

FILE: 48-C1

IDENTIFICATION STAMP DIVISION OF THE STATE ARCHITECT		
02-116082		
AC	<u>JCC</u>	FLS <u>GBC</u> ss <u>PVL</u>
DATE:	10/31/2017	

Solano Community College District Vacaville Classroom Building Renovation Project (REH)

APPLICATION #02-116082

PROJECT MANUAL

DSA SUBMITTAL

October 30, 2017

TRACKING NUMBER:

48- C1

VOLUME I of I



SCCD – Vacaville Campus
2000 North Village Parkway
Vacaville, CA 95688



CA Architects
475 Gate 5 Rd, Suite 107
Sausalito, CA 94965
Tel: 415.331.7655

**RFP#18-005 VACAVILLE
CLASSROOM BUILDING (ANNEX)
RENOVATION PROJECT MANUAL**

PROJECT/CONTRACT NUMBER: #18-005

**Renovation of Existing Classroom Building to
Obtain DSA Certification**

SOLANO COMMUNITY COLLEGE DISTRICT

OCTOBER 30, 2017

TABLE OF CONTENTS

00 00 00 Procurement and Contracting Requirements

- 00 01 01 Project Title Page**
- 00 01 10 Table of Contents**
- 00 01 15 List of Drawings and Tables**
- 00 01 20 List of Schedules**

00 10 00 Solicitation

- 00 11 00 Advertisements and Invitations**
- 00 11 16 Notice to Bidders**

00 20 00 Instructions for Procurement

- 00 21 00 Instructions**
- 00 21 13 Instructions to Bidders**
- 00 21 13.1 Bidder Information and Forms

00 30 00 Available Information

- 00 31 00 Available Project Information**
- 00 31 19 Existing Conditions**
- 00 31 32 Geotechnical Data**

00 40 00 Procurement Forms and Supplements

- 00 41 00 Bid Forms**
- 00 41 13 Bid Form and Proposal**
- 00 43 00 Procurement Form Supplements**
- 00 43 13 Bid Bond**
- 00 43 36 Designated Subcontractors List**

00 45 00 Representations and Certifications

- 00 45 01 Site Visit Certification**
- 00 45 19 Non-Collusion Declaration**
- 00 45 26 Workers' Compensation Certification**
- 00 45 46 Governmental Certifications**
- 00 45 46.01 Prevailing Wage and Related Labor Requirements Certification
- 00 45 46.03 Drug-Free Workplace Certification
- 00 45 46.04 Tobacco-Free Environment Certification
- 00 45 46.05 Hazardous Materials Certification
- 00 45 46.06 Lead-Based Materials Certification
- 00 45 46.07 Imported Materials Certification
- 00 45 46.08 Sex Offender Registration Act Certification

00 45 46.10 Roofing Project Certification
00 45 46.11 Iran Contracting Act Certification
00 45 90 Post-Bid Interview

00 50 00 Contracting Forms and Supplements

00 51 00 Notice of Award
00 52 00 Agreement Forms
00 52 13 Agreement Form – Stipulated Sum (Single-
Prime Contract)
00 55 00 Notice to Proceed
00 56 00 Escrow Bid Documentation
00 57 00 Escrow Agreement in Lieu of Retention

00 60 00 Project Forms

00 61 00 Bond Forms
00 61 13 Performance and Payment Bond
00 61 13.13 Performance Bond
00 61 13.16 Payment Bond
00 63 00 Clarification and Modification Forms
00 63 63 Change Order Form
00 65 00 Closeout Forms
00 65 19 Certificate of Completion Form
00 65 19.26 Agreement and Release of Any and All Claims
00 65 36 Guarantee Form

00 70 00 Conditions of the Contract

00 71 00 Contracting Definitions
00 72 00 General Conditions
00 72 13 General Conditions– Stipulated Sum (Single-
Prime Contract)
00 73 00 Supplementary Conditions
00 73 13 Special Conditions
00 73 56 Hazardous Materials Procedures and
Requirements

01 00 00 General Requirements

01 10 00 Summary

01 11 00 Summary of Work

01 20 00 Price and Payment Procedures

01 22 00 Unit Prices

01 25 00 Substitution Procedures

01 25 13 Product Options and Substitutions

01 26 00 Changes in the Work

01 29 00 Application for Payment and Conditional and Unconditional Waiver and Release Forms

01 30 00 Administrative Requirements

01 31 00 Project Management and Coordination

01 31 19 Project Meetings

01 33 00 Submittals

01 35 00 Special Procedures

01 35 13 Special Project Procedures

01 35 13.23 Site Standards

01 40 00 Quality Requirements

01 41 00 Regulatory Requirements

01 42 00 References

01 42 13 Abbreviations and Acronyms

01 42 16 Definitions

01 42 19 References

01 43 00 Materials and Equipment

01 45 00 Quality Control

01 50 00 Temporary Facilities and Controls

01 50 13 Construction Waste Management and Disposal

01 52 13 Field Offices

01 60 00 Product Requirements

01 64 00 Owner-Furnished Products

01 66 00 Product Delivery, Storage and Handling

01 70 00	Execution and Closeout Requirements
01 71 00	Examination and Preparation
01 71 23	Field Engineering
01 73 00	Execution
01 73 29	Cutting and Patching
01 76 00	Alteration Project Procedures
01 77 00	Contract Closeout and Final Cleaning
01 78 00	Closeout Submittals
01 78 23	Operation and Maintenance Data
01 78 36	Warranties
01 78 39	Record Documents

Attachment A - CGS Review Letter

Attachment B - wka GeoTech Report

Attachment C - SLDBE Bid Form Sheet

Attachment D - SLDBE Good Faith Effort Checklist Sheet

Division 02 – Existing Conditions

02 41 13	Selective Site Demolition
02 41 19	Selective Demolition

Division 03 – Concrete

032000	Concrete Reinforcement
032500	Expansion Anchors
032520	Drilled Dowels and Anchors in Resin
033000	Cast in Place Concrete
033500	Concrete Finishes
036000	Concrete Tests and Inspections

Division 05 – Metal

052100	Structural Steel
05 40 00	Cold-Formed Metal Framing

Division 06 – Wood, Plastic, and Composites

061000 Rough Carpentry

Division 07 – Thermal and Moisture Protection

070150.19 Re-Roof Preparation
07 21 00 Thermal Insulation
07 72 00 Roof Hatch
075113 Built-Up Asphalt Roofing
076200 Sheet Metal Flashing and Trim
077100 Roof Specialties
077200 Roof Accessories

Division 08 – Openings

083313 Coiling Counter Doors

Division 09 – Finishes

092216 Non-Structural Metal Framing
092400 Cement Plastering
092900 Gypsum Board
093013 Ceramic Tiling
095113 Acoustical Panel Ceiling
096813 Tile Carpeting
099113 Exterior Painting
099123 Interior Painting

Division 10 – Specialties

102113.13 Metal Toilet Room Partitions
102800 Toilet, Bath, and Laundry Accessories

Division 21 – Fire Protection

210000 Fire Protection Cut Sheets and Materials
210000 Fire Protection – Hydraulic Calculations

Division 22 – Plumbing

220600 PIPING SYSTEMS AND AUXILIARIES
221100 VALVES AND PIPE MOUNTED DEVICES
221500 PLUMBING WORK

Division 23 – HVAC

230100 MECHANICAL GENERAL PROVISIONS
230800 INSULATION
238150 HVAC DUCTWORK
239900 HVAC TESTING, ADJUSTING AND BALANCING

Division 26 – Electrical

See Documents for Specifications

Division 28 – Fire Alarm

280000 Fire Alarm System and Materials (94 Pages)

CA Architects
July 20, 2017
100% CD

Solano Community College District
Vacaville Classroom Building (Annex) Renovation Project
Vacaville, California

