

ABBREVIATIONS			
A OR AMP	AMPERES	MCC	MOTOR CONTROL CENTER
AC	ALTERNATING CURRENT	MCP	MOTOR CIRCUIT PROTECTOR
AF	AMP FRAME/AMP FUSE	MECH	MECHANICAL
AFC	AVAILABLE FAULT CURRENT	MFG	MANUFACTURER
ARCH	ARCHITECTURAL	MG	MOTOR-GENERATOR
AS	ABOVE FINISHED FLOOR	MH	MANHOLE
AT	AMP TRIP	MIN	MINIMUM
ATC	ABOVE FINISHED GRADE	MISC	MISCELLANEOUS
AUTO	AUTOMATIC	MTD	MOUNTED
AWG	AMERICAN WIRE GAUGE	MTR	MOUNTING
ATS	AUTOMATIC TRANSFER SWITCH	(N)	NEW
BD	BOARD	(NC)	NORMALLY CLOSED
BRK	BREAKER	NEC	NATIONAL ELECTRICAL CODE
BLDG	BUILDING	NEF	NON FUSED
C	CONDUIT	NIC	NOT IN CONTRACT
CB	CIRCUIT BREAKER	NO	NORMALLY OPEN
CCC	CALIFORNIA BUILDING CODE	NON AUTO	NON AUTOMATIC
CKT	CIRCUIT	N.T.S.	NOT TO SCALE
CLG	CEILING	PA	PUBLIC ADDRESS
COMM	COMMUNICATION	PH OR #	PHASE
CEC	CALIFORNIA ELECTRICAL CODE	PNL	PANEL
CFR	CALIFORNIA FIRE CODE	PRI	PRIMARY
DIA OR #	DIAMETER	PVC	POLYVINYL CHLORIDE
DIAG	DIAGRAM	PWR	POWER
DISC	DISCONNECT	(R)	REMOVED
DNS	DO NOT SWITCH	REQ	REQUIRED
DWG	DRAWING	RM	ROOM
ECP	ELECTRICAL CONTRACTOR	RCS	RIGID GALVANIZED STEEL CONDUIT
FACP	FIRE ALARM CONTROL PANEL	SCHED	SCHEDULE
FLA	FULL LOAD AMPS	SEC	SECONDARY
(V)	VOLTS	SPEC	SPECIFICATION
GC	GENERAL CONTRACTOR	STD	STANDARD
GFI	GROUND FAULT INTERRUPTING	UNSW	UNSWITCHED
GND	GROUND	TEL	TELEPHONE
HP	HORSEPOWER	TR	TRANSFORMER
HID	HIGH INTENSITY DISCHARGE	TYP	TYPICAL
HZ	HERTZ	UNL	UNLESS OTHERWISE NOTED
IG	ISOLATED GROUND	UC	UNDERGROUND
JB	JUNCTION BOX	V	VOLT
KVA	KILOVOLT AMPERE	VA	VOLT-AMPERE
KW	KILOWATT	WD	WOLGE DROP
LSC	LONG CONTINUOUS LOAD	W	WATT
LFMC	LIQUID TIGHT FLEXIBLE METAL CONDUIT	W/	WITH
LTS	LIGHTING	WP	WEATHERPROOF
MAG	MAGNET, MAGNETIC	(X)	EXISTING
MAX	MAXIMUM	SP	SINGLE POLE
		3P	THREE POLE
		Ø	Ø

**U.L. STANDARD 486B TORQUING RECOMMENDATIONS**

WIRE SIZE	TIGHTENING TORQUE FOR SCREWS (a) TORQUE, POUND - INCHES				SPLIT-BOLT CONNECTORS	OTHER CONNECTORS
	SLOTTED HEAD NO. 10 AND LARGER (b)		HEXAGONAL HEAD/EXTERNAL DRIVE SOCKET WRENCH			
	SLOT WIDTH (IN.) TO 3/64	SLOT LENGTH (IN.) OVER 3/64	TO 1/4	OVER 1/4		
18-10 AWG	20	35	20	35	80	75
8	25	40	25	40	80	75
6	35	45	35	45	165	110
4	45	50	45	50	165	110
3	50	55	50	55	275	150
2	50	60	50	60	275	150
1	50	65	50	65	275	150
1/0	50	70	50	70	385	180
2/0	50	75	50	75	385	180
3/0	50	80	50	80	500	250
4/0	50	85	50	85	500	250
250 kcmil	50	90	50	90	650	325
300	50	95	50	95	650	325
350	50	100	50	100	650	325
400	50	105	50	105	825	325
500	50	110	50	110	825	375
600	50	115	50	115	1000	375
700	50	120	50	120	1000	375
750	50	125	50	125	1000	375
800	50	130	50	130	1100	500
900	50	135	50	135	1100	500
1000	50	140	50	140	1100	500
1250	50	145	50	145	1100	600
1500	50	150	50	150	1100	600
1750	50	155	50	155	1100	600
2000	50	160	50	160	1100	600

THIS TABLE GIVES RECOMMENDED CONNECTOR INSTALLING TORQUES FOR COPPER AND ALUMINUM CONDUCTORS. THEY ARE FOR GUIDANCE ONLY WHERE NO TIGHTENING INFORMATION IS AVAILABLE AND SHOULD NOT BE USED TO REPLACE MANUFACTURER'S INSTRUCTIONS WHICH SHOULD ALWAYS BE FOLLOWED.

(a) CLAMPING SCREWS WITH MULTIPLE TIGHTENING MEANS; FOR EXAMPLE FOR A SLOTTED HEXAGONAL HEAD SCREW, USE THE HIGHEST TORQUE VALUE ASSOCIATED WITH THE DIFFERENT TIGHTENING MEANS.

(b) FOR VALUES OF SLOT WIDTH OR LENGTH OTHER THAN THOSE SPECIFIED, SELECT THE LARGEST TORQUE VALUE ASSOCIATED WITH CONDUCTOR SIZE.

**CEC ART. 310 CONDUCTOR DERATING**

NEC #310.15 (B)(2)(c) ADJUSTMENT FACTORS

(c) MORE THAN THREE CURRENT-CARRYING CONDUCTORS IN A RACEWAY OR CABLE, WHERE THE NUMBER OF CURRENT-CARRYING CONDUCTORS IN A RACEWAY OR CABLE EXCEEDS THREE, THE ALLOWABLE AMPACITIES SHALL BE REDUCED AS SHOWN IN THE FOLLOWING TABLE:

NUMBER OF CURRENT-CARRYING CONDUCTORS	PERCENT OF VALUES IN TABLES AS ADJUSTED FOR AMBIENT TEMPERATURE, IF NECESSARY
4 THROUGH 6	80
7 THROUGH 9	70
10 THROUGH 20	50
21 THROUGH 30	45
31 THROUGH 40	40
41 AND ABOVE	35

WHERE SINGLE CONDUCTORS OR MULTICONDUCTOR CABLES ARE STACKED OR BUNDLED LONGER THAN 24 INCHES (610 mm) WITHOUT MAINTAINING SPACING AND ARE NOT INSTALLED IN RACEWAYS, THE ALLOWABLE AMPACITY OF EACH CONDUCTOR SHALL BE REDUCED AS SHOWN IN THE ABOVE TABLE.

EXCEPTION NO. 1: WHERE CONDUCTORS OF DIFFERENT SYSTEMS, AS PROVIDED IN SECTION 300-3, ARE INSTALLED IN A COMMON RACEWAY OR CABLE, THE DERATING FACTORS SHOWN ABOVE SHALL APPLY TO THE NUMBER OF POWER AND LIGHTING (ARTICLES 210, 215, 220, AND 230) CONDUCTORS ONLY.

EXCEPTION NO. 2: FOR CONDUCTORS INSTALLED IN CABLE TRAYS, THE PROVISIONS OF SECTION 392.11 SHALL APPLY.

EXCEPTION NO. 3: DERATING FACTORS SHALL NOT APPLY TO CONDUCTORS IN NIPPLES HAVING A LENGTH NOT EXCEEDING 24 INCHES (600mm).

EXCEPTION NO. 4: DERATING FACTORS SHALL NOT APPLY TO UNDERGROUND CONDUCTORS ENTERING OR LEAVING AN OUTDOOR TRENCH IF THOSE CONDUCTORS HAVE PHYSICAL PROTECTION IN THE FORM OF RIGID METAL CONDUIT, INTERMEDIATE METAL CONDUIT, OR RIGID NONMETALLIC CONDUIT HAVING A LENGTH NOT EXCEEDING 10 FEET (3.05m) ABOVE GRADE AND THE NUMBER OF CONDUCTORS DOES NOT EXCEED FOUR.

**CEC WIRE FILL TABLE 370-16**

JUNCTION BOX DIMENSION, INCHES TRADE SIZE OR TYPE	MIN. CU. IN. CAP.	MAXIMUM NUMBER OF CONDUCTORS			
		NO. 14	NO. 12	NO. 10	NO. 8
4 x1-1/4 ROUND OR OCTAGONAL	12.5	6	5	5	4
4 x1-1/2 ROUND OR OCTAGONAL	15.5	7	6	6	5
4 x2-1/8 ROUND OR OCTAGONAL	21.5	10	9	8	7
4 x1-1/4 SQUARE	18.0	9	8	7	6
4 x1-1/2 SQUARE	21.0	10	9	8	7
4 x2-1/8 SQUARE	30.3	15	13	12	10
4-11/16 x1-1/4 SQUARE	25.5	12	11	10	8
4-11/16 x1-1/2 SQUARE	29.5	14	13	11	9
4-11/16 x2-1/8 SQUARE	42.0	21	18	16	14
3 x2 x1-1/2 DEVICE	7.5	3	3	3	2
3 x2 x2 DEVICE	10.0	4	4	4	3
3 x2 x2-1/4 DEVICE	10.5	5	4	4	3
3 x2 x2-1/2 DEVICE	12.5	6	5	5	4
3 x2 x2-3/4 DEVICE	14.0	7	6	5	4
3 x2 x3-1/2 DEVICE	18.0	9	8	7	6
4 x2-1/8 x1-1/2 DEVICE	10.3	5	4	4	3
4 x2-1/8 x1-1/8 DEVICE	13.0	6	5	5	4
4 x2-1/8 x2-1/8 DEVICE	14.5	7	6	5	4
3-3/4 x2 x2-1/2 MASONRY BOX / GANG	14.0	7	6	5	4
3-3/4 x2 x3-1/2 MASONRY BOX / GANG	21.0	10	9	8	7
FS - MINIMUM INTERNAL DEPTH 1-3/4 SINGLE COVER / GANG	13.5	6	6	5	4
FD - MINIMUM INTERNAL DEPTH 2-3/8 SINGLE COVER / GANG	18.0	9	8	7	6
FS - MINIMUM INTERNAL DEPTH 1-3/4 MULTIPLE COVER / GANG	18.0	9	8	7	6
FD - MINIMUM INTERNAL DEPTH 2-3/8 MULTIPLE COVER / GANG	24.0	12	10	9	8

# ROOSEVELT ELEMENTARY SCHOOL



## FIRE ALARM PANEL REPLACEMENT DSA SUBMITTAL SET

DSA FILE NO.

AGENCY TRACKING NO.

ALL WORK SHALL CONFORM TO 2019 TITLE 24, CALIFORNIA CODE OF REGULATIONS (CCR). CHANGES TO THE APPROVED DRAWINGS AND SPECIFICATIONS SHALL BE MADE BY AN ADDENDUM OR A CONSTRUCTION CHANGED DOCUMENT (CCD) APPROVED BY THE DIVISION OF THE STATE ARCHITECT, AS REQUIRED BY SECTION 4-338, PART 1, TITLE 24, CCR.

A "DSA CERTIFIED" PROJECT INSPECTOR EMPLOYED BY THE DISTRICT (OWNER) AND APPROVED BY THE DSA SHALL PROVIDE CONTINUOUS INSPECTION OF THE WORK. THE DUTIES OF THE INSPECTOR ARE DEFINED IN SECTION 4-342, PART 1, TITLE 24, CCR.

A DSA ACCEPTED TESTING LABORATORY DIRECTLY EMPLOYED BY THE DISTRICT (OWNER) SHALL CONDUCT ALL THE REQUIRED TESTS AND INSPECTIONS FOR THE PROJECT.

THE INTENT OF THESE DRAWINGS AND SPECIFICATIONS IS THAT THE WORK OF THE ALTERATION, REHABILITATION OR RECONSTRUCTION IS TO BE IN ACCORDANCE WITH TITLE 24, CCR. SHOULD ANY EXISTING CONDITIONS SUCH AS A DETERIORATION OR NON-COMPLYING CONSTRUCTION BE DISCOVERED WHICH IS NOT COVERED BY THE CONTRACT DOCUMENTS WHEREIN THE FINISHED WORK WILL NOT COMPLY WITH TITLE 24, CCR, A CONSTRUCTION CHANGE DOCUMENT (CCD), OR A SEPARATE SET OF PLANS AND SPECIFICATIONS, DETAILING AND SPECIFYING THE REQUIRED WORK SHALL BE SUBMITTED TO AND APPROVED BY DSA BEFORE PROCEEDING WITH THE WORK. (SECTION 4-317(c), PART 1, TITLE 24, CCR)

GRADING PLANS, DRAINAGE IMPROVEMENTS, ROAD AND ACCESS REQUIREMENTS AND ENVIRONMENTAL HEALTH CONSIDERATIONS SHALL COMPLY WITH ALL LOCAL ORDINANCES.

### APPLICABLE CODES AND REGULATIONS

CALIFORNIA CODE OF REGULATIONS (C.C.R.), TITLE 24 (APPLIES AFTER JANUARY 1, 2020):

- PART 1-CALIFORNIA BUILDINGS STANDARD ADMINISTRATIVE CODE 2019 EDITION
- PART 2-CALIFORNIA BUILDING CODE 2019 EDITION
- PART 3-CALIFORNIA ELECTRICAL CODE 2019 EDITION
- PART 4-CALIFORNIA MECHANICAL CODE 2019 EDITION
- PART 5-CALIFORNIA PLUMBING CODE 2019 EDITION
- PART 6-CALIFORNIA ENERGY CODE 2019 EDITION

- PART 9-CALIFORNIA FIRE CODE 2019 EDITION
- PART 10-CALIFORNIA EXISTING BUILDING CODE 2019 EDITION
- PART 11-CALIFORNIA GREEN BUILDING STANDARDS CODE 2019 EDITION
- PART 12-CALIFORNIA REFERENCE STANDARDS CODE 2019 EDITION

PARTIAL LIST OF NFPA STANDARDS:

- NFPA 13- AUTOMATIC SPRINKLER SYSTEM (CA AMENDED) 2016 EDITION
- NFPA 14- STANDPIPE SYSTEMS (CA AMENDED) 2016 EDITION
- NFPA 17A- WET CHEMICAL SYSTEMS, 2017 EDITION
- NFPA 20- STANDARD FOR THE INSTALLATION OF STATIONARY PUMPS FOR FIRE PROTECTION 2016 EDITION
- NFPA 24- PRIVATE FIRE MAINS (CA AMENDED) 2016 EDITION
- NFPA 72- NAT. FIRE ALARM & SIGNALING CODE (CALIFORNIA AMENDED) 2016 EDITION

- NFPA 80- STANDARD FOR FIRE DOORS AND OTHER OPENING PROTECTIVES 2016 EDITION
- NFPA 2001- STANDARD ON CLEAN AGENT FIRE EXTINGUISHING SYSTEMS (CA AMENDED) 2015 EDITION

- UL 300- STANDARD FOR FIRE TESTING OF FIRE EXTINGUISHING SYSTEMS FOR PROTECTION OF COMMERCIAL COOKING EQUIPMENT 2005 (R2010)

- UL 464- AUDIBLE SIGNALING DEVICES FOR FIRE ALARM AND SIGNALING SYSTEMS, INCLUDING ACCESSORIES 2003 EDITION

- UL 521- STANDARD FOR HEAT DETECTORS FOR FIRE PROTECTIVE SIGNALING SYSTEMS 1999 EDITION

- UL 1971- STANDARD FOR SIGNALING DEVICES FOR THE HEARING IMPAIRED 2002 (R2010)

- ICC 300- STANDARD FOR BLEACHERS, FOLDING AND TELESCOPING SEATING, AND GRANDSTANDS 2017 EDITION

FOR A COMPLETE LIST OF APPLICABLE NFPA STANDARDS REFER TO 2019 CBC (SFM) CHAPTER 35 AND CALIFORNIA FIRE CODE CHAPTER 80.

