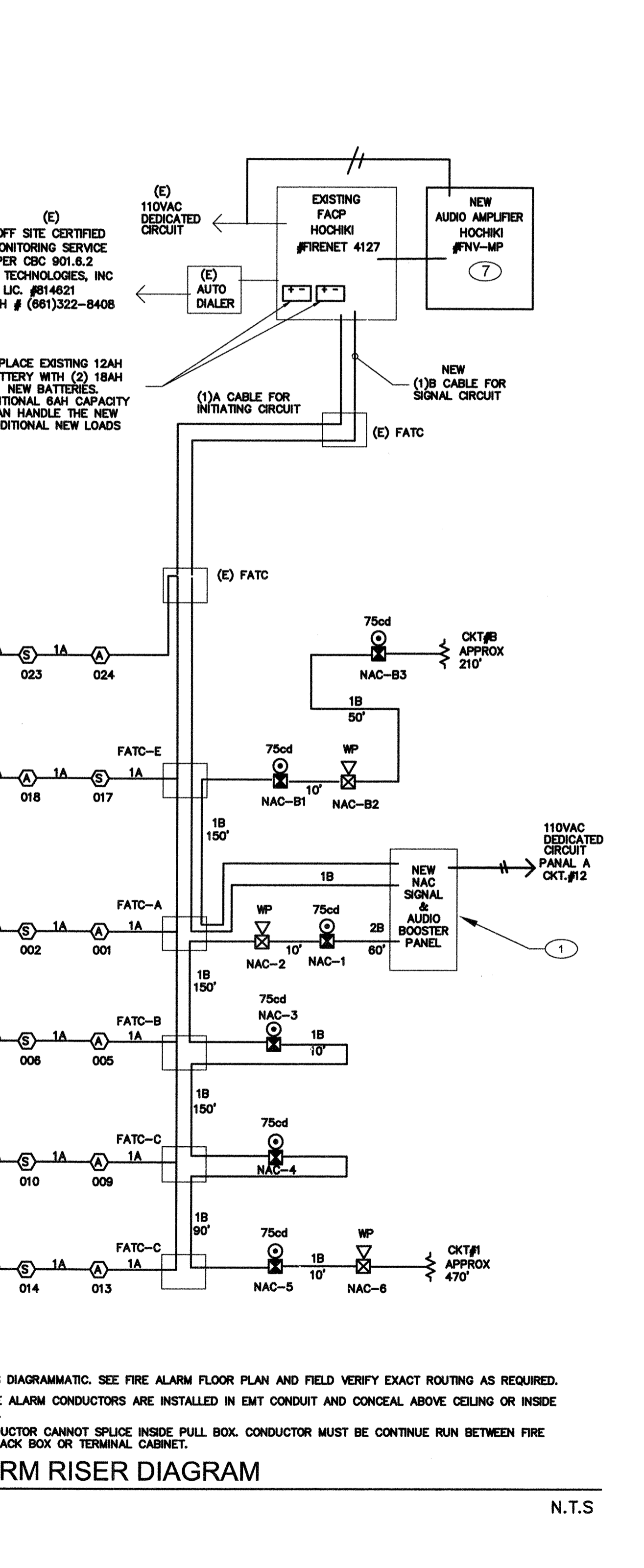
CKT	OUTDOOR SPEAKER	MINI HORN	VISUAL	SPEAKER/STROBE 15cd	SPEAKER/STROBE 30cd	SPEAKER/STROBE 75cd	SPEAKER/STROBE 110cd	SYNC MODULE	TOTAL
CKT 1	0	0	0	0	0	4	0	0	0.82A
CKT 2	1	0	0	0	0	2	0	0	0.410A

FA CABLE SCHEDULE

TYPE	DESCRIPTION
A	INITIATING CIRCUIT CABLE 2#16 AWG SOLID COPPER PVC JACKET POWER LIMITED FPLR 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 FPLR CABLE FOR INDOOR VIA J-HOOK AND OUTDOOR VIA 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)



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 CONTINUE RUN BETWEEN FIRE ALARM DEVICES BACK BOX OR TERMINAL CABINET.

