

## **ADDENDUM M (NON-DSA APPROVAL)**

### **HAMMEL, GREEN AND ABRAHAMSON, INC., ARCHITECTS & ENGINEERS**

1918 Main Street, Third Floor  
Santa Monica, CA 90405

**PROJECT:** Santa Ana College  
Science Center

**DATE:** 10/04/2017

**OWNER:** RSCCD  
2323 N. Broadway, Suite 112  
Santa Ana, CA 92706

**DSA File No.:** 30-C2  
**DSA Applications No.:** 04-115788  
**HGA Commission No.:** 3584-001-00

### **CONSTRUCTION MANAGER:**

**BERNARDS**  
3633 E. Inland Empire Blvd., Suite 800  
Ontario, CA 91764

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The additions, revisions, omissions, corrections and clarifications contained herein shall be made to drawings and specifications for the project and shall be included in scope of work and bids to be submitted. Additionally, reference documents, such as as-built documentation of existing buildings, are provided to further quantify the scope of work. References made below to specifications, drawings, and other documents shall be used as a general guide only. Bidders and Contractors shall determine for themselves the work affected by Addendum items.

### **RFP**

None

### **SPECIFICATIONS**

None

### **DRAWINGS**

None

### **DRAWINGS – AS-BUILT**

Item AD-M-1 – Santa Ana College Fire Alarm System Replacement – Bid Package  
Item AD-M-2 – Santa Ana College Quad and Infrastructure Renovation – As-Built

### **RESPONSES TO PRE-BID CLARIFICATION (“PBC”)**

None

### **Attachments:**

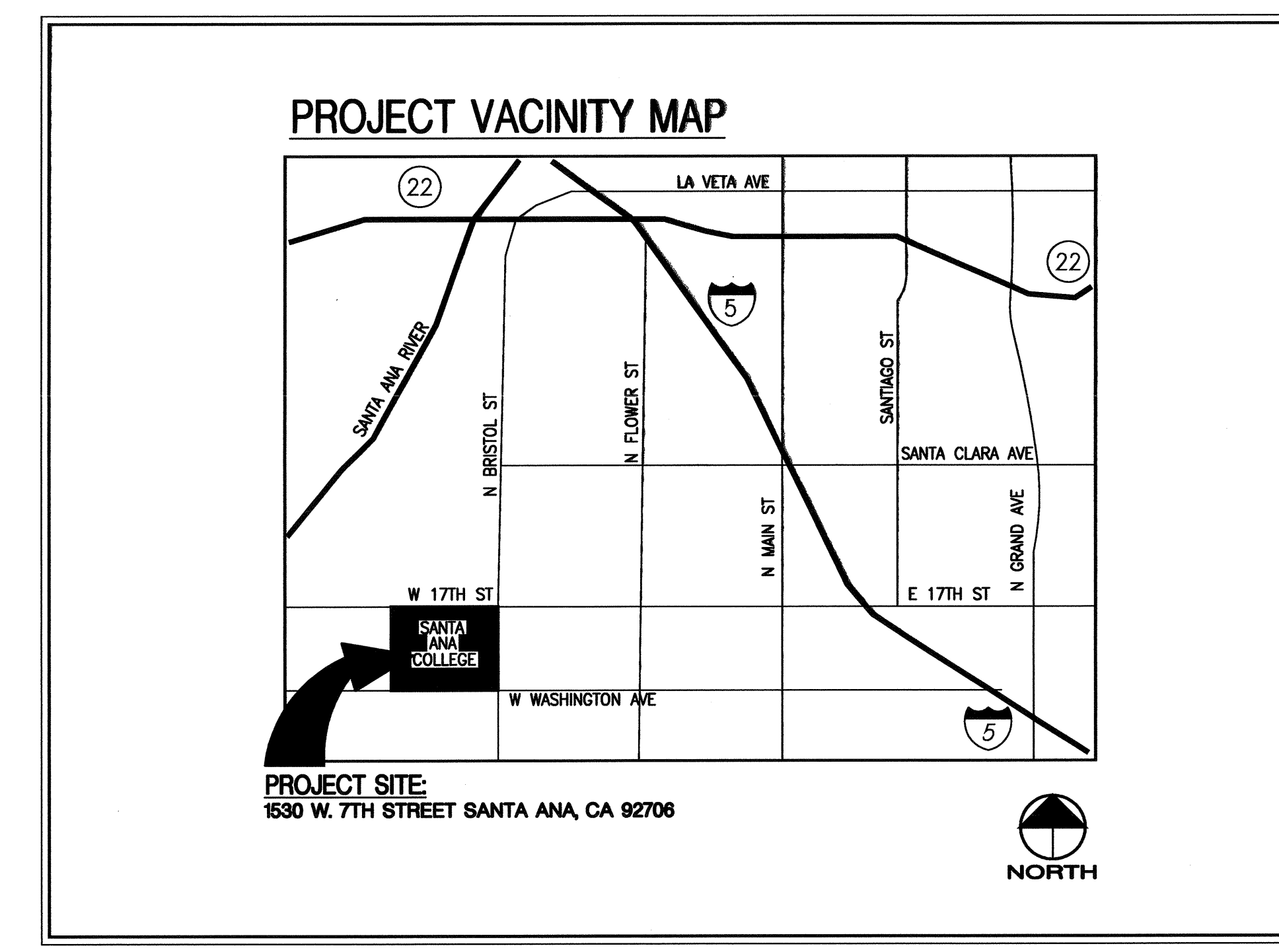
AD-M-1 (48 sheets)

END OF ADDENDUM M

# SANTA ANA COLLEGE

## FIRE ALARM SYSTEM REPLACEMENT PHASE 2 BID # 1126

1530 W. 17TH STREET SANTA ANA, CALIFORNIA 92706



REV.	DESCRIPTION	DATE
1	BID DOCUMENT	6/24/09

**Fundament & Associates Inc**  
Engineering Consultants  
26 Executive Park Suite 100 Irvine Ca 92614

**SANTA ANA COLLEGE**  
FIRE ALARM SYSTEM REPLACEMENT  
PHASE 2 BID #1126  
1530 W. 17TH Street Santa Ana, CA 92706

FILE	DATE	DESIGNED	CHECKED
DATE	DATE	DATE	DATE

NO. OF REVISIONS  
DATE



COVER SHEET

SUBMITTAL DATE  
NOVEMBER 7, 2008  
PROJECT NUMBER  
4134  
SHEET NUMBER  
EQO

*Handwritten:* Fire Alarm System Replacement Phase 2  
BID SET  
Dsa # 07-110022

RECORD (OR) CLASSIFICATION FOR THE PROJECT. IORs SHALL BE DSA APPROVED AND CONFORM TO THE CLASSIFICATION CRITERIA AS PROVIDED IN INTERPRETATION OF REGULATIONS (R) A-7, DATED DEC. 1999.

AD-M-1

TUBE #506

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**DSA NOTES:**  
 1. ALL CONDUITS SHALL BE SUPPORTED PER "SMACNA" GUIDELINES FOR SEISMIC RESTRAINT OF MECHANICAL AND PLUMBING PIPING SYSTEMS.  
 2. EQUIPMENT TO BE FURNISHED SHALL BE DESIGNED, CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH THE SEISMIC ZONE IV REQUIREMENTS OF THE CALIFORNIA CODE, TITLE 24, SECTION 1905.4, AND THE CALIFORNIA BUILDING CODE MOUNTING RECOMMENDATIONS SHALL BE AS PROVIDED BY THE MANUFACTURER.

**SCOPE OF WORK:**  
 PROVIDE THE FIRE ALARM SYSTEM COMPLETE AND OPERABLE AS INDICATED HEREIN. FIRE ALARM SYSTEM IS MANUAL WITH SUPPLEMENTAL AUTOMATIC SMOKE DETECTION.

**FIRE ALARM NOTE:**  
 FIRE ALARM SUBMITTAL IS A COMPLETE PLAN SUBMITTAL IN ACCORDANCE WITH DSA POLICY #66-03 (FLS)

**APPLICABLE CODES:**  
 1. THE ELECTRICAL INSTALLATION SHALL CONFORM TO THE FOLLOWING APPLICABLE CODES AND STANDARDS:  
 A. PART 1 - 2007 CALIFORNIA STANDARDS ADMINISTRATIVE CODE, TITLE 24 C.C.R.  
 PART 2 - 2007 CALIFORNIA BUILDING CODE (CBC), TITLE 24, C.C.R. VOLUMES 1 AND 2. (WITH 2006 I.B.C. FOR VOL. 1 AND 2)  
 PART 3 - 2007 CALIFORNIA ELECTRICAL CODE, TITLE 24, C.C.R. (WITH 2005 NATIONAL ELECTRICAL CODE OF NATIONAL FIRE PROTECTION ASSOCIATION)  
 PART 4 - 2007 CALIFORNIA MECHANICAL CODE (CMC), TITLE 24, C.C.R. (WITH 2006 UNIFORM MECHANICAL CODE OF INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS)  
 PART 5 - 2007 CALIFORNIA PLUMBING CODE, TITLE 24, C.C.R. (WITH 2006 UNIFORM PLUMBING CODE OF INTERNATIONAL ASSOCIATION OF PLUMBING AND MECHANICAL OFFICIALS)  
 PART 9 - 2007 CALIFORNIA FIRE CODE, TITLE 24, C.C.R. (WITH 2006 UNIFORM FIRE CODE BY THE ICC)  
 PART 12 - 2007 CALIFORNIA REFERENCE STANDARDS CODE, TITLE 24, C.C.R.  
 B. PARTIAL LIST OF APPLICABLE NFPA STANDARDS:  
 2007 CALIFORNIA BUILDING CODE (FOR SFM) NATIONAL STANDARDS CHAPTER 35.  
 NFPA 13 - AUTOMATIC SPRINKLER SYSTEMS, 2002 EDITION  
 NFPA 14 - STANDPIPE SYSTEMS, 2003 EDITION  
 NFPA 17A - WET CHEMICAL SYSTEMS, 2002 EDITION  
 NFPA 24 - PRIVATE FIRE MAINS, 2002 EDITION  
 NFPA 72 - (CALIFORNIA AMENDED) NATIONAL FIRE ALARM CODES, 2002 EDITION

**FIRE ALARM GENERAL NOTES:**  
 1. ALL WIRING SHALL BE INSTALLED IN ACCORDANCE WITH C.E.C. ARTICLE 760 POWER LIMITED FIRE PROTECTIVE SIGNALING CIRCUITS.  
 2. THE FIRE ALARM SYSTEM SHALL CONFORM TO THE CAL. ELECTRICAL CODE, ARTICLE 760, DEVICES SHALL BE INSTALLED PER NFPA 72, 2005 EDITION.  
 3. FIRE ALARM SYSTEM SHALL BE CONNECTED TO DEDICATED POWER SUPPLY AND SHALL INCORPORATE INTERNAL RECHARGEABLE BATTERIES TO PROVIDE A MINIMUM OF (48) AMP/HOURS STAND BY IN ACCORDANCE WITH N.F.P.A. 72, 1-5.2.6  
 4. ALL WIRING, ANNUNCIATING DEVICES, AND ANNUNCIATOR PANEL SHALL BE SUPERVISED AT THE PRINCIPAL POINT OF ANNUNCIATION. (FIRE ALARM PANEL TO SUPERVISE THE ANNUNCIATOR PANEL, ALL CIRCUITS, AND INITIATING DEVICES).  
 5. PROVIDE ALL WIRING AND NEW END OF LINE RESISTORS FOR FIRE ALARM SYSTEM.  
 6. PROVIDE ALL PATHWAYS, BACK BOXES FOR FIRE ALARM DEVICES. ALL BACK BOXES SHALL BE 4'S TYPE MINIMUM UNO.  
 7. 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 FIRE MARSHALL.  
 8. A STAMPED SET OF APPROVED FIRE ALARM PLANS SHALL BE ON THE JOB SITE AND USED FOR INSTALLATION. ANY DEVIATION FROM APPROVED PLANS INCLUDING THE SUBMITTAL OF DEVICES, SHALL BE APPROVED BY THE FIRE MARSHALL.  
 9. ANY DISCREPANCY BETWEEN THE DRAWINGS AND THE CODE OF RECOGNIZED STANDARDS SHALL BE BROUGHT TO THE ATTENTION OF THE INSPECTOR OF RECORD, PROJECT ENGINEER & PROJECT ARCHITECT.  
 10. ALL DEVICES ON THE FIRE ALARM SYSTEM SHALL BE APPROVED AND LISTED BY THE CALIFORNIA STATE FIRE MARSHALL.  
 11. CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED TO THE FIRE MARSHALL. CFC SEC. 901.5 AN ACCEPTABLE TEST WITNESSED BY THE FIRE MARSHALL SHALL BE PERFORMED PRIOR TO FINAL APPROVAL NFPA 72, CHAPTER 1.  
 12. ALL WIRING SHALL BE INSTALLED IN METAL CONDUITS/PATHWAYS.  
 13. SEAL ALL CONDUIT PENETRATIONS THROUGH THE FIRE RATED WALLS AND FLOORS WITH APPROVED SAME RATING FIRE RATED UL APPROVED FIRE PROOFING METHOD.  
 14. PROVIDE SUPPORT FOR ALL CONDUITS AND VERTICAL WIRING AS REQUIRED BY C.E.C. & NECA STANDARDS OF INSTALLATION.  
 15. CENTRAL STATION FOR FIRE ALARM MONITORING IS DONE BY THE DISTRICT SAFETY DEPARTMENT IN BUILDING X (STAFFED 24HRS A DAY, 7 DAYS A WEEK).  
 16. PENETRATIONS OF FIRE RATED WALLS SHALL BE PROTECTED IN ACCORDANCE WITH 2007 CALIFORNIA BUILDING CODE (CBC), PART 2, TITLE 24 C.C.R. (2006 INTERNATIONAL BUILDING CODE VOLUMES 1 - 2)  
 17. UPON COMPLETION OF SYSTEM INSTALLATION, THE SYSTEM SHALL BE TESTED IN THE PRESENCE OF AND IN A MANNER ACCEPTABLE TO DSA/PROJECT INSPECTOR. THE CONTRACTOR MUST SUPPLY NECESSARY TESTING EQUIPMENT INCLUDING A "SOUND LEVEL METER" TO CHECK ACCEPTABLE DECIBEL LEVELS OF AUDIBLE DEVICES. PROVIDE TEST RESULTS PER THE NFPA 72 "RECORD OF COMPLETION" TO ARCHITECT, DSA, PROJECT INSPECTOR, OWNER, AND TO THE LOCAL FIRE AUTHORITY. ALL NORMALLY OCCUPIED AREAS SHALL BE PROVIDED WITH A FIRE ALARM AUDIBLE DECIBEL LEVEL AT 15dBA ABOVE AMBIENT NOISE LEVELS.  
 18. SMOKE DETECTORS SHALL NOT BE CLOSER THAN 3 FT. FROM AIR VENTS.  
 19. FIRE ALARM SYSTEM IS A COMPLETE DSA SUBMITTAL. ANY SUBSTITUTIONS SHALL BE APPROVED BY THE ENGINEER. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE NEW APPROVED DSA PLANS WITH SUBSTITUTION EQUIPMENT AT NO ADDITIONAL CHARGE PRIOR TO WORK BEING PERFORMED  
 20. AUDIBLE DEVICE(S) TO BE AT LEAST 15dBA ABOVE THE EQUIVALENT SOUND LEVEL BUT NOT LESS THAN 75 dBA AT 10' OR MORE THAN 110dBA AT THE MINIMUM HEARING DISTANCE  
 21. AUDIBLE DEVICE SHALL SOUND THE CALIFORNIA TEMPORAL PATTERN FIRE ALARM SIGNAL  
 22. VISUAL DEVICES SHALL NOT EXCEED 2 FLASHES PER SECOND AND SHALL NOT BE SLOWER THAN 1 FLASH EVERY SECOND.  
 23. UPON RECEIPT OF THE CERTIFICATE OF COMPLIANCE, THE INSTALLER SHALL SUPPLY THE OWNER WITH A WRITTEN OPERATING, TESTING AND MAINTENANCE INSTRUCTIONS, POINT-TO-POINT AS BUILT DRAWINGS AND EQUIPMENT SPECIFICATIONS.