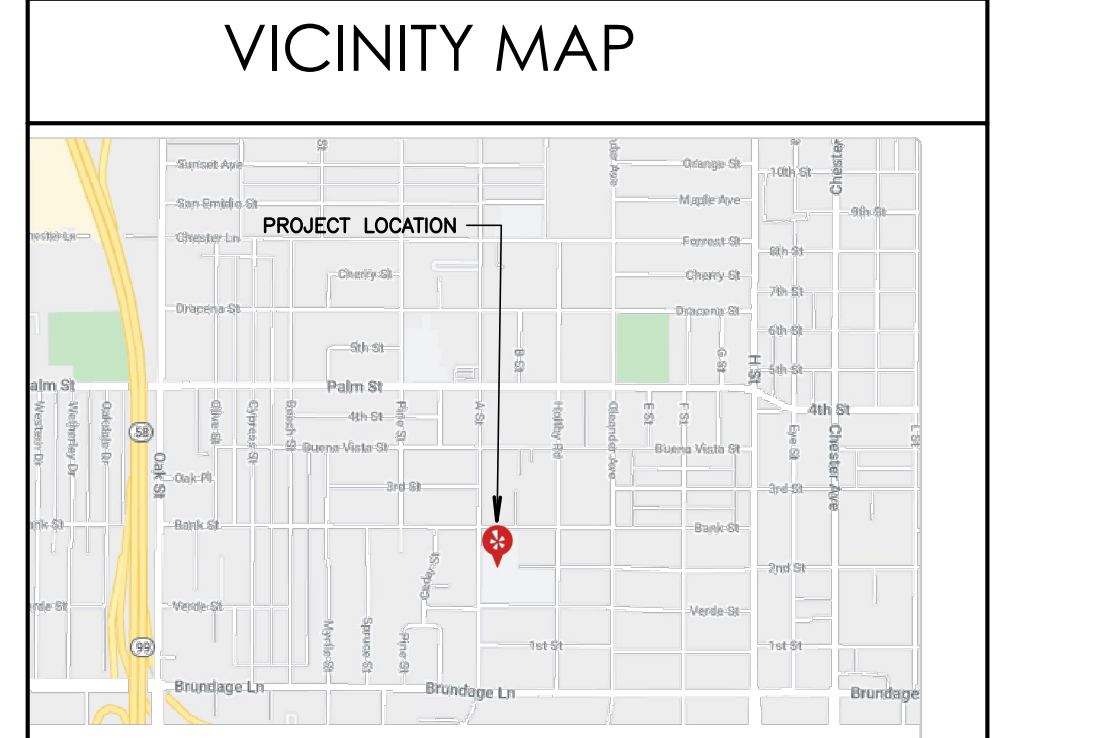
### SCOPE OF WORK

THE PROJECT CONSISTS OF REMOVING THE EXISTING MAIN FIRE ALARM CONTROL PANEL AND REPLACING THE MAIN FIRE ALARM CONTROL PANEL WITH A NEW ADDRESSABLE FIRE ALARM CONTROL PANEL. EXISTING SIGNALING LINE CIRCUITS AND EXISTING NOTIFICATION APPLIANCE (NAC) CIRCUITS SHALL BE RECONNECTED TO NEW FIRE ALARM EQUIPMENT. A VOICE EVACUATION PANEL WILL BE PROVIDED FOR FUTURE WORK WHERE VOICE EVACUATION IS PROVIDED.

SHEET INDEX	
SHEET	DESCRIPTION
E0.0	COVER SHEET
E1.0	ELECTRICAL SYMBOLS AND GENERAL NOTES
E2.0	SITE FIRE ALARM PLAN
E2.1	BLDG 100 FIRE ALARM PLAN
E3.0	FIRE ALARM NOTES, FIRE ALARM SPECIFICATIONS
E3.1	FIRE ALARM RISER DIAGRAM, BATTERY CALCULATIONS

PROJECT TEAM	
OWNER:	BAKERSFIELD CITY SCHOOL DISTRICT 1300 BAKER STREET BAKERSFIELD, CA 93305 PHONE: (805) 831-5885 FAX:(805) 834-9986
CONTACT:	ROBERT VAN TASSEL
ELECTRICAL ENGINEER:	FERRANTI ENGINEERING CONSULTING ELECTRICAL ENGINEERS 1211 MARICOPA HWY, SUITE 250 OJAI, CA 93023 805.705.4772 CONTACT: DALE FERRANTI

FIRE WATCH NOTE: WHERE A REQUIRED FIRE ALARM SYSTEM IS OUT OF SERVICE, THE AUTHORITY HAVING JURISDICTION SHALL BE NOTIFIED, AND THE BUILDING SHALL BE EVACUATED OR AN APPROVED FIRE WATCH SHALL BE PROVIDED FOR ALL PARTIES LEFT UNPROTECTED BY THE SHUTDOWN UNTIL THE FIRE ALARM SYSTEM HAS BEEN RETURNED TO SERVICE.



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DATE: 04/23/2021

APP# 03-121106  
FILE # 15-6

PTN# 63321-375

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**BAKERSFIELD CITY SCHOOL DISTRICT**

**ROOSEVELT ELEMENTARY SCHOOL  
FIRE ALARM PANEL REPLACEMENT**

2324 VERDE STREET  
BAKERSFIELD, CALIFORNIA 93306

COVER SHEET

REVISIONS:	DATE:

DATE: 3/19/2021  
DRAWN: D.FERRANTI  
JOB NO.

E0.0

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GENERAL ELECTRICAL NOTES

SCOPE: THE DRAWINGS AND THESE GENERAL NOTES DESCRIBE THE SCOPE OF WORK AND SYSTEMS. THE MATERIAL REQUIRED FOR THE WORK SHALL BE CONTRACTOR FURNISHED AND CONTRACTOR INSTALLED, UNLESS SPECIFICALLY NOTED OTHERWISE. THE WORK INCLUDES BUT IS NOT LIMITED TO THE FOLLOWING PRINCIPAL SYSTEMS AND EQUIPMENT.

2.) DO ALL DRILLING, CUTTING, CHANNELING AND PATCHING REQUIRED TO INSTALL ELECTRICAL WORK AS INDICATED OR HEREIN SPECIFIED. ALL HOLES, CURBS, ETC., IN FLOORS, CEILINGS AND WALLS SHALL BE PATCHED, UNLESS INDICATED OTHERWISE. PAINT ALL NEW ELECTRICAL RACEWAYS, CABINETS, ENCLOSURES, AND FITTINGS PENETRATING INTO FIRE RATED ENVELOPES, SPACES, ETC.

ELECTRICAL SYMBOL LIST

ANNOTATIONS & CALLOUTS: ELECTRICAL KEYNOTE: DENOTES KEYNOTE #1 OF NOTES ON SAME SHEET. INDICATES LIGHTING FIXTURE TAG NUMBER. INDICATES WATTAGE OF LIGHT FIXTURE (FOUND ON LIGHT FIXTURE SCHEDULE).

POWER: PANELBOARD PER PLANS, FLUSH MOUNTED IN WALL @ +6'-6" TO TOP OF TRIM. PANELBOARD PER PLANS, SURFACE MOUNTED ON WALL @ +6'-6" TO TOP OF TRIM. SINGLE RECEPTACLE, WALL MOUNTED @ +18" AFF, NEMA 5-20R UON.

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ELECTRICAL SYMBOLS AND GENERAL NOTES

BAKERSFIELD CITY SCHOOL DISTRICT ROOSEVELT ELEMENTARY SCHOOL FIRE ALARM PANEL REPLACEMENT 2324 VERDE STREET BAKERSFIELD, CALIFORNIA 93306