Division 32 Exterior Improvements
321216 ASPHALT PAVING
321723 PAV MARKING

END OF DOCUMENT

LIST OF DRAWINGS AND TABLES**Need to finalize once have CA Architects final drawing set**

DRAWINGS

<u>Sheet number</u>	<u>Description</u>
A0.00	COVER SHEET
C1	SITE PLAN
C2	ACCESSIBLE DETAILS
C3	ENLARGED PLANS
C4	ENLARGED PLANS
C5	PARTIAL SURVEY
A0.01	LOCAL FIRE AUTHORITY PLAN
A0.10	ACCESS PLAN
A0.20	ACCESSIBILITY – ADA DETAILS
A0.30	EGRESS PLAN
D1.01	EXISTING/DEMO ROOF PLAN
D1.01-ALT1	EXISTING/DEMO ROOF PLAN
D2.00	EXISTING/DEMO FLOOR PLAN
D2.01	EXISTING TOILET ROOMS & DRINKING FOUNTAINS
D3.00	EXISTING/DEMO ELEVATIONS
D5.00	DEMO/EXISTING INTERIOR ELEVATIONS
D5.01	DEMO/EXISTING INTERIOR RESTROOM ELEVATIONS
D6.00	EXISTING/DEMO RCP
A1.00	SITE PLAN
A1.01	ROOF PLAN
A1.01-ALT1	ROOF PLAN
A2.00	FLOOR PLAN
A2.01	TOILET ROOMS & DRINKING FOUNTAINS
A3.00	EXTERIOR ELEVATIONS
A3.01-ALT1	ROOF PARAPET ELEVATIONS
A5.01	INTERIOR ELEVATIONS
A6.00	REFLECTED CEILING PLAN
A8.00	EXTERIOR DETAILS
A8.01	EXTERIOR DETAILS
A8.02	EXTERIOR DETAILS
A8.03	EXTERIOR DETAILS
A8.04	EXTERIOR DETAILS
A9.00	INTERIOR DETAILS
A9.01	INTERIOR DETAILS
A9.02	INTERIOR DETAILS
A9.03	INTERIOR DETAILS
E0.10	GENERAL NOTES, ABBREVIATIONS & LEGENDS
E0.11	ELECTRICAL SPECIFICATIONS
E0.30	ENERGY COMPLIANCE FORMS
E0.40	ENERGY COMPLIANCE FORMS
E0.50	ENERGY COMPLIANCE FORMS

E0.60	ENERGY COMPLIANCE FORMS
E1.00	POWER PLAN
E1.01	POWER PLAN AT ROOF
E2.00	LIGHTING PLAN
E2.10	WIRING DIAGRAMS
FA1.01	FIRE ALARM LEGENDS, NOTES & MOUNTING HEIGHT DETAILS
FA2.00	FIRE ALARM FLOOR PLAN
FA3.00	FIRE ALARM DEVICE DETAILS
FA4.00	FIRE ALARM CALCULATIONS AND RISER DIAGRAM
FA5.00	FIRE STOP DETAILS
FP1-0	FIRE PROTECTION SYSTEM COVER SHEET
FP1-1	FIRE PROTECTION SYSTEM SITE PLAN
FP2-0	FIRE PROTECTION SYSTEM SITE PLAN
FP2-1	FIRE PROTECTION SYSTEM SITE PLAN
MO.1	MECHANICAL NOTES, SYMBOL, LEGEND AND SCHEDULE
MO.2	MECHANICAL TITLE 24
MO.3	HVAC LOAD CALCULATIONS
M2.1D	MECHANICAL DEMO FLOOR PLAN
M2.1	MECHANICAL FLOOR PLAN
M2.2	MECHANICAL ROOF PLAN
M6.1	MECHANICAL DETAILS
M6.2	MECHANICAL DETAILS
PO.1	PLUMBING NOTES, SYMBOL, LEGEND AND SCHEDULE
P2.1D	PLUMBING DEMO FLOOR PLAN
P2.1	PLUMBING FLOOR PLAN
P2.2D	PLUMBING DEMO ROOF PLAN
P4.1	ENLARGED PLUMBING FLOOR PLAN
P6.1	PLUMBING DETAILS
S0.1	GENERAL NOTES
S0.2	GENERAL NOTES
S1.0	TYPICAL DETAILS
S2.1	1 ST FLOOR AND FOUNDATION PLAN
S2.2	ROOF FRAMING PLAN
S3.1	WALL ELEVATIONS
S3.2	WALL ELEVATIONS
S4.1	SECTIONS & DETAILS
S4.2	SECTIONS & DETAILS
S4.3	SECTIONS & DETAILS

TABLES

END OF DOCUMENT

LIST OF SCHEDULES

SCHEDULES

Issue for Bid	November 1, 2017
Pre-Bid Conference – Mandatory	November 13, 2017
Last Day to Submit RFIs	November 15, 2017
Last Day to Submit Substitution Request	November 17, 2017
Last Day to Issue RFI Responses	November 21, 2017
Bids Due	November 30, 2017
SCCD Board of Trustees Approval Construction Contract	December 20, 2017
Notice to Proceed	TBD
Construction Final Completion	July 13, 2018

END OF DOCUMENT

NOTICE TO BIDDERS

1. Notice is hereby given that the governing board ("Board") of the Solano Community College District ("District") will receive sealed bids for the following project, **Bid No. 18-005** ("Project" or "Contract"):

VACAVILLE CLASSROOM BUILDING (ANNEX) RENOVATION PROJECT

2. The Project consists of:

Renovation of an approximately 16,400sf one story classroom building. The scope of work can generally be described as structural upgrades, accessibility upgrades, replacement of HVAC ductwork, lighting, suspended ceiling, fire alarm system, some interior finishes and some roofing.

3. To bid on this Project, the Bidder is required to possess one or more of the following State of California Contractor Licenses:

B

The Bidder's license(s) must remain active and in good standing throughout the term of the Contract.

4. To bid on this Project, the Bidder is required to be registered as a public works contractor with the Department of Industrial Relations. The Bidder's registration must remain active throughout the term of the Contract.
5. Contract Documents are available on November 1, 2017, for review at the District Facilities Office. In addition, Contract Documents are available for bidders' review at the following builders' exchanges:
 - A. Builder's Exchange of Sacramento/Solano/Napa Counties
 - B. Builder's Exchange of Contra Costa County
 - C. Bay Area Builders Exchange
 - D. BP Express, Benecia CA ()

6. Sealed Bids will be received until 2:00_p.m at the District Office, 4000 Suisun Valley Road, Administration Building 600, Dennis Honeychurch Board Room, California, at or after which time the bids will be opened and publicly read aloud. Any bid that is submitted after this time shall be non-responsive and returned to the bidder. Any claim by a bidder of error in its bid must be made in compliance with section 5100 et seq. of the Public Contract Code.
7. All bids shall be on the form provided by the District. Each bid must conform and be responsive to all pertinent Contract Documents, including, but not limited to, the Instructions to Bidders.

8. A bid bond by an admitted surety insurer on the form provided by the District, cash, or a cashier's check or a certified check, drawn to the order of the Solano Community College District, in the amount of ten percent (10%) of the total bid price, shall accompany the Bid Form and Proposal, as a guarantee that the Bidder will, within seven (7) calendar days after the date of the Notice of Award, enter into a contract with the District for the performance of the services as stipulated in the bid.
9. A mandatory pre-bid conference and site visit will be held on November 13, 2017, at 11:00 AM. at 2000 North Village Parkway, Vacaville, California. All participants are required to sign in on the attendance sheet. The Site Visit is expected to take approximately one and a half hours. Failure to attend or tardiness will render bid ineligible.
10. The Construction Manager for the District is Bob Collins, Swinerton Management and Consulting. All questions during the bid process shall be submitted via email to Robert.Collins@solano.edu 415-710-9454. All questions must be submitted in writing via email. no phone questions will be responded to.
11. The successful Bidder shall be required to furnish a 100% Performance Bond and a 100% Payment Bond if it is awarded the contract for the Work.
12. The successful Bidder may substitute securities for any monies withheld by the District to ensure performance under the Contract, in accordance with the provisions of section 22300 of the Public Contract Code.
13. The Contractor and all Subcontractors under the Contractor shall pay all workers on all work performed pursuant to this Contract not less than the general prevailing rate of per diem wages and the general prevailing rate for holiday and overtime work as determined by the Director of the Department of Industrial Relations, State of California, for the type of work performed and the locality in which the work is to be performed within the boundaries of the District, pursuant to sections 1770 et seq. of the California Labor Code. Prevailing wage rates are also available from the District or on the Internet at: <<http://www.dir.ca.gov>>.
14. This Project is subject to labor compliance monitoring and enforcement by the Department of Industrial Relations pursuant to Labor Code section 1771.4 and subject to the requirements of Title 8 of the California Code of Regulations. The Contractor and all Subcontractors under the Contractor shall furnish electronic certified payroll records directly to the Labor Commissioner weekly or within ten (10) days of any request by the District or the Labor Commissioner. The successful Bidder shall comply with all requirements of Division 2, Part 7, Chapter 1, of the Labor Code.
15. The District's Board has found and determined that District Standard item(s) shall be used on this Project based on the purpose(s) indicated. (Public Contract Code section 3400(c)): A particular material, product, thing, or service is designated by specific brand or trade name for the following purpose(s): these items can be found on the District Website www.solano.edu/bondsprogram/planningdocuments/districtstandards

- (1) In order to match other products in use on a particular public improvement either completed or in the course of completion.
16. The District shall award the Contract, if it awards it at all, to the lowest responsive responsible bidder based on:
- A. The base bid amount plus the following alternates:
additive alternate no. 1;
17. The Board reserves the right to reject any and all bids and/or waive any irregularity in any bid received. If the District awards the Contract, the security of unsuccessful bidder(s) shall be returned within sixty (60) days from the time the award is made. Unless otherwise required by law, no bidder may withdraw its bid for ninety (90) days after the date of the bid opening.

END OF DOCUMENT

INSTRUCTIONS TO BIDDERS

Contractors shall follow the instructions in this document, and shall submit all documents, forms, and information required for consideration of a Bid.

Solano Community College District ("District") will evaluate information submitted by the apparent low Bidder and, if incomplete or unsatisfactory to District, Bidder's bid may be rejected at the sole discretion of District.

1. Bids are requested for a general construction contract, or work described in general, for the following project ("Project" or "Contract"):

VACAVILLE CLASSROOM BUILDING (ANNEX) RENOVATION PROJECT

2. District will receive sealed Bids from Bidders as stipulated in the Notice to Bidders.
3. Bidders must submit Bids on the Bid Form and Proposal and all other required District forms. Bids not submitted on the District's required forms shall be deemed non-responsive and shall not be considered. Additional sheets required to fully respond to requested information are permissible.
4. Bidders must supply all information required by each Bid Document. Bids must be full and complete. District reserves the right in its sole discretion to reject any Bid as non-responsive as a result of any error or omission in the Bid. Bidders must complete and submit all of the following documents with the Bid Form and Proposal:
 - a. Bid Bond on the District's form or other security.
 - b. Designated Subcontractors List.
 - c. Site-Visit Certification.
 - d. Noncollusion Declaration.
 - e. Iran Contracting Act Certification, if contract value is \$1,000,000 or more.
5. Bidders must submit with their Bids cash, a cashier's check or a certified check payable to District, or a bid bond by an admitted surety insurer of not less than ten percent (10%) of amount of base Bid, plus all additive alternates. If Bidder chooses to provide a Bid Bond as security, Bidder must use the required form of corporate surety provided by District. The Surety on Bidder's Bid Bond must be an insurer admitted in the State of California and authorized to issue surety bonds in the State of California. Bids submitted without necessary bid security will be deemed non-responsive and will not be considered.
7. If Bidder to whom Contract is awarded fails or neglects to enter into Contract and submit required bonds, insurance certificates, and all other required documents, within **SEVEN (7)** calendar days after the date of the Notice of Award, District may deposit Bid Bond, cash, cashier's check, or certified check for collection, and proceeds thereof may be retained by District as liquidated damages for failure of Bidder to enter into Contract, in the sole discretion of District. It is agreed that calculation of damages District may suffer as a result of Bidder's failure to enter into

the Contract would be extremely difficult and impractical to determine and that the amount of the Bidder's required bid security shall be the agreed and conclusively presumed amount of damages.

8. Bidders must submit with the Bid the Designated Subcontractors List for those subcontractors who will perform any portion of Work, including labor, rendering of service, or specially fabricating and installing a portion of the Work or improvement according to detailed drawings contained in the plans and specifications, in excess of one half of one percent (0.5%) of total Bid. All of the listed subcontractors are required to be registered as a public works contractor with the Department of Industrial Relations. The subcontractor's registration must remain active throughout the term of the Contract. Failure to submit this list when required by law shall result in Bid being deemed non-responsive and the Bid will not be considered.
 - a. An inadvertent error in listing the California contractor license number on the Designated Subcontractors List shall not be grounds for filing a bid protest or grounds for considering the bid nonresponsive if the correct contractor's license number is submitted to the District within 24 hours after the bid opening and the corrected number corresponds with the submitted name and location for that subcontractor.
 - b. An inadvertent error listing an unregistered subcontractor shall not be grounds for filing a bid protest or grounds for considering the bid nonresponsive provided that any of the following apply:
 - (1) The subcontractor is registered prior to the bid opening.
 - (2) The subcontractor is registered and has paid the penalty registration fee within 24 hours after the bid opening.
 - (3) The subcontractor is replaced by another registered subcontractor pursuant to Public Contract Code section 4107.
9. If a mandatory pre-bid conference and site visit ("Site Visit") is requested as referenced in the Notice to Bidders, then Bidders must submit the Site-Visit Certification with their Bid. District will transmit to all prospective Bidders of record such Addenda as District in its discretion considers necessary in response to questions arising at the Site Visit. Oral statements shall not be relied upon and will not be binding or legally effective. Addenda issued by the District as a result of the Site Visit, if any, shall constitute the sole and exclusive record and statement of the results of the Site Visit.
10. Bidders shall submit the Noncollusion Declaration with their Bids. Bids submitted without the Noncollusion Declaration shall be deemed non-responsive and will not be considered.
11. Bids shall be clearly written without erasure or deletions. District reserves the right to reject any Bid containing erasures or deletions.

12. Bidders shall not modify the Bid Form and Proposal or qualify their Bids. Bidders shall not submit to the District a scanned, re-typed, word-processed, or otherwise recreated version of the Bid Form and Proposal or other District-provided document.
13. The Bidder and all Subcontractors under the Contractor shall pay all workers on all work performed pursuant to this Contract not less than the general prevailing rate of per diem wages and the general prevailing rate for holiday and overtime work as determined by the Director of the Department of Industrial Relations, State of California, for the type of work performed and the locality in which the work is to be performed within the boundaries of the District, pursuant to sections 1770 et seq. of the California Labor Code. Copies of the general prevailing rates of per diem wages for each craft, classification, or type of worker needed to execute the Contract, as determined by Director of the State of California Department of Industrial Relations, are available upon request at the District's principal office. Prevailing wage rates are also available on the internet at <http://www.dir.ca.gov>.
14. The Bidder and all Subcontractors under the contract shall abide by the District's Small, Local, Diverse Business Program (SLDBE). This program has been established to ensure access, equity and inclusion of Solano County businesses in the area of construction contracting. The SLDBE program is innovative and inclusionary; defining and promoting diversity in contracting and procurement by extending Measure Q Bond Program opportunities to Solano County small businesses, minority-owned business, women-owned business and those of disabled veterans. The goal for SLDBE in construction projects is 15% contracting/subcontracting goal. The bidding contractor shall list their small, local and diverse subcontractors and/or suppliers on the SLDBE bid Form attached and include the filled out form in the bid submission. Contractors who fail to meet the 15% goal must submit, with the bid submission, evidence of having made a Good Faith Effort (GFE checklist) to attempt to achieve the 15% goal. The bidding contractor shall submit the SLDBE list of subcontractor/supplier forms with their bid and/or the GFE checklist with their bid.
15. Submission of Bid signifies careful examination of Contract Documents and complete understanding of the nature, extent, and location of Work to be performed. Bidders must complete the tasks listed below as a condition to bidding, and submission of a Bid shall constitute the Bidder's express representation to District that Bidder has fully completed the following:
 - a. Bidder has visited the Site, if required, and has examined thoroughly and understood the nature and extent of the Contract Documents, Work, Site, locality, actual conditions, as-built conditions, and all local conditions and federal, state and local laws, and regulations that in any manner may affect cost, progress, performance, or furnishing of Work or that relate to any aspect of the means, methods, techniques, sequences, or procedures of construction to be employed by Bidder and safety precautions and programs incident thereto;
 - b. Bidder has conducted or obtained and has understood all examinations, investigations, explorations, tests, reports, and studies that pertain to the subsurface conditions, as-built conditions, underground facilities, and all other physical conditions at or contiguous to the Site or otherwise that may affect the cost, progress, performance, or furnishing of Work, as Bidder considers

necessary for the performance or furnishing of Work at the Contract Sum, within the Contract Time, and in accordance with the other terms and conditions of Contract Documents, including specifically the provisions of the General Conditions; and no additional examinations, investigations, explorations, tests, reports, studies, or similar information or data are or will be required by Bidder for such purposes;

- c. Bidder has correlated its knowledge and the results of all such observations, examinations, investigations, explorations, tests, reports, and studies with the terms and conditions of the Contract Documents;
- d. Bidder has given the District prompt written notice of all conflicts, errors, ambiguities, or discrepancies that it has discovered in or among the Contract Documents and the actual conditions, and the written resolution thereof by the District is acceptable to Bidder;
- e. Bidder has made a complete disclosure in writing to the District of all facts bearing upon any possible interest, direct or indirect, that Bidder believes any representative of the District or other officer or employee of the District presently has or will have in this Contract or in the performance thereof or in any portion of the profits thereof;
- f. Bidder must, prior to bidding, perform the work, investigations, research, and analysis required by this document and that Bidder represented in its Bid Form and Proposal and the Agreement that it performed prior to bidding. Contractor under this Contract is charged with all information and knowledge that a reasonable bidder would ascertain from having performed this required work, investigation, research, and analysis. Bid prices must include entire cost of all work "incidental" to completion of the Work.
- g. Conditions Shown on the Contract Documents: Information as to underground conditions, as-built conditions, or other conditions or obstructions, indicated in the Contract Documents, e.g., on Drawings or in Specifications, has been obtained with reasonable care, and has been recorded in good faith. However, District only warrants, and Contractor may only rely, on the accuracy of limited types of information.
 - (1) As to above-ground conditions or as-built conditions shown or indicated in the Contract Documents, there is no warranty, express or implied, or any representation express or implied, that such information is correctly shown or indicated. This information is verifiable by independent investigation and Contractor is required to make such verification as a condition to bidding. In submitting its Bid, Contractor shall rely on the results of its own independent investigation. In submitting its Bid, Contractor shall not rely on District-supplied information regarding above-ground conditions or as-built conditions.
 - (2) As to any subsurface condition shown or indicated in the Contract Documents, Contractor may rely only upon the general accuracy of actual reported depths, actual reported character of materials, actual

reported soil types, actual reported water conditions, or actual obstructions shown or indicated. District is not responsible for the completeness of such information for bidding or construction; nor is District responsible in any way for any conclusions or opinions of Contractor drawn from such information; nor is the District responsible for subsurface conditions that are not specifically shown (for example, District is not responsible for soil conditions in areas contiguous to areas where a subsurface condition is shown).

- h. Conditions Shown in Reports and Drawings Supplied for Informational Purposes: Reference is made to the document entitled Geotechnical Data, and the document entitled Existing Conditions, for identification of:
- (1) Subsurface Conditions: Those reports of explorations and tests of subsurface conditions at or contiguous to the Site that have been utilized by Architect in preparing the Contract Documents; and
 - (2) Physical Conditions: Those drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site that has been utilized by Architect in preparing the Contract Documents.
 - (3) These reports and drawings are **not** Contract Documents and, except for any "technical" data regarding subsurface conditions specifically identified in Geotechnical Data and Existing Conditions, and underground facilities data, Contractor may not in any manner rely on the information in these reports and drawings. Subject to the foregoing, Contractor must make its own independent investigation of all conditions affecting the Work and must not rely on information provided by District.
16. Bidders may examine any available "as-built" drawings of previous work by giving District reasonable advance notice. District will not be responsible for accuracy of "as-built" drawings. The document entitled Existing Conditions applies to all supplied "as-built" drawings.
17. All questions about the meaning or intent of the Contract Documents are to be directed in writing to the District. Interpretations or clarifications considered necessary by the District in response to such questions will be issued in writing by Addenda emailed, faxed, mailed, or delivered to all parties recorded by the District as having received the Contract Documents. Questions received less than **SEVEN (7)** calendar days prior to the date for opening Bids may not be answered. Only questions answered by formal written Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.
18. Addenda may also be issued to modify other parts of the Contract Documents as deemed advisable by the District.
19. Each Bidder must acknowledge each Addendum in its Bid Form and Proposal by number or its Bid shall be considered non-responsive. Each Addendum shall be part

of the Contract Documents. A complete listing of Addenda may be secured from the District.

20. Bids shall be based on products and systems specified in Contract Documents or listed by name in Addenda. Whenever in the Specifications any materials, process, or article is indicated or specified by grade, patent, or proprietary name, or by name of manufacturer, that Specification shall be deemed to be followed by the words "or equal." Bidder may, unless otherwise stated, offer any material, process, or article that shall be substantially equal or better in every respect to that so indicated or specified. The District is not responsible and/or liable in any way for a Contractor's damages and/or claims related, in any way, to that Contractor's basing its bid on any requested substitution that the District has not approved. Contractors and materials suppliers who submit requests for substitutions prior to the award of the Contract must do so in writing and in compliance with Public Contract Code section 3400. All requests must comply with the following:
 - a. District must receive any request for substitution a minimum of **TEN (10)** calendar days prior to bid opening.
 - b. Within 35 days after the date of the Notice of Award, the Successful Bidder shall submit data substantiating a request for substitution containing sufficient information to assess acceptability of product or system and impact on Project, including, without limitation, the requirements specified in the Special Conditions and the Specifications. Insufficient information shall be grounds for rejection of substitution.
 - c. Approved substitutions, if any, shall be listed in Addenda. District reserves the right not to act upon submittals of substitutions until after bid opening.
 - d. Substitutions may be requested after Contract has been awarded only if indicated in and in accordance with requirements specified in the Special Conditions and the Specifications.
21. All Bids must be sealed, and marked with name and address of the Bidder and the Project Number, Bid number, Bid package, and time of bid opening. Bids will be received as indicated in the Notice to Bidders.
 - a. Mark envelopes with the name of the Project.
 - b. Bids must be submitted to the Bond Purchasing Department, Administration Building 600, Dennis Honeychurch Board Room, by date and time shown in the Notice to Bidders.
 - c. Bids must contain all documents as required herein.
22. Bids will be opened at or after the time indicated for receipt of bids.
23. This Contract may include alternates. Alternates are defined as alternate products, materials, equipment, systems, methods, or major elements of the construction that may, at the District's option and under terms established in the Contract and pursuant to section 20103.8 of the Public Contract Code, be selected for the Work.

