## LODI UNIFIED SCHOOL DISTRICT

## 2020 Fire Alarm Project – Phase 2

## PROJECT NUMBER: 0923-8223 DSA #:02-118026 Lawrence Elementary

# ADDENDUM NO. 1

MARCH 27, 2020

Owner:	Lodi Unified School District 1305 E. Vine Street Lodi, CA 95240
Engineer:	The Engineering Enterprise 1125 High Street Auburn, CA 95603
Project Manager:	Capital Program Management, Inc. 1851 Heritage Lane, Suite 210

This Addendum has been prepared to clarify, modify, delete, or add to the drawings and/or specifications for the above referenced project, and revisions to items listed here shall supersede description thereof prior to the above stated date. All conditions not specifically referenced here shall remain the same. It is the obligation of the Prime Contractor to make subcontractors aware of any items herein that may affect submitted bids.

Acknowledge receipt of this addendum by inserting its number and date in the bidding documents. Failure to do so may subject bidder to disqualification.

All addenda items refer to the plans and specifications unless specifically noted otherwise.

TOTAL PAGES IN THIS ADDENDUM (including attachments): 21 Pages

Sacramento, CA 95815

## LODI UNIFIED SCHOOL DISTRICT

2020 Fire Alarm Project – Phase 2

## PROJECT NUMBER: 0923-8223 DSA #:02-118026 Lawrence Elementary

# ADDENDUM NO. 1

# PART A - BIDDING AND CONTRACT REQUIREMENTS

- 1.1 ADD Document 00 45 01 Site Visit Certification, Addendum No. 1
- 1.2 **ADD** Document 00 57 00 Escrow Agreement in Lieu of Retention, Addendum No. 1.

# PART B - TECHNICAL REQUIREMENTS

- 1.3 **ADD** Entek Asbestos and Lead Work Practices Report Exhibit C, dated March 18, 2020.
- 1.4 Refer to Lawrence ES, Specification Section 26 61 16 Fire Alarm Safety System, 1.09 Warranty, **REPLACE** wording in "A" as follows: "A. Units and components under this Section shall be covered by a (2) year parts and labor warranty for malfunctions resulting from defects in materials and workmanship. Warranty shall begin upon acceptance by the Owner"

# **PART C - DRAWINGS**

- 1.5 Replace Drawing Sheet E2.00 in its entirety with Addendum 1 Drawing Sheet E2.00 Dated 3-23-20 (See attachment)
- 1.6 Replace Drawing Sheet E3.00 in its entirety with Addendum 1 Drawing Sheet E3.00 Dated 3-23-20 (See attachment)
- 1.7 Replace Drawing Sheet E4.01 in its entirety with Addendum 1 Drawing Sheet E4.01 Dated 3-23-20 (See attachment)

# PART D – RESPONSES TO CONTRACTOR QUESTIONS

1.8 N/A

## LODI UNIFIED SCHOOL DISTRICT

## 2020 Fire Alarm Project – Phase 2

## PROJECT NUMBER: 0923-8223 DSA #:02-118026 Lawrence Elementary

# ADDENDUM NO. 1

# PART E – List of Attachments

- 1.9 Pre-bid Conference & Site Visit Agenda (1 Page)
- 1.10 Pre-Bid Conference & Site Visit Sign-In Sheet (1 Page)
- 1.11 Document 00 45 01 Site Visit Certification, Addendum No. 1 (2 Pages)
- 1.12 Document 00 57 00 Escrow Agreement in Lieu of Retention, Addendum No. 1 (3 Pages)
- 1.13 Entek Asbestos and Lead Work Practices Report Exhibit C, dated March 18, 2020 (8 pages)
- 1.14 Addendum 1 Drawing Sheet E2.00 Dated 3-23-20 (1 Page)
- 1.15 Addendum 1 Drawing Sheet E3.00 Dated 3-23-20 (1 Page)
- 1.16 Addendum 1 Drawing Sheet E4.01 Dated 3-23-20 (1 Page)

End of Addendum

## Lodi Unified School District Project No. 0923-8223 2020 Phase II Fire Alarm Project Lawrence Elementary School

## PRE-BID CONFERENCE & SITE VISIT AGENDA

Date: Wednesday, March 18, 2020

School: Lawrence Elementary

Bid Date: Thursday, April 2, 2020 by 2:00:00 p.m.

## I. Meeting Called to Order

## II. Introduction of Project Team

- A. District Representatives, Vickie Brum and Joe Patty, Planning & Facilities
- B. Capital Program Management, Doug McCalla and Mark Rosson
- C. The Engineering Enterprise (TEE), Electrical Engineer , Jesse Wheeler
- III. Bidding Documents: Available from District <u>https://www.lodiusd.net/district/departments/business-</u> services/facilities-and-planning/fp-projects
- **IV. Contracting Format:** (1) Prime Contract
- V. Scope of Work Descriptions: Document 01 11 00 Part 1.02 A Summary of Work and Drawings
- VI. Engineer's Estimated Construction Budget: \$118,000.00

## VII. Bidding and Contract Award Requirements:

- A. License requirement(s): C-10
- B. Bid Bond or Certified Check, 10% of bid
- C. Prevailing Wages certified payrolls, payroll records and other documents shall be required along with your progress billings: <u>www.dir.ca.gov/dlsr/DPreWageDetermination.htm</u>
- D. DIR Registration of Contractor & Subcontractors (See General Conditions, Section 0072 13)
- E. Disabled Veterans Business Enterprise (DVBE Section 00 45 46.02)
- F. Bond and Insurance Requirements (See General Conditions, Section 00 72 13)
- G. Bid Form (See Bid Form, Section 00 41 13):
  - 1. Completed Forms
  - 2. No exclusions
  - 3. No faxes, phone or email bids
  - 4. Bids good for 90 days
- H. Pre-Qualified Bid Requirements https://pqbids.com/lodi/

## VIII. Inspection Procedures: DSA Project Inspector: Jason Zachary

- IX. Project Schedule: See General Conditions, Section 00 01 20
  - Construction Start: April 27, 2020
  - Construction Completion: July 31, 2020
- X. Department of Justice (DOJ) Clearance, Badges and Security: District Protocols
- XI. Site Information:
  - A. Contact: Vickie Brum, 209-331-7223
  - B. Site access, temporary facilities, staging areas and parking
  - C. Conduct on school premises: No dialogue or contact with students, no smoking or tobacco and all employees on site are to conduct themselves professionally.
  - D. Contractor's working hours.
  - E. Contractor's supervision: The designated Superintendent must be present at all times when subcontractors or self-performance work is taking place.

### XII. Owner Meetings:

A. Weekly meeting day, time and location TBD

### XIII. Questions

### XIV. Adjournment

**Important note:** Responses to inquiries and discussions occurring at this pre-bid walk-through shall in no way change or modify the bid documents. The bid documents will be affected only by addenda issued prior to the bid date.

Send written inquiries by March 25, 2020 to: Doug McCalla, dougm@capitalpm.com

Time: 2:00 p.m.

#### Lodi Unified School District PRE-BID CONFERENCE AND SITE VISIT SIGN-IN SHEET FOR PROJECT NO. 0923-8223 2020 Phase II Fire Alarm Projects Lawrence Elementary Wednesday, March 18, 2020 2:00 PM

Company Name & Representative	Company Street Address	Phone #	E-Mail
Collins Electric Nabieha Migbel Sizra Building Systems	3412 Metro Drive Stockton, CA 95215 So2 Gouzpri Et Still	609) 466-3691	d plaster Ceollin
Jon Moorz Bockmon & Woody Elec-	Roseville, CA	(530) 613-6932	John Gsizern buildings.
Bockmon & Woody Elec- Gary M. Woody	1528 El pinal Piñe Stockton ut	209 - 993 - 2548	Sonme sizern buildingsys gavy me bockmonn mikem @ rbigroup powerby baran @Gma.1-c
Gary M. Woudy Pacific Power + Systems Mike Messer Baran Electric	4970 Reaboly Rd. Fairfield, CA 94533 10020 Bromley way	707-580-0345	miken @ rhiarous
Baran Electric Cigmaek Azimpow	10020 Bromley way Saevamento Ca 95827	916.508.6628	Powerby baran OGma. 1-0
Cidimet FI Chilfan	Journal Ci (101-1		

rs electric.com
tans. net
voody. com
p. net cam
cam

#### DOCUMENT 00 45 01

## SITE VISIT CERTIFICATION

#### TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID IF SITE VISIT WAS MANDATORY

#### PROJECT: <u>2020 Fire Alarm Project – Phase 2; Lawrence Elementary</u>

Check option that applies:

\_\_\_\_\_ I certify that I visited the Site of the proposed Work, received the attached \_\_\_\_\_\_ pages of information, and became fully acquainted with the conditions relating to construction and labor. I fully understand the facilities, difficulties, and restrictions attending the execution of the Work under contract.

I certify that \_\_\_\_\_\_ (Bidder's representative) visited the Site of the proposed Work, received the attached \_\_\_\_\_\_ pages of information, and became fully acquainted with the conditions relating to construction and labor. The Bidder's representative fully understood the facilities, difficulties, and restrictions attending the execution of the Work under contract.

Bidder fully indemnifies the Lodi Unified School District, its Architect, its Engineers, its Construction Manager, and all of their respective officers, agents, employees, and consultants from any damage, or omissions, related to conditions that could have been identified during my visit and/or the Bidder's representative's visit to the Site.

I certify under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Date:

Proper Name of Bidder: \_\_\_\_\_

Signature:

Print Name:

Title:

## ATTACHMENTS:

- 1.
- 2.
- 3.

END OF DOCUMENT

LODI UNIFIED SCHOOL DISTRICT

#### DOCUMENT 00 57 00

## ESCROW AGREEMENT IN LIEU OF RETENTION (Public Contact Code Section 22300)

#### (Note: Contractor must use this form.)

This Escrow Agreement in Lieu of Retention ("Esci	row Agreement") is made and entered into
this day of	, 20, by and between
the Lodi Unified School District ("District"), whose	address is 1305 E. Vine Street , Lodi ,
California 95240 , and	("Contractor"), whose address is
, and	("Escrow
Agent"), a state or federally chartered bank in the	e state of California, whose address is

For the consideration hereinafter set forth, District, Contractor, and Escrow Agent agree as follows:

- 1. Pursuant to section 22300 of Public Contract Code of the State of California, which is hereby incorporated by reference, Contractor has the following two (2) options:
  - Deposit securities with Escrow Agent as a substitute for retention earnings required to be withheld by District pursuant to the Construction Contract No.\_\_\_\_\_ entered into between District and Contractor for the \_\_\_\_\_\_

	Project, in the amount of
	Dollars (\$)
dated,	, 20, (the "Contract"); <u>or</u>

□ On written request of Contractor, District shall make payments of the retention earnings for the above referenced Contract directly to Escrow Agent.

When Contractor deposits the securities as a substitute for Contract earnings (first option), Escrow Agent shall notify District within ten (10) calendar days of the deposit. The market value of the securities at the time of substitution and at all times from substitution until the termination of the Escrow Agreement shall be at least equal to the cash amount then required to be withheld as retention under the terms of the Contract between District and Contractor.

Securities shall be held in the name of Lodi Unified School District, and shall designate Contractor as beneficial owner.

- 2. District shall make progress payments to Contractor for those funds which otherwise would be withheld from progress payments pursuant to Contract provisions, provided that Escrow Agent holds securities in form and amount specified above.
- 3. When District makes payment of retentions earned directly to Escrow Agent, Escrow Agent shall hold them for the benefit of Contractor until the time that the escrow created under this Escrow Agreement is terminated. Contractor may direct the investment of the payments into securities. All terms and conditions of this Escrow Agreement and the rights and responsibilities of the Parties shall be equally applicable and binding when District pays Escrow Agent directly.

#### LODI UNIFIED SCHOOL DISTRICT

ESCROW AGREEMENT IN LIEU OF RETENTION ADDENDUM NO. 1 DOCUMENT 00 57 00-1

- 4. Contractor shall be responsible for paying all fees for the expenses incurred by Escrow Agent in administering the Escrow Account, and all expenses of District. The District will charge Contractor \$\_\_\_\_\_ for each of District's deposits to the escrow account. These expenses and payment terms shall be determined by District, Contractor, and Escrow Agent.
- 5. Interest earned on securities or money market accounts held in escrow and all interest earned on that interest shall be for sole account of Contractor and shall be subject to withdrawal by Contractor at any time and from time to time without notice to District.
- 6. Contractor shall have the right to withdraw all or any part of the principal in the Escrow Account only by written notice to Escrow Agent accompanied by written authorization from District to Escrow Agent that District consents to withdrawal of amount sought to be withdrawn by Contractor.
- 7. District shall have the right to draw upon the securities and/or withdraw amounts from the Escrow Account in the event of default by Contractor. Upon seven (7) days' written notice to Escrow Agent from District of the default, if applicable, Escrow Agent shall immediately convert the securities to cash and shall distribute the cash as instructed by District. Escrow Agent shall not be authorized to determine the validity of any notice of default given by District pursuant to this paragraph, and shall promptly comply with District's instructions to pay over said escrowed assets. Escrow Agent further agrees to not interplead the escrowed assets in response to a conflicting demand.
- 8. Upon receipt of written notification from District certifying that the Contract is final and complete, and that Contractor has complied with all requirements and procedures applicable to the Contract, Escrow Agent shall release to Contractor all securities and interest on deposit less escrow fees and charges of the Escrow Account. The escrow shall be closed immediately upon disbursement of all monies and securities on deposit and payments of fees and charges.
- 9. Escrow Agent shall rely on written notifications from District and Contractor pursuant to Paragraphs 5 through 8, inclusive, of this Escrow Agreement and District and Contractor shall hold Escrow Agent harmless from Escrow Agent's release and disbursement of securities and interest as set forth above.

[REMAINDER OF PAGE INTENTIONALLY LEFT BLANK]

10. Names of persons who are authorized to give written notice or to receive written notice on behalf of District and on behalf of Contractor in connection with the foregoing, and exemplars of their respective signatures are as follows:

On behalf of District:	On behalf of Contractor:
Title	Title
Name	Name
Signature	Signature
Address	Address
On behalf of Escrow Agent:	
Title	
Name	
Signature	
Address	
At the time that the Escrow Account is Escrow Agent a fully executed copy of	opened, District and Contractor shall deliver to this Agreement.
IN WITNESS WHEREOF, the parties hav on the date first set forth above.	ve executed this Agreement by their proper officers
On behalf of District:	On behalf of Contractor:
Title	Title
Name	Name
Signature	Signature
Address	Address
EN	ID OF DOCUMENT

LODI UNIFIED SCHOOL DISTRICT

ESCROW AGREEMENT IN LIEU OF RETENTION ADDENDUM NO. 1 DOCUMENT 00 57 00-3

## ASBESTOS and LEAD IN PAINT WORK PRACTICES TABLE OF CONTENTS

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#### SECTION 1. DESCRIPTION OF PROJECT

#### Part 1.1 - Project Overview

This project includes installation of fire alarm systems associated with the Fire Alarm Upgrade Project. The project primarily involves installation of these systems throughout the campus by attachment to wall or ceiling systems. The installation process includes drilling small holes and surface attachment in building systems.

The age of the buildings included in this project can date back to the 1950/1960's when it was common for lead to be present in paint and for asbestos to be present in building materials. In order to save the school district money for sampling all the different building systems for asbestos and lead in paint, the school district is assuming all building materials might contain asbestos in finish materials and/or lead in paints or coatings. Data from the district's AHERA inspections indicate asbestos is present in drywall wall or ceiling systems in most locations, with various other ceiling and wall materials also known to contain asbestos. It is assumed all interior and exterior wall and hard ceiling systems contain low levels of asbestos (as either joint compound, texture or in stucco) and it is assumed the various wall and ceiling systems also contain various concentrations of lead in the painted surfaces.

With this premise, the focus of these Asbestos and Lead in Paint Work Practices is for the contractor to follow prescribed work practices to control all dust while drilling holes or attaching components onto building systems. This project is not considered asbestos abatement or lead abatement, since this is not the reason for the project. Installation and attachment of the new systems will disturb small amounts of the building components that might contain asbestos and might contain lead in paint, which can be managed by the contractor performing the work.

These work practices/specifications for asbestos and lead are provided to assist the contractor in performing the work safely and meeting the requirements of Cal/OSHA for Asbestos in Construction Section 1529 and lead in Construction Section 1532.1. This project does not require a licensed asbestos contractor nor a contractor with lead certification typically by the California Department of Public Health (CDPH). It does require a contractor to have some asbestos and lead training to perform the work efficiently and safely. These work practices/specifications outline these work practices and requirements.

The owner's third party Certified Asbestos Consultant (CAC) will conduct personal air sampling for asbestos and lead during hole drilling activity of the contractor to assess effectiveness of the HEPA vacuum/shroud combination engineering controls that are required on this project. The air sampling will be provided for compliance with the Cal/OSHA regulations for Title 8 1529 Asbestos and Title 8 1532.1 Lead.

#### SECTION 2. DEFINITIONS

<u>Air monitoring</u> - The process of measuring the fiber content or lead content of a known volume of air collected during a specific period of time. The procedure normally utilized for asbestos follows the NIOSH Standard Analytical Method for Asbestos in Air P&CAM 239 or Method 7400. The procedure normally utilized for lead follows the NIOSH Method 7082.

<u>Asbestos</u> - Means the asbestiform varieties of serpentine (chrysotile), riebeckite (crocidolite), cummingtonite grunerite (amosite), anthophyllite, actinolite, and tremolite.

<u>Asbestos-Containing Hazardous Waste</u> - Materials defined by the State of California to be packaged, labeled, transported, and disposed of as an asbestos hazardous waste. This includes all friable asbestos-containing material over one-percent (1%) asbestos. This also includes all asbestos-containing construction materials containing less than one-percent asbestos for which one or more bulk samples have not been point counted and found to contain less than one-percent (1%) asbestos.

<u>Asbestos-Containing Construction Material</u> - Materials defined by the State of California as any manufactured construction material which contains more than 1/10th of 1% asbestos by weight.

<u>Asbestos-Containing Material (ACM)</u> - Cal/OSHA - Material composed of asbestos of any type and in an amount greater than one percent (1%) either alone or mixed with fibrous or non-fibrous materials. EPA - Asbestos-containing materials with more than one percent asbestos.

<u>Class I, II, III, or IV Work</u> - Work classes described in 8 CCR 1529 that describe different levels of asbestos work.

**DOP** - Dispersed oil particles which are normally used as an agent for testing the efficiency of HEPA filters.

<u>Friable asbestos</u> - Asbestos-containing material which can be crumbled to dust when dry, under hand pressure.

<u>HEPA Filter</u> - A high efficiency particulate air filter capable of removing particles 0.3 microns in diameter from an air stream with 99.97% efficiency.

<u>HEPA-Filtered-Vacuum With Shroud</u> - This is a mechanical tool that has a shroud or covering over the area of a surface disturbed by a mechanical system in order to eliminate or significantly reduce the amount of dust released to the ambient air by the mechanical process. The shroud must be attached to a working vacuum with HEPA filtration.

**HEPA Vacuum** - A vacuum system equipped with HEPA filtration. These units will need to be challenge tested before being allowed to be used inside of buildings on this project.

**Lead-Based Paint** - Materials meeting the definition of lead-based paint as defined by the California Department of Public Health and the United States Environmental Projection Agency. Currently defined as containing lead in concentrations equal to or greater than 1.0 mg/cm<sup>2</sup>, 5000 ppm, or 0.5% by weight.

**Lead-Containing Material** - Materials that contain measurable, quantifiable amounts of lead. The disturbance of these materials is regulated by Cal/OSHA.

<u>Permissible Exposure Limit (PEL)</u> - Permissible Exposure Limit in 8 CCR is based on an eight hour average for asbestos of 0.1 fiber/cubic centimeter and a 30 minute PEL for asbestos at 1 fiber/cc. The 8 hour PEL for lead is 50  $\mu$ g/m<sup>3</sup> for lead.

## EXHIBIT C

**<u>Regulated Area</u>** - Means an area established by a Contractor to demarcate areas where airborne concentrations of asbestos or lead exceed, or there is a reasonable possibility they may exceed, the permissible exposure limit. Additionally "Regulated Area" means any measure used to restrict access to an area where personnel impacting asbestos or lead containing materials are required to wear respiratory protection and/or protective clothing by the project specifications regardless of airborne asbestos concentration levels.

**Regulations** - shall include but not be limited to:

- a. Title 8 California Code of Regulations (CCR) Construction Safety Orders, Section 1529 Asbestos.
- b. Title 8 California Code of Regulations (CCR) Construction Safety Orders, Section 1532.1 Lead.
- c. "Asbestos Hazard Emergency Response Act", U. S. Environmental Protection Agency, 40 CFR, Part 763. Final Rule and Notice.

**<u>Removal</u>** - The stripping of any asbestos-containing materials from surface or components of a facility.

<u>Visible emissions</u> - Any emissions containing particulate asbestos or lead material that are visually detectable without the aid of instruments. This does not include condensed uncombined water vapor.

#### SECTION 3. NOTIFICATIONS

#### Part 3.1 - Notification

This asbestos and lead related work on this project will not trigger notifications to Cal/OSHA, EPA, San Joaquin Valley Air Pollution Control District (SJAPCD) or CDPH, since the asbestos and lead related work will include disturbance and not "removal" of materials.

#### SECTION 4. TRAINING

Prior to commencement of asbestos and lead in paint related work all personnel will be required to have received a limited Class III asbestos training class for drilling holes and lead awareness training for drilling holes in building materials. The anticipated total length of such a training class to meet the requirements of Cal/OSHA Title 8 1529 Asbestos is 4 hours and for Title 8 1532.1 Lead 2-4 hours for a total length of class of 6-8 hours.

#### SECTION 5. SPECIFIC PROCEDURES AND REQUIREMENTS

The contractor will be required to use a HEPA filtered vacuum in conjunction with a shroud attached to collect all dust that is being generated during the drilling activity and when screwing into building systems. This method has been proven to be extremely effective at capturing and controlling dust emissions when drilling and screwing activities are done. Attached to this document are pictures of two well known manufactured shrouds that work excellent when attached to a vacuum. There are many readily available shrouds on the market for the contractor to choose that may be just as effective.

The HEPA vacuum with attached dust shroud will be the primary engineering control for all dust that may include asbestos in finish materials and lead in paint if they are present in the building system being drilled or screwed into for various electrical equipment or conduit.

#### SECTION 6. SUBMITTALS

#### Part 6.1 - Pre-Construction Submittal

The contractor performing the work shall have received asbestos and lead training as specified in this document. Proof of such training shall be provided to the owner prior to the start of the work.

Submit Safety Data Sheets (SDS) for any and all applicable materials that will be used on the project. These documents must be legible and completely reveal information required to be communicated to the Contractor's employees, visitors, and Owner Representatives.

Submit information on the type of shroud that will be used in conjunction with the HEPA vacuum while making any holes or screwing into building systems for dust control.

Submit information on the successful third party DOP testing of all HEPA vacuums that will be used on the project. All HEPA filtered systems used on this project shall be tested and certified by an independent company, approved in advance by Owner's agent/site representative, on-site and prior to use. All vacuums shall meet ANSI Z9.2, using an appropriate testing agent. Documentation of these tests shall be provided to the Owner's agent/site representative prior to the use of any HEPA system.

All HEPA filtered vacuums shall be tested onsite by an independent testing company. Testing of HEPA vacuums must include testing of the wheel attachments, control panel, and seam and rivets of the housing, as well as, the HEPA filter itself.

All HEPA equipped equipment to be used on the project must be delivered to the site empty of all debris, clean and free of dust, and in full operating condition. DOP or equivalent testing must be conducted approved in advance by Owner's agent/site representative. Contractors may not test their own equipment. DOP or equivalent testing is required when any HEPA filters are changed or if the HEPA filtered systems are moved off site and brought back onto the site. The DOP testing is good for one year or until the filter bags are removed, in which case DOP testing is required again.

#### Part 6.2 - Post-Construction Submittal

Contractor shall provide the following post-construction submittals to Owner's Representative within thirty (30) days of the completion of asbestos and lead related work. Receipts from the licensed asbestos contractor who removed the vacuum bags from those used on the project for asbestos and lead related work. The abatement contractor would be responsible for disposal of the vacuum bags with the waste debris.

## **EXHIBIT C**

#### Part 6.3 - Pre-Construction Submittal List

1	Worker Documentation
	a) Training Records for Asbestos - Cal/OSHA Limited Class III for Drilling Holes and for Lead for Drilling Holes
2	Equipment used on the project including the type of HEPA filtered vacuum and type of shroud that will be required to be used in conjunction with the vacuum
3	Safety Data Sheets (SDS) for all materials to be used on the project
4	Name of Asbestos Contractor or Hazardous Waste Hauler who will be taking waste from HEPA vacuum for disposal of asbestos and possible lead in paint drilling dust

#### Part 6.4 - Post Construction Submittal List

Contractor shall provide the following post-construction submittals to the Owner within thirty (30) days of the completion of asbestos abatement work.

1. \_\_\_\_\_ Receipts from the licensed asbestos contractor who removed the vacuum bags from those used on the project for asbestos and lead related work. The abatement contractor would be responsible for disposal of the vacuum bags with the waste debris

## **EXHIBIT C**

## PREPARED BY:

Blake Howes, CAC Senior Project Manager Entek Consulting Group, Inc. CAC #13-5015 CDPH Lead #3315 March 18, 2020

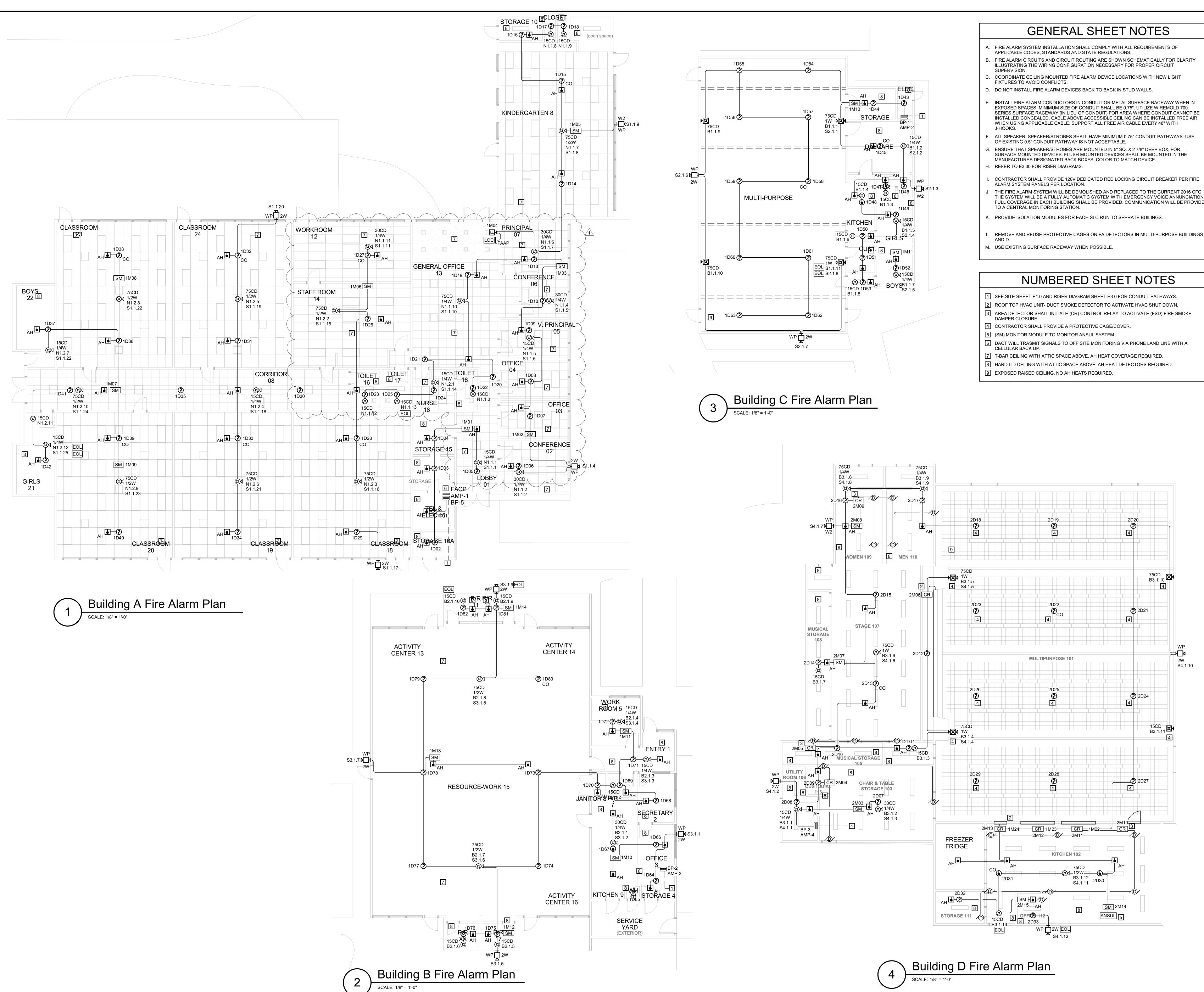
C:\Users\bhowes\Entek Consulting Group, Inc\Entekgroup - Documents\Clients\Lodi USD\20-5480 Lawrence ES Fire Alarm\Specs\Asbestos and Lead Work Practices Exhibit C Lawrence ES 3-18-20.wpd



BOSCH HDC200 Shroud attached to a HEPA Vacuum

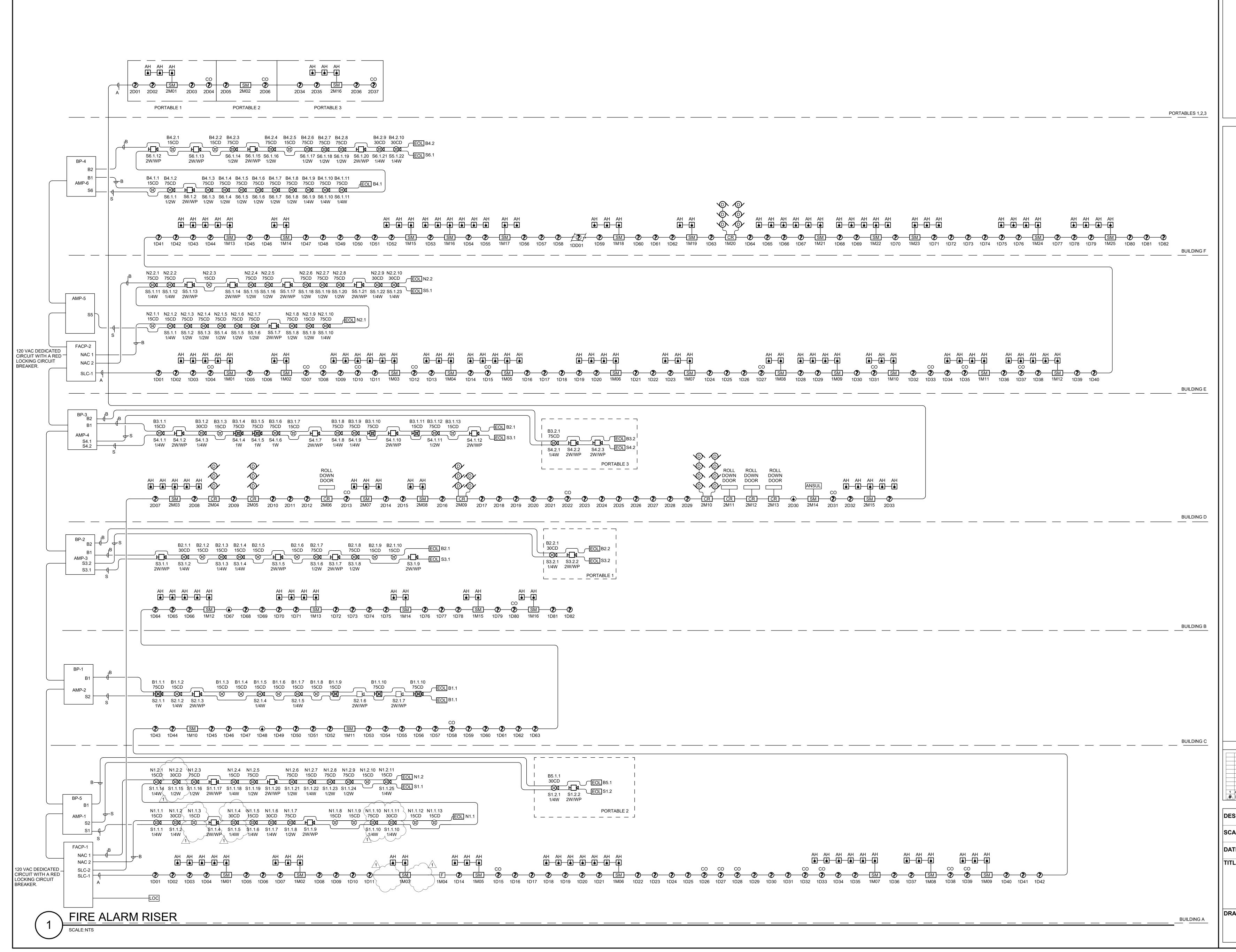


Bit Buddy Shroud attached to a HEPA vacuum



- THE SYSTEM WILL BE A FULLY AUTOMATIC SYSTEM WITH EMERGENCY VOICE ANNUNCIATION. FULL COVERAGE IN EACH BUILDING SHALL BE PROVIDED. COMMUNICATION WILL BE PROVIDED
- . REMOVE AND REUSE PROTECTIVE CAGES ON FA DETECTORS IN MULTI-PURPOSE BUILDINGS C

Lawrence Elementary School 721 Calaveras St, Lodi, CA 95240
REVISIONS
DESIGNER:Designer  SCALE: 1/8" = 1'-0"  DATE:2019.12.20  TITLE:  FIRE ALARM PLAN - A, B, C & D



IDENTIFICATION STAMP DIV. OF THE STATE ARCHITECT APPL. # 02-118026 INC: # REVIVEWED FOR SSFLSACS DATE:	
<section-header><section-header><section-header><section-header><section-header><section-header><section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header>	
Lawrence Elementary School 721 Calaveras St, Lodi, CA 95240	
REVISIONS	
Addendum-1 03/23/2020	
DESCRIPTION DATE	
ALE: NTS	
E:2019.12.20	
FIRE ALARM RISER	
WING NO.	
E3.00	

System Current Draw	LAWRENCE AMPLIFIER1	LAWRENCE AMPLIFIER 2	LAWRENCE AMPLIFIER 3
E3 Series Control Panel with Broadband	Standby Current (amps) Alarm Current (amps)	Standby Current (amps) Alarm Current (amps)	Standby Current (amps) Alarm Current (amps)
	Device Type QTY Watts Current Draw Total Qty Current Draw Total	Device Type QTY Watts Current Draw Total Qty Current Draw Total	Device Type QTY Watts Current Draw Total Qty Current Draw Total
Total Standby 0.444 A Total Alarm 12.015 A	1. System	1. System	
Standby Current Alarm Current	HONEYWELL DAA2 1 50 X 0.0860 = 0.0860 0 X 2.2060 = 2.2060	HONEYWELL DAA2 1 50 X 0.0860 = 0.0860 0 X 2.2060 = 2.2060	1. System           HONEYWELL DAA2         1         50         X         0.0860         =         0.0860         0         X         2.2060         =         2.2060
vice Qty Draw Standby Qty Draw Alarm	X = 0.0000	X = 0.0000	X = 0 X = 0.0000
System Device el. Loop Interface, Main Board (ILI-MB-E3) 1 x 0.08100 0.08100 1 x 0.15000 0.15000	X = 0.0000	X = 0.0000	X = 0 X = 0.0000
el. Loop Interface Supplement Board (ILI-S-E3) 0 x 0.08100 0 x 0.15000	2. Speakers	2. Speakers	2. Speakers
e. Loop Interface Main Board - Apollo (ILI95-MB-E3)         0         x         0.05000         0         x         0.09100           e. Loop Interface Supplement Board - Apollo (ILI95-S-E3)         0         x         0.05000         0         x         0.09100	Total Speaker Watts @ 25Vrms 0 0.0000 = 0.0000	Total Speaker Watts @ 25Vrms 0 0.0000 = 0.0000	Total Speaker Watts @ 25Vrms 0 0.0000 = 0.0000
00 Panel, 1 SLC 1 x 0.05600 0.05600 1 x 0.07600 0.07600	Total Speaker Watts @ 70.7Vrms 14.75 0.2086 = 0.2086	Total Speaker Watts @ 70.7Vrms 7.75 0.1096 = 0.1096	Total Speaker Watts @ 70.7Vrms 9.75 0.1379 = 0.1379
00 Panel, 1 SLC with DACT 0 x 0.07500 0 x 0.09500	Total Standby Load 0.0860 Total Alarm Load 2.4146	Total Standby Load 0.0860 Total Alarm Load 2.3156	Total Standby Load 0.0860 Total Alarm Load 2.3439
00 Panel, 2 SLC         0         x         0.06500         0         x         0.08500           00 Panel, 2 SLC with DACT         0         x         0.08500         0         x         0.10500	ζΟ	0	0
E3 Optional Modules	Required Standby Time in Hours	Required Standby Time in Hours	Required Standby Time in Hours
OV Power Supply Sub-Assembly (PM-9)         0         x         0.05000         0         x         0.05000           0/ Power Supply Sub-Assembly (PM-9G)         0         x         0.02700         0         x         0.05000	Standby Load Current (Amps) 0.0860 Amps X 24 = 2.064 AH	Standby Load Current (Amps)     0.0860 Amps     X     24     =     2.064 AH	Standby Load Current (Amps) 0.0860 Amps X 24 = 2.064 A
OV Power Supply Sub-Assembly (PM-9G)         0         x         0.02700         0         x         0.05000           D Display & Switch Control (LCD-E3)         0         x         0.02400         0         x         0.02800         7	Required Alarm Time in Hours	Required Alarm Time in Hours	Required Alarm Time in Hours
CNET Repeater (RPT-E3) 0 x 0.01300 0 x 0.01300	Alarm Load Current (Amps)         2.4146 Amps         X         15         =         0.604 AH	Alarm Load Current (Amps)         2.3156 Amps         X         15         =         0.579 AH	Alarm Load Current (Amps) 2.3439 Amps X 15 = 0.586 A
tianal Demote Serial Appunisator (LCD 7100)         1         x         0.01800         1         x         0.01800         0.01800	Total Current Load 2.67 AH	Total Current Load 2.64 AH	Total Current Load 2.65 A
tional Remote Serial Annunicator (LCD-7100)         0         x         0.05000         0         x         0.07500           twork LCD Annunicator (NGA)         0         x         0.20000         0         x         0.20000	*Multiply by the Derating Factor = x 1.20	*Multiply by the Derating Factor = x 1.20	*Multiply by the Derating Factor = x 1. Total Ampere Hours Required 3.18
xiliary Switch Sub-Assembly (ASM-16) 0 x 0.01100 0 x 0.01100	Total Ampere Hours Required 3.20 AH	Total Ampere Hours Required 3.17 AH	
mote LED Driver Module (ANU-48)         0         x         0.01100         0         x         0.01100           dressable Node Expander (ANX)         0         x         0.06500         0         x         0.06500	Recommended Batteries: 7AH BATTERIES	Recommended Batteries: 7AH BATTERIES	
7100 Optional Modules	*Derating Factor required to compensate for the non-linear discharge characteristic of a battery.	*Derating Factor required to compensate for the non-linear discharge characteristic of a battery.	*Derating Factor required to compensate for the non-linear discharge characteristic of a battery.
Igent Network Inferface Module (INI-7100)         0         x         0.04000         0         x         0.04000           nter Transient Module (PTRM)         0         x         0.02000         0	L L L L L L L L L L L L L L L L L L L		
nter Transient Module (PTRM)         0         x         0.02000         0         x         0.02000           mote LED Driver Module (LDM-7100)         0         x         0.03500         0         x         0.20000			
ass A Option Module (CAOM) 0 x 0.00100 0 x 0.00100			
inicipal Circuit Option Module (MCOM) 0 x 0.00100 0 x 0.00100 0 x 0.00100			
el. Network Command Center (INI-VGC) 0 x 0.15000 0 x 0.15000			
dressable Switch Sub-assembly (ASM-16)         0         x         0.01100         0         x         0.01100           ice Paging Microphone (Microphone)         0         x         0.00100         0         x         0.00100	LAWRENCE AMPLIFIER 4	LAWRENCE AMPLIFIER 5	LAWRENCE AMPLIFIER 6
efighter's Telephone (Handset) 0 x 0.02000 0 x 0.02000			Standby Current (ampa) Alarm Current (ampa)
dressable Output Module-Telephone (AOM-TEL) 0 x 0.00200 0 x 0.00650 0 x 0.00650	Standby Current (amps) Alarm Current (amps)	Standby Current (amps) Alarm Current (amps)	Standby Current (amps) Alarm Current (amps)
el. Network Voice Gateway (INI-VGX) 0 x 0.15000 0 x 0.15000	Device Type QTY Watts Current Draw Total Qty Current Draw Total	Device Type QTY Watts Current Draw Total Qty Current Draw Total	Device Type QTY Watts Current Draw Total Qty Current Draw Total
0V Power Supply Sub-Assembly (PM-9)         0         x         0.05000         0         x         0.05000           0V Power Supply Sub-Assembly (PM-9G)         0         x         0.02700         0         x         0.05000	I. System           HONEYWELL DAA2         1         50         X         0.0860         0         X         2.2060         =         2.2060	1. System	1. System           HONEYWELL DAA2         1         50         X         0.0860         =         0.0860         0         X         2.2060         =         2.2060
nplifier Sub-assembly, 50 watt 25V (AM-50) 3 x 0.08600 0.25800 3 x 2.20600 6.61800		HONEYWELL DAA2 1 50 X 0.0860 = 0.0860 0 X 2.2060 = 2.2060	HONEYWELL DAA2         1         50         X         0.0860         =         0.0860         0         X         2.2060         =         2.2060           X         =         0         X         =         0         X         =         0.0000
Implifier Sub-assembly, 50 watt 70V (AM-50-70)         0         x         0.04900         0         x         2.30000           dressable Output Module-Signal (AOM-2SF)         0         x         0.00200         0         x         0.00650	X = 0 X = 0.0000	X = 0 X = 0.0000	
dressable Output Module-Telephone (AOM-TEL)         0         x         0.00200         0         x         0.00650	X = 0 X = 0.0000		2. Speakers
dressable Output Module-Audio (AOM-MUX) 0 x 0.00200 0 x 0.00650 INI-VGE Command Center Voice Gateway	2. Speakers           Total Speaker Watts @ 25Vrms         0         0.0000         =         0.0000	2. Speakers           Total Speaker Watts @ 25Vrms         0         0.0000         =         0.0000	Total Speaker Watts @ 25Vrms 0 0.0000 = 0.0000
Introduction     Command Center Voice Gateway       el. Network Command Voice Gateway (INI-VGE)     0     x     0.15000     0     x     0.15000       dressable Switch Sub-assembly (ASM-16)     0     x     0.01100     0     x     0.01100	Total Speaker Watts @ 20 Virits         10 0         0.0000         0.0000         0.0000         0.0000           Total Speaker Watts @ 70.7Vrms         12.5         0.1768         0.1768         0.1768	Total Speaker Watts @ 25Vrms         0         0.0000         =         0.0000           Total Speaker Watts @ 70.7Vrms         17.25         0.2440         =         0.2440	Total Speaker Watts @ 70.7Vrms         17.25         0.2440         =         0.2440
	Total Standby Load 0.0860 Total Alarm Load 2.3828	Total Standby Load 0.0860 Total Alarm Load 2.4500	Total Standby Load 0.0860 Total Alarm Load 2.4500
ice Paging Microphone (Microphone)         1         x         0.00100         1         x         0.00100         0.00100           efighter's Telephone (Handset)         0         x         0.02000			0
dressable Output Module-Signal (AOM-2SF) 0 x 0.00200 0 x 0.00650	Required Standby Time in Hours	Required Standby Time in Hours	Required Standby Time in Hours
dressable Output Module-Telephone (AOM-TEL) 0 x 0.00200 0 x 0.00650	Standby Load Current (Amps) 0.0860 Amps X 24 = 2.064 AH	Standby Load Current (Amps) 0.0860 Amps X 24 = 2.064 AH	Standby Load Current (Amps)         0.0860 Amps         X         24         =         2.064
dressable Output Module-Audio (AOM-MUX) 0 x 0.00200 0 x 0.00650 Smoke Detectors/Modules	Required Alarm Time in Hours	Required Alarm Time in Hours	Required Alarm Time in Hours
D-L2F HEAT DETECTOR 0 x 0.00030 0 x 0.00650	Alarm Load Current (Amps) 2.3828 Amps X 15 = 0.596 AH	Alarm Load Current (Amps) 2.4500 Amps X 15 = 0.612 AH	Alarm Load Current (Amps) 2.4500 Amps X 15 = 0.612
B-2F BEAM DETECTOR         0         x         0.00200         0         x         0.08500           95 DUCT DETECTOR         0         x         0.00400         0         x         0.20000	Total Current Load 2.66 AH	Total Current Load 2.68 AH	Total Current Load 2.68
35 DOCT DETECTOR         0         x         0.00400         0         x         0.20000           CS-COF CO/SMOKE DETECTOR         6         x         0.00030         0.00180         6         x         0.003900	*Multiply by the Derating Factor = x 1.20	*Multiply by the Derating Factor = x 1.20	*Multiply by the Derating Factor = x 1
	Total Ampere Hours Required 3.19 AH	Total Ampere Hours Required 3.21 AH	Total Ampere Hours Required 3.21
1M2IF DUAL MONITOR MODULE 0 x 0.00750 0 x 0.00570	Total Ampere Hours Required 5.19 Am		
IM2IF DUAL MONITOR MODULE         0         x         0.00750         0         x         0.00570           IM-4F MONITOR MODULE         14         x         0.00038         0.00525         14         x         0.00500         0.07000	Recommended Batteries: 7AH BATTERIES	Recommended Batteries: 7AH BATTERIES	Recommended Batteries: 7AH BATTERIES
IM2IF DUAL MONITOR MODULE       0       x       0.00750       0       x       0.00570         IM-4F MONITOR MODULE       14       x       0.00038       0.00525       14       x       0.00500       0.07000         IM-4F MONITOR MODULE       0       x       0.00500       0       x       0.00500       0.07000         IM-4F MONITOR MODULE       0       x       0.00500       0       x       0.00500         IM-4F MONITOR MODULE       0       x       0.00500       0       x       0.00500         IM-4F MONITOR MODULE       0       x       0.00500       0       x       0.00500         IM-4F MONITOR MODULE       0       x       0.00038       0       x       0.00500			Recommended Batteries:         7AH BATTERIES           *Derating Factor required to compensate for the non-linear discharge characteristic of a battery.         * Derating Factor required to compensate for the non-linear discharge characteristic of a battery.
IM2IF DUAL MONITOR MODULE       0       x       0.00750       0       x       0.00570         IM-4F MONITOR MODULE       14       x       0.00038       0.00525       14       x       0.00500       0.07000         MM-4F MONITOR MODULE       0       x       0.000500       0       x       0.00500       0.07000         MM-2RF RELAY MODULE       0       x       0.00038       0       x       0.00650         S7 PULL STATION       1       x       0.00030       1       x       0.00300       0.00300	Recommended Batteries: 7AH BATTERIES	Recommended Batteries: 7AH BATTERIES	
M2IF DUAL MONITOR MODULE       0       x       0.00750       0       x       0.00570         MM-4F MONITOR MODULE       14       x       0.00038       0.00525       14       x       0.00500       0.07000         MM-4F MONITOR MODULE       0       x       0.00500       0       x       0.00500       0.07000         MM-2RF RELAY MODULE       0       x       0.00038       0       x       0.00650       0         S7 PULL STATION       1       x       0.00030       1       x       0.00300       0.00300         SD-PL3 PHOTO SMOKE DETECTOR       76       x       0.00030       0.02280       76       x       0.00650       0.49400	Recommended Batteries: 7AH BATTERIES	Recommended Batteries: 7AH BATTERIES	
IM2IF DUAL MONITOR MODULE       0       x       0.00750       0       x       0.00570         IM-4F MONITOR MODULE       14       x       0.00038       0.00525       14       x       0.00500       0.07000         MM-4F MONITOR MODULE       0       x       0.000500       0       x       0.00500       0.07000         MM-2RF RELAY MODULE       0       x       0.00038       0       x       0.00650         S7 PULL STATION       1       x       0.00030       1       x       0.00300       0.00300	Recommended Batteries: 7AH BATTERIES	Recommended Batteries: 7AH BATTERIES	
IM2IF DUAL MONITOR MODULE       0       x       0.00750       0       x       0.00570         IM-4F MONITOR MODULE       14       x       0.00038       0.00525       14       x       0.00500       0.07000         MM-4F MONITOR MODULE       0       x       0.000500       0       x       0.00500       0.07000         MM-2RF RELAY MODULE       0       x       0.00038       0       x       0.00650       0         MM-2RF RELAY MODULE       0       x       0.00030       1       x       0.00300       0.00300         S7 PULL STATION       1       x       0.00030       0.002280       76       x       0.00300       0.00300         GD-PL3 PHOTO SMOKE DETECTOR       76       x       0.00000       0.02280       76       x       0.049400         Notification Appliances       12       x       0.00000       0.00000       12       x       0.14300       1.71600         CC24CW15       12       x       0.00000       0.00000       5       x       0.15300       0.76500	Recommended Batteries: 7AH BATTERIES	Recommended Batteries: 7AH BATTERIES	
IM2IF DUAL MONITOR MODULE       0       x       0.00750       0       x       0.00570         IM-4F MONITOR MODULE       14       x       0.00038       0.00525       14       x       0.00500       0.07000         MM-4F MONITOR MODULE       0       x       0.000500       0       x       0.00500       0.07000         MM-2R FRELAY MODULE       0       x       0.00030       0       x       0.000300       0       x       0.000300         MM-2RF RELAY MODULE       0       x       0.00030       0.00030       1       x       0.000300       0.00300         S7 PULL STATION       1       x       0.00030       0.02280       76       x       0.000300       0.00300         BD-PL3 PHOTO SMOKE DETECTOR       76       x       0.00000       0.02280       76       x       0.00650       0.49400         Notification Appliances       2       x       0.14300       1.71600         CC24CR30       5       x       0.00000       0.00000       5       x       0.15300       0.76500         CC24CR75       7       x       0.00000       0.00000       7       x       0.29500       2.06500	Recommended Batteries: 7AH BATTERIES	Recommended Batteries: 7AH BATTERIES	
IM2IF DUAL MONITOR MODULE       0       x       0.00750       0       x       0.00570         IM-4F MONITOR MODULE       14       x       0.00038       0.00525       14       x       0.00500       0.07000         600X ISOLATION MODULE       0       x       0.000500       0       x       0.00500       0       x       0.00500         0M-2RF RELAY MODULE       0       x       0.00038       0       x       0.00650       0       x       0.00300	Recommended Batteries: 7AH BATTERIES	Recommended Batteries: 7AH BATTERIES	
M2IF DUAL MONITOR MODULE       0       x       0.00750       0       x       0.00570         MM-4F MONITOR MODULE       14       x       0.00038       0.00525       14       x       0.00500       0.07000         MM-4F MONITOR MODULE       0       x       0.00500       0       x       0.00500       0.07000         MM-2RF RELAY MODULE       0       x       0.00030       0       x       0.00650       0         MM-2RF RELAY MODULE       0       x       0.00030       0.00030       1       x       0.00300       0.00300         MM-2RF RELAY MODULE       0       x       0.00030       0.00030       1       x       0.000300       0.00300         MODULE STATION       1       x       0.00030       0.02280       76       x       0.00300       0.00300         SD-PL3 PHOTO SMOKE DETECTOR       76       x       0.00000       12       x       0.14300       1.71600         C24CW15       12       x       0.00000       0.00000       5       x       0.15300       0.76500         C24CR75       7       x       0.00000       0       x       0.00000       0       x       0.00000	Recommended Batteries: 7AH BATTERIES	Recommended Batteries: 7AH BATTERIES	
M2IF DUAL MONITOR MODULE       0       x       0.00750       0       x       0.00570         MM-4F MONITOR MODULE       14       x       0.00038       0.00525       14       x       0.00500       0.07000         MM-4F MONITOR MODULE       0       x       0.00500       0       x       0.00500       0.07000         S00X ISOLATION MODULE       0       x       0.00038       0       x       0.00500         DM-2RF RELAY MODULE       0       x       0.00030       1       x       0.00300       0.00300         S7 PULL STATION       1       x       0.00030       0.02280       76       x       0.00300       0.00300         SD-PL3 PHOTO SMOKE DETECTOR       76       x       0.00000       0.00000       12       x       0.14300       1.71600         C24CW15       12       x       0.00000       0.00000       5       x       0.15300       0.76500         C24CR75       7       x       0.00000       0       x       0.00000       0       x       0.00000         0       x       0.00000       0       x       0.00000       0       x       0.00000       0       x       0.00000	Recommended Batteries: 7AH BATTERIES	Recommended Batteries: 7AH BATTERIES	
IM2IF DUAL MONITOR MODULE       0       x       0.00750       0       x       0.00570         IM-4F MONITOR MODULE       14       x       0.00038       0.00525       14       x       0.00500       0.07000         M0-4F MONITOR MODULE       0       x       0.00500       0       x       0.00500       0.07000         M0-4F MONITOR MODULE       0       x       0.00030       0       x       0.00500       0       x       0.00500         M0-2RF RELAY MODULE       0       x       0.00030       1       x       0.00300       0.00300       0.00300         M0-2RF RELAY MODULE       0       x       0.00030       0.00030       1       x       0.00300       0.00300         M0-2RF RELAY MODULE       0       x       0.00030       0.00030       1       x       0.00300       0.00300         DD-PL3 PHOTO SMOKE DETECTOR       76       x       0.00000       12       x       0.14300       1.71600         C24CW15       12       x       0.00000       0       x       0.15300       0.76500         C24CR75       7       x       0.00000       0       x       0.00000       0       x       0.29500	Recommended Batteries: 7AH BATTERIES	Recommended Batteries: 7AH BATTERIES	
IM2IF DUAL MONITOR MODULE       0       x       0.00750       0       x       0.00570         IM-4F MONITOR MODULE       14       x       0.00038       0.00525       14       x       0.00500       0.07000         500X ISOLATION MODULE       0       x       0.000500       0       x       0.00500       0       x       0.00500         DM-2RF RELAY MODULE       0       x       0.00038       0       x       0.00650       0.00300       0.000	Recommended Batteries: 7AH BATTERIES	Recommended Batteries: 7AH BATTERIES	
IM2IF DUAL MONITOR MODULE       0       x       0.00750       0       x       0.00570         IM-4F MONITOR MODULE       14       x       0.00038       0.00525       14       x       0.00500       0.07000         ioox ISOLATION MODULE       0       x       0.00030       0       x       0.00500       0       x       0.00500         DM-2RF RELAY MODULE       0       x       0.00030       1       x       0.00300       0.0030	Recommended Batteries: 7AH BATTERIES	Recommended Batteries: 7AH BATTERIES	

	LAV	VRE	N	CE A	M	PLIFI	EF	2	7		
		Standb	y Cu	irrent (amp	s)		Alar	m C	Current (amps	3)	
Device Type	QTY	Watts	Cu	rrent Draw		Total	Qty	Qty Current Draw Total			Total
1. System											
HONEYWELL DAA2	1	50	Х	0.0860	=	0.0860	0	Х	2.2060	=	2.2060
			Х		=		0	Х		=	0.0000
			Х		=		0	Х		=	0.0000
2. Speakers											
Total Speaker Watts @ 25	Vrms	0							0.0000	=	0.0000
Total Speaker Watts @ 70.7Vrms 8.75 0.1238							=	0.1238			
Total Standby Load 0.0860 Total Alarm Loa						ad	2.3298				
				0							
							Req	uire	ed Standby Ti	ime	in Hours
Standby Load Current (Amps) 0.0860 Amps X 24						=	2.064 AF				
							Req	uire	d Alarm Time	e ir	1 Hours
Alarm Load Current (Amps) 2.3298 Amps X 15						=	0.582 AH				
Total Current Loa						ad	2.65 AF				
*Multiply by the Derating Factor						=	x 1.20				
						Total Amp	ere F	lou	rs Required		3.18 AF
				Recomme	nde	d Batteries:			7AH BATT	ER	lies
*Derating Factor required to c	ompensat	e for the no	on-lin	ear discharg	je cł	naracteristic of	a bat	tery.			

Voltage Drop Calculations

CIRCUIT NAME: NAC Circuit 1 POWER SOURCE: BPS-4 MODEL NUMBER: HPF24S8 BRAND: HPP VOLTS: 20.4 AWG: 12 POWER: DC AMPS: 3

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CLASS: CLASS B TOTAL DEVICES: 11 39.2 % (1.176) AMPS USED 3.37 % (0.687) VOLTAGE DROP

#	MODEL	CANDELA	PATTERN	VOLUME	TONE	CURRENT	DISTANCE	12 AWG	14 AWG	16 AWG	18 AWG
1	SPSCWL	75				0.111	25	20.282	20.212	20.101	19.925
2	SPSCWL	75				0.111	25	20.175	20.042	19.830	19.495
3	SPSCWL	75				0.111	25	20.079	19.890	19.588	19.110
4	SPSCWL	75				0.111	25	19.994	19.756	19.374	18.769
5	SPSCWL	75				0.111	25	19.920	19.639	19.188	18.473
6	SPSCWL	75				0.111	25	19.858	19.540	19.030	18.222
7	SPSCWL	75				0.111	25	19.807	19.459	18.900	18.016
8	SPSCWL	75				0.111	25	19.767	19.395	18.799	17.855
9	SPSCWL	75				0.111	25	19.738	19.349	18.726	17.739
10	SPSCWL	75				0.111	25	19.720	19.321	18.681	17.667
11	SCW	15				0.066	25	19.713	19.310	18.664	17.640
							VOLTAGE [	0.687	1.090	1.736	2.760

Voltage Drop Calculations CIRCUIT NAME: NAC Circuit 1 POWER SOURCE: BPS-1 MODEL NUMBER: HPF24S8 BRAND: HPP VOLTS: 20.4 AWG: 12 POWER: DC

AMPS: 3

#	MODEL	CANDELA	PATTERN	VOLUME	TONE	CURRENT (	DISTANCE	12 AWG	14 AWG	16 AWG	18 AWG
	1 SPSW (Stro	75				0.158	25	20.307	20.252	20.165	20.025
	2 SPSW (Stro	75				0.158	25	20.230	20.129	19.970	19.714
	3 SCW	15				0.066	25	20.169	20.032	19.815	19.467
	4 SCW	15				0.066	25	20.114	19.945	19.677	19.247
	5 SCW	15				0.066	25	20.066	19.869	19.555	19.053
	6 SCW	15				0.066	25	20.024	19.803	19.450	18.886
	7 SPSCWL	15				0.041	25	19.989	19.748	19.362	18.746
	8 SPSCWL	15				0.041	25	19.958	19.699	19.284	18.622
	9 SPSCWL	15				0.041	25	19.931	19.657	19.217	18.515
	10 SW	15				0.066	25	19.908	19.621	19.160	18.425
	11 SW	75				0.158	25	19.892	19.596	19.120	18.363
							VOLTAGE D	0.508	0.804	1.280	2.039

# Voltage Drop Calculations

CIRCUIT NAME: NAC Circuit 1 POWER SOURCE: BPS-5 MODEL NUMBER: HPF24S8 BRAND: HPP VOLTS: 20.4 AWG: 12 POWER: DC

AMPS: 3

#	MODEL	CANDELA	PATTERN	VOLUME	TONE	CURRENT (	DISTANCE	12 AWG	14 AWG	16 AWG	18 AWG
1	SPSCWL	30				0.063	25	20.376	20.362	20.340	20.304
2	SPSCWL	30				0.063	25	20.359	20.334	20.296	20.234
3	SPSCWL	75				0.111	25	20.348	20.316	20.268	20.189
							VOLTAGE [	0.052	0.084	0.132	0.211

CLASS: CLASS B TOTAL DEVICES: 11

30.9 % (0.927) AMPS USED 2.49 % (0.508) VOLTAGE DROP Voltage Drop Calculations

CIRCUIT NAME: NAC Circuit 1
POWER SOURCE: BPS-2
MODEL NUMBER: HPF24S8
BRAND: HPP
VOLTS: 20.4
AWG: 12
POWER: DC
AMPS: 3

CLASS: CLASS B TOTAL DEVICES: 10 23.23 % (0.697) AMPS USED 1.95 % (0.397) VOLTAGE DROP

#	MODEL	CANDELA	PATTERN	VOLUME	TONE	CURRENT (	DISTANCE	12 AWG	14 AWG	16 AWG	18 AWG
1	SPSCWL	15				0.041	25	20.330	20.289	20.223	20.11
2	SPSCWL	15				0.041	25	20.264	20.184	20.056	19.85
3	SPSCWL	30				0.063	25	20.202	20.086	19.900	19.60
4	SPSCWL	75				0.111	25	20.147	19.998	19.760	19.38
5	SPSCWL	75				0.111	25	20.103	19.928	19.648	19.20
6	SCW	15				0.066	25	20.070	19.875	19.564	19.07
7	SCW	15				0.066	25	20.043	19.833	19.497	18.96
8	SCW	15				0.066	25	20.023	19.801	19.447	18.88
9	SCW	15				0.066	25	20.010	19.780	19.413	18.83
10	SCW	15				0.066	25	20.003	19.769	19.396	18.8
							VOLTAGE D	0.397	0.631	1.004	1.59

CIRCUIT NAME: NAC Circuit 2
POWER SOURCE: BPS-4
MODEL NUMBER: HPF24S8
BRAND: HPP
VOLTS: 20.4
AWG: 12
POWER: DC

AMPS: 3

CLASS: CLASS B TOTAL DEVICES: 10 29.3 % (0.879) AMPS USED 2.56 % (0.522) VOLTAGE DROP

										-	
#	MODEL	CANDELA	PATTERN	VOLUME	TONE	CURRENT (	DISTANCE	12 AWG	14 AWG	16 AWG	18 AWG
1	SCW	15				0.066	25	20.312	20.260	20.177	20.045
2	SCW	15				0.066	25	20.230	20.130	19.970	19.717
3	SCW	15				0.066	25	20.155	20.011	19.780	19.415
4	SPSCWL	75				0.111	25	20.087	19.902	19.607	19.140
5	SPSCWL	75				0.111	25	20.030	19.811	19.462	18.910
6	SPSCWL	30				0.063	25	19.984	19.738	19.345	18.725
7	SPSCWL	30				0.063	25	19.944	19.675	19.244	18.565
8	SPSCWL	75				0.111	25	19.911	19.622	19.159	18.430
9	SPSCWL	75				0.111	25	19.889	19.587	19.103	18.340
10	SPSCWL	75				0.111	25	19.878	19.569	19.075	18.295

# CLASS: CLASS B TOTAL DEVICES: 3 7.9 % (0.237) AMPS USED .25 % (0.052) VOLTAGE DROP

Voltage Drop Calculations	Voltage Drop	Calculations
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CIRCUIT NAME: NAC Circuit 1 POWER SOURCE: BPS-3 MODEL NUMBER: HPF24S8 BRAND: HPP VOLTS: 20.4

AWG: 12 POWER: DC AMPS: 3

VOLTAGE 0.522 0.831 1.325

CLASS: CLASS B TOTAL DEVICES: 13 42.87 % (1.286) AMPS USED 4.66 % (0.950) VOLTAGE DROP

DISTANCE	12 AWG	14 AWG	16 AWG	18 AWG	Б												
					#	#	MODEL	CANDELA	PATTERN	VOLUME	TONE	CURRENT (	DISTANCE	12 AWG	14 AWG	16 AWG	18 AWG
25	20.312	20.260	20.177	20.045		1	SPSCWL	75				0.111	25	20.271	20.195	20.073	19.880
25	20.230	20.130	19.970	19.717		2	SPSCWL	75				0.111	25	20.153	20.008	19.775	19.405
25	20.155	20.011	19.780	19.415		3	SPSCWL	75				0.111	25	20.046	19.838	19.505	18.975
25	20.087	19.902	19.607	19.140		4	SPSCWL	75				0.111	25	19.950			
						5	SPSCWL	15				0.041	25	19.865	19.552	19.049	18.250
25	20.030			18.910	Г	6	SCW	15				0.066	25	19.784	19.424	18.846	17.926
25	19.984	19.738	19.345	18.725		7	SPSCWL	30				0.063	25	19.710	19.307	18.659	17.629
25	19.944	19.675	19.244	18.565		8	SCW	15				0.066	25	19.642	19.200	18.488	17.358
25	19.911	19.622	19.159	18.430		9	SCW	15				0.066	25	19.581	19.103	18.334	17.113
25	19.889	19.587	19.103	18.340		10	SPSW (Stro	75				0.158	25	19.527	19.017	18.197	16.895
						11	SPSW (Stro	75				0.158	25	19.489	18.956	18.100	16.741
25	19.878	19.569		18.295	Г	12	SW	15				0.066	25	19.466	18.920	18.043	16.651
/OLTAGE [	0.522	0.831	1.325	2.105	F	13	SW	75				0.158	25	19.450			
									•	-	•	-	VOLTAGE [	0.950	1.505	2.397	3.813
					L	13	500	75				0.138					

IDENTIFICATION STAMP DIV. OF THE STATE ARCHITECT APPL. # 02-118026 INC: # REVIVEWED FOR SSFLSACS DATE:
CONSULTING ENGINEERS 125 HIGH STREET AUBURN, CA 95603 (530) 886-8556 No. E015491 Exp. 96/20/21 No. E015491 Exp. 96/20/21 Consulting Engineering No. E015491 Exp. 96/20/21
Lawrence Elementary School 721 Calaveras St, Lodi, CA 95240
REVISIONS         Image: marked state s
TITLE: FIRE ALARM CALCULATIONS DRAWING NO. E4.01