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**SHEET NOTES**

1. CONTRACTOR SHALL CALL UNDERGROUND SERVICE ALERT AT 811 TO LOCATE UNDERGROUND UTILITIES AT LEAST 2 WORKING DAYS PRIOR TO DIGGING. CONTRACTOR SHALL FIELD VERIFY LOCATION AND DEPTH OF EXISTING IMPROVEMENTS PRIOR TO START OF CONSTRUCTION.
2. VERIFY LOCATION OF ALL BUILDINGS AND APPENDITURES ON ARCHITECTURAL AND CIVIL PLANS.
3. FIELD VERIFY LOCATION ON ALL UNDERGROUND UTILITIES PRIOR TO TRENCHING. SCHEDULE AND COORDINATE ALL SITE WORK WITH OWNER PRIOR TO ANY TRENCHING.
4. CONTRACTOR SHALL VERIFY LOCATION & REQUIREMENTS OF ALL DEVICES/EQUIPMENT REQUIRING ELECTRICAL CONNECTION PRIOR TO BID PROPOSAL, ROUGH-IN, AND FINISH.
5. CONTRACTOR SHALL, IN ROUTING ALL CIRCUITS, INCREASE CONDUCTOR & CONDUIT SIZE TO ALLOW FOR VOLTAGE DROP SHOULD THE CONTRACTOR EXCEED ROUTING INDICATED ON DRAWINGS. ENGINEER OF RECORD MUST BE NOTIFIED PRIOR TO ANY DEVIATIONS FROM APPROVED PLAN CHECK (PERMIT SET) DRAWINGS.
6. ALL 90 DEGREE CONDUIT BENDS AND RISERS SHALL BE PVC COATED RIGID STEEL.
7. CONTRACTOR SHALL COORDINATE AND PROVIDE ALL SITE ELECTRICAL SERVICE REQUIREMENTS WITH SERVING UTILITY.
8. ALL SERVICE ENTRANCE EQUIPMENT SHOP DRAWINGS SHALL BE SUBMITTED TO THE LOCAL UTILITY COMPANY FOR APPROVAL, WITH WRITTEN APPROVAL RECEIVED PRIOR TO SUBMISSION TO ELECTRICAL ENGINEER FOR APPROVAL.
9. VERIFY LOCATION OF ALL EQUIPMENT ON ARCHITECTURAL AND CIVIL PLANS.
10. MINIMUM CONDUIT BURIAL DEPTH IS 24", 36" MINIMUM BELOW STREETS AND PARKING LOTS. FOR 0-600 VOLT SYSTEMS.
11. PROVIDE CODE SIZED EQUIPMENT GROUNDING CONDUCTORS IN ALL OCCUPIED CONDUITS.
12. 1" CONDUIT MINIMUM UNDERGROUND.
13. COORDINATE WORK WITH OTHER TRADES. OBTAIN ALL DRAWINGS THAT WILL REQUIRE COORDINATION AND PROVIDE ALL ELECTRICAL CONNECTIONS, DEVICES, AND WIRING REQUIRED, WHETHER SHOWN ON THE ELECTRICAL DRAWINGS OR NOT.
14. CONTRACTOR SHALL FURNISH AND INSTALL PULL BOXES AS REQUIRED TO INSTALL CONDUCTORS PER CONDUCTOR MANUFACTURERS RECOMMENDATIONS, PER THE NATIONAL ELECTRICAL CODE, AND PER LOCAL AUTHORITIES HAVING JURISDICTION.
15. FIELD CONDITIONS GOVERN DEMOLITION AND NEW CONSTRUCTION. CONTRACTOR SHALL VERIFY ACTUAL CONDITIONS PRIOR TO START OF WORK. THE ARCHITECT/ENGINEER SHALL BE NOTIFIED OF POSSIBLE FIELD PROBLEMS PRIOR TO DEMOLITION. CONTRACTOR SHALL NOTIFY DISTRICT REPRESENTATIVE OF WORK BEING PERFORMED. COORDINATE WITH DISTRICT REPRESENTATIVE.
16. ALL EMPTY CONDUITS SHALL BE PROVIDED WITH DIMENSIONED NYLON PULL STRING.
17. CONTRACTOR SHALL FIELD VERIFY LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO ANY EXCAVATION OR TRENCHING. CONTRACTOR SHALL PROTECT ALL EXISTING/REMAINING UTILITIES IN PLACE. CONTRACTOR, AT HIS SOLE EXPENSE, SHALL REPAIR ANY UTILITY SYSTEMS DAMAGED DURING CONSTRUCTION.
18. VERIFY AND PROVIDE ALL UTILITY SYSTEMS PER SERVING UTILITY STANDARD REQUIREMENTS.
19. CONTRACTOR SHALL PROVIDE CONCRETE ENCASEMENT AT ALL VERIZON COMPANY CONDUIT BENDS PER VERIZON COMPANY REQUIREMENTS.

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**BAKERSFIELD CITY SCHOOL DISTRICT**



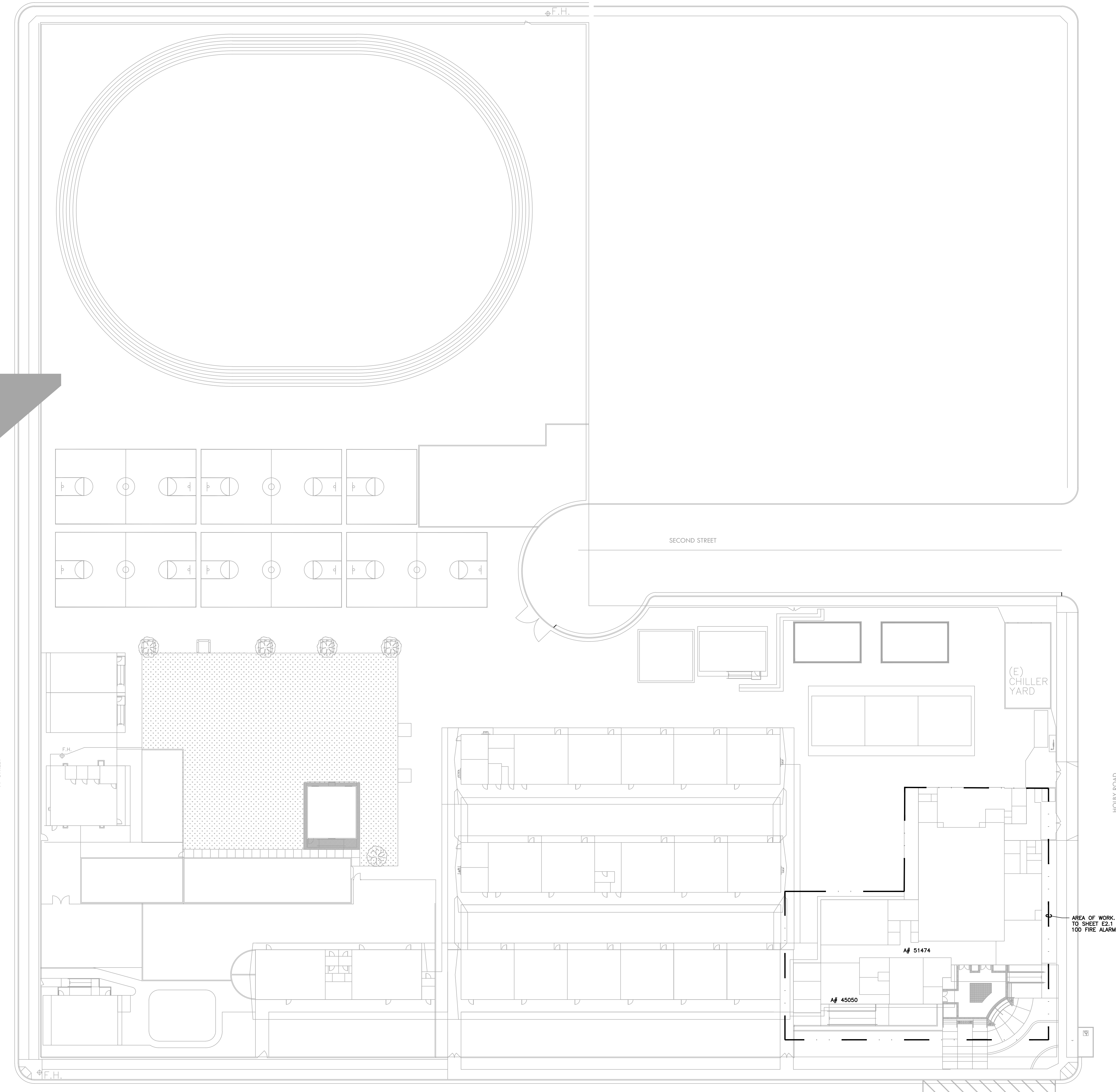
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**FIRE ALARM PANEL REPLACEMENT**  
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**SITE FIRE ALARM PLAN**

REVISIONS:	DATE:

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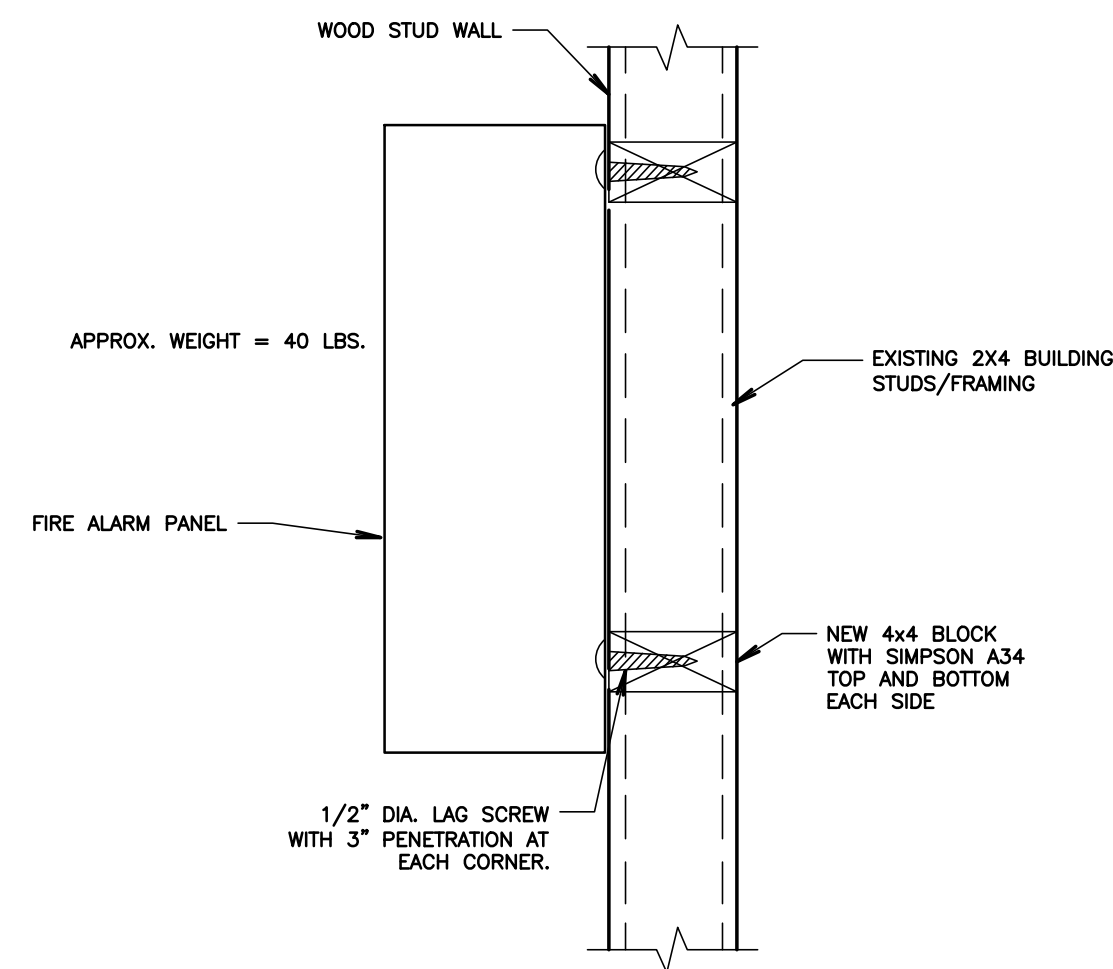


**1 SITE FIRE ALARM PLAN**

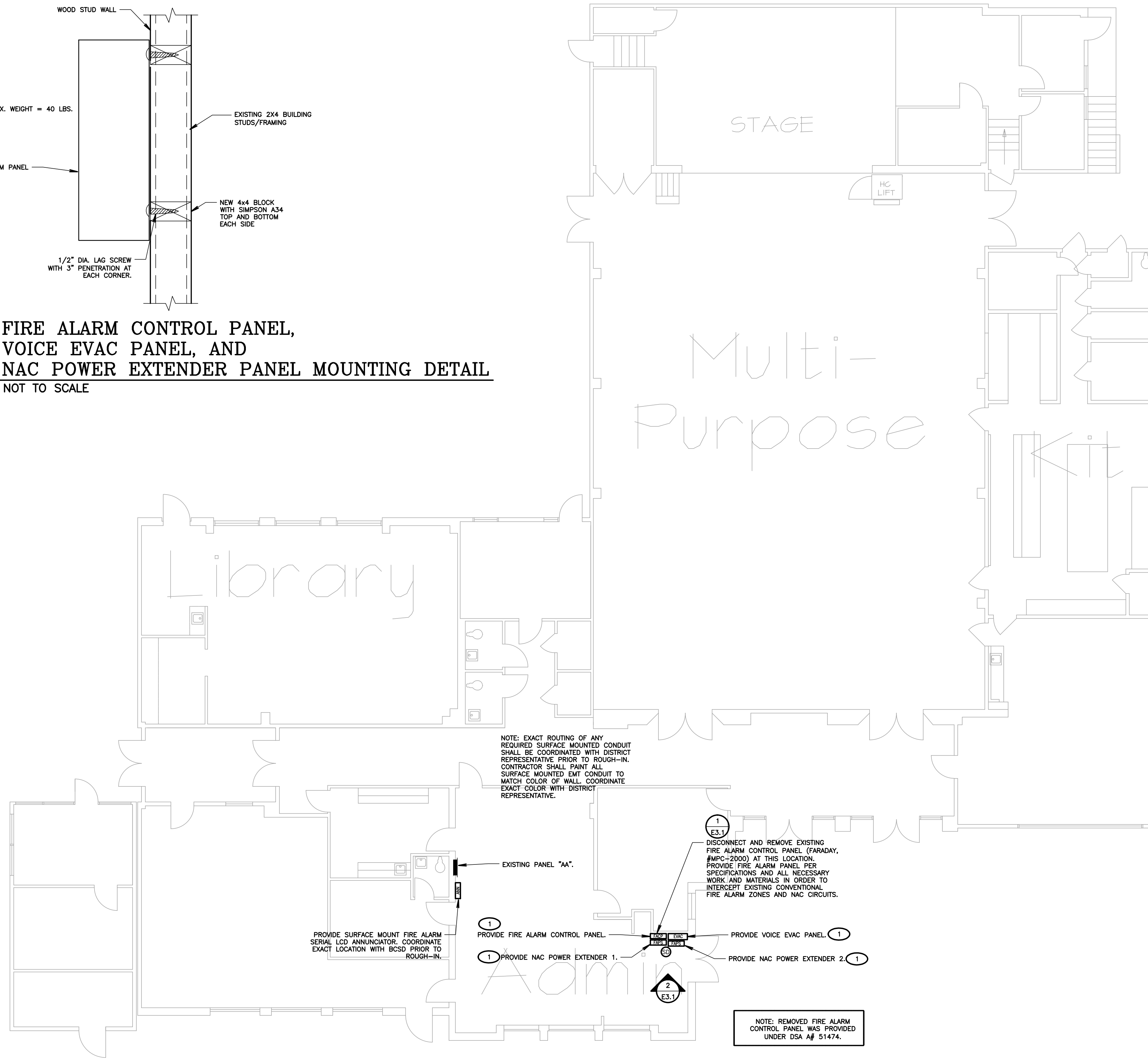
1"=30'-0"

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**FIRE ALARM CONTROL PANEL,  
VOICE EVAC PANEL, AND  
NAC POWER EXTENDER PANEL MOUNTING DETAIL**  
NOT TO SCALE



**KEY NOTES (RISER DIAGRAM)**  
(NOTE: THESE NOTES MAY NOT APPEAR ON ALL SHEETS.)

1 REFER TO MOUNTING DETAIL ON THIS SHEET.

**1 BUILDING 100 FIRE ALARM PLAN**  
1/8"=1'-0"

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**ROOSEVELT  
ELEMENTARY SCHOOL  
FIRE ALARM PANEL  
REPLACEMENT**  
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**BLDG 100 FIRE ALARM PLAN**

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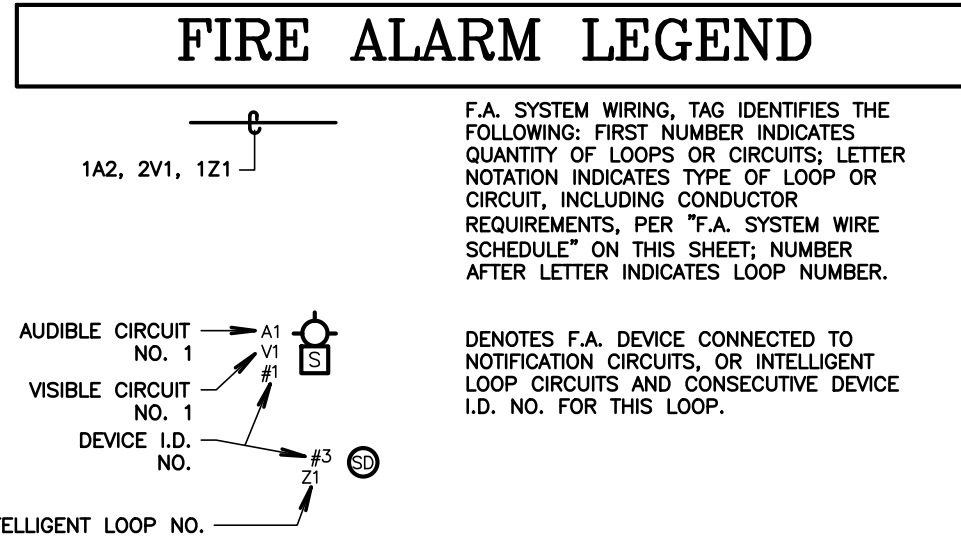
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F.A. SYSTEM WIRE SCHEDULE				
TAG	CONDUCTORS	DEVICE/FUNCTION	INTERIOR INSTALLATION	EXTERIOR INSTALLATION
V	2#12, THWN/THHN	VISIBLE NOTIFICATION DEVICES-STROBE LIGHTS	MIN. 3/4" CONDUIT	MIN. 1" CONDUIT
Z	1-PAIR #16 TWISTED, SHIELDED PAIR WEST PENN ACC294 (BLDG. EXTERIOR & UNDERGROUND)	CAMPUS/BLDG. SLC INTELLIGENT LOOP INITIATING DEVICES (PULL STATIONS, SMOKE AND HEAT DETECTORS, WATER FLOW AND TAMPER SWITCHES, MONITOR AND CONTROL MODULES, ETC.)	MIN. 3/4" CONDUIT	MIN. 1" CONDUIT
P	2#14, THWN/THHN	DEVICE POWER-24VDC	MIN. 3/4" CONDUIT	MIN. 1" CONDUIT
A	1-PAIR #16 TWISTED SHIELDED PAIR, WEST PENN ACC294 (BLDG. EXTERIOR & UNDERGROUND) 1-PAIR #16 TWISTED SHIELDED PAIR, WEST PENN 991. (BLDG. INTERIOR).	AUDIBLE NOTIFICATION DEVICES-SPEAKERS	MIN. 3/4" CONDUIT	MIN. 1" CONDUIT



**GENERAL NOTES**

- SMOKE DETECTORS SHALL BE INSTALLED 3' AWAY FROM SUPPLY AND RETURN AIR GRILLES.
- FINAL FIRE ALARM TEST OF ALL DEVICES SHALL BE WITNESSED BY THE PROJECT INSPECTOR. TEST SHALL INCLUDE ALL INFORMATION PER NFPA 72, FIGURE 14.6.2.4 AND READ OUT VERIFICATION FORM FROM CENTRAL STATION. TEST SHALL ALSO BE WITNESSED BY THE LOCAL AUTHORITY HAVING JURISDICTION (A.H.J.).
- UNDERGROUND AND EXTERIOR CONDUITS WILL HAVE WATER-TIGHT FITTINGS (C.E.C. 110.11 AND 300.6).
- AUDIBLE DEVICE(S) SHALL BE AT LEAST 15db ABOVE AVERAGE AMBIENT SOUND LEVEL, BUT NOT LESS THAN 75dbA AT 10' OR MORE THAN 110 dbA IN TOTAL, THROUGHOUT (NFPA 72 18.4.1 AND C.F.C. 907.6.2).
- AUDIBLE DEVICES SHALL SOUND THE CALIFORNIA CODE IN TEMPORAL PATTERN, CODE 3.
- VISUAL DEVICES SHALL NOT EXCEED TWO FLASHES PER SECOND AND SHALL NOT BE SLOWER THAN ONE FLASH PER SECOND. (NFPA 72 18.5.2.1).
- PROVIDE AN ENGRAVED NAMEPLATE INDICATING THE D.S.A. APPLICATION NUMBER, FILE NUMBER AND DATE OF INSTALLATION AT FIRE ALARM POWER EXPANDER PANEL. WHITE LETTERS ON A RED BACKGROUND.
- PROVIDE A COPY OF THE BATTERY CALCULATION AT THE FIRE ALARM POWER EXPANDER PANEL. BATTERY CALCULATION SHALL CONTAIN INFORMATION AS NOTED ON SCHEDULES AND BE PLASTIC LAMINATED. MOUNT ONTO INSIDE FACE OF DOOR.
- MORE THAN TWO VISIBLE NOTIFICATION APPLIANCES OR GROUPS OF SYNCHRONIZED APPLIANCES IN THE SAME ROOM OR ADJACENT SPACE WITHIN THE FIELD OF VIEW SHALL FLASH IN SYNCHRONIZATION (NFPA 72 18.5.4.3.2(4)).
- THE AUTOMATIC ALARM SYSTEM SHALL BE INSTALLED, TESTED AND MAINTAINED IN ACCORDANCE WITH THE STATE FIRE MARSHAL'S REGULATIONS (C.F.C. 907.9).
- THE FIRE ALARM SYSTEM SHALL CONFORM TO ARTICLE 760 OF THE CALIFORNIA ELECTRICAL CODE, CURRENT CALIFORNIA TITLE 24 REQUIREMENTS, CALIFORNIA FIRE CODE, NFPA 72 AND 101 STANDARDS, AMERICAN WITH DISABILITY ACT (ADA) REQUIREMENTS.
- DRAWINGS DO NOT SHOW ALL THE NECESSARY J-BOXES AND PULL BOXES WHICH WILL BE REQUIRED THROUGHOUT. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE ALL THESE BOXES AS NECESSARY TO TERMINATE CONDUITS AND RACEWAYS. PAINT BOXES TO MATCH COLOR OF THE FINISHED BUILDING WALLS.
- ALL JUNCTIONS BOXES AND DEVICES INDICATED ON BUILDING EXTERIORS SHALL BE WEATHERPROOF TYPE.
- FIRE ALARM WIRES SHALL BE COPPER TYPE THWN/THHN.
- ALL SIGNAL WIRING IN UNDERGROUND CONDUITS SHALL BE WET LOCATION TYPE.
- WHEN ALL FIRE ALARM DEVICES ARE INSTALLED AND PROGRAMMING IS COMPLETE, PROVIDE A FIRE ALARM DEVICE MAP IN THE SCHOOL MAIN OFFICE TO INDICATE TO SCHOOL PERSONNEL THE LOCATIONS OF THE NEW DEVICES.
- JUNCTION BOXES SHALL NOT CONTAIN SPLICES. CONDUCTORS SHALL BE PULLED THROUGH. TERMINATIONS SHALL BE PERFORMED.
- ALL EXPOSED CONDUITS AND BOXES SHALL BE PAINTED TO MATCH THE SURFACE WHERE INSTALLED.

FIRE ALARM EQUIPMENT SPECIFICATIONS SCHEDULE							
SYMBOL	MODEL NO	DESCRIPTION	MANUFACTURER	CSFM. LISTING #	BACKBOX REQUIREMENTS	MOUNTING HEIGHT (TO CENTER U.O.N.)	REMARKS
	FIRENET 4127	FIRE ALARM CONTROL PANEL W/ DIGITAL ALARM COMMUNICATOR	HOCHIKI	7165-0410-159			
	EVAX-50-4	VOICE EVAC PANEL (50W, 4-ZONES)	HOCHIKI	6911-0410-176			
	FN-LCD-S	SERIAL LCD ANNUNCIATOR	HOCHIKI	7120-0410-165			
	FN-642-ULADA	NAC POWER EXTENDER	HOCHIKI	7315-0410-0166			
	ALN-V HSB-NSA-6	ADDRESSABLE SMOKE DETECTOR W/6" BASE	HOCHIKI	7272-0410-0204 7300-0410-0132	4" SQ. X. 2 1/8" DP. OUTLET BOX WITH S.G. RAISED RING		
	DCP-CZM	CONVENTIONAL ZONE MODULE	HOCHIKI	7300-0410-150	4" SQ. X. 2 1/8" DP. OUTLET BOX		
	-	END OF LINE RESISTOR			4" SQ. X. 2 1/8" DP. OUTLET BOX		

	SEQUENCE OF OPERATIONS																		
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	
1	MANUAL PULL STATIONS	•	•	•	•	•													
2	SMOKE DETECTORS	•	•	•	•	•													
3	FIRE ALARM SYSTEM AC POWER FAIL	•	•	•	•	•							•						
4	FIRE ALARM SYSTEM LOW BATTERY	•	•	•	•	•													
5	OPEN CIRCUIT	•	•	•	•	•													
6	GROUND FAULT	•	•	•	•	•													
8	HEAT DETECTORS	•	•	•	•	•													
9	NOTIFICATION CIRCUIT SHORT	•	•	•	•	•													
10																			

**CODE, RULES & REGULATIONS**

ALL WORK AND MATERIALS SHALL COMPLY WITH THE LATEST REGULATIONS OF THE STATE FIRE MARSHAL, CALIFORNIA CODE OF REGULATIONS, SERVING UTILITY COMPANIES AND OTHER APPLICABLE STATE ORDINANCES. NOTHING IN THESE PLANS OR SPECIFICATIONS IS TO BE CONSTRUED AS TO PERMIT WORK NOT CONFORMING TO THESE CODES. WHERE WORK OF A HIGHER DEGREE IS INDICATED IN THE PLANS OR SPECIFICATIONS THIS REQUIREMENT SHALL GOVERN.

**FIRE ALARM LEVEL OF AUDIBILITY**

ALARM INDICATING DEVICES OF A FIRE ALARM SYSTEM INTENDED TO ALERT ALL OCCUPANTS SHALL BE SO LOCATED AND UNOBSTRUCTED AS TO CAUSE A LEVEL OF AUDIBILITY OF NOT LESS THAN 15db ABOVE AMBIENT NOISE LEVELS MEASURED FOUR FEET ABOVE THE FLOOR INSIDE BUILDING.

AMBIENT NOISE LEVELS SHALL BE CONSTRUED TO MEAN THAT WHICH CAN NORMALLY BE EXPECTED TO EXIST WHEN THE FACILITY, BUILDING, ROOM OR AREA IS FUNCTIONING UNDER NORMAL OPERATIVE OR WORKING CONDITIONS.

THE FIRE ALARM SIGNAL SHALL COMPLY WITH THE CALIFORNIA EDUCATION CODE, SECTIONS 32000 AND 32004, AND BE A TEMPORAL PATTERN, CODE 3.

**FIRE ALARM SYSTEM INSTALLATION NOTES**

ALL DRAWINGS ARE DIAGRAMMATIC ONLY, AND SHALL NOT BE USED IN DETERMINING ACTUAL CONDUIT ROUTING. THE CONTRACTOR SHALL VERIFY ALL CONDUIT ROUTING CONDITIONS AT THE PROJECT SITE AS CONSTRUCTION PROGRESSES.

ALL FIRE ALARM DATA COMMUNICATIONS AND INITIATING CIRCUITS SHALL BE INSTALLED UTILIZING SOLID COPPER CONDUCTORS WITH OUTER COVERING COLORS PER THE SPECIFICATIONS AND AS SHOWN ON THE DRAWINGS. ALL SMOKE DAMPER AND REMOTE TROUBLE INDICATOR CIRCUITS SHALL BE YELLOW. ALL CIRCUITS SHALL BE INDIVIDUALLY LABELED, BOTH AT THE DEVICE END AND AT THE SIGNAL TERMINAL CABINET AND/OR FIRE ALARM MASTER PANEL TERMINATION POINT.

ALL FIRE ALARM CIRCUITS SHALL BE CONTINUOUS FROM DEVICE TO DEVICE. SPLICES ARE NOT ALLOWED UNLESS IN COVERED JUNCTION BOXES ON APPROVED TERMINAL BLOCKS. "T" TAPPING IS ALLOWED ONLY UNDER THESE CONDITIONS.

**FIRE ALARM MONITORING NOTE**

AUTOMATIC FIRE ALARM SYSTEMS SHALL TRANSMIT THE ALARM, SUPERVISORY AND TROUBLE SIGNALS TO AN APPROVED SUPERVISING STATION AS REQUIRED BY NFPA 72 AS AMENDED BY ARTICLE 91. THE SUPERVISING STATION SHALL BE LISTED AS EITHER UUFX OR ULUS BY UNDERWRITERS LABORATORY OF SHALL MEET THE REQUIREMENTS OF FACTORY MUTUAL RESEARCH APPROVAL STANDARD 3011. SUPERVISION OF SYSTEM AND LEASED TELEPHONE LINES SHALL BE ARRANGED BY OWNER.

**COMPLETE AUTOMATIC FIRE ALARM PLAN SUBMITTAL**

THE FIRE ALARM SYSTEM SHOWN ON THESE PLANS HAS BEEN SUBMITTED AND APPROVED BY THE 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 FIRE ALARM SYSTEM SHALL BE A TOTAL (COMPLETE) AUTOMATIC HEAT AND SMOKE DETECTION SYSTEM, PER C.F.C SECTION 907.2.3.5, AND SHALL COVER EVERY ROOM AND/OR AREA. UPON THE ACTIVATION OF ANY INITIATION DEVICE THE FIRE ALARM SYSTEM SHALL ALERT ALL OCCUPANTS AND TRANSMIT THE ALARM, SUPERVISION, AND TROUBLE SIGNALS TO AN APPROVED SUPERVISING STATION (C.F.C. SECTION 907.2.3.5).

**SCHOOLS FIRE ALARM REQUIREMENTS**

THE FIRE ALARM SYSTEM SHALL CONFORM TO CALIFORNIA BUILDING CODE, SECTION 907.2.3; CALIFORNIA ELECTRICAL CODE, ARTICLE 760 AND CALIFORNIA FIRE CODE, CHAPTER 9, SECTION 907.

UPON COMPLETION OF THE INSTALLATION OF THE FIRE PROTECTIVE SIGNALING EQUIPMENT, A SATISFACTORY TEST OF THE ENTIRE SYSTEM SHALL BE MADE IN THE PRESENCE OF THE AUTHORITY HAVING JURISDICTION, NFPA 72. IF TESTING RESULTS DETERMINE FIRE ALARM AUDIBILITY DOES NOT MEET 15db OVER AMBIENT NOISE LEVELS, ADDITIONAL FIRE ALARM SIGNALING DEVICES MAY BE REQUIRED BY THE AUTHORITY HAVING JURISDICTION.

FIRE ALARM SYSTEM CERTIFICATION AND DESCRIPTION SHALL BE PROVIDED FOR TESTING AND A PLASTIC LAMINATED COPY SHALL REMAIN (WITH INSTRUCTIONS) AT THE FIRE ALARM CONTROL PANEL PER NFPA 72.

THE FIRE ALARM "RECORD OF COMPLETION" FORM, FIGURE 10, 18, 2, 1 IN NFPA 72, SHALL BE COMPLETED, SIGNED AND SUBMITTED TO THE SCHOOL DISTRICT AND THE LOCAL AUTHORITY (K.C.F.D.) HAVING JURISDICTION AT THE COMPLETION OF THE TEST.

AGENCY INFORMATION:

IDENTIFICATION STAMP  
DIV. OF THE STATE ARCHITECT  
APP: 03-121106 INC:  
REVIEWED FOR  
SS  FLS  ACS   
DATE: 04/23/2021

APP# 03-121106  
FILE # 15-6

PTN# 63321-375

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BAKERSFIELD CITY SCHOOL DISTRICT

**ROOSEVELT  
ELEMENTARY SCHOOL  
FIRE ALARM PANEL  
REPLACEMENT**

2324 VERDE STREET  
BAKERSFIELD, CALIFORNIA 93306

---

FIRE ALARM NOTES, FIRE ALARM SPECIFICATIONS

REVISIONS:	DATE:

DATE: 3/19/2021  
DRAWN: D.FERRANTI  
JOB NO. -

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ROOSEVELT ELEMENTARY					
"FACP" POWER & BATTERY CALCULATION					
DEVICE	PANEL		QUANTITY	FACP	
	STAND-BY (mA)	ALARM (mA)		STAND-BY (mA)	ALARM (mA)
FIRE ALARM CONTROL PANEL (2-LOOPS)	350	620	1	350	620
DIGITAL ALARM COMMUNICATOR	20	20	1	20	20
SERIAL LCD ANNUNCIATOR	20	110	1	20	110
CONVENTIONAL ZONE MODULE	0.67	0	6	4.02	0
SMOKE DETECTORS	0.45	0.54	1	0.45	0.54
TOTALS (AMPS):				I(s)	I(a)
				0.394	0.751
Amp Hour:					11.59
Battery to be provided -					18.0

ROOSEVELT ELEMENTARY					
"NAC POWER EXTENDER 1" POWER & BATTERY CALCULATION					
DEVICE	PANEL		QUANTITY	FACP	
	STAND-BY (mA)	ALARM (mA)		STAND-BY (mA)	ALARM (mA)
FIRE ALARM REMOTE POWER SUPPLY	130	130	1	130	130
EXISTING NAC CIRCUIT #1	0	590	1	0	590
EXISTING NAC CIRCUIT #2	0	150	1	0	150
EXISTING NAC CIRCUIT #3	0	470	1	0	470
EXISTING NAC CIRCUIT #4	0	490	1	0	490
TOTALS (AMPS):				I(s)	I(a)
				0.130	1.830
Amp Hour:					4.29
Battery to be provided -					7.0

ROOSEVELT ELEMENTARY					
"NAC POWER EXTENDER 2" POWER & BATTERY CALCULATION					
DEVICE	PANEL		QUANTITY	FACP	
	STAND-BY (mA)	ALARM (mA)		STAND-BY (mA)	ALARM (mA)
FIRE ALARM REMOTE POWER SUPPLY	130	130	1	130	130
EXISTING NAC CIRCUIT #5	0	280	1	0	280
TOTALS (AMPS):				I(s)	I(a)
				0.130	0.410
Amp Hour:					3.87
Battery to be provided -					7.0

FORMULAS USED FOR CALCULATIONS:

FORMULA FOR BATTERY SIZING:  
 FOR FACP/FAPS/DFM - 24 HOURS STANDBY & 15 MIN IN ALARM:  
 AMP HOUR = 1.20 [(24 HOURS X I(S)) + (15/60 HOUR X I(A))]

WHERE:  
 I(20) = BATTERY DERATING VALUE  
 I(S) = TOTAL SUPERVISORY CURRENT (0 FOR NOTIFICATION DEVICES AND 48 mA FOR FCPs-24)  
 I(A) = TOTAL ALARM CURRENT

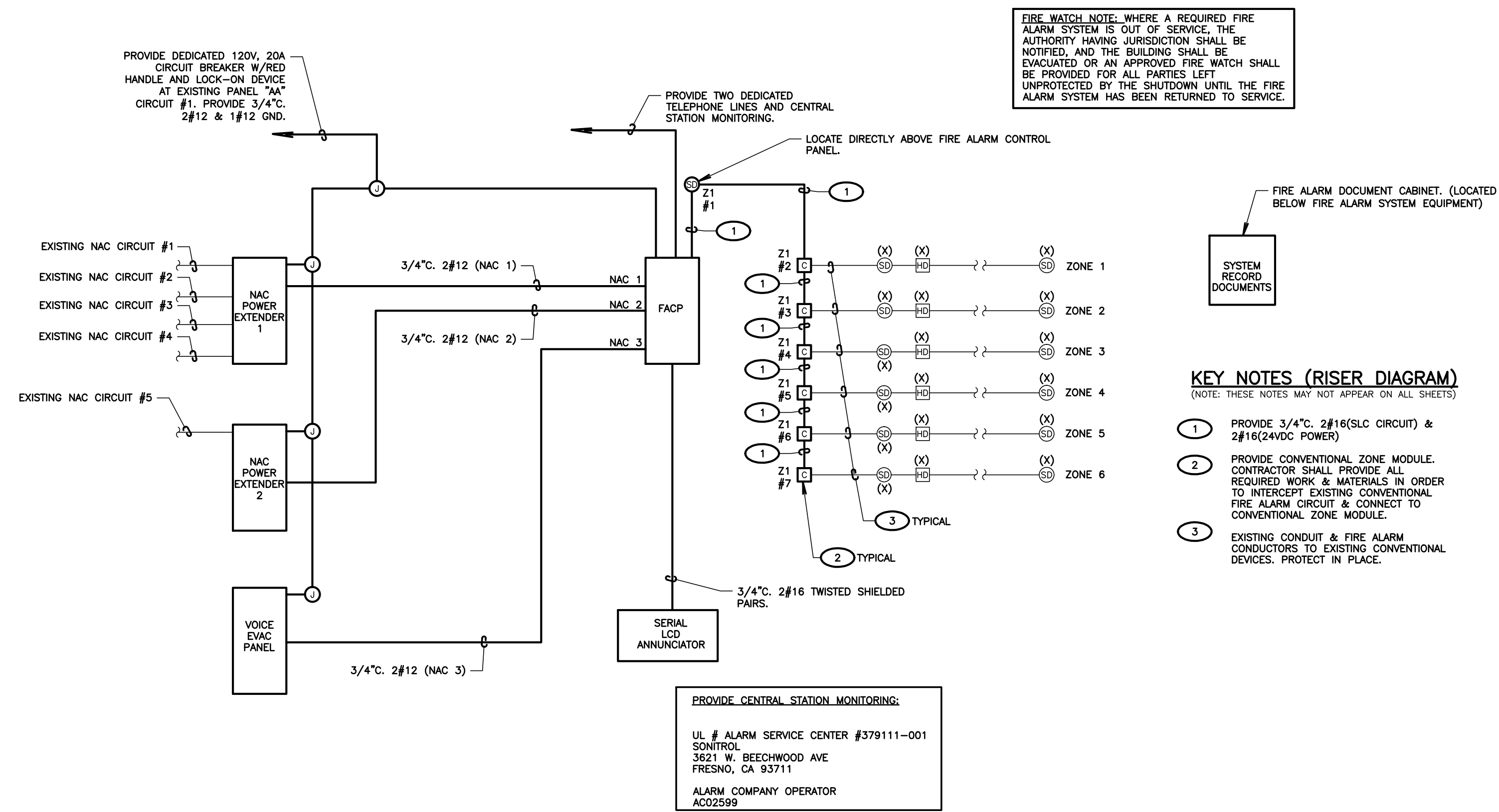
FORMULA FOR VOLTAGE DROP CALCULATIONS

TOTAL DC RESISTANCE = # OF WIRES X Rdc/1000 X ONE-WAY LOOP LENGTH FROM POWER SUPPLY TO MIDDLE OF LOAD

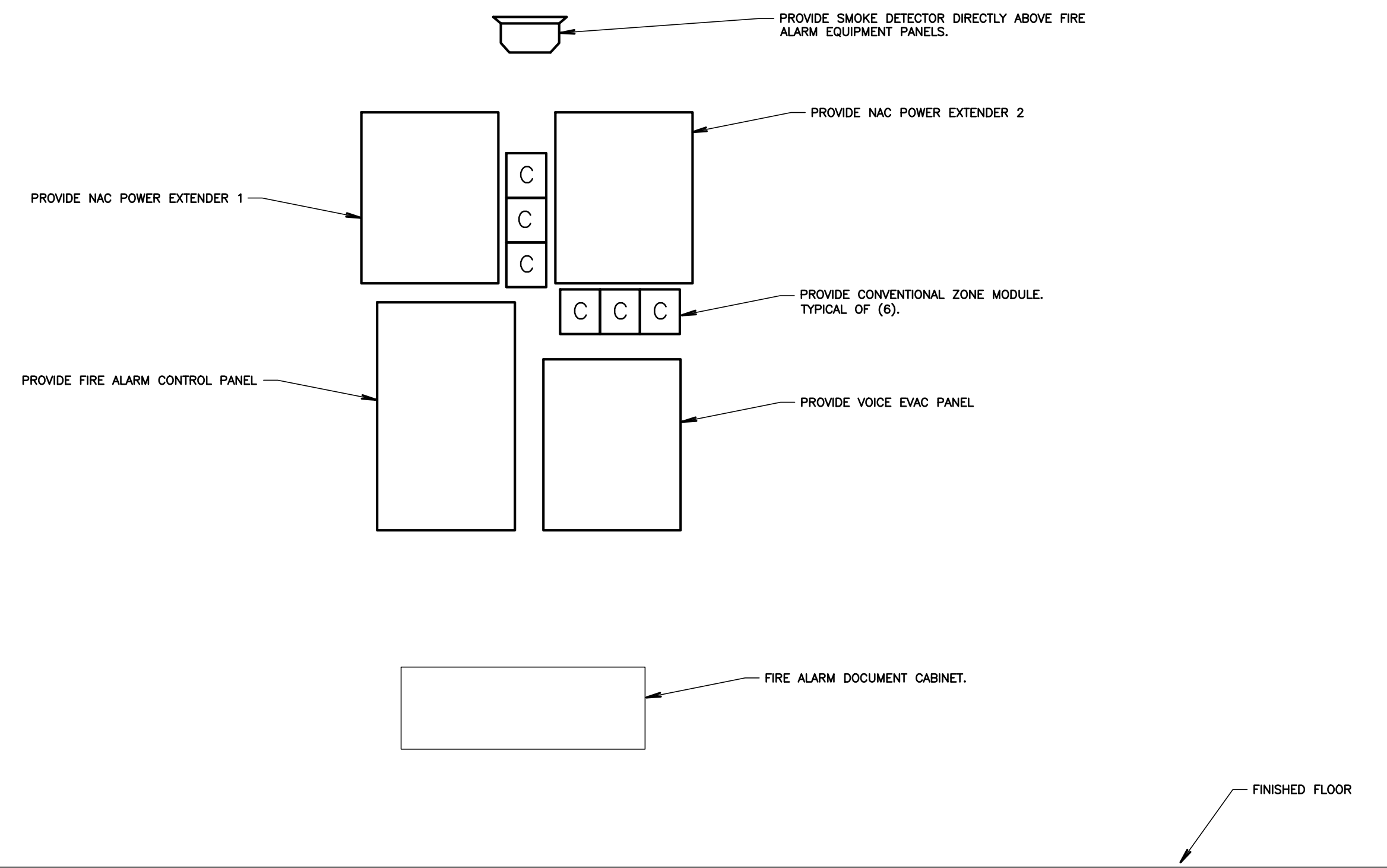
TOTAL VD = TOTAL DC RESISTANCE X TOTAL ALARM CURRENT

MINIMUM VOLTAGE AT DEVICES = 20.4V - TOTAL VD  
 20.4V = MINIMUM VOLTAGE AT END OF USEFUL BATTERY LIFE (85% OF 24VDC)

NOTE:  
 THE MANUFACTURER'S OPERATING VOLTAGE IS BETWEEN 16VDC AND 33 VDC (FOR 24VDC NOMINAL)



1 FIRE ALARM RISER DIAGRAM  
 SCALE: NOT TO SCALE



2 FIRE ALARM PANEL ELEVATION  
 SCALE: NOT TO SCALE

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BAKERSFIELD CITY SCHOOL DISTRICT

ROOSEVELT ELEMENTARY SCHOOL  
 FIRE ALARM PANEL REPLACEMENT  
 2324 VERDE STREET  
 BAKERSFIELD, CALIFORNIA 93306

FIRE ALARM RISER DIAGRAM, BATTERY CALCULATIONS

REVISIONS:	DATE:

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