24. The District shall award the Contract, if it awards it at all, to the lowest responsive responsible bidder based on the criteria as indicated in the Notice to Bidders. In the event two or more responsible bidders submit identical bids, the District shall select the Bidder to whom to award the Contract by lot.
25. Time for Completion: District may issue a Notice to Proceed as soon as practicable from the date of the Notice of Award. Once Contractor has received the Notice to Proceed, Contractor shall complete the Work by July 13, 2018 indicated in the Contract Documents.
 - a. In the event that the District desires to postpone issuing the Notice to Proceed beyond this period, it is expressly understood that with reasonable notice to the Contractor, the District may postpone issuing the Notice to Proceed.
 - b. It is further expressly understood by Contractor that Contractor shall not be entitled to any claim of additional compensation as a result of the postponement of the issuance of the Notice to Proceed beyond this period. If the Contractor believes that a postponement of issuance of the Notice to Proceed will cause a hardship to the Contractor, the Contractor may terminate the Contract. Contractor's termination due to a postponement beyond this 3-month period shall be by written notice to District within **TEN (10)** calendar days after receipt by Contractor of District's notice of postponement.
 - c. It is further understood by the Contractor that in the event that Contractor terminates the Contract as a result of postponement by the District, the District shall only be obligated to pay Contractor for the Work that Contractor had performed at the time of notification of postponement and which the District had in writing authorized Contractor to perform prior to issuing a Notice to Proceed.
 - d. Should the Contractor terminate the Contract as a result of a notice of postponement, District shall have the authority to award the Contract to the next lowest responsive responsible bidder.
26. The Bidder to whom Contract is awarded shall execute and submit the following documents by 5:00 p.m. of the **SEVENTH (7th)** calendar day following the date of the Notice of Award. Failure to properly and timely submit these documents entitles District to reject the bid as non-responsive.
 - a. Agreement: To be executed by successful Bidder. Submit four (4) copies, each bearing an original signature.
 - b. Escrow of Bid Documentation: This must include all required documentation. See the document Escrow of Bid Documentation for more information.
 - c. Performance Bond (100%): On the form provided in the Contract Documents and fully executed as indicated on the form.

- d. Payment Bond (100%) (Contractor's Labor and Material Bond): On the form provided in the Contract Documents and fully executed as indicated on the form.
 - e. Insurance Certificates and Endorsements as required.
 - f. Workers' Compensation Certification.
 - g. Prevailing Wage and Related Labor Requirements Certification.
 - h. Drug-Free Workplace Certification.
 - i. Tobacco-Free Environment Certification.
 - j. Hazardous Materials Certification.
 - k. Lead-Based Paint Certification.
 - l. Imported Materials Certification.
 - m. Roofing Project Certification: from Contractor, Material Manufacturer and/or Vendor.
27. Any bid protest by any Bidder regarding any other bid must be submitted in writing to the District, before 5:00 p.m. of the **THIRD (3rd)** business day following bid opening.
- a. Only a Bidder who has actually submitted a bid, and who could be awarded the Contract if the bid protest is upheld, is eligible to submit a bid protest. Subcontractors are not eligible to submit bid protests. A Bidder may not rely on the bid protest submitted by another Bidder.
 - b. A bid protest must contain a complete statement of any and all bases for the protest and all supporting documentation. Materials submitted after the bid protest deadline will not be considered.
 - c. The protest must refer to the specific portions of all documents that form the basis for the protest.
 - (1) Without limitation to other bases for protest, an inadvertent error in listing the California contractor license number on the Designated Subcontractors List shall not be grounds for filing a bid protest or grounds for considering the bid nonresponsive if the correct contractor's license number is submitted to the District within 24 hours after the bid opening and the corrected number corresponds with the submitted name and location for that subcontractor.
 - (2) Without limitation to other bases for protest, an inadvertent error listing an unregistered subcontractor shall not be grounds for filing a bid protest or grounds for considering the bid nonresponsive provided that any of the following apply:

- (i) The subcontractor is registered prior to the bid opening.
 - (ii) The subcontractor is registered and has paid the penalty registration fee within 24 hours after the bid opening.
 - (iii) The subcontractor is replaced by another registered subcontractor pursuant to Public Contract Code section 4107.
 - d. The protest must include the name, address and telephone number of the person representing the protesting party.
 - e. The party filing the protest must concurrently transmit a copy of the protest and any attached documentation to all other parties with a direct financial interest that may be adversely affected by the outcome of the protest. Such parties shall include all other bidders or proposers who appear to have a reasonable prospect of receiving an award depending upon the outcome of the protest.
 - f. The procedure and time limits set forth in this paragraph are mandatory and are each bidder's sole and exclusive remedy in the event of bid protest. Failure to comply with these procedures shall constitute a waiver of any right to further pursue the bid protest, including filing a Government Code Claim or legal proceedings.
28. District reserves the right to reject any or all bids, including without limitation the right to reject any or all nonconforming, non-responsive, unbalanced, or conditional bids, to re-bid, and to reject the bid of any bidder if District believes that it would not be in the best interest of the District to make an award to that bidder, whether because the bid is not responsive or the bidder is unqualified or of doubtful financial ability or fails to meet any other pertinent standard or criteria established by District. District also reserves the right to waive inconsequential deviations not involving price, time, or changes in the Work. For purposes of this paragraph, an "unbalanced bid" is one having nominal prices for some work items and/or enhanced prices for other work items.
29. Discrepancies between written words and figures, or words and numerals, will be resolved in favor of numerals or figures.
30. Prior to the award of Contract, District reserves the right to consider the responsibility of the Bidder. District may conduct investigations as District deems necessary to assist in the evaluation of any bid and to establish the responsibility, including, without limitation, qualifications and financial ability of Bidders, proposed subcontractors, suppliers, and other persons and organizations to perform and furnish the Work in accordance with the Contract Documents to District's satisfaction within the prescribed time.

END OF DOCUMENT

DOCUMENT 00 21 13.1

BIDDER INFORMATION AND FORMS

**[INTENTIONALLY LEFT BLANK UNLESS PROVIDED IN SPECIAL CONDITIONS
– SEPARATE PREQUALIFICATION PROCESS RECOMMENDED]**

END OF DOCUMENT

EXISTING CONDITIONS

1. Summary

This document describes existing conditions at or near the Project, and use of information available regarding existing conditions. This document is **not** part of the Contract Documents. See General Conditions for definition(s) of terms used herein.

2. Reports and Information on Existing Conditions

- a. Documents providing a general description of the Site and conditions of the Work may have been collected by Solano Community College District ("District"), its consultants, contractors, and tenants. These documents may include previous contracts, contract specifications, tenant improvement contracts, as-built drawings, utility drawings, and information regarding underground facilities.
- b. Information regarding existing conditions may be inspected at the District offices or the Construction Manager's offices, if any, and copies may be obtained at cost of reproduction and handling upon Bidder's agreement to pay for such copies. These reports, documents, and other information are **not** part of the Contract Documents.
- c. Information regarding existing conditions may also be included in the Project Manual, but shall **not** be considered part of the Contract Documents.
- d. Prior to commencing this Work, Contractor and the District's representative shall survey the Site to document the condition of the Site. Contractor will record the survey in digital videotape format and provide an electronic copy to the District within fourteen (14) days of the survey.
- e. Contractor may also document any pre-existing conditions in writing, provided that both the Contractor and the District's representative agree on said conditions and sign a memorandum documenting the same.
- f. The reports and other data or information regarding existing conditions and underground facilities at or contiguous to the Project are the following:
 - (1) Original Construction Drawings.

3. Use of Information

- a. Information regarding existing conditions was obtained only for use of District and its consultants, contractors, and tenants for planning and design and is **not** part of the Contract Documents.
- b. District does not warrant, and makes no representation regarding, the accuracy or thoroughness of any information regarding existing conditions.

Bidder represents and agrees that in submitting a bid it is not relying on any information regarding existing conditions supplied by District.

- c. Under no circumstances shall District be deemed to warrant or represent existing above-ground conditions, as-built conditions, or other actual conditions, verifiable by independent investigation. These conditions are verifiable by Contractor by the performance of its own independent investigation that Contractor must perform as a condition to bidding and Contractor should not and shall not rely on this information or any other information supplied by District regarding existing conditions.
- d. Any information shown or indicated in the reports and other data supplied herein with respect to existing underground facilities at or contiguous to the Project may be based upon information and data furnished to District by the District's employees and/or consultants or builders of such underground facilities or others. District does not assume responsibility for the completeness of this information, and Bidder is solely responsible for any interpretation or conclusion drawn from this information.
- e. District shall be responsible only for the general accuracy of information regarding underground facilities, and only for those underground facilities that are owned by District, and only where Bidder has conducted the independent investigation required of it pursuant to the Instructions to Bidders, and discrepancies are not apparent.

4. Investigations/Site Examinations

- a. Before submitting a Bid, each Bidder is responsible for conducting or obtaining any additional or supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface, and underground facilities) at or contiguous to the Site or otherwise, that may affect cost, progress, performance, or furnishing of Work or that relate to any aspect of the means, methods, techniques, sequences, or procedures of construction to be employed by Bidder and safety precautions and programs incident thereto or that Bidder deems necessary to determine its Bid for performing and furnishing the Work in accordance with the time, price, and other terms and conditions of Contract Documents.
- b. On request, District will provide each Bidder access to the Site to conduct such examinations, investigations, explorations, tests, and studies, as each Bidder deems necessary for submission of a Bid. Bidders must fill all holes and clean up and restore the Site to its former condition upon completion of its explorations, investigations, tests, and studies. Such investigations and Site examinations may be performed during any and all Site visits indicated in the Notice to Bidders and only under the provisions of the Contract Documents, including, but not limited to, proof of insurance and obligation to indemnify against claims arising from such work, and District's prior approval.

END OF DOCUMENT

GEOTECHNICAL DATA

1. Summary

This document describes geotechnical data at or near the Project that is in the District's possession available for Contractor's review, and use of data resulting from various investigations. This document is **not** part of the Contract Documents. See General Conditions for definition(s) of terms used herein.

2. Geotechnical Reports

- a. Geotechnical reports may have been prepared for and around the Site by soil investigation engineers hired by Solano Community College District ("District"), and its consultants, contractors, and tenants, or others.
- b. Geotechnical reports may be inspected at the District offices or the Construction Manager's offices, if any, and copies may be obtained at cost of reproduction and handling upon Bidder's agreement to pay for such copies. These reports are **not** part of the Contract Documents.
- c. The reports and drawings of physical conditions that may relate to the Project are the following:

Attachment A: California Geological Survey Letter dated September 15, 2017

Attachment B: Geologic Hazards and Geotechnical Engineering Report prepared for Solano County Office of Education by Wallace Kuhl, December 18, 2013

3. Use of Data

- a. Geotechnical data were obtained only for use of District and its consultants, contractors, and tenants for planning and design and are **not** a part of Contract Documents.
- b. Except as expressly set forth below, District does not warrant, and makes no representation regarding, the accuracy or thoroughness of any geotechnical data. Bidder represents and agrees that in submitting a Bid it is not relying on any geotechnical data supplied by District, except as specifically allowed below.
- c. Under no circumstances shall District be deemed to make a warranty or representation of existing above ground conditions, as-built conditions, or other actual conditions verifiable by independent investigation. These conditions are verifiable by Contractor by the performance of its own independent investigation that Contractor should perform as a condition to

bidding and Contractor must not and shall not rely on information supplied by District.

4. Limited Reliance Permitted on Certain Information

- a. Reference is made herein for identification of:

Reports of explorations and tests of subsurface conditions at or contiguous to the Site that have been utilized by District in preparation of the Contract Documents.

Drawings of physical conditions in or relating to existing subsurface structures (except underground facilities) that are at or contiguous to the Site and have been utilized by District in preparation of the Contract Documents.

- b. Bidder may rely upon the general accuracy of the "technical data" contained in the reports and drawings identified above, but only insofar as it relates to subsurface conditions, provided Bidder has conducted the independent investigation required pursuant to Instructions to Bidders, and discrepancies are not apparent. The term "technical data" in the referenced reports and drawings shall be limited as follows:

- (1) The term "technical data" shall include actual reported depths, reported quantities, reported soil types, reported soil conditions, and reported material, equipment or structures that were encountered during subsurface exploration. The term "technical data" does not include, and Bidder may not rely upon, any other data, interpretations, opinions or information shown or indicated in such drawings or reports that otherwise relate to subsurface conditions or described structures.
- (2) The term "technical data" shall not include the location of underground facilities.
- (3) Bidder may not rely on the completeness of reports and drawings for the purposes of bidding or construction. Bidder may rely upon the general accuracy of the "technical data" contained in such reports or drawings.
- (4) Bidder is solely responsible for any interpretation or conclusion drawn from any "technical data" or any other data, interpretations, opinions, or information provided in the identified reports and drawings.

5. Investigations/Site Examinations

- a. Before submitting a Bid, each Bidder is responsible for conducting or obtaining any additional or supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface, and underground facilities) at or contiguous to the Site or otherwise, that may affect cost, progress, performance, or furnishing of Work or that relate to any aspect of the means, methods, techniques, sequences,

or procedures of construction to be employed by Bidder and safety precautions and programs incident thereto or that Bidder deems necessary to determine its Bid for performing and furnishing the Work in accordance with the time, price, and other terms and conditions of Contract Documents.

- b. On request, District will provide each Bidder access to the Site to conduct such examinations, investigations, explorations, tests, and studies, as each Bidder deems necessary for submission of a Bid. Bidders must fill all holes and clean up and restore the Site to its former condition upon completion of its explorations, investigations, tests, and studies. Such investigations and Site examinations may be performed during any and all Site visits indicated in the Notice to Bidders and only under the provisions of the Contract Documents, including, but not limited to, proof of insurance and obligation to indemnify against claims arising from such work, and District's prior approval.

END OF DOCUMENT

BID FORM AND PROPOSAL

To: Governing Board of Solano Community College District ("District" or "Owner")

From: _____
(Proper Name of Bidder)

The undersigned declares that the Contract Documents including, without limitation, the Notice to Bidders and the Instructions to Bidders have been read and agrees and proposes to furnish all necessary labor, materials, and equipment to perform and furnish all work in accordance with the terms and conditions of the Contract Documents, including, without limitation, the Drawings and Specifications of Bid No. 18-005.

PROJECT: **VACAVILLE CLASSROOM BUILDING (ANNEX) RENOVATION PROJECT**

("Project" or "Contract") and will accept in full payment for that Work the following total lump sum amount, all taxes included:

_____ dollars \$ _____
BASE BID

Additive Alternates:

Alternate #1

_____ dollars \$ _____
Additive
Remove and replace built-up roofing.

Alternate #2

_____ dollars \$ _____
Additive
Remodel existing restrooms

Descriptions of alternates are primarily scope definitions and do not necessarily detail the full range of materials and processes needed to complete the construction.

1. **Allowance.** The Bidder's Base Bid and each alternate shall include a ten percent (10%) allowance for unforeseen items.

The above allowances are strictly for the District use and are not to be considered a change order reserve. The above allowance shall only be allocated for unforeseen items relating to the Work. Contractor shall not bill for or be due any portion of this allowance unless the District has identified specific work, Contractor has submitted a price for that work or the District has proposed a price for that work, the District has accepted the cost for that work, and the District has prepared a change order incorporating that work. Contractor hereby authorizes the District to execute a unilateral deductive change order at or near the end of the Project for all or any portion of the allowance not allocated.

2. The undersigned has reviewed the Work outlined in the Contract Documents and fully understands the scope of Work required in this Proposal, understands the construction and project management function(s) is described in the Contract Documents, and that each Bidder who is awarded a contract shall be in fact a prime contractor, not a subcontractor, to the District, and agrees that its Proposal, if accepted by the District, will be the basis for the Bidder to enter into a contract with the District in accordance with the intent of the Contract Documents.
3. The undersigned has notified the District in writing of any discrepancies or omissions or of any doubt, questions, or ambiguities about the meaning of any of the Contract Documents, and has contacted the Construction Manager before bid date to verify the issuance of any clarifying Addenda.
4. The undersigned agrees to commence work under this Contract on the date established in the Contract Documents and to complete all work within the time specified in the Contract Documents.
5. The liquidated damages clause of the General Conditions and Agreement is hereby acknowledged.
6. It is understood that the District reserves the right to reject this bid and that the bid shall remain open to acceptance and is irrevocable for a period of ninety (90) days.
7. The following documents are attached hereto:
 - Bid Bond on the District's form or other security
 - Designated Subcontractors List
 - Site-Visit Certification
 - Noncollusion Declaration
 - Iran Contracting Act Certification

8. Receipt and acceptance of the following addenda is hereby acknowledged:

No.____, Dated _____	No.____, Dated _____
No.____, Dated _____	No.____, Dated _____
No.____, Dated _____	No.____, Dated _____

- 9. Bidder acknowledges that the license required for performance of the Work is a B license.
- 10. The undersigned hereby certifies that Bidder is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the Work.
- 11. Bidder specifically acknowledges and understands that if it is awarded the Contract, that it shall perform the Work of the Project while complying with all requirements of the Department of Industrial Relations.
- 12. The Bidder represents that it is competent, knowledgeable, and has special skills with respect to the nature, extent, and inherent conditions of the Work to be performed. Bidder further acknowledges that there are certain peculiar and inherent conditions existent in the construction of the Work that may create, during the Work, unusual or peculiar unsafe conditions hazardous to persons and property.
- 13. Bidder expressly acknowledges that it is aware of such peculiar risks and that it has the skill and experience to foresee and to adopt protective measures to adequately and safely perform the Work with respect to such hazards.
- 14. Bidder expressly acknowledges that it is aware that if a false claim is knowingly submitted (as the terms "claim" and "knowingly" are defined in the California False Claims Act, Cal. Gov. Code, §12650 et seq.), the District will be entitled to civil remedies set forth in the California False Claim Act. It may also be considered fraud and the Contractor may be subject to criminal prosecution.
- 15. The undersigned Bidder certifies that it is, at the time of bidding, and shall be throughout the period of the contract, licensed by the State of California to do the type of work required under the terms of the Contract Documents and registered as a public works contractor with the Department of Industrial Relations. Bidder further certifies that it is regularly engaged in the general class and type of work called for in the Contract Documents.

Furthermore, Bidder hereby certifies to the District that all representations, certifications, and statements made by Bidder, as set forth in this bid form, are true and correct and are made under penalty of perjury.

Dated this _____ day of _____ 2017

Name of Bidder _____

Type of Organization _____

Signed by _____

Title of Signer _____

Address of Bidder _____

Taxpayer's Identification No. of Bidder _____

Telephone Number _____

Fax Number _____

E-mail _____ Web page _____

Contractor's License No(s): No.: _____ Class: _____ Expiration Date: _____

No.: _____ Class: _____ Expiration Date: _____

No.: _____ Class: _____ Expiration Date: _____

Public Works Contractor Registration No.: _____

If Bidder is a corporation, affix corporate seal.

Name of Corporation: _____

President: _____

Secretary: _____

Treasurer: _____

Manager: _____

END OF DOCUMENT

BID BOND

(Note: If Bidder is providing a bid bond as its bid security, Bidder must use this form, NOT a surety company form.)

KNOW ALL PERSONS BY THESE PRESENTS:

That the undersigned, as _____ as Principal ("Principal"),
and _____ as Surety ("Surety"),
a corporation organized and existing under and by virtue of the laws of the State of
California and authorized to do business as a surety in the State of California, are held and
firmly bound unto the Solano Community College District ("District") of County, State of
California as Obligee, in the sum of

_____ Dollars (\$ _____)

lawful money of the United States of America, for the payment of which sum well and truly
to be made, we, and each of us, bind ourselves, our heirs, executors, administrators,
successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that whereas the Principal has submitted a
bid to the District for all Work specifically described in the accompanying bid;

NOW, THEREFORE, if the Principal is awarded the Contract and, within the time and manner
required under the Contract Documents, after the prescribed forms are presented to
Principal for signature, enters into a written contract, in the prescribed form in accordance
with the bid, and files two bonds, one guaranteeing faithful performance and the other
guaranteeing payment for labor and materials as required by law, and meets all other
conditions to the contract between the Principal and the Obligee becoming effective, or if
the Principal shall fully reimburse and save harmless the Obligee from any damage
sustained by the Obligee through failure of the Principal to enter into the written contract
and to file the required performance and labor and material bonds, and to meet all other
conditions to the Contract between the Principal and the Obligee becoming effective, then
this obligation shall be null and void; otherwise, it shall be and remain in full force and
effect. The full payment of the sum stated above shall be due immediately if Principal fails
to execute the Contract within seven (7) days of the date of the District's Notice of Award to
Principal.

Surety, for value received, hereby stipulates and agrees that no change, extension of time,
alteration or addition to the terms of the Contract or the call for bids, or to the work to be
performed thereunder, or the specifications accompanying the same, shall in any way affect
its obligation under this bond, and it does hereby waive notice of any such change,
extension of time, alteration or addition to the terms of the Contract or the call for bids, or
to the work, or to the specifications.

In the event suit is brought upon this bond by the Obligee and judgment is recovered, the
Surety shall pay all costs incurred by the Obligee in such suit, including a reasonable
attorneys' fee to be fixed by the Court.

If the District awards the bid, the security of unsuccessful bidder(s) shall be returned within sixty (60) days from the time the award is made. Unless otherwise required by law, no bidder may withdraw its bid for ninety (90) days after the date of the bid opening.

IN WITNESS WHEREOF, this instrument has been duly executed by the Principal and Surety above named, on the _____ day of _____, 2017.

(Affix Corporate Seal)

Principal

By

(Affix Corporate Seal)

Surety

By

Name of California Agent of Surety

Address of California Agent of Surety

Telephone Number of California Agent of Surety

Bidder must attach Power of Attorney and Certificate of Authority for Surety and a Notarial Acknowledgment for all Surety's signatures. The California Department of Insurance must authorize the Surety to be an admitted Surety Insurer.

END OF DOCUMENT

DESIGNATED SUBCONTRACTORS LIST
(TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID)

PROJECT: **VACAVILLE CLASSROOM BUILDING (ANNEX) RENOVATION PROJECT**

Bidder acknowledges and agrees that under Public Contract Code section 4100, et seq., it must clearly set forth below the name, location and California contractor license number of each subcontractor who will perform work or labor or render service to the Bidder in or about the construction of the Work or who will specially fabricate and install a portion of the Work according to detailed drawings contained in the plans and specifications in an amount in excess of one-half of one percent (0.5%) of Bidder's total Bid and the kind of Work that each will perform. Vendors or suppliers of materials only do not need to be listed.

Bidder acknowledges and agrees that under Public Contract Code section 4100, et seq., if Bidder fails to list as to any portion of Work, or if Bidder lists more than one subcontractor to perform the same portion of Work, Bidder must perform that portion itself or be subjected to penalty under applicable law. In case more than one subcontractor is named for the same kind of Work, state the portion of the kind of Work that each subcontractor will perform.

If alternate bids are called for and Bidder intends to use subcontractors different from or in addition to those subcontractors listed for work under the base Bid, Bidder must list subcontractors that will perform Work in an amount in excess of one half of one percent (0.5%) of Bidder's total Bid, including alternates.

If further space is required for the list of proposed subcontractors, attach additional sheets showing the required information, as indicated below.

Subcontractor Name: _____

CA Cont. Lic. #: _____ Location: _____

Portion of Work: _____

Subcontractor Name: _____

CA Cont. Lic. #: _____ Location: _____

Portion of Work: _____

Subcontractor Name: _____

CA Cont. Lic. #: _____ Location: _____

Portion of Work: _____

Subcontractor Name: _____

CA Cont. Lic. #: _____ Location: _____

Portion of Work: _____

Subcontractor Name: _____

CA Cont. Lic. #: _____ Location: _____

Portion of Work: _____

Subcontractor Name: _____

CA Cont. Lic. #: _____ Location: _____

Portion of Work: _____

Subcontractor Name: _____

CA Cont. Lic. #: _____ Location: _____

Portion of Work: _____

Subcontractor Name: _____

CA Cont. Lic. #: _____ Location: _____

Portion of Work: _____

Subcontractor Name: _____

CA Cont. Lic. #: _____ Location: _____

Portion of Work: _____

Subcontractor Name: _____

CA Cont. Lic. #: _____ Location: _____

Portion of Work: _____

Date: _____

Proper Name of Bidder: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

SITE VISIT CERTIFICATION

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

PROJECT: VACAVILLE CLASSROOM BUILDING (ANNEX) RENOVATION PROJECT

Check option that applies:

_____ I certify that I visited the Site of the proposed Work 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 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 Solano Community College School District, its Architect, its Engineer, 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: _____

END OF DOCUMENT

**NON-COLLUSION DECLARATION
TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID
Public Contract Code Section 7106**

The undersigned declares:

I am the _____ of _____, the party making the foregoing bid.

The bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation. The bid is genuine and not collusive or sham. The bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid. The bidder has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or to refrain from bidding. The bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder. All statements contained in the bid are true. The bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof, to effectuate a collusive or sham bid, and has not paid, and will not pay, any person or entity for such purpose.

Any person executing this declaration on behalf of a bidder that is a corporation, partnership, joint venture, limited liability company, limited liability partnership, or any other entity, hereby represents that he or she has full power to execute, and does execute, this declaration on behalf of the bidder.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration is executed on _____[date], at _____[city], _____[state].

Date: _____

Proper Name of Bidder: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

WORKERS' COMPENSATION CERTIFICATION

PROJECT/CONTRACT NO.: **VACAVILLE CLASSROOM BUILDING (ANNEX)
RENOVATION PROJECT/#18-005** between Solano Community College District ("District")
and _____ ("Contractor" or "Bidder")
("Contract" or "Project").

Labor Code section 3700, in relevant part, provides:

Every employer except the State shall secure the payment of compensation in one or more of the following ways:

- a. By being insured against liability to pay compensation by one or more insurers duly authorized to write compensation insurance in this state; and/or
- b. By securing from the Director of Industrial Relations a certificate of consent to self-insure, which may be given upon furnishing proof satisfactory to the Director of Industrial Relations of ability to self-insure and to pay any compensation that may become due to his employees.

I am aware of the provisions of section 3700 of the Labor Code which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the Work of this Contract.

Date: _____

Proper Name of Contractor: _____

Signature: _____

Print Name: _____

Title: _____

(In accordance with Article Labor Code sections 1860 and 1861, the above certificate must be signed and filed with the awarding body prior to performing any Work under this Contract.)

END OF DOCUMENT

**PREVAILING WAGE AND
RELATED LABOR REQUIREMENTS CERTIFICATION**

PROJECT/CONTRACT NO.: **VACAVILLE CLASSROOM BUILDING (ANNEX)
RENOVATION PROJECT/#18-005** between Solano Community College_District ("District")
and _____ ("Contractor" or "Bidder")
("Contract" or "Project").

I hereby certify that I will conform to the State of California Public Works Contract requirements regarding prevailing wages, benefits, on-site audits with 48-hours notice, payroll records, and apprentice and trainee employment requirements, for all Work on the above Project including, without limitation, labor compliance monitoring and enforcement by the Department of Industrial Relations.

Date: _____

Proper Name of Contractor: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

DRUG-FREE WORKPLACE CERTIFICATION

PROJECT/CONTRACT NO.: **VACAVILLE CLASSROOM BUILDING (ANNEX) RENOVATION PROJECT/#18-005** between Solano Community College District ("District") and _____ ("Contractor" or "Bidder") ("Contract" or "Project").

This Drug-Free Workplace Certification form is required from the successful Bidder pursuant to Government Code section 8350 et seq., the Drug-Free Workplace Act of 1990. The Drug-Free Workplace Act of 1990 requires that every person or organization awarded a contract or grant for the procurement of any property or service from any state agency must certify that it will provide a drug-free workplace by doing certain specified acts. In addition, the Act provides that each contract or grant awarded by a state agency may be subject to suspension of payments or termination of the contract or grant, and the contractor or grantee may be subject to debarment from future contracting, if the contracting agency determines that specified acts have occurred.

The District is not a "state agency" as defined in the applicable section(s) of the Government Code, but the District is a local agency and public school district under California law and requires all contractors on District projects to comply with the provisions and requirements of Government Code section 8350 et seq., the Drug-Free Workplace Act of 1990.

Contractor shall certify that it will provide a drug-free workplace by doing all of the following:

- a. Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensation, possession, or use of a controlled substance is prohibited in the person's or organization's workplace and specifying actions which will be taken against employees for violations of the prohibition.
- b. Establishing a drug-free awareness program to inform employees about all of the following:
 - (1) The dangers of drug abuse in the workplace.
 - (2) The person's or organization's policy of maintaining a drug-free workplace.
 - (3) The availability of drug counseling, rehabilitation, and employee-assistance programs.
 - (4) The penalties that may be imposed upon employees for drug abuse violations.
- c. Requiring that each employee engaged in the performance of the contract or grant be given a copy of the statement required above, and that, as a condition of employment on the contract or grant, the employee agrees to abide by the terms of the statement.

I, the undersigned, agree to fulfill the terms and requirements of Government Code section 8355 listed above and will publish a statement notifying employees concerning (a) the

prohibition of controlled substance at the workplace, (b) establishing a drug-free awareness program, and (c) requiring that each employee engaged in the performance of the Contract be given a copy of the statement required by section 8355(a), and requiring that the employee agree to abide by the terms of that statement.

I also understand that if the District determines that I have either (a) made a false certification herein, or (b) violated this certification by failing to carry out the requirements of section 8355, that the Contract awarded herein is subject to termination, suspension of payments, or both. I further understand that, should I violate the terms of the Drug-Free Workplace Act of 1990, I may be subject to debarment in accordance with the requirements of the aforementioned Act.

I acknowledge that I am aware of the provisions of Government Code section 8350 et seq. and hereby certify that I will adhere to the requirements of the Drug-Free Workplace Act of 1990.

Date: _____
Proper Name of Contractor: _____
Signature: _____
Print Name: _____
Title: _____

END OF DOCUMