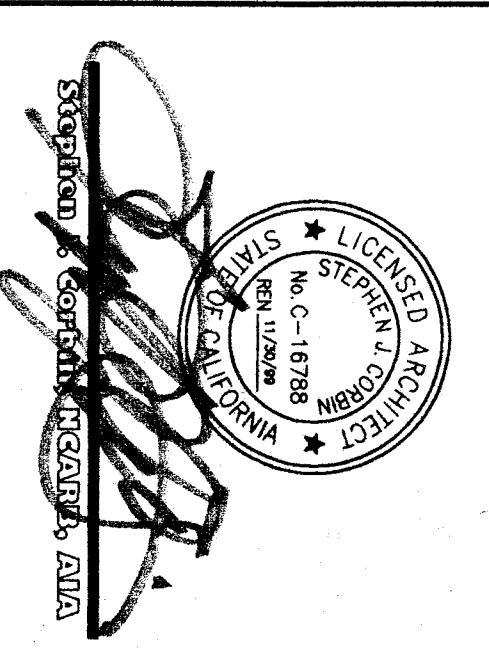
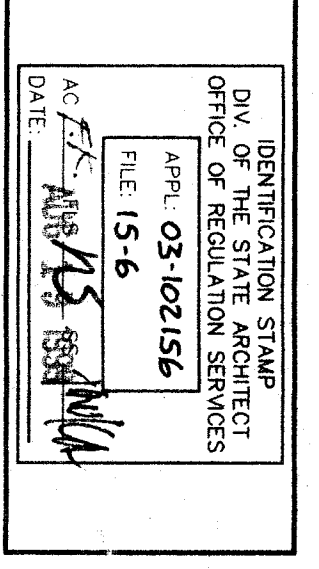


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**RUTH HARDING SCHOOL
MODERNIZATION**
3201 PICO ST.
FOR
BAKERSFIELD CITY SCHOOL DISTRICT
BAKERSFIELD, KERN COUNTY, CALIFORNIA

**FIRE ALARM
SINGLE LINE
AND DETAILS**

DATE	REVISIONS

SYMBOL SCHEDULE

SYMBOL	NAME	DESCRIPTION
FACP	FIRE ALARM CONTROL PANEL	THORN #FREQUEST 300 CSFM #765-1493.162
	FIRE ALARM PULL STATION	THORN #RAS-1P CSFM #7150-1493.156
	FIRE ALARM HORN	WHEELOCK #MT-12/24-R CSFM #7135-0785.118
	FIRE ALARM VISUAL	WHEELOCK #RS-2519W-FR CSFM #7125-0785.111
	FIRE ALARM VISUAL SYNCHRONIZED	WHEELOCK #RS-2430W-FR CSFM #7125-0785.111
	FIRE ALARM VISUAL SYNCHRONIZED	WHEELOCK #AS-2430W-FR CSFM #7125-0785.131
	HORN/STROBE COMBINATION	WHEELOCK #AS-2475W-FR CSFM #7125-0785.131
	HORN/STROBE COMBINATION SYNCHRONIZED	WHEELOCK #MT-24-R CSFM #7135-0785.115
	MINI HORN DEVICE	THORN #RSC-365P CSFM #7273-1493.155
	SMOKE DETECTOR	WHEELOCK #SM-12/24-R CSFM #7200-0785.132
	SMOKE DETECTOR SYNCHRONIZED MODULE	

STANDBY BATTERY CALCULATIONS

SYMBOL	QTY	DESCRIPTION	EQUIPMENT	CURRENT DRAIN EACH	STANDBY CURRENT	ALARM CURRENT
FACP	1	FIRE ALARM CONTROL PANEL	FREQUEST 300	265	265	995
	42	HORN PULL STATION	RAS-1P	0.23	0.23	0.23
	7	WHEELOCK EXT HORNS	W-12/24-R	0.23	0.23	1.61
	15	WHEELOCK VISUAL	RSS-2430W-FR	0.50	0.50	1.05
	30	WHEELOCK VISUAL	RSS-2430W-FR	0.81	0.81	0.81
	6	WHEELOCK HORN/STROBE	AS-2430W-FR	1.05	1.05	6.30
	10	WHEELOCK HORN/STROBE	AS-2430W-FR	1.56	1.56	1.56
	26	WHEELOCK MINI HORN	W-24-R	0.12	0.12	3.12
	1	THORN SMOKE DET	RS-35P	0.52	0.000045	0.52
	2	WHEELOCK SYNC. MOD.	SM-12/24-R	0.25	0.25	0.60
TOTALS					2850454	48914

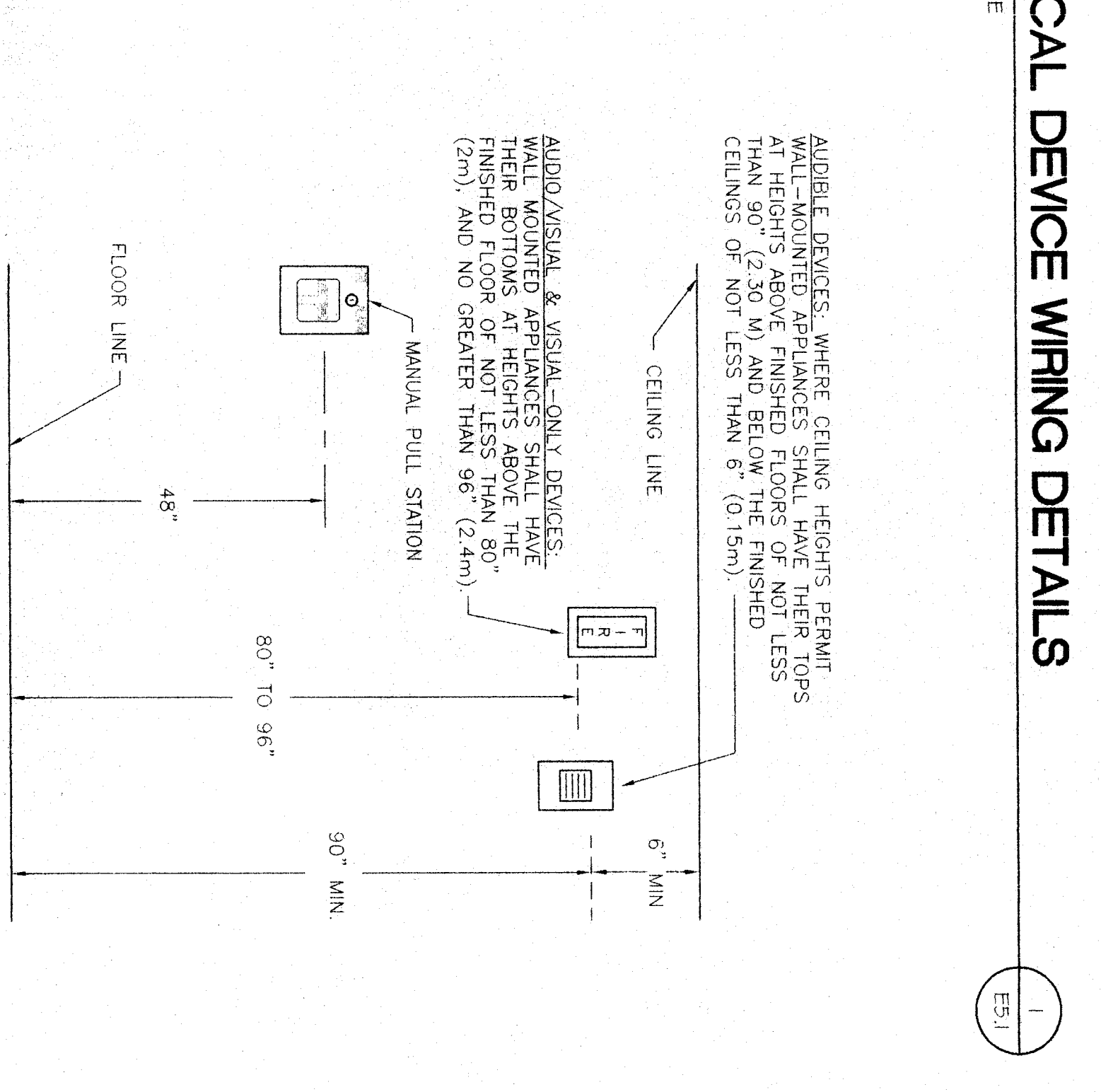
VOLTAGE DROP CALCULATIONS

SIGNAL CIRCUIT "A"	SIGNAL CIRCUIT "B"	SIGNAL CIRCUIT "C"	SIGNAL CIRCUIT "D"
$V_D = \text{Voltage Drop}$ $I = \text{Total Load } (6 \times 0.50) + (105) + (156) + (0.23) = 584.4$ $K = 11(\text{Copper Constant}) (110)$ $L = \text{Distance to the load } (110)$ $CM = \text{Circuit Wire Cross Section of 12 AWG} = 6530$ $V = \text{Voltage } (240)$ $V_D = K \cdot I \cdot L \cdot CM = 1.1 \cdot 584.4 \cdot (2 \cdot 110) = 216$ $V_D = 216/24 = 0.09 \text{ OR } 0.9\% \text{ VOLTAGE DROP}$	$V_D = \text{Voltage Drop}$ $I = \text{Total Load } (3 \times 0.50) + (105) + (156) + (0.23) = 516.4$ $K = 11(\text{Copper Constant}) (110)$ $L = \text{Distance to the load } (360)$ $CM = \text{Circuit Wire Cross Section of 12 AWG} = 6530$ $V = \text{Voltage } (240)$ $V_D = K \cdot I \cdot L \cdot CM = 1.1 \cdot 516.4 \cdot (2 \cdot 360) = 198$ $V_D = 198/24 = 0.82 \text{ OR } 8.2\% \text{ VOLTAGE DROP}$	$V_D = \text{Voltage Drop}$ $I = \text{Total Load } (3 \times 0.50) + (105) + (156) + (0.23) = 516.4$ $K = 11(\text{Copper Constant}) (110)$ $L = \text{Distance to the load } (360)$ $CM = \text{Circuit Wire Cross Section of 12 AWG} = 6530$ $V = \text{Voltage } (240)$ $V_D = K \cdot I \cdot L \cdot CM = 1.1 \cdot 516.4 \cdot (2 \cdot 360) = 198$ $V_D = 198/24 = 0.82 \text{ OR } 8.2\% \text{ VOLTAGE DROP}$	$V_D = \text{Voltage Drop}$ $I = \text{Total Load } (3 \times 0.50) + (105) + (156) + (0.23) = 516.4$ $K = 11(\text{Copper Constant}) (110)$ $L = \text{Distance to the load } (360)$ $CM = \text{Circuit Wire Cross Section of 12 AWG} = 6530$ $V = \text{Voltage } (240)$ $V_D = K \cdot I \cdot L \cdot CM = 1.1 \cdot 516.4 \cdot (2 \cdot 360) = 198$ $V_D = 198/24 = 0.82 \text{ OR } 8.2\% \text{ VOLTAGE DROP}$

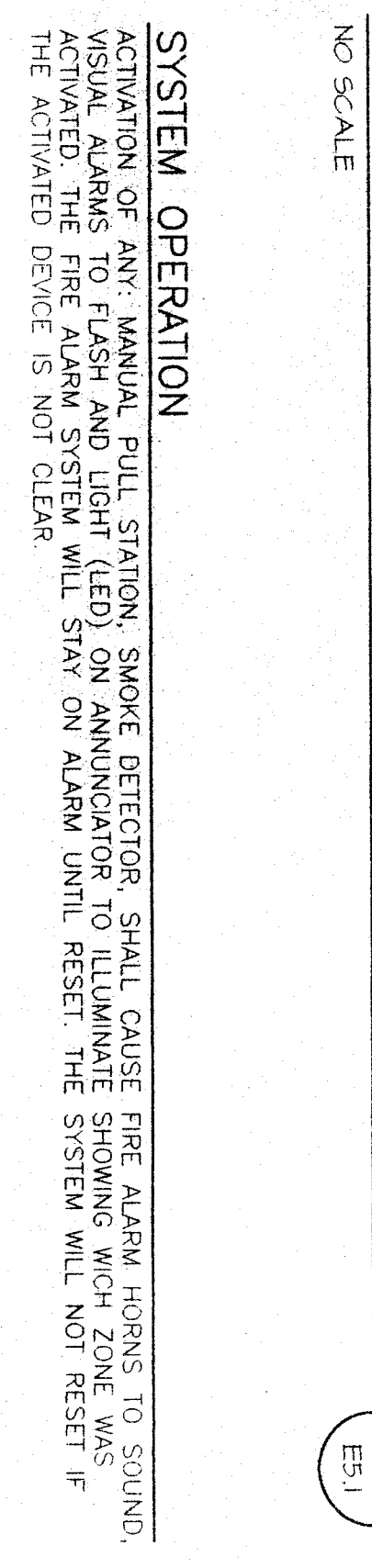
FIRE ALARM SYSTEM NOTES:

- ALL WIRING IS SHOWN PARAMOUNTALLY. CONTRACTOR MAY USE EQUIVALENT OR BETTER. HOWEVER, ALL CIRCUITS SHALL BE CONTINUOUS AND SUPERCLOSED FROM DEVICE TO DEVICE OR FAT TO DEVICE OR FAT TO FAT. NO PARALLEL BRANCHING SHALL BE ALLOWED. ANY CONNECTION OF ANY BREAK IN ANY CONDUCTOR SHALL BE BY TERMINAL CONNECTION AT A DEVICE OR AT A PULL POINT.
- ALL CONNECTIONS SHALL BE PROPERLY LABELED BY CONDUCTOR AND SHALL HAVE STAKE-ON LUG CONNECTORS.
- FIRE ALARM TERMINAL CABINETS SHALL HAVE SUFFICIENT SPACE, TERMINAL BOARDS AND SCREW TERMINAL CONNECTORS TO ALLOW CONNECTION OF ALL CONDUCTORS SHOWN. EQUIPMENT INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S DRAWINGS OF THE PROPOSED CONNECTIONS AT EACH FIRE ALARM TERMINAL CABINET PRIOR TO COMMENCING ANY WORK.
- ALL CONDUCTORS SHOWN SHALL BE #12 & #14 AWG. SOLID COPPER, UNLESS OTHERWISE NOTED (THIN/THICK - BELOW GRADE). 18/2 USE WEST EBN 975. USE WPA00-531 BELOW GRADE.
- WIREPULL CERTIFICATION USING NFPA 70, INSPECTION AND TESTING PERFORM BY THE FIRE ALARM EQUIPMENT INSTALLER OR WIREPULLER WITH HIS OWNERS AND COMMIS. DETAILED DRAWINGS OF THE PROPOSED CONNECTIONS AT EACH FIRE ALARM TERMINAL CABINET PRIOR TO COMMENCING ANY WORK.
- INSTALLATION OF THE FIRE ALARM SYSTEM SHALL NOT BE STARTED UNTIL WORKING DRAWINGS, INCLUDING STATE FIRE MARSHAL LISTING NUMBERS OF ALL FIRE ALARM COMPONENTS, ARE SUBMITTED TO AND APPROVED BY THE OFFICE OF REGULATION SERVICES.
- TEST OF THE ENTIRE SYSTEM SHALL BE MADE IN THE PRESENCE OF THE ENFORCING AGENCY.
- NEW FIRE ALARM AUDIBLES SHALL BE THE SAME BASIC SOUND & PATTERN AS EXISTING.
- REMOVE ANY UNUSED EXISTING DEVICES IN NEW BUILDING. PATCH AND COVER AS REQUIRED.
- INSTALLATION OF FIRE ALARM SYSTEM SHALL NOT BE STARTED UNTIL DETAIL PLANS, SPECIFICATIONS AND ENGINEERING CALCULATIONS HAVE BEEN ACCEPTED AND SIGNED BY THE ARCHITECT OR STRUCTURAL ENGINEER IN GENERAL CHARGE OF DESIGN AND THE RESPONSIBILITY COVERING THE WORK SHOWN ON A PARTICULAR PLAN BE SPECIFICATION, AND APPROVED BY THE OFFICE OF THE REGULATION SERVICES.

TYPICAL DEVICE WIRING DETAILS



F.A. DEVICE ELEVATION



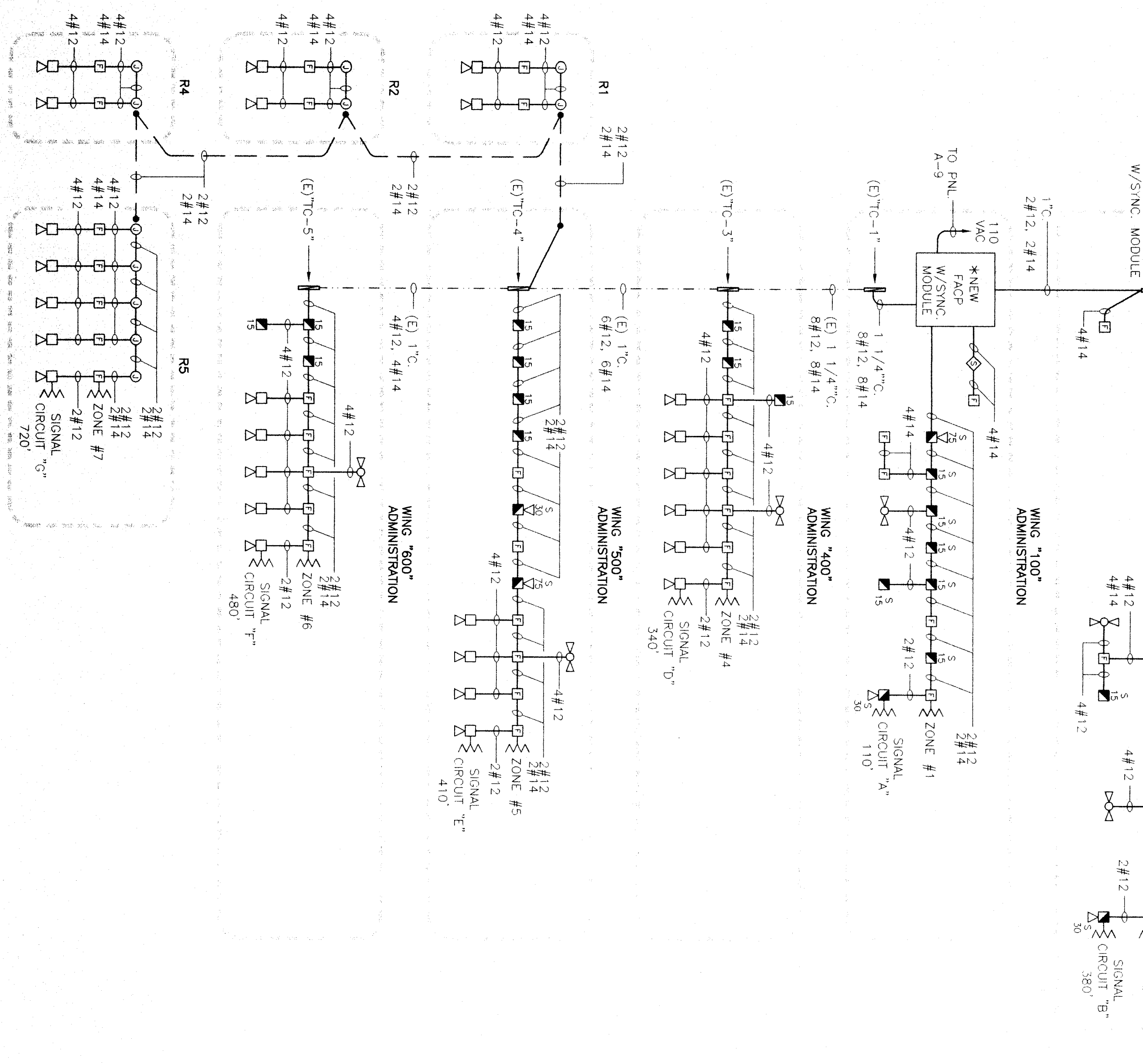
SYSTEM OPERATION

ACTIVATION OF ANY FIRE ALARM DEVICE SHALL CAUSE THE FIRE ALARM SIGNAL TO SOUND. THE FIRE ALARM SIGNAL SHALL BE TRANSMITTED TO THE FIRE ALARM CONTROL PANEL. THE FIRE ALARM SYSTEM WILL STAY ON ALARM UNTIL RESET. THE SYSTEM WILL NOT RESET IF THE ACTIVATED DEVICE IS NOT CLEAR.

CODES, STANDARDS & GUIDES

- Effective Date: 02/01/95
- 1995 BUILDING STANDARDS ADMINISTRATIVE CODE. PART 1, TITLE 24 C.C.R.
 - 1995 CALIFORNIA BUILDING CODE (CBC), PART 2, TITLE 24 C.C.R. (1994 UNIFORM BUILDING CODE VOLUMES 1-3 AND 1995 CALIFORNIA AMENDMENTS)
 - 1995 CALIFORNIA ELECTRICAL CODE (CEC), PART 3, TITLE 24 C.C.R. (1993 NATIONAL ELECTRICAL CODE AND 1996 CALIFORNIA AMENDMENTS)
 - 1995 CALIFORNIA MECHANICAL CODE (CMC), PART 4, TITLE 24 C.C.R. (1994 UNIFORM MECHANICAL CODE AND 1995 CALIFORNIA AMENDMENTS)
 - 1995 CALIFORNIA PLUMBING CODE (CPC), PART 5, TITLE 24 C.C.R. (1994 UNIFORM PLUMBING CODE AND 1995 CALIFORNIA AMENDMENTS)
 - 1995 CALIFORNIA FIRE CODE (FC), PART 6, TITLE 24 C.C.R. (1994 UNIFORM FIRE CODE AND 1995 CALIFORNIA AMENDMENTS)
 - 1995 CALIFORNIA REFERENCED STANDARDS CODE. PART 12, TITLE 24 C.C.R.
 - 1990 TITLE 19, C.C.R., PUBLIC SAFETY, STATE FIRE MARSHAL REGULATIONS.
- Standards & Guides:**
- NFPA 72 - NATIONAL FIRE ALARM CODES, 1993 EDITION WITH CALIFORNIA AMENDMENTS.
- REFERENCE CODE SECTION FOR NFPA STANDARDS-CBC [SFM] 5003.1.3**

FIRE ALARM SYSTEM SINGLE LINE



**FIRE ALARM COMPLETE
PLAN SUBMITTAL**