**FIRE ALARM SEQUENCE OF OPERATIONS**

INITIATION	BLDG MANUAL PULL STATION	BLDG SMOKE DETECTOR	DUCT SMOKE DETECTOR @ HVAC	FIRE SPRINKLER FLOW SWITCH	FIRE SPRINKLER TAMPER SWITCH	POST INDICATION VALVE	BLDG DEVICE TROUBLE/FAULT	BLDG FACP 120V POWER FAILURE
ANNUNCIATE AT BLDG FACP	YES	YES	YES	YES	YES	YES	YES	YES
SOUND TROUBLE BUZZER AT BLDG FACP	NO	NO	NO	NO	NO	NO	YES	YES
SOUND SUPERVISORY BUZZER WITHIN BLDG ACTIVATED	NO	NO	NO	YES	YES	NO	NO	NO
ACTIVATE AUDIBLE (INDICATION) DEVICES WITHIN BLDG ACTIVATED	YES	YES	YES	NO	NO	NO	NO	NO
ACTIVATE VISUAL (INDICATION) DEVICES WITHIN BLDG ACTIVATED	YES	YES	YES	NO	NO	NO	NO	NO
ANNUNCIATE FIRE ALARM ANNUNCIATOR AT BLDG X - 24 HOUR MONITORING	YES	YES	YES	YES	YES	YES	YES	YES
SHUT DOWN ALL RESPECTIVE HVAC UNITS WITHIN BLDG ACTIVATED	NO	NO	YES	NO	NO	NO	NO	NO

**FIRE ALARM DEVICE SCHEDULE**

SYMBOLS	DESCRIPTION	MODEL/CSFM NO.	MOUNTING
FACP	FIRE ALARM CONTROL PANEL VOICE EVACUATION	NOTIFIER NFS-640/C48-C3/D3 7165-0028:214	
ANN	FIRE ALARM ANNUNCIATOR	NOTIFIER NCA-2 7170-0028:244	EXISTING FIELD MODIFY LED DISPLAY PER PLAN
11000 7500 3000 1500	MULTI-CANDELA SPEAKER/STROBE LIGHT CANDELA SETTING AS INDICATED	WHEELLOCK E770-24MCC-FR 7125-0785:152	+90" - WALL, REFER TO DETAIL 7/EO.2 FOR SURFACE MOUNTING. PROVIDE LOWPROFILE BACK BOX WHEELLOCK #SBB. FOR FLUSH MOUNTING, PROVIDE 4"SQ BOX WITH 4"SQ EXTENSION RING PER MANUFACTURER INSTALLATION.
11000 7500 3000 1500	MULTI-CANDELA STROBE LIGHT CANDELA SETTING AS INDICATED	WHEELLOCK RSS-24MCC-FW 7125-0785:141	+90" - WALL, REFER TO DETAIL 7/EO.2 FOR SURFACE MOUNTING. PROVIDE WHEELLOCK LOWPROFILE BACK BOX
11000 7500 3000 1500	CEILING SPEAKER/STROBE	WHEELLOCK E790-24MCC-FW 7125-0785:152	CEILING
11000 7500 3000 1500	CEILING STROBE LIGHT	WHEELLOCK RSS-24MCC-FW 7125-0785:141	CEILING
S WP	OUTDOOR SPEAKER	WHEELLOCK E770-R 7125-0785:152	+90", REFER TO DETAIL 7/EO.2 FOR SURFACE MOUNTING. PROVIDE LOWPROFILE BACK BOX WHEELLOCK #SBB. FOR FLUSH MOUNTING, PROVIDE 4"SQ BOX WITH 4"SQ EXTENSION RING PER MANUFACTURER INSTALLATION.
F	ADDRESSABLE PULL STATION	NOTIFIER N8C-12LX 7150-0028:199	+48" REFER TO DETAIL 7/EO.2
SD	SMOKE DETECTOR SMOKE BASE	NOTIFIER FS1-851 7271-0028:201	CEILING
DD	DUCT DETECTOR	NOTIFIER FSD-751P 3240-0028:205	PROVIDE NEMA 3R LOCKABLE ENCLOSURE FOR ALL EXTERIOR USE.
R	ADDRESSABLE RELAY MODULE	NOTIFIER FFM-1 7300-0028:202	
M	ADDRESSABLE MONITOR MODULE	NOTIFIER FMM-1 7300-0028:202	
FS	FLOW SWITCH PROVIDE MONITOR MODULE	NOTIFIER FFM-1 7300-0028:202	
TS	TAMPER SWITCH PROVIDE MONITOR MODULE	NOTIFIER FMM-1 7300-0028:202	
EOL	END OF LINE RESISTOR - 4.7K OHM		
WP	WEATHERPROOF		PROVIDE WEATHERPROOF BACKBOX, FITTING, AND WEATHERPROOF DEVICE.
TS WP	(E) AFS RISER WITH WATER FLOW AND TAMPER SWITCH		

**FIRE ALARM CABLE SCHEDULE**

SYMBOL	DESCRIPTION	JACKET COLOR	FUNCTION
A	1 PAIR #16 AWG UNSHIELDED WEST PENN # 0990 1 PAIR #16 FPL UNSHIELDED WEST PENN # A-225 FOR UNDERGROUND INSTALLATION	RED RED	SLC
S	2 #12 AWG THHN	RED BLACK	STROBE CIRCUIT
F	2 STRAND MULTI-MODE FIBER CABLE 62.5/125 MICROMETER CABLE, 8dB LIMIT GENERAL CABLE XXX021AWR.BK	BLACK	NETWORK CIRCUIT DIGITAL VOICE/ADDRESS LOOP
V	1 PAIR #14 AWG UNSHIELDED TWISTED PAIR	BLUE WHITE	SPEAKER CIRCUIT

\* LABEL ALL CABLE TERMINATIONS

**SHEET INDEX:**

- NO. SHEET DESCRIPTION
0. E0.0 COVER SHEET
  1. E0.1 FIRE ALARM GENERAL NOTES AND SCHEDULES
  2. E0.2 FIRE ALARM DETAILS
  3. E1.0 FIRE ALARM SITE PLAN
  4. E2.1A BUILDING "A" - FIRST FLOOR (WEST) FIRE ALARM PLAN
  5. E2.2A BUILDING "A" - FIRST FLOOR (EAST) FIRE ALARM PLAN
  6. E2.3A BUILDING "A" - SECOND FLOOR (WEST) FIRE ALARM PLAN
  7. E2.4A BUILDING "A" - SECOND FLOOR (EAST) FIRE ALARM PLAN
  8. E2.1B BUNGALOWS "B15-31"
  9. E2.2B BUNGALOWS "B33, B34, F117, P114"
  10. E2.1F BUILDING "F" - FIRE ALARM PLAN
  11. E3.1 FIRE ALARM RISER DIAGRAMS
  12. E4.1 FIRE ALARM CALCULATIONS

REVISIONS

REV.	DESCRIPTION	DATE
1	BID DOCUMENT	6/24/09

**Fundament & Associates Inc** Engineering Consultant  
 26 Executive Park Suite 100 Irvine Ca 92614

**SANTA ANA COLLEGE**  
 FIRE ALARM SYSTEM REPLACEMENT  
 PHASE 2 BID #1126  
 Santa Ana, CA 92706  
 1630 W. 17TH Street

LINE IS 2 INCHES AT FULL SIZE (or not 2" - scale accordingly)

DATE: 08/18/2009

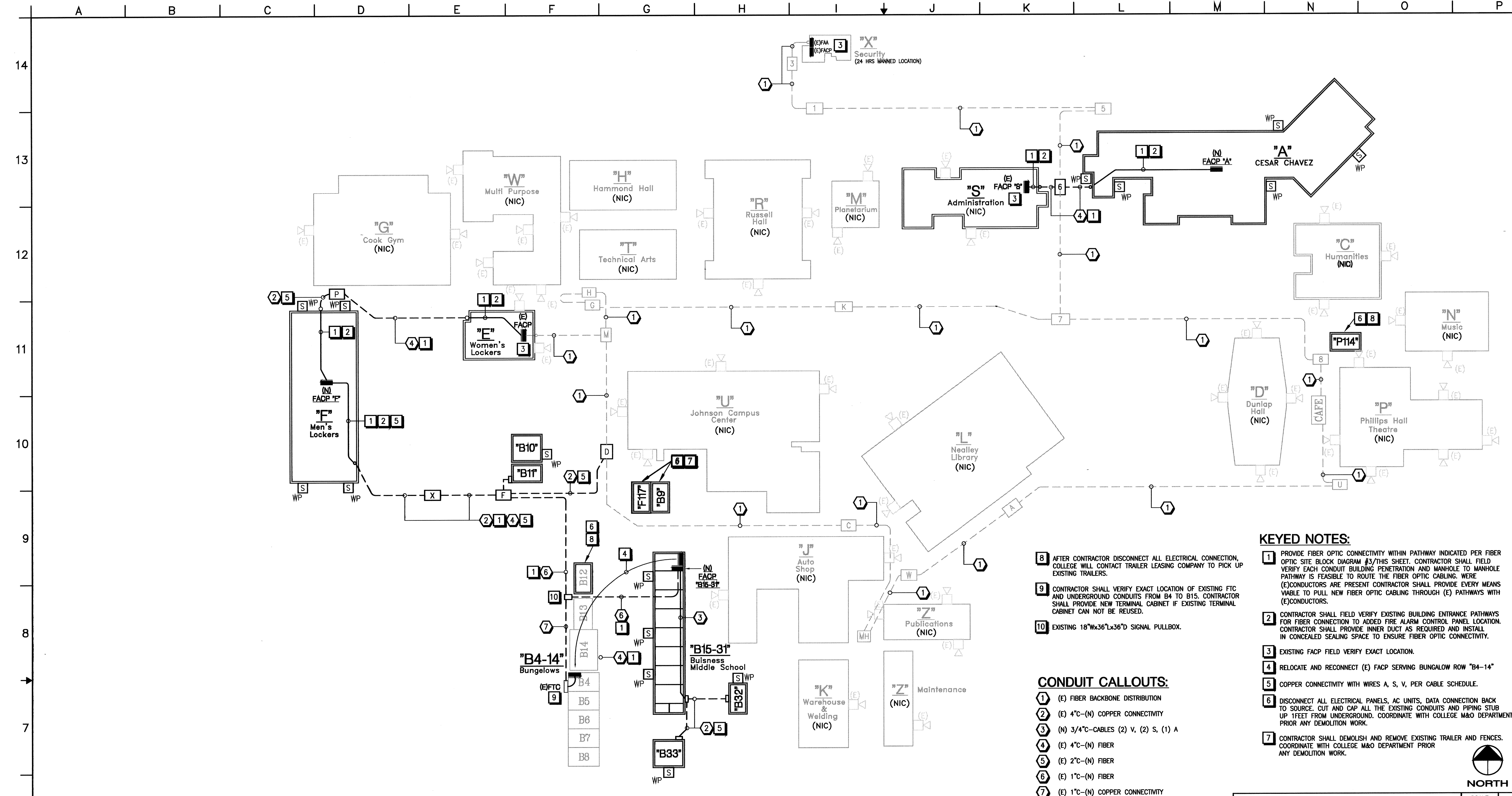
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 DRAWN: [ ]  
 DATE: [ ]

REGISTERED PROFESSIONAL ENGINEER  
 No. E 08090  
 State of California

FIRE ALARM GENERAL NOTES & SCHEDULES

SUBMITTAL DATE: NOVEMBER 7, 2008  
 PROJECT NUMBER: 4134  
 SHEET NUMBER: E0.1





- GENERAL NOTES:**
- CABLING, WIRING AND CONDUIT SHOWN ON THESE PLANS ARE DIAGRAMMATIC. CONTRACTOR SHALL ROUTE ALL SUCH CABLING, WIRING AND CONDUIT TO PRODUCE A PROFESSIONAL INSTALLATION ALIGNED WITH BUILDING ELEMENTS AND CONCEALED TO THE EXTENT POSSIBLE. CONTRACTOR SHALL SUBMIT INSTALLATION SHOP DRAWINGS DEMONSTRATING THE ABOVE ELEMENTS FOR DISTRICT APPROVAL THREE WEEKS PRIOR TO ANY FIELD INSTALLATION.
  - CONTRACTOR SHALL FIELD VERIFY EXISTING MANHOLE LOCATIONS IN DETAIL WITH SCHOOL DISTRICT REPRESENTATIVE. AS-BUILT AND FIELD SURVEY DOCUMENTATION WILL BE PROVIDED TO THE CONTRACTOR FOR FURTHER CLARIFICATION OF EXISTING CONDITIONS. CONTRACTOR SHALL ASSUME COMPLETE RESPONSIBILITY FOR IDENTIFYING EXISTING CONDITIONS AND SHALL INSURE THAT ALL WORK PERFORMED UNDER THIS SCOPE OF WORK IS EXECUTED IN A PROFESSIONAL AND ACCEPTABLE MANNER TO THE APPROVAL OF THE SCHOOL DISTRICT.
  - THE EXACT ROUTING OF THE SITE FIBER OPTICS SHALL BE FIELD VERIFIED BY THE CONTRACTOR AND THEY SHALL PROVIDE ALL REQUIRED LABOR AND MATERIALS AS REQUIRED TO ENSURE A COMPLETE AND OPERABLE FIBER OPTIC BACKBONE DISTRIBUTION SYSTEM. SUBMIT SHOP DWGS INDICATING SITE PATHWAY DISTRIBUTION.
  - CONTRACTOR SHALL PROVIDE 20 AMP SINGLE POLE CIRCUIT BREAKERS WITH RED LOCK OUT TAB FOR ALL ADDED 120V CIRCUITS REQUIRED AT FACP(S) & FOP(S).
  - CONTRACTOR SHALL FIELD COORDINATE AND VERIFY WITH OWNER THE EXACT LOCATION OF EACH ADDED FIRE ALARM CONTROL PANEL. RELOCATED WITHIN EACH BUILDING INDICATED. THIS SHALL INCLUDE THE REMOVAL AND/OR RELOCATION OF EXISTING ELECTRICAL EQUIPMENT. REFER TO FIRE ALARM BUILDING MATRIX SHEET E0.1.
  - THE EXISTING ELEVATORS THROUGHOUT THE CAMPUS DO NOT HAVE ELEVATOR RECALL FUNCTION CAPABILITY AND IS THEREFORE THE FIRE ALARM INTERFACE TO THE ELEVATOR SYSTEM IS NOT CONSIDERED PART OF THIS SCOPE OF WORK.
  - BUILDING "A" IS THE ONLY (E)BUILDING THAT HAS AN AUTOMATIC FIRE SPRINKLER SYSTEM. MONITORING THE SYSTEM SHALL BE AS INDICATED ON FIRE ALARM SEQUENCE OF OPERATIONS.
  - CONTRACTOR SHALL PROVIDE AND INSTALL FIRE ALARM FIBER OPTIC CABLE IN METAL CONDUIT WITHIN BUILDING.
  - CONTRACTOR SHALL PROVIDE EXTERIOR/INTERIOR FOR FIBER OPTIC CABLE WHERE EXISTING CONDUIT ELBOW CAN NOT BE USED BECAUSE OF FILLING REQUIREMENT AND BEND RADIUS REQUIREMENT.
  - CONTRACTOR SHALL PAINT ALL EXTERIOR EXPOSED CONDUIT TO MATCH ADJACENT SURFACES. PROVIDE WATERPROOF PRIMER OR DIRECT-TO-METAL GLOSS LATEX METAL PAINT.
  - CONTRACTOR SHALL PROVIDE MONITORING MODULE FOR ANY EXISTING SPRINKLER, ANSUL, P.V., BACKFLOW PREVENTERS SYSTEM. CONNECT IT BACK TO FIRE ALARM CONTROL PANEL AS REQUIRED.

- KEYED NOTES:**
- PROVIDE FIBER OPTIC CONNECTIVITY WITHIN PATHWAY INDICATED PER FIBER OPTIC SITE BLOCK DIAGRAM #3/THIS SHEET. CONTRACTOR SHALL FIELD VERIFY EACH CONDUIT BUILDING PENETRATION AND MANHOLE TO MANHOLE PATHWAY IS FEASIBLE TO ROUTE THE FIBER OPTIC CABLING. WERE (E)CONDUCTORS ARE PRESENT CONTRACTOR SHALL PROVIDE EVERY MEANS VISIBLE TO PULL NEW FIBER OPTIC CABLING THROUGH (E) PATHWAYS WITH (E)CONDUCTORS.
  - CONTRACTOR SHALL FIELD VERIFY EXISTING BUILDING ENTRANCE PATHWAYS FOR FIBER CONNECTION TO ADDED FIRE ALARM CONTROL PANEL LOCATION. CONTRACTOR SHALL PROVIDE INNER DUCT AS REQUIRED AND INSTALL IN CONCEALED SEALING SPACE TO ENSURE FIBER OPTIC CONNECTIVITY.
  - EXISTING FACP FIELD VERIFY EXACT LOCATION.
  - RELOCATE AND RECONNECT (E) FACP SERVING BUNGALOW ROW "B4-14"
  - COPPER CONNECTIVITY WITH WIRES A, S, V, PER CABLE SCHEDULE.

- KEYED NOTES:**
- PROVIDE FIBER OPTIC CONNECTIVITY WITHIN PATHWAY INDICATED PER FIBER OPTIC SITE BLOCK DIAGRAM #3/THIS SHEET. CONTRACTOR SHALL FIELD VERIFY EACH CONDUIT BUILDING PENETRATION AND MANHOLE TO MANHOLE PATHWAY IS FEASIBLE TO ROUTE THE FIBER OPTIC CABLING. WERE (E)CONDUCTORS ARE PRESENT CONTRACTOR SHALL PROVIDE EVERY MEANS VISIBLE TO PULL NEW FIBER OPTIC CABLING THROUGH (E) PATHWAYS WITH (E)CONDUCTORS.
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  - EXISTING FACP FIELD VERIFY EXACT LOCATION.
  - RELOCATE AND RECONNECT (E) FACP SERVING BUNGALOW ROW "B4-14"
  - COPPER CONNECTIVITY WITH WIRES A, S, V, PER CABLE SCHEDULE.
  - DISCONNECT ALL ELECTRICAL PANELS, AC UNITS, DATA CONNECTION BACK TO SOURCE, CUT AND CAP ALL THE EXISTING CONDUITS AND PIPING STUB UP 1 FEET FROM UNDERGROUND. COORDINATE WITH COLLEGE M&O DEPARTMENT PRIOR ANY DEMOLITION WORK.
  - CONTRACTOR SHALL DEMOLISH AND REMOVE EXISTING TRAILER AND FENCES. COORDINATE WITH COLLEGE M&O DEPARTMENT PRIOR ANY DEMOLITION WORK.

- CONDUIT CALLOUTS:**
- (E) FIBER BACKBONE DISTRIBUTION
  - (E) 4"-(N) COPPER CONNECTIVITY
  - (N) 3/4"-(N) CABLES (2) V, (2) S, (1) A
  - (E) 4"-(N) FIBER
  - (E) 2"-(N) FIBER
  - (E) 1"-(N) FIBER
  - (E) 1"-(N) COPPER CONNECTIVITY

**KEYED NOTES:**

- PROVIDE FIBER OPTIC CONNECTIVITY WITHIN PATHWAY INDICATED PER FIBER OPTIC SITE BLOCK DIAGRAM #3/THIS SHEET. CONTRACTOR SHALL FIELD VERIFY EACH CONDUIT BUILDING PENETRATION AND MANHOLE TO MANHOLE PATHWAY IS FEASIBLE TO ROUTE THE FIBER OPTIC CABLING. WERE (E)CONDUCTORS ARE PRESENT CONTRACTOR SHALL PROVIDE EVERY MEANS VISIBLE TO PULL NEW FIBER OPTIC CABLING THROUGH (E) PATHWAYS WITH (E)CONDUCTORS.
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- RELOCATE AND RECONNECT (E) FACP SERVING BUNGALOW ROW "B4-14"
- COPPER CONNECTIVITY WITH WIRES A, S, V, PER CABLE SCHEDULE.
- DISCONNECT ALL ELECTRICAL PANELS, AC UNITS, DATA CONNECTION BACK TO SOURCE, CUT AND CAP ALL THE EXISTING CONDUITS AND PIPING STUB UP 1 FEET FROM UNDERGROUND. COORDINATE WITH COLLEGE M&O DEPARTMENT PRIOR ANY DEMOLITION WORK.
- CONTRACTOR SHALL DEMOLISH AND REMOVE EXISTING TRAILER AND FENCES. COORDINATE WITH COLLEGE M&O DEPARTMENT PRIOR ANY DEMOLITION WORK.

**LEGEND**

- INTERIOR CONDUIT, INNERDUCT PATHWAY AS REQUIRED
- (E) UNDERGROUND DUCTBANK-CONNECTIVITY AS INDICATED
- (N) UNDERGROUND DUCTBANK-CONNECTIVITY AS INDICATED
- (E) MANHOLE/HANDHOLE-FIELD COORDINATE EXACT LOCATION

**NOTES:**

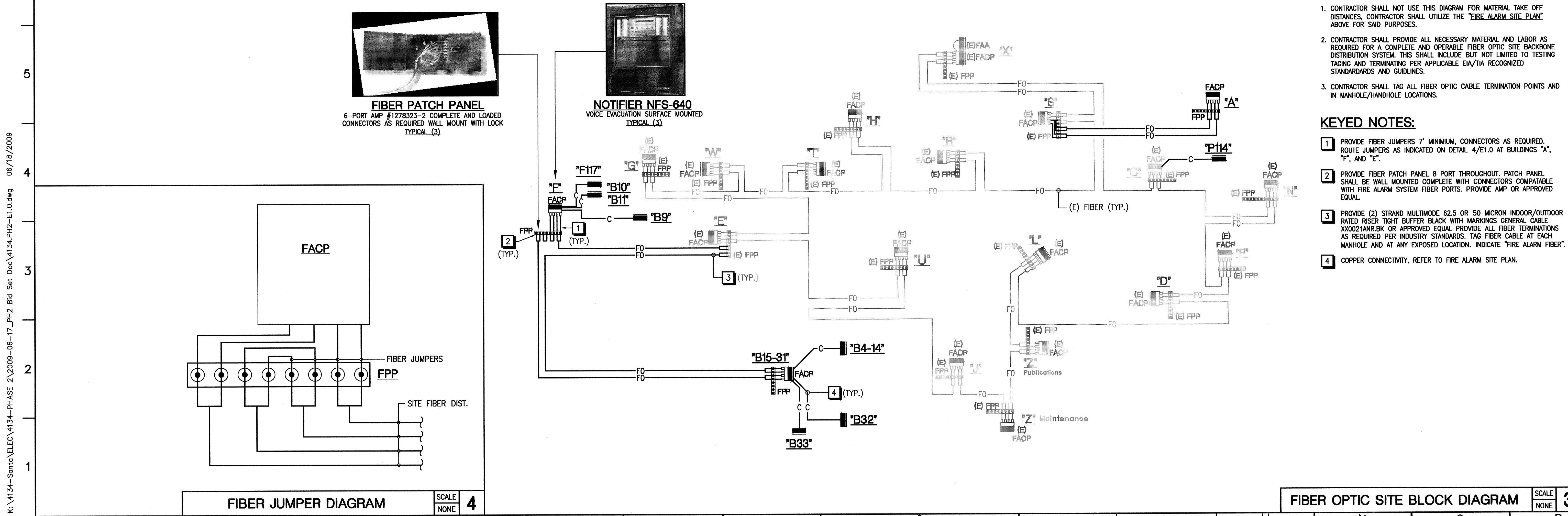
- CONTRACTOR SHALL NOT USE THIS DIAGRAM FOR MATERIAL TAKE OFF DISTANCES. CONTRACTOR SHALL UTILIZE THE "FIRE ALARM SITE PLAN" ABOVE FOR SAID PURPOSES.
- CONTRACTOR SHALL PROVIDE ALL NECESSARY MATERIAL AND LABOR AS REQUIRED FOR A COMPLETE AND OPERABLE FIBER OPTIC SITE BACKBONE DISTRIBUTION SYSTEM. THIS SHALL INCLUDE BUT NOT LIMITED TO TESTING TIGING AND TERMINATING PER APPLICABLE EIA/ITA RECOGNIZED STANDARDS AND GUIDELINES.
- CONTRACTOR SHALL TAG ALL FIBER OPTIC CABLE TERMINATION POINTS AND IN MANHOLE/HANDHOLE LOCATIONS.

**KEYED NOTES:**

- PROVIDE FIBER JUMPERS 7' MINIMUM. CONNECTORS AS REQUIRED. ROUTE JUMPERS AS INDICATED ON DETAIL 4/E1.0 AT BUILDINGS "A", "F", AND "E".
- PROVIDE FIBER PATCH PANEL 8 PORT THROUGHOUT. PATCH PANEL SHALL BE WALL MOUNTED COMPLETE WITH CONNECTORS COMPATIBLE WITH FIRE ALARM SYSTEM FIBER PORTS. PROVIDE AMP OR APPROVED EQUAL.
- PROVIDE (2) STRAND MULTIMODE 62.5 OR 50 MICRON INDOOR/OUTDOOR RATED RISER TIGHT BUTTER BLACK WITH MARKING GENERAL CABLE X00021ANR-BK OR APPROVED EQUAL PROVIDE ALL FIBER TERMINATIONS AS REQUIRED PER INDUSTRY STANDARDS. TAG FIBER CABLE AT EACH MANHOLE AND AT ANY EXPOSED LOCATION. INDICATE "FIRE ALARM FIBER".
- COPPER CONNECTIVITY, REFER TO FIRE ALARM SITE PLAN.

**SCALE** 1"=60'-0"

**SCALE** 1"=60'-0"



- LEGEND**
- INTERIOR CONDUIT, INNERDUCT PATHWAY AS REQUIRED
  - (E) UNDERGROUND DUCTBANK-CONNECTIVITY AS INDICATED
  - (N) UNDERGROUND DUCTBANK-CONNECTIVITY AS INDICATED
  - (E) MANHOLE/HANDHOLE-FIELD COORDINATE EXACT LOCATION
- NOTES:**
- CONTRACTOR SHALL NOT USE THIS DIAGRAM FOR MATERIAL TAKE OFF DISTANCES. CONTRACTOR SHALL UTILIZE THE "FIRE ALARM SITE PLAN" ABOVE FOR SAID PURPOSES.
  - CONTRACTOR SHALL PROVIDE ALL NECESSARY MATERIAL AND LABOR AS REQUIRED FOR A COMPLETE AND OPERABLE FIBER OPTIC SITE BACKBONE DISTRIBUTION SYSTEM. THIS SHALL INCLUDE BUT NOT LIMITED TO TESTING TIGING AND TERMINATING PER APPLICABLE EIA/ITA RECOGNIZED STANDARDS AND GUIDELINES.
  - CONTRACTOR SHALL TAG ALL FIBER OPTIC CABLE TERMINATION POINTS AND IN MANHOLE/HANDHOLE LOCATIONS.
- KEYED NOTES:**
- PROVIDE FIBER JUMPERS 7' MINIMUM. CONNECTORS AS REQUIRED. ROUTE JUMPERS AS INDICATED ON DETAIL 4/E1.0 AT BUILDINGS "A", "F", AND "E".
  - PROVIDE FIBER PATCH PANEL 8 PORT THROUGHOUT. PATCH PANEL SHALL BE WALL MOUNTED COMPLETE WITH CONNECTORS COMPATIBLE WITH FIRE ALARM SYSTEM FIBER PORTS. PROVIDE AMP OR APPROVED EQUAL.
  - PROVIDE (2) STRAND MULTIMODE 62.5 OR 50 MICRON INDOOR/OUTDOOR RATED RISER TIGHT BUTTER BLACK WITH MARKING GENERAL CABLE X00021ANR-BK OR APPROVED EQUAL PROVIDE ALL FIBER TERMINATIONS AS REQUIRED PER INDUSTRY STANDARDS. TAG FIBER CABLE AT EACH MANHOLE AND AT ANY EXPOSED LOCATION. INDICATE "FIRE ALARM FIBER".
  - COPPER CONNECTIVITY, REFER TO FIRE ALARM SITE PLAN.
- ABBREVIATIONS**
- C CONDUIT
  - (E) EXISTING
  - (N) NEW-IN REFERENCE TO EXISTING-ALL ITEMS ARE NEW UNLESS OTHERWISE NOTED AS EXISTING
  - MT EMPTY CONDUIT
  - (TYP) TYPICAL
  - NIC NOT IN CONTRACT
  - NTS NOT TO SCALE
  - UNO UNLESS NOTED OTHERWISE
- SCALE** 1"=60'-0"

- DSA APPROVED BLDG. NOS.:**
- BUNGALOWS INDICATED HEREIN ARE WITHIN THIS SCOPE OF WORK. ALL OTHER BUILDINGS ARE NOT WITHIN THIS SCOPE OF WORK.
  - BUILDING "A" - CESAR CHAVEZ BUSINESS (DSA APPROVAL #A-59692)
  - BUILDING "F" - MEN'S/WOMEN'S LOCKERS (DSA APPROVAL #A-44028)
  - BUNGALOWS:
    - "B10" & "B11" - (DSA APPROVAL #A-60811)
    - "B9", "F117" & "P114" - (DSA APPROVAL #A-60920)
    - "B32" & "B33" - (DSA APPROVAL #A-100440)
    - "B15" THRU "B31" - (DSA APPROVAL #A-103116)

DATE	6/24/09
REV. DESCRIPTION	1 BID DOCUMENT
REVISIONS	

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Engineering Consultants  
26 Executive Park Suite 100 Irvine Ca 92614

**SANTA ANA COLLEGE**  
FIRE ALARM SYSTEM REPLACEMENT  
PHASE 2 BID #1126  
Santa Ana, CA 92706  
1530 W. 17TH Street

LINE IS 2 INCHES AT FULL SIZE OF NOT 2-SCALE ACCORDINGLY

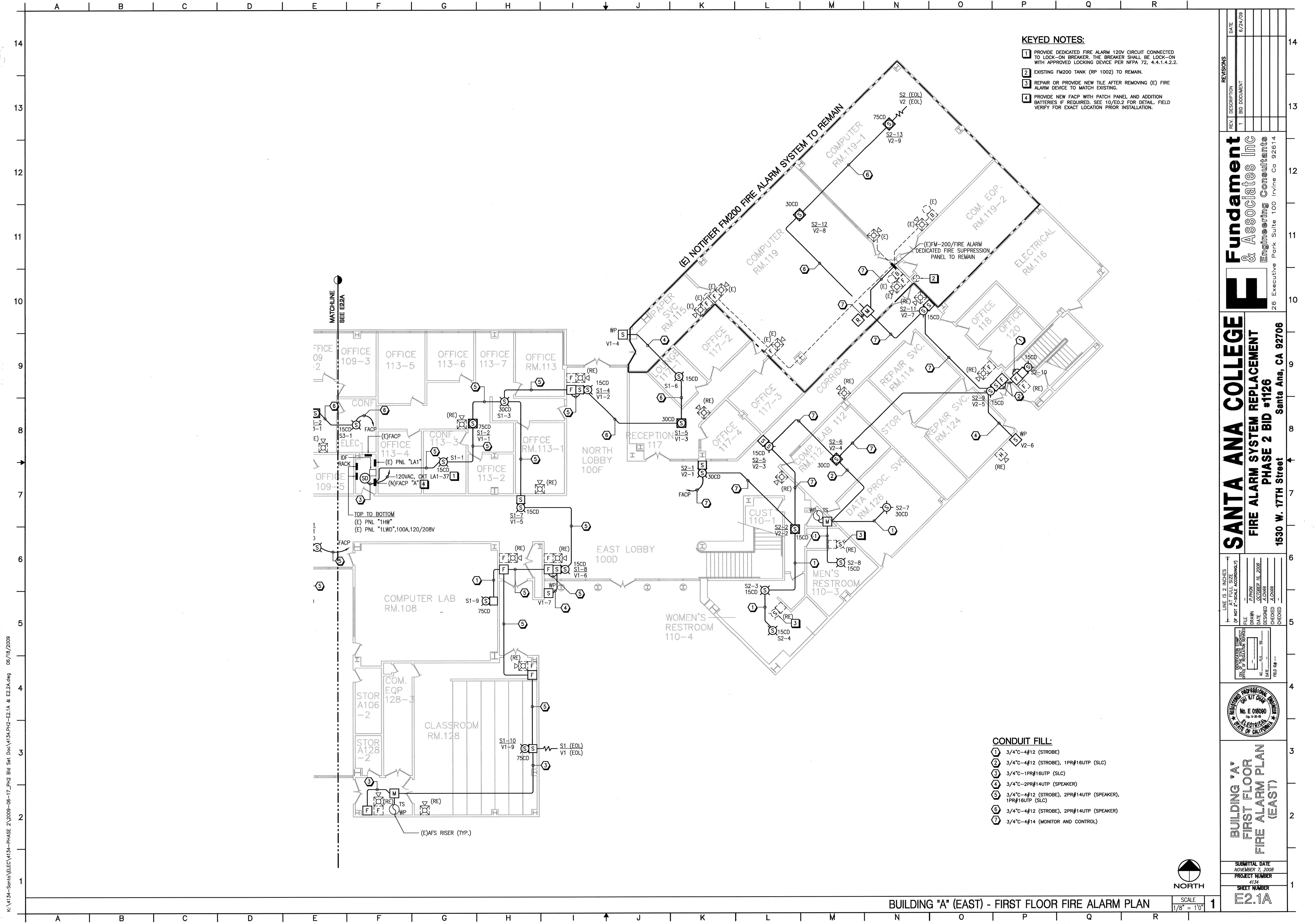
FILE: /PHASE 2/090618\_16\_2008  
DATE: 06/24/09  
DESIGNED: JAC/MT  
CHECKED: JAC/MT  
FIELD BY: \_\_\_\_\_

**FIRE ALARM SITE PLAN**

NO. E 018090  
DATE: 6-24-09

SUBMITTAL DATE: NOVEMBER 7, 2008  
PROJECT NUMBER: 4124  
SHEET NUMBER: E1.0

K:\4134-Santa Ana\elec\4134-PHASE 2\2009-06-17\_PPH2 Bid Set Doc\4134\_P1-E1.0.dwg 06/18/2009



- KEYED NOTES:**
- 1 PROVIDE DEDICATED FIRE ALARM 120V CIRCUIT CONNECTED TO LOCK-ON BREAKER. THE BREAKER SHALL BE LOCK-ON WITH APPROVED LOCKING DEVICE PER NFPA 72, 4.4.1.4.2.2.
  - 2 EXISTING FM200 TANK (RP 1002) TO REMAIN.
  - 3 REPAIR OR PROVIDE NEW TILE AFTER REMOVING (E) FIRE ALARM DEVICE TO MATCH EXISTING.
  - 4 PROVIDE NEW FACP WITH PATCH PANEL AND ADDITION BATTERIES IF REQUIRED. SEE 10/E0.2 FOR DETAIL. FIELD VERIFY FOR EXACT LOCATION PRIOR INSTALLATION.

- CONDUIT FILL:**
- 1 3/4" - 4#12 (STROBE)
  - 2 3/4" - 4#12 (STROBE), 1PR#16UTP (SLC)
  - 3 3/4" - 1PR#16UTP (SLC)
  - 4 3/4" - 2PR#14UTP (SPEAKER)
  - 5 3/4" - 4#12 (STROBE), 2PR#14UTP (SPEAKER), 1PR#16UTP (SLC)
  - 6 3/4" - 4#12 (STROBE), 2PR#14UTP (SPEAKER)
  - 7 3/4" - 4#14 (MONITOR AND CONTROL)

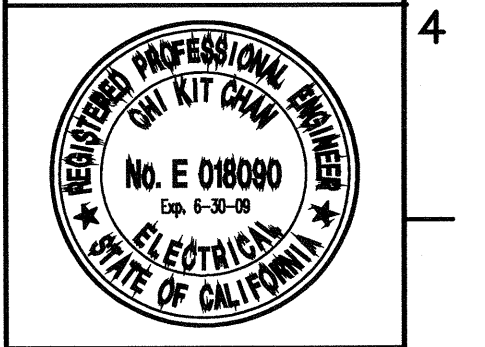
REV	DESCRIPTION	DATE
1	BID DOCUMENT	6/24/08

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 Engineering Consultants  
 26 Executive Park Suite 100 Irvine Ca 92614

**SANTA ANA COLLEGE**  
 FIRE ALARM SYSTEM REPLACEMENT  
 PHASE 2 BID #1126  
 1530 W. 17TH Street Santa Ana, CA 92706

LINE IS 2" INCHES AT FULL SIZE (IF NOT 2" SCALE ACCORDINGLY)
FILE
DRAWN
DATE
DESIGNED
CHECKED

PROFESSIONAL SEAL  
 No. E 018080  
 STATE OF CALIFORNIA



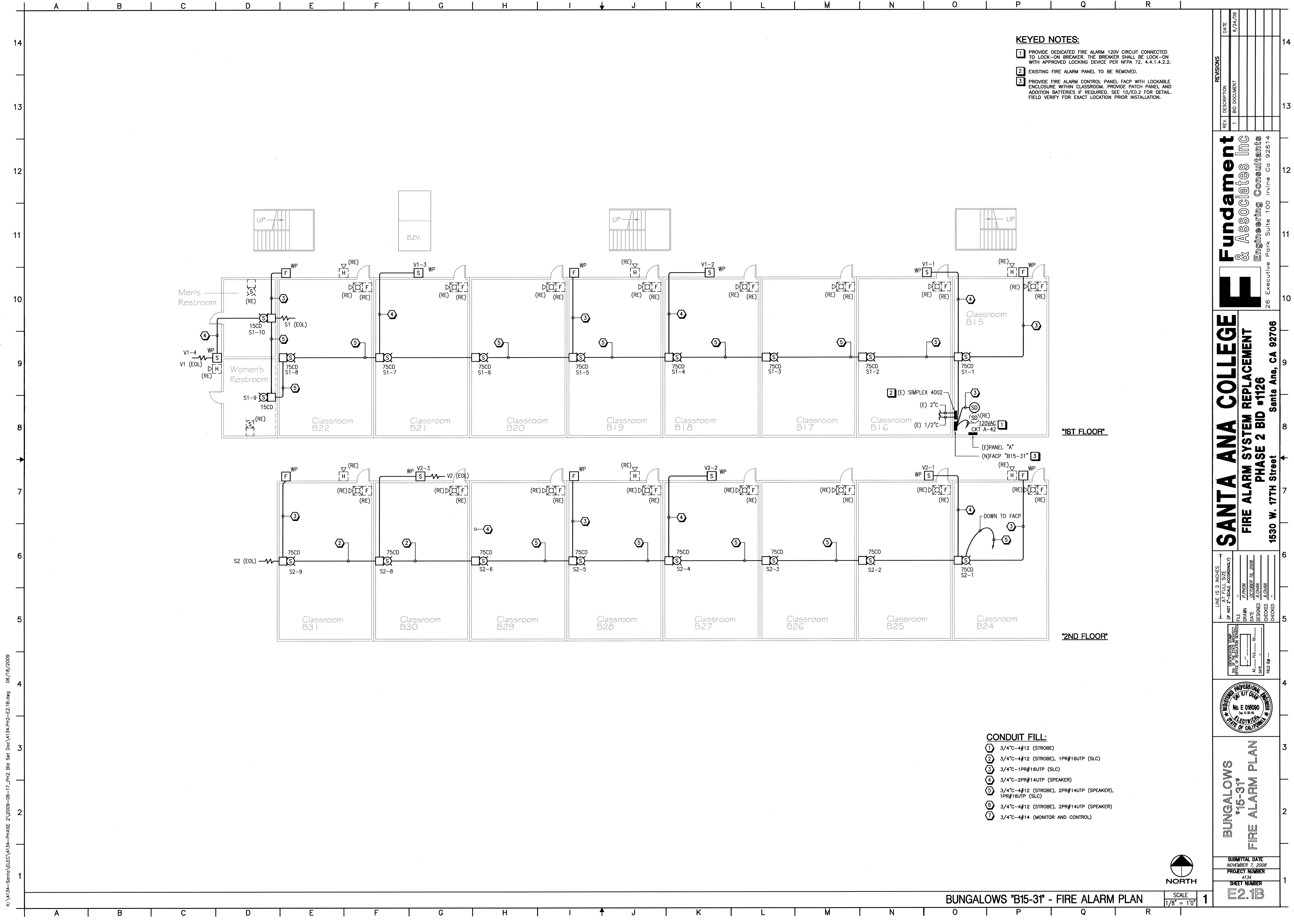
**BUILDING "A" FIRST FLOOR FIRE ALARM PLAN (EAST)**

SUBMITTAL DATE: NOVEMBER 7, 2008  
 PROJECT NUMBER: 4134  
 SHEET NUMBER: E2.1A



BUILDING "A" (EAST) - FIRST FLOOR FIRE ALARM PLAN  
 SCALE: 1/8" = 1'0"

K:\4134-Santa Ana College\4134-PHASE 2\2008-06-17\_P12 Bid Set Doc\4134.PH2-E2.1A & E2.2A.dwg 06/18/2008



**KEYED NOTES:**

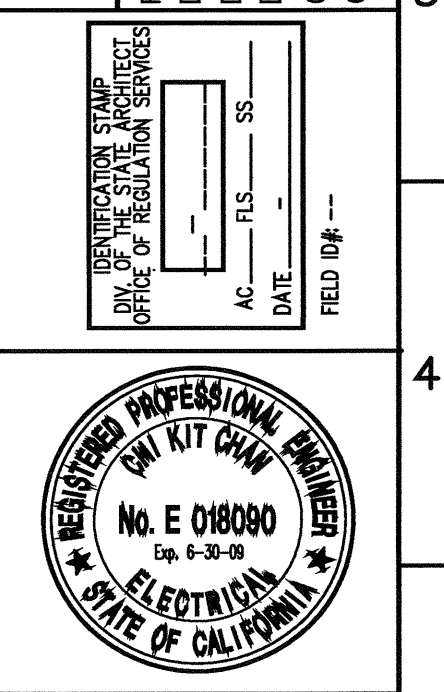
- 1 PROVIDE DEDICATED FIRE ALARM 120V CIRCUIT CONNECTED TO LOCK-ON BREAKER. THE BREAKER SHALL BE LOCK-ON WITH APPROVED LOCKING DEVICE PER NFPA 72, 4.4.1.4.2.2.
- 2 EXISTING FIRE ALARM PANEL TO BE REMOVED.
- 3 PROVIDE FIRE ALARM CONTROL PANEL, FACP WITH LOCKABLE ENCLOSURE WITHIN CLASSROOM. PROVIDE PATCH PANEL AND ADDITION BATTERIES IF REQUIRED. SEE 10/EO.2 FOR DETAIL. FIELD VERIFY FOR EXACT LOCATION PRIOR INSTALLATION.

REV.	DESCRIPTION	DATE
1	BID DOCUMENT	8/24/09

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 Engineering Consultants  
 26 Executive Park Suite 100 Irvine Ca 92614

**SANTA ANA COLLEGE**  
 FIRE ALARM SYSTEM REPLACEMENT  
 PHASE 2 BID #1126  
 1530 W. 17TH Street Santa Ana, CA 92706

LINE IS 2" INCHES AT FULL SIZE (IF NOT 2" SCALE ACCORDING TO)
FILE
DATE
DESIGNED
CHECKED
DATE



**CONDUIT FILL:**

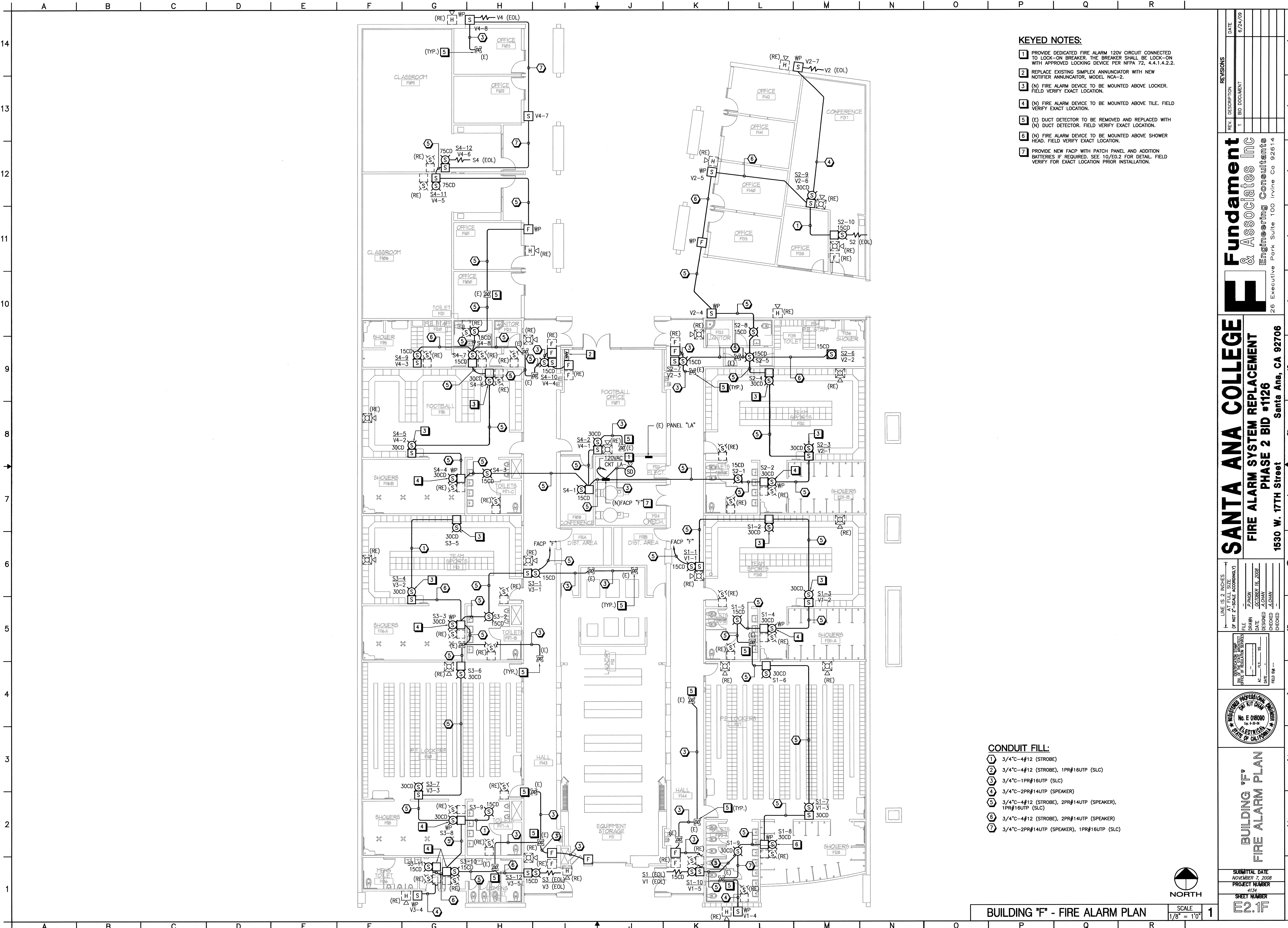
- 1 3/4" - 4#12 (STROBE)
- 2 3/4" - 4#12 (STROBE), 1PR#16UTP (SLC)
- 3 3/4" - 1PR#16UTP (SLC)
- 4 3/4" - 2PR#14UTP (SPEAKER)
- 5 3/4" - 4#12 (STROBE), 2PR#14UTP (SPEAKER), 1PR#16UTP (SLC)
- 6 3/4" - 4#12 (STROBE), 2PR#14UTP (SPEAKER)
- 7 3/4" - 4#14 (MONITOR AND CONTROL)



K:\4134-Santa Ana\ELEC\4134-PHASE 2\2009-08-17\_PH2 Bid Set Doc\4134-PH2-E2.1B.dwg 06/18/2009



K:\134-Santa Ana\elec\134-PHASE 2\2009-06-17\_P12 Bid Set Doc\134-PH2-E2.1F.dwg 06/18/2009



**KEYED NOTES:**

- 1 PROVIDE DEDICATED FIRE ALARM 120V CIRCUIT CONNECTED TO LOCK-ON BREAKER. THE BREAKER SHALL BE LOCK-ON WITH APPROVED LOCKING DEVICE PER NFPA 72, 4.4.1.4.2.2.
- 2 REPLACE EXISTING SIMPLEX ANNUNCIATOR WITH NEW NOTIFIER ANNUNCIATOR, MODEL NCA-2.
- 3 (N) FIRE ALARM DEVICE TO BE MOUNTED ABOVE LOCKER. FIELD VERIFY EXACT LOCATION.
- 4 (N) FIRE ALARM DEVICE TO BE MOUNTED ABOVE TILE. FIELD VERIFY EXACT LOCATION.
- 5 (E) DUCT DETECTOR TO BE REMOVED AND REPLACED WITH (N) DUCT DETECTOR. FIELD VERIFY EXACT LOCATION.
- 6 (N) FIRE ALARM DEVICE TO BE MOUNTED ABOVE SHOWER HEAD. FIELD VERIFY EXACT LOCATION.
- 7 PROVIDE NEW FACP WITH PATCH PANEL AND ADDITION BATTERIES IF REQUIRED. SEE 10/EO.2 FOR DETAIL. FIELD VERIFY FOR EXACT LOCATION PRIOR INSTALLATION.

**CONDUIT FILL:**

- 1 3/4" C-4#12 (STROBE)
- 2 3/4" C-4#12 (STROBE), 1PR#16UTP (SLC)
- 3 3/4" C-1PR#16UTP (SLC)
- 4 3/4" C-2PR#14UTP (SPEAKER)
- 5 3/4" C-4#12 (STROBE), 2PR#14UTP (SPEAKER), 1PR#16UTP (SLC)
- 6 3/4" C-4#12 (STROBE), 2PR#14UTP (SPEAKER)
- 7 3/4" C-2PR#14UTP (SPEAKER), 1PR#16UTP (SLC)

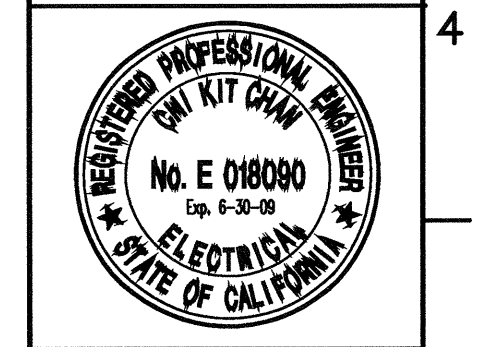
REV.	DESCRIPTION	DATE
1	BID DOCUMENT	8/24/09

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 Engineering Consultants  
 26 Executive Park Suite 100 Irvine Ca 92614

**SANTA ANA COLLEGE**  
 FIRE ALARM SYSTEM REPLACEMENT  
 PHASE 2 BID #1126  
 1530 W. 17TH Street Santa Ana, CA 92706

LINE IS 2 INCHES AT FULL SIZE (OF NOT 2-SCALE ACCORDING)
FILE: 7/18/09
DATE: 02/08/09
DESIGNED: JLB
CHECKED: JLB
DATE: 02/08/09
FILED BY: JLB

DATE: 02/08/09  
 TIME: 10:00 AM  
 PROJECT: SANTA ANA COLLEGE  
 SHEET: E2.1F

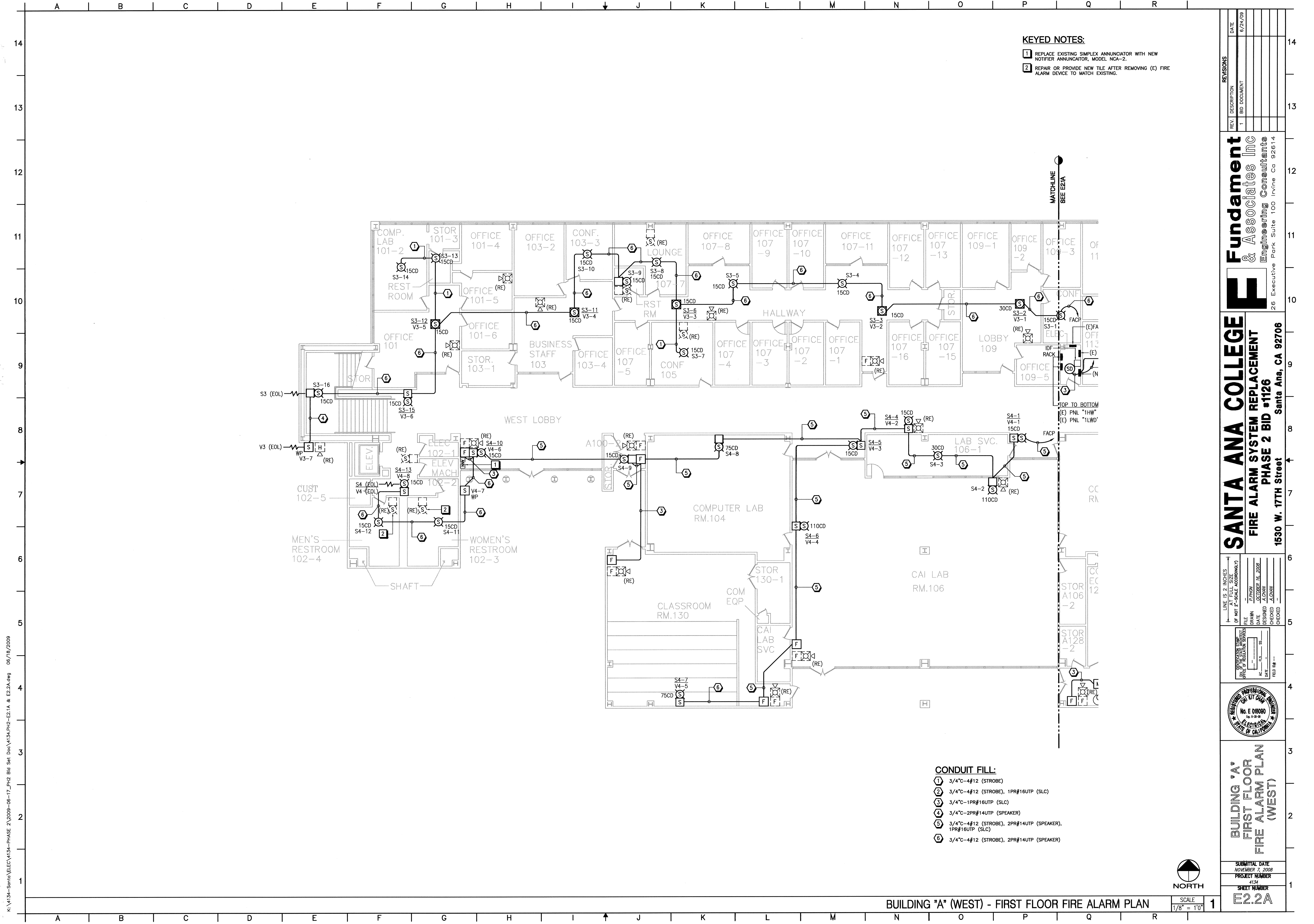


**BUILDING 'F' FIRE ALARM PLAN**

SUBMITTAL DATE: NOVEMBER 7, 2008  
 PROJECT NUMBER: 1126  
 SHEET NUMBER: E2.1F

**BUILDING 'F' - FIRE ALARM PLAN**  
 SCALE: 1/8" = 1'0" 1





**KEYED NOTES:**

- 1 REPLACE EXISTING SIMPLEX ANNUNCIATOR WITH NEW NOTIFIER ANNUNCIATOR, MODEL NCA-2.
- 2 REPAIR OR PROVIDE NEW TILE AFTER REMOVING (E) FIRE ALARM DEVICE TO MATCH EXISTING.

**CONDUIT FILL:**

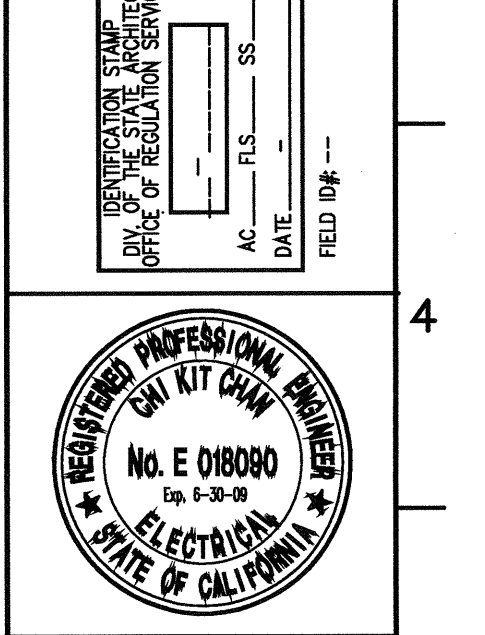
- 1 3/4" - 4#12 (STROBE)
- 2 3/4" - 4#12 (STROBE), 1PR#16UTP (SLC)
- 3 3/4" - 1PR#16UTP (SLC)
- 4 3/4" - 2PR#14UTP (SPEAKER)
- 5 3/4" - 4#12 (STROBE), 2PR#14UTP (SPEAKER), 1PR#16UTP (SLC)
- 6 3/4" - 4#12 (STROBE), 2PR#14UTP (SPEAKER)

REV	DESCRIPTION	DATE
1	BID DOCUMENT	6/24/09

**Fundament & Associates Inc**  
 Engineering Consultants  
 26 Executive Park Suite 100 Irvine Ca 92614

**SANTA ANA COLLEGE**  
 FIRE ALARM SYSTEM REPLACEMENT  
 PHASE 2 BID #1126  
 Santa Ana, CA 92706  
 1530 W. 17TH Street

FILE	7-PROJ
DRAWN	A.G.HAY
DATE	OCTOBER 16, 2008
DESIGNED	A.G.HAY
CHECKED	A.G.HAY
DATE	
REVISION	



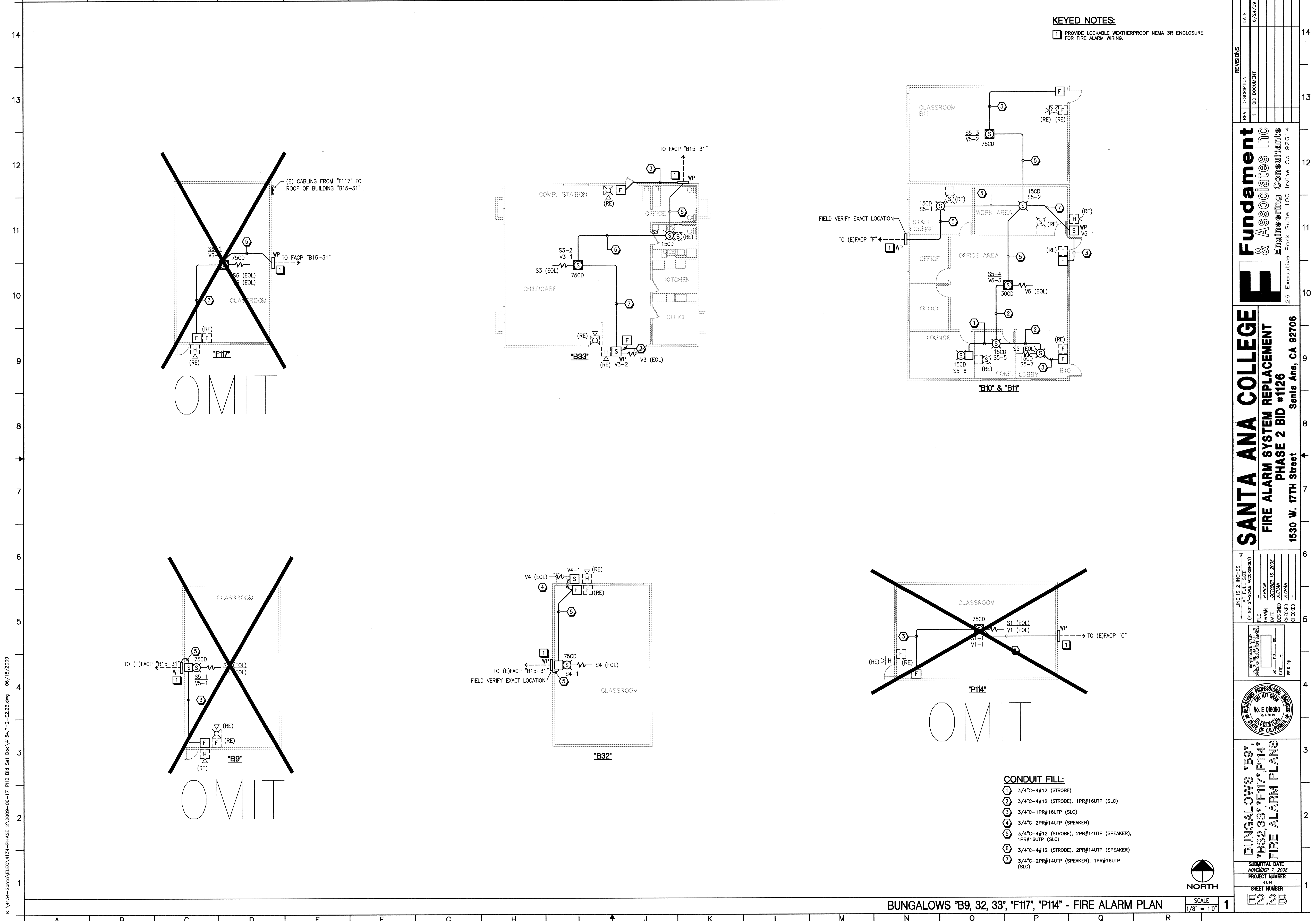
**BUILDING "A"  
 FIRST FLOOR  
 FIRE ALARM PLAN  
 (WEST)**

SUBMITTAL DATE  
 NOVEMBER 7, 2008  
 PROJECT NUMBER  
 4134  
 SHEET NUMBER  
**E2.2A**



BUILDING "A" (WEST) - FIRST FLOOR FIRE ALARM PLAN  
 SCALE 1/8" = 1'0" 1

K:\4134-Santa Ana\elec\4134-PHASE 2\008-06-17\_P12 Bid Set Doc\4134.PH2-E2.1A & E2.2A.dwg 06/18/2009



**KEYED NOTES:**  
 1 PROVIDE LOCKABLE WEATHERPROOF NEMA 3R ENCLOSURE FOR FIRE ALARM WIRING.

REV.	DESCRIPTION	DATE
1	BID DOCUMENT	6/24/09

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**SANTA ANA COLLEGE**  
 FIRE ALARM SYSTEM REPLACEMENT  
 PHASE 2 BID #1126  
 Santa Ana, CA 92706  
 1530 W. 177TH Street

LINE IS 2 INCHES AT FULL SIZE OF NOT 2-SCALE ACCORDINGLY
FILE: P:\PHON
DATE: OCTOBER 16, 2008
DRAWN: A. CHAY
DESIGNED: A. CHAY
CHECKED: A. CHAY
DATE: 11.3.08
FILED BY: --



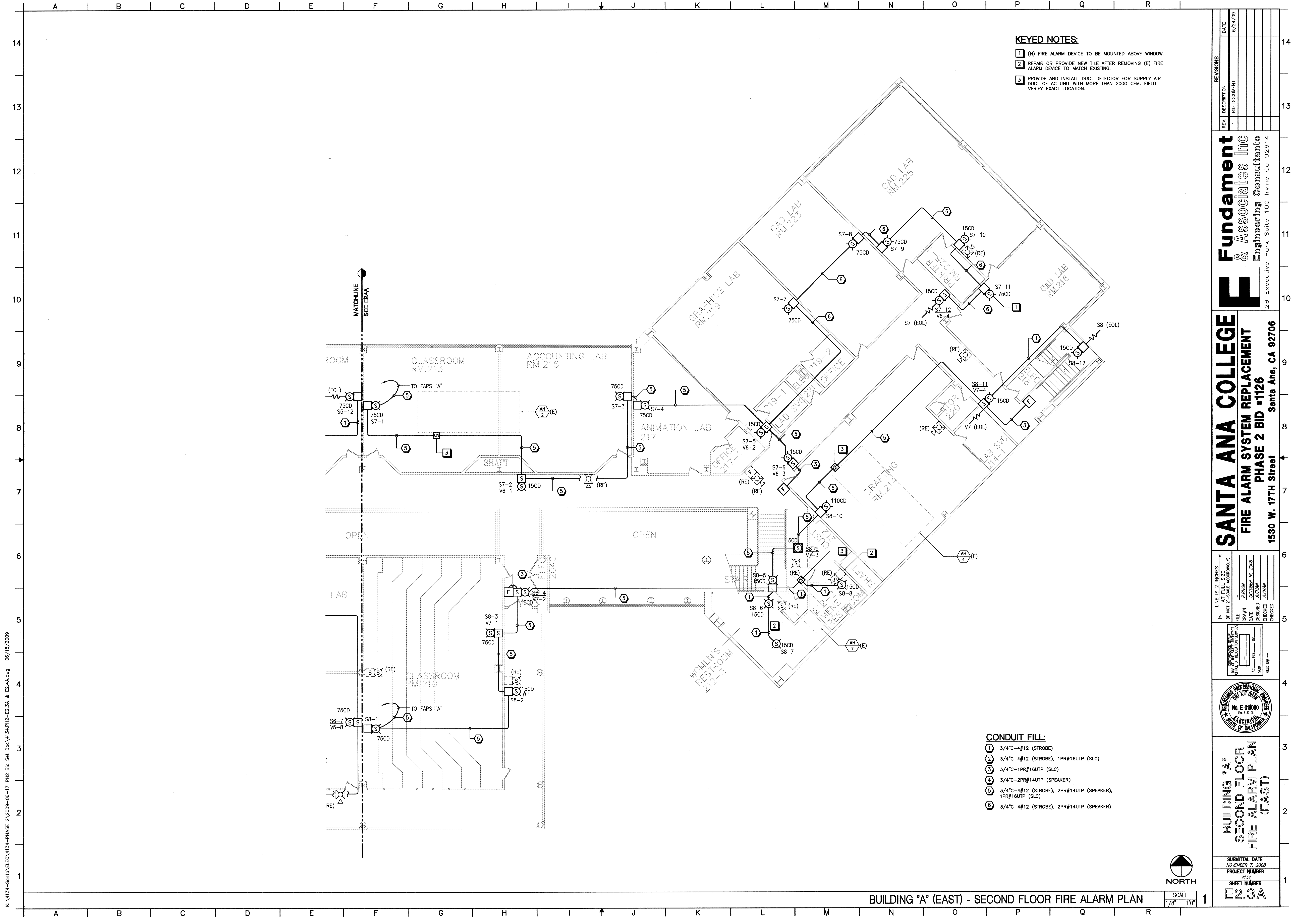
BUNGALOWS "B9", "B32,33", "F117", "P114" FIRE ALARM PLANS

SUBMITTAL DATE: NOVEMBER 7, 2008
PROJECT NUMBER: 4134
SHEET NUMBER: E2.2B

- CONDUIT FILL:**
- 1 3/4" - 4#12 (STROBE)
  - 2 3/4" - 4#12 (STROBE), 1PR#16UTP (SLC)
  - 3 3/4" - 1PR#16UTP (SLC)
  - 4 3/4" - 2PR#14UTP (SPEAKER)
  - 5 3/4" - 4#12 (STROBE), 2PR#14UTP (SPEAKER), 1PR#16UTP (SLC)
  - 6 3/4" - 4#12 (STROBE), 2PR#14UTP (SPEAKER)
  - 7 3/4" - 2PR#14UTP (SPEAKER), 1PR#16UTP (SLC)



K:\4134-Santa Ana\elec\4134-PHASE 2\2009-06-17\_P114\_Bid Set Doc\4134\_P114-E2.2B.dwg 06/18/2009



- KEYED NOTES:**
- 1 (N) FIRE ALARM DEVICE TO BE MOUNTED ABOVE WINDOW.
  - 2 REPAIR OR PROVIDE NEW TILE AFTER REMOVING (E) FIRE ALARM DEVICE TO MATCH EXISTING.
  - 3 PROVIDE AND INSTALL DUCT DETECTOR FOR SUPPLY AIR DUCT OF AC UNIT WITH MORE THAN 2000 CFM. FIELD VERIFY EXACT LOCATION.

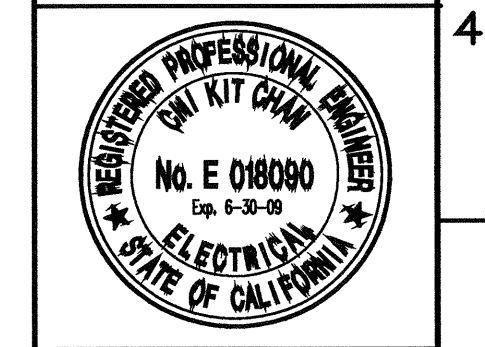
- CONDUIT FILL:**
- 1 3/4" - 4#12 (STROBE)
  - 2 3/4" - 4#12 (STROBE), 1PR#16UTP (SLC)
  - 3 3/4" - 1PR#16UTP (SLC)
  - 4 3/4" - 2PR#14UTP (SPEAKER)
  - 5 3/4" - 4#12 (STROBE), 2PR#14UTP (SPEAKER), 1PR#16UTP (SLC)
  - 6 3/4" - 4#12 (STROBE), 2PR#14UTP (SPEAKER)

REV.	DESCRIPTION	DATE
1	BID DOCUMENT	6/24/08

**Fundament & Associates Inc**  
 Engineering Consultants  
 26 Executive Park Suite 100 Irvine Ca 92614

**SANTA ANA COLLEGE**  
 FIRE ALARM SYSTEM REPLACEMENT  
 PHASE 2 BID #1126  
 1530 W. 17TH Street Santa Ana, CA 92706

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2-SCALE ACCORDINGLY)
FILE: P1100
DATE: OCTOBER 16, 2008
DRAWN: J. CHAN
DESIGNED: J. CHAN
CHECKED: J. CHAN
FIELD BY: ---



**BUILDING "A" SECOND FLOOR FIRE ALARM PLAN (EAST)**

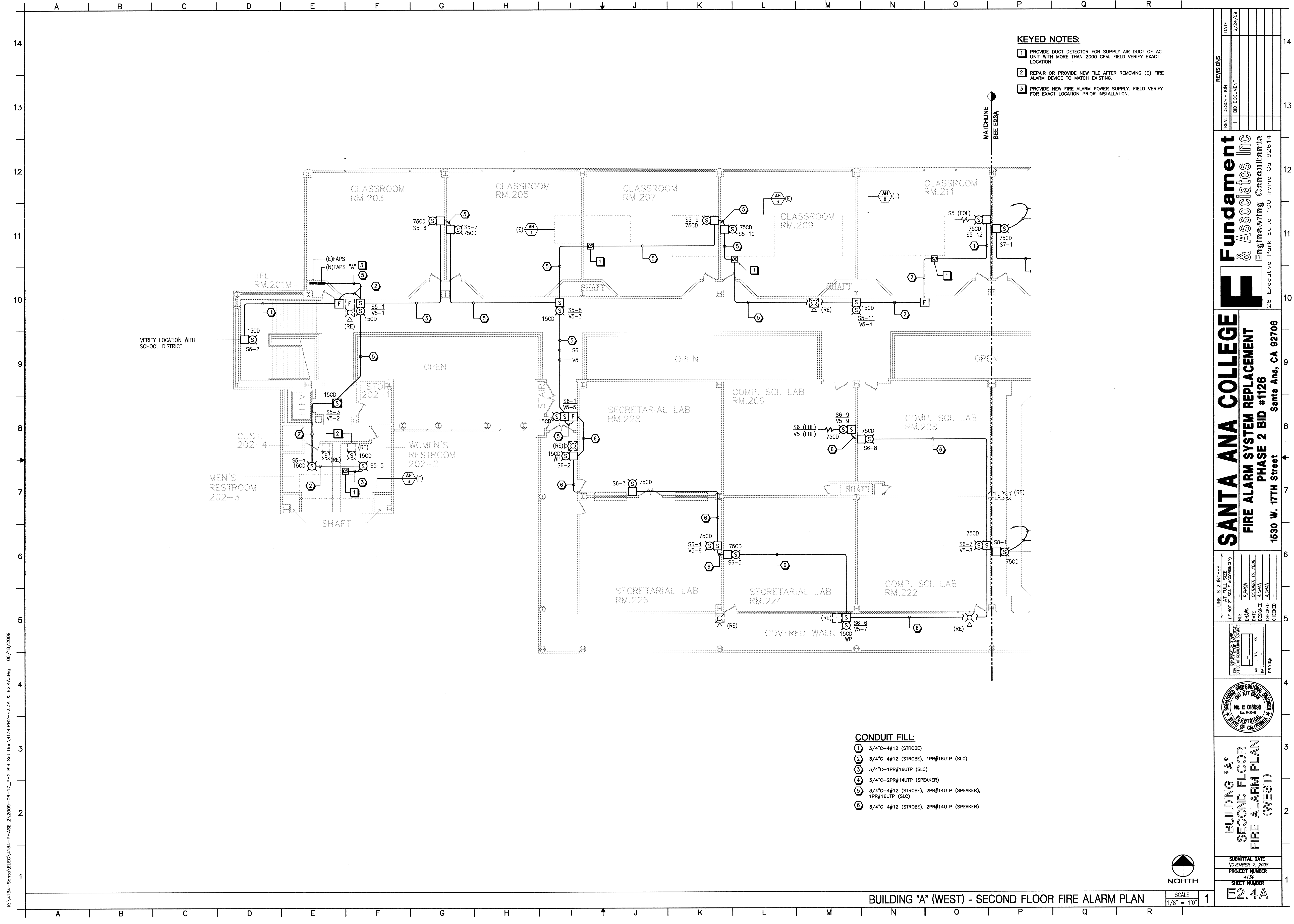
SUBMITTAL DATE: NOVEMBER 7, 2008
PROJECT NUMBER: 4154
SHEET NUMBER: F2.3A



**BUILDING "A" (EAST) - SECOND FLOOR FIRE ALARM PLAN**

SCALE: 1/8" = 1'0"

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**KEYED NOTES:**

- 1 PROVIDE DUCT DETECTOR FOR SUPPLY AIR DUCT OF AC UNIT WITH MORE THAN 2000 CFM. FIELD VERIFY EXACT LOCATION.
- 2 REPAIR OR PROVIDE NEW TILE AFTER REMOVING (E) FIRE ALARM DEVICE TO MATCH EXISTING.
- 3 PROVIDE NEW FIRE ALARM POWER SUPPLY. FIELD VERIFY FOR EXACT LOCATION PRIOR INSTALLATION.

- CONDUIT FILL:**
- 1 3/4" - 4#12 (STROBE)
  - 2 3/4" - 4#12 (STROBE), 1PR#16UTP (SLC)
  - 3 3/4" - 1PR#16UTP (SLC)
  - 4 3/4" - 2PR#14UTP (SPEAKER)
  - 5 3/4" - 4#12 (STROBE), 2PR#14UTP (SPEAKER), 1PR#16UTP (SLC)
  - 6 3/4" - 4#12 (STROBE), 2PR#14UTP (SPEAKER)

REV	DESCRIPTION	DATE
1	BID DOCUMENT	6/24/08

**Fundament & Associates Inc**  
 Engineering Consultants  
 26 Executive Park Suite 100 Irvine Co 92614

**SANTA ANA COLLEGE**  
**FIRE ALARM SYSTEM REPLACEMENT**  
**PHASE 2 BID #1126**  
 1530 W. 17TH Street Santa Ana, CA 92706

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" SCALE, ADDITIONAL?)	FILE
DATE	DESIGNED
CHECKED	CHECKED

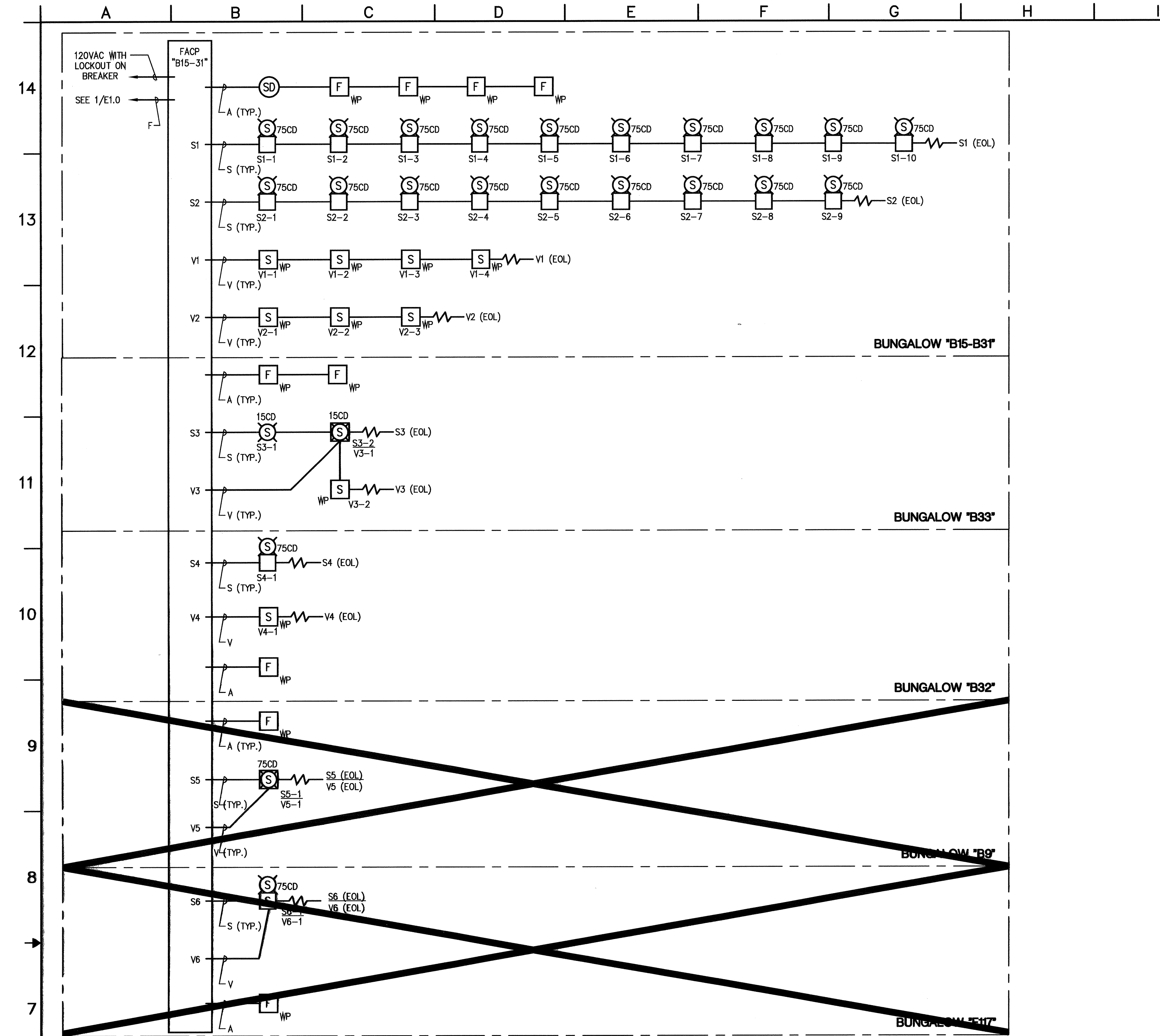


**BUILDING "A" SECOND FLOOR FIRE ALARM PLAN (WEST)**

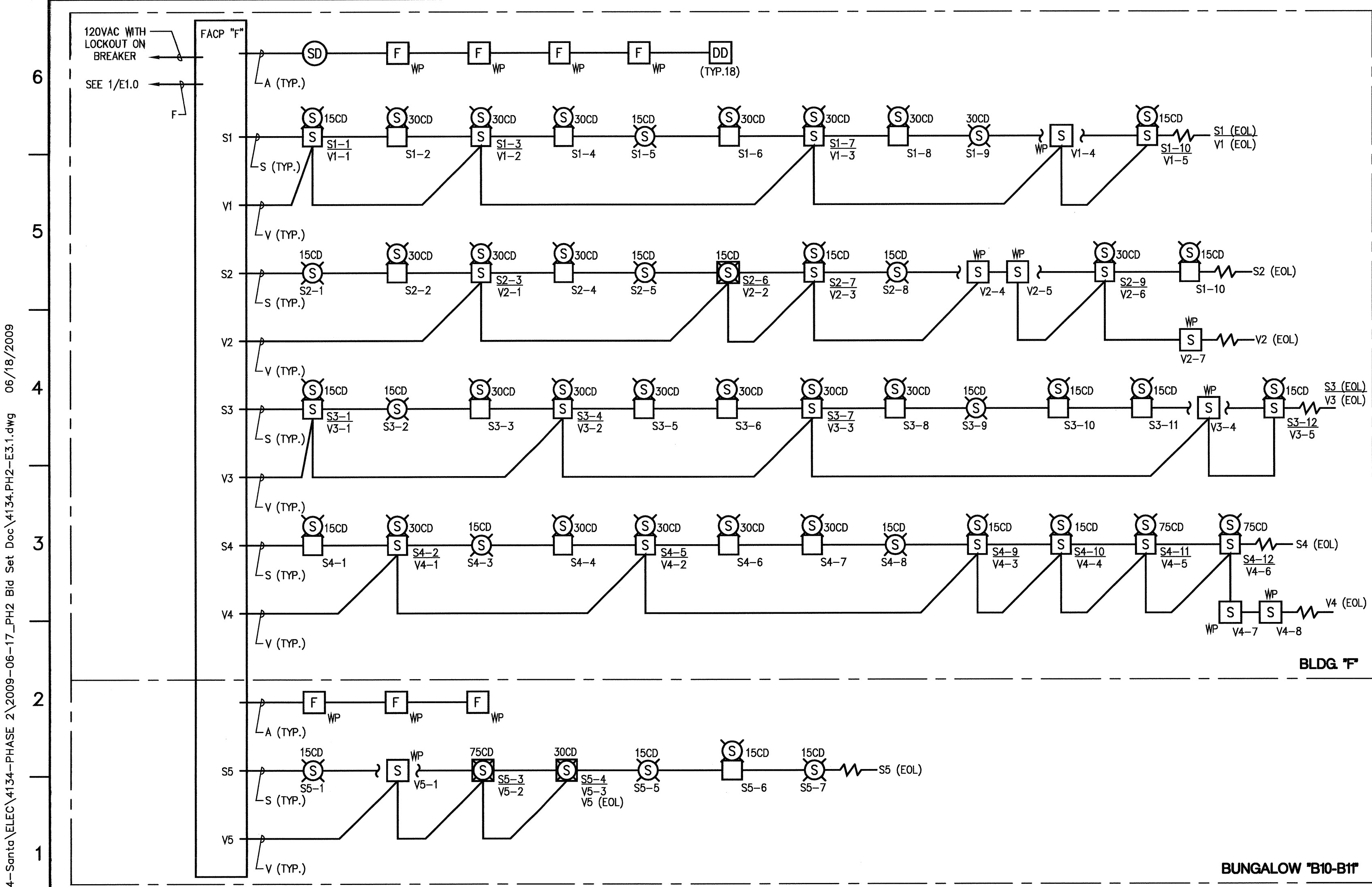
SUBMITTAL DATE: NOVEMBER 7, 2008  
 PROJECT NUMBER: 4134  
 SHEET NUMBER: E2.4A



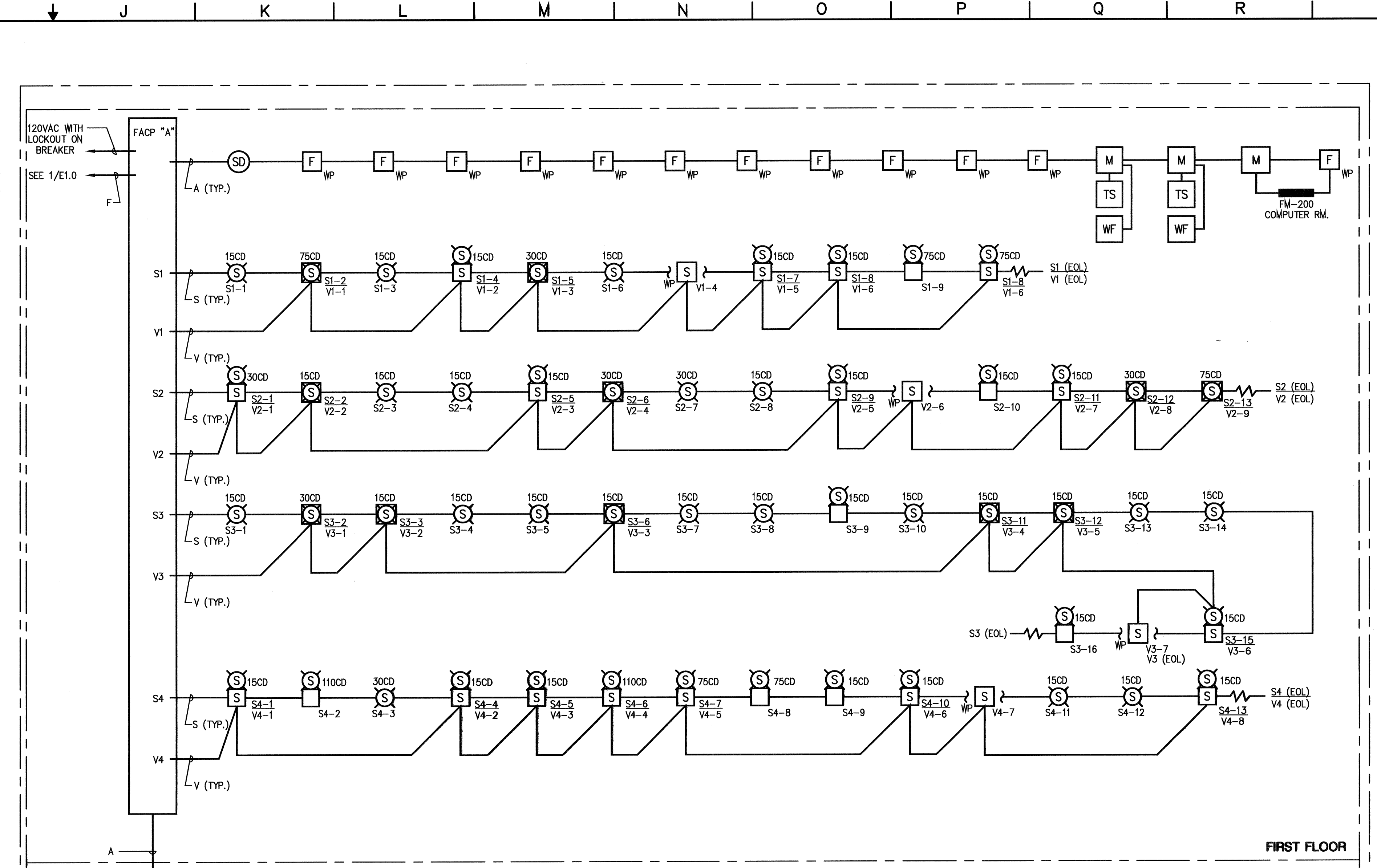
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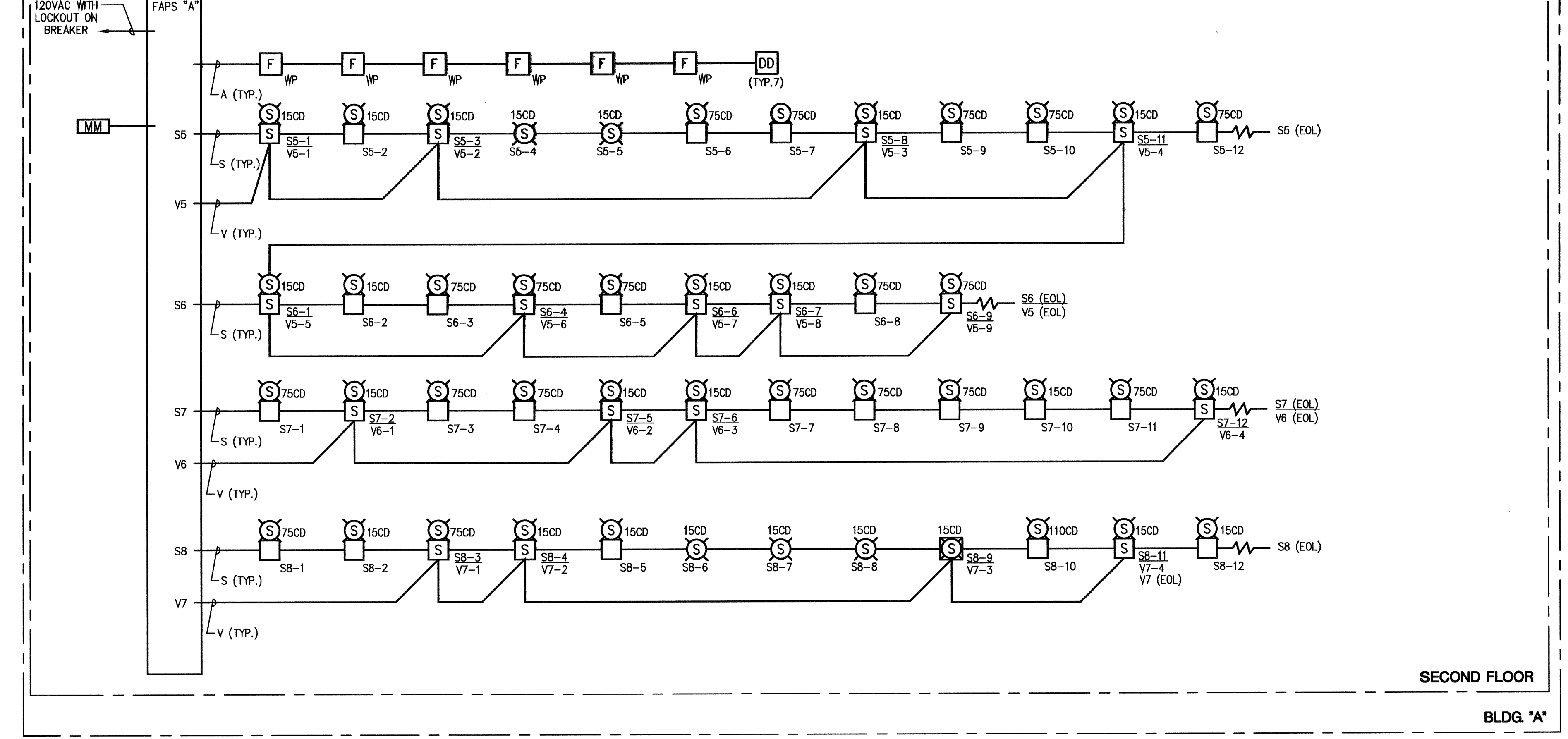
FIRE ALARM RISER DIAGRAM FACP "B15-B31" SCALE NONE 3



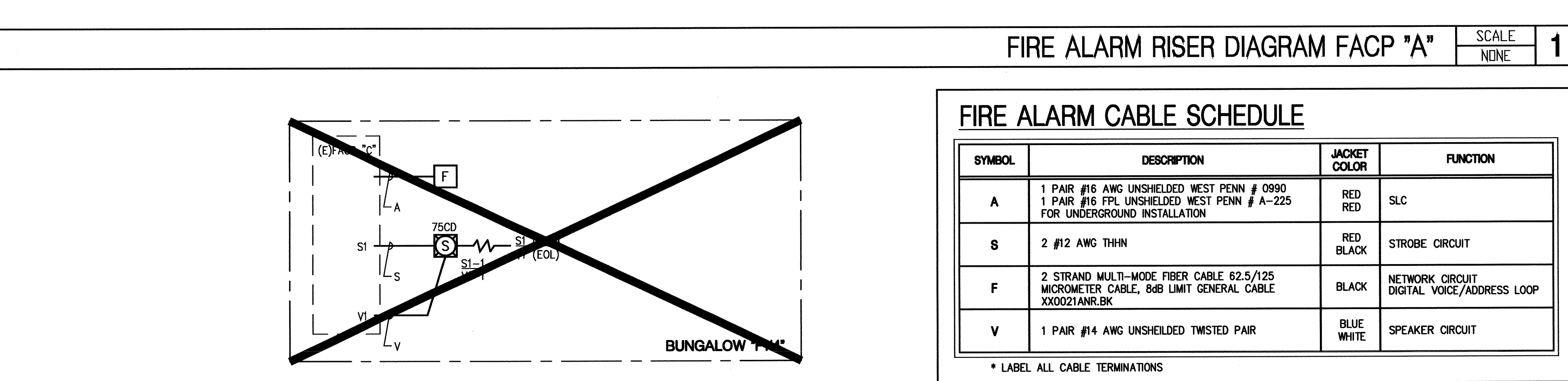
FIRE ALARM RISER DIAGRAM FACP "F" SCALE NONE 4



FIRE ALARM RISER DIAGRAM FACP "A" SCALE NONE 1



FIRE ALARM RISER DIAGRAM FACP "A" SCALE NONE 1



FIRE ALARM RISER DIAGRAM FACP "C" SCALE NONE 2

**FIRE ALARM CABLE SCHEDULE**

SYMBOL	DESCRIPTION	JACKET COLOR	FUNCTION
A	1 PAIR #16 AWG UNSHIELDED WEST PENN # 0990	RED	SLC
	1 PAIR #16 FPL UNSHIELDED WEST PENN # A-225 FOR UNDERGROUND INSTALLATION	RED	
S	#12 AWG THIN	RED BLACK	STROBE CIRCUIT
F	2 STRAND MULTI-MODE FIBER CABLE 62.5/125 MICROMETER CABLE, 800 LMT GENERAL CABLE XX0021ANR.BK	BLACK	NETWORK CIRCUIT DIGITAL VOICE/ADDRESS LOOP
V	1 PAIR #14 AWG UNSHIELDED TWISTED PAIR	BLUE WHITE	SPEAKER CIRCUIT

\* LABEL ALL CABLE TERMINATIONS

**SANTA ANA COLLEGE**  
FIRE ALARM SYSTEM REPLACEMENT  
PHASE 2 BID #1126  
1530 W. 17TH Street  
Santa Ana, CA 92706

**Fundament & Associates Inc**  
Engineering Consultants  
26 Executive Park Suite 100 Irvine Ca 92614

REVISIONS  
DATE: 6/24/09  
REV. DESCRIPTION: 1 BID DOCUMENT

LINE IS 3/8 INCHES (OF NOT 2" SCALE ACCORDING TO)

FILE: P:\PHASE 2\1126\1126-17\_P142\_Bldg Set Doc\4134\_P142-ES1.dwg  
DATE: OCTOBER 16, 2008  
DESIGNED: A.GRAY  
CHECKED: A.GRAY

NO. E 018000  
NOVEMBER 7, 2008  
PROJECT NUMBER  
SHEET NUMBER

**FIRE ALARM RISER DIAGRAM**

SCALE NONE 1

K:\1134-SantaAna\1134-PHASE 2\2008-06-17\_P142\_Bldg Set Doc\4134\_P142-ES1.dwg 06/19/2009

VOLTAGE DROP CALCULATIONS																					
WALL SPEAKER/STROBE				WALL STROBE				CEILING SPEAKER/STROBE				CEILING STROBE			TOTAL AMPS	WIRE DISTANCE (FEET)	% VOLTAGE DROP				
SPEAKERS	15CD	30CD	75CD	110CD	15CD	30CD	75CD	110CD	15CD	30CD	75CD	15CD	30CD	75CD							
<b>FACP "A"</b>																					
STROBE CKT "S1"	0	3	0	1	0	0	0	0	0	0	1	0	1	2	1	3	1	0	0.693	390	<b>3.7250</b>
STROBE CKT "S2"	0	3	1	0	0	1	0	0	0	0	1	2	1	1	3	1	0	0.759	560	<b>5.8811</b>	
STROBE CKT "S3"	0	1	0	0	0	2	0	0	0	4	1	0	8	0	0	0	0	0.738	390	<b>3.9669</b>	
STROBE CKT "S4"	0	5	0	1	1	1	0	1	1	0	0	0	2	1	0	0	0	0.950	455	<b>5.9575</b>	
STROBE CKT "S5"	0	4	0	0	0	1	0	5	0	0	0	0	2	0	0	0	0	0.875	450	<b>5.4269</b>	
STROBE CKT "S6"	0	3	0	2	0	1	0	3	0	0	0	0	0	0	0	0	0	0.744	310	<b>3.1788</b>	
STROBE CKT "S7"	0	4	0	0	0	1	0	7	0	0	0	0	0	0	0	0	0	1.017	425	<b>5.9572</b>	
STROBE CKT "S8"	0	2	0	1	0	3	0	1	1	1	0	0	3	0	0	0	0	0.772	450	<b>4.7881</b>	
VOICE CKT "V1"	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.350	330	<b>2.0260</b>	
VOICE CKT "V2"	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.450	560	<b>3.4732</b>	
VOICE CKT "V3"	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.600	390	<b>3.2251</b>	
VOICE CKT "V4"	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.400	455	<b>2.5084</b>	
VOICE CKT "V5"	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.450	650	<b>4.0314</b>	
VOICE CKT "V6"	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.200	425	<b>1.1715</b>	
VOICE CKT "V7"	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.200	450	<b>1.2404</b>	
VOICE CKT "V8"	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	0	<b>0.0000</b>	

VOLTAGE DROP CALCULATIONS																				
WALL SPEAKER/STROBE				WALL STROBE				CEILING SPEAKER/STROBE				CEILING STROBE			TOTAL AMPS	WIRE DISTANCE (FEET)	% VOLTAGE DROP			
SPEAKERS	15CD	30CD	75CD	110CD	15CD	30CD	75CD	110CD	15CD	30CD	75CD	15CD	30CD	75CD						
<b>FACP "F"</b>																				
STROBE CKT "S1"	0	2	2	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0.577	270	<b>2.1472</b>
STROBE CKT "S2"	0	1	2	0	0	1	2	0	0	1	0	0	3	0	0	0	0	0.516	300	<b>2.1335</b>
STROBE CKT "S3"	0	2	2	0	0	2	4	0	0	0	0	0	2	0	0	0	0	0.632	300	<b>2.6132</b>
STROBE CKT "S4"	0	2	2	2	0	1	3	0	0	0	0	0	2	0	0	0	0	0.761	340	<b>3.5661</b>
STROBE CKT "S5"	0	0	0	0	0	1	0	0	0	1	1	3	0	0	0	0	0	0.379	550	<b>2.8730</b>
STROBE CKT "S6"	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	0	<b>0.0000</b>
STROBE CKT "S7"	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	0	<b>0.0000</b>
STROBE CKT "S8"	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.250	270	<b>0.9303</b>
VOICE CKT "V1"	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.300	330	<b>1.3645</b>
VOICE CKT "V2"	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.250	300	<b>1.0337</b>
VOICE CKT "V3"	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.400	380	<b>2.0949</b>
VOICE CKT "V4"	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.150	540	<b>1.1164</b>
VOICE CKT "V5"	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	0	<b>0.0000</b>
VOICE CKT "V6"	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	0	<b>0.0000</b>
VOICE CKT "V7"	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	0	<b>0.0000</b>

VOLTAGE DROP CALCULATIONS																				
WALL SPEAKER/STROBE				WALL STROBE				CEILING SPEAKER/STROBE				CEILING STROBE			TOTAL AMPS	WIRE DISTANCE (FEET)	% VOLTAGE DROP			
SPEAKERS	15CD	30CD	75CD	110CD	15CD	30CD	75CD	110CD	15CD	30CD	75CD	15CD	30CD	75CD						
<b>FACP "15-31"</b>																				
STROBE CKT "S1"	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	1.160	250	<b>3.9969</b>
STROBE CKT "S2"	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	1.044	200	<b>2.8778</b>
STROBE CKT "S3"	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0.090	140	<b>0.1737</b>
STROBE CKT "S4"	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0.116	140	<b>0.2238</b>
STROBE CKT "S5"	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0.128	120	<b>0.2117</b>
STROBE CKT "S6"	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.116	120	<b>0.1919</b>
STROBE CKT "S7"	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	0	<b>0.0000</b>
STROBE CKT "S9"	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	0	<b>0.0000</b>
VOICE CKT "V1"	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.200	450	<b>1.2404</b>
VOICE CKT "V2"	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.150	320	<b>0.6616</b>
VOICE CKT "V3"	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.100	140	<b>0.1930</b>
VOICE CKT "V4"	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.050	140	<b>0.0965</b>
VOICE CKT "V5"	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.050	120	<b>0.0827</b>
VOICE CKT "V6"	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.050	120	<b>0.0827</b>
VOICE CKT "V7"	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	0	<b>0.0000</b>

VOLTAGE DROP CALCULATIONS																				
WALL SPEAKER/STROBE				WALL STROBE				CEILING SPEAKER/STROBE				CEILING STROBE			TOTAL AMPS	WIRE DISTANCE (FEET)	% VOLTAGE DROP			
SPEAKERS	15CD	30CD	75CD	110CD	15CD	30CD	75CD	110CD	15CD	30CD	75CD	15CD	30CD	75CD						
<b>FACP "C"</b>																				
STROBE CKT "S1"	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0.128	165	<b>0.2911</b>
STROBE CKT "S2"	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	0	<b>0.0000</b>
STROBE CKT "S3"	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	0	<b>0.0000</b>
STROBE CKT "S4"	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	0	<b>0.0000</b>
STROBE CKT "S5"	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	0	<b>0.0000</b>
STROBE CKT "S6"	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	0	<b>0.0000</b>
STROBE CKT "S7"	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	0	<b>0.0000</b>
STROBE CKT "S8"	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	0	<b>0.0000</b>
VOICE CKT "V1"	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.050	165	<b>0.1137</b>
VOICE CKT "V2"	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	0	<b>0.0000</b>
VOICE CKT "V3"	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	0	<b>0.0000</b>
VOICE CKT "V4"	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	0	<b>0.0000</b>
VOICE CKT "V5"	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	0	<b>0.0000</b>
VOICE CKT "V6"	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	0	<b>0.0000</b>
VOICE CKT "V7"	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.000	0	<b>0.0000</b>

**VOLTAGE DROP FORMULA**

$$\text{VOLTAGE DROP} = \frac{\text{LENGTH} \times \text{AMPS} \times 21.6}{6530} \times \frac{100}{\text{VOLTAGE}} = \% \text{ VOLTS DROP}$$

BATTERY CAPACITY CALCULATION SHEET									
FACP "A"									
QUAN.	DESCRIPTION	STANDBY UNIT CURRENT (AMPS)	STANDBY TOTAL CURRENT (AMPS)	ALARM UNIT CURRENT (AMPS)	ALARM TOTAL CURRENT (AMPS)	STANDBY UNIT CURRENT (AMPS)	STANDBY TOTAL CURRENT (AMPS)	ALARM UNIT CURRENT (AMPS)	ALARM TOTAL CURRENT (AMPS)
1	NFS2-640 CPU2-640 W/KAPS-24	0.290	0.290	0.250	0.250				
1	NFS2-640 NCM-F	0.110	0.110	0.110	0.110				
1	NFS2-640 LEM-320	0.100	0.100	0.100	0.100				
1	VOICE DAA-5020	0.350	0.350	0.600	0.600				
3	MONITOR MOD FMM-1	0.001	0.001	0.006	0.018				
1	RELAY FRM-1	0.001	0.001	0.007	0.007				
7	SYNCH MOD SYNCH MOD	0.000	0.000	0.035	0.245				
1	SMOKE DET SMOKE DET	0.001	0.001	0.007	0.007				
17	PULL STATION PULL STATION	0.001	0.001	0.007	0.119				
4	EXT. SPEAKER SPEAKERS .5 WATT TAP	0.000	0.000	0.050	0.200				
10	STROBE 15CD WALL	0.000	0.000	0.041	0.410				
0	STROBE 30CD WALL	0.000	0.000	0.062	0.000				
18	STROBE 75CD WALL	0.000	0.000	0.116	2.088				
2	STROBE 110CD WALL	0.000	0.000	0.155	0.310				