1 FIRE ALARM RISER DIAGRAM N.T.S.

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 #9 MEASURE VOLTAGE DROP AND VOLTAGE LOSS FOR EACH NAC SIGNAL CIRCUIT, 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 DETAILS.
- LOCATE HEAT DETECTOR IN ATTIC AND SURFACE MOUNT ON THE BOTTOM OF RAFTER. DETECTOR COVERAGE WILL BE DERIVED 50% ACROSS 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 APP#03-115601 FA DRAWINGS.
- NEW FATC ON BUILDING EXTERIOR WALL. EXTEND NEW FA CONDUIT AND WIRING TO NEW BUILDINGS PER PLANS. FIELD VERIFY LOCATION.
- 3/4" FA CONDUIT ON BUILDING EXTERIOR WALL. FIELD VERIFY LOCATION.
- PROVIDED 3/4" WEATHERPROOF DIGITAL CONDUIT BETWEEN BUILDING.
- PROVIDE NEW FIRE ALARM SIGNAL AND AUDIO BOOSTER PANEL AND INTERCONNECT TO EXISTING FIRE ALARM CONTROL PANEL AND SURFACE MOUNT NEXT TO (E) FACE. FIELD VERIFY EXACT LOCATION.
- EXISTING UNDERGROUND FA CONDUIT. PULL IN NEW FA CABLE PER PLANS. FIELD VERIFY LOCATION WITH OWNER AND GENERAL CONTRACTOR PRIOR TO INSTALLATION.

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 CIRCUIT. 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 780, 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, 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, C.B.C.)
- 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 SFM 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 MEASURED @ 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 UUPF OR UJUS BY UNDERWRITERS OF FACTORY MUTUAL RESEARCH APPROVAL STANDARD 3011. SUPERVISION OF SYSTEM AND LEASED TELEPHONE LINES SHALL BY ARRANGED BY OWNER.

Ownership of Documents
 This document, the ideas and designs incorporated herein, as an instrument of Professional Service is the property of Integrated Designs by SOMAM Inc. and is not to be used, in whole or in part for any other project without written authorization. © COPYRIGHT 2013

integrated designs by SOMAM Inc.
 ARCHITECTURE · ENGINEERING · INTERIOR DESIGN · CONSTRUCTION MANAGEMENT
 6011 N. Fremont Suite 150 • Fresno, CA 93710
 Phone (559) 438-0881 Fax (559) 438-0887 E-Mail: design@integrateddesigns.com
 www.integrateddesigns.com

6 RELOCATABLE CLASSROOMS
 FRANKLIN ELEMENARY SCHOOL
 BAKERSFIELD CITY SCHOOL DISTRICT
 2400 TRUXTON AVE., BAKERSFIELD, CA

FIRE ALARM PLAN

Issue Date: 00/00/16
 Date: 5/31/16
 Designer: J CHONG
 DDC: J CHONG
 PC: C.M

Agency Approval Stamp:
 FILE # 15-16
 IDENTIFICATION STAMP
 DIV. OF THE STATE ARCHITECT
 OFFICE OF REGULATION SERVICES
 03-117022
 AC: FLS/INT/SS/7/16
 DATE: 6/1/16
 TRACKING #: DSA TRACKING NO

Stamp(s):
 LICENSED ARCHITECT
 JOHN S. CHONG
 No. C 28966
 Exp. 5-31-15
 STATE OF CALIFORNIA

Job No.: 5142
 Sheet No.: E-3
 Release:

CONSULTING ENGINEERS
 JOHN CHONG ENGINEERING
 JOHN S. CHONG
 E 14419
 Exp. 6/30/2018
 ELECTRICAL
 1017 E. DELAUR AVE. FRESNO CA 93710
 (559) 318-2986 • FAX 257-2421
 jcheng@eeer001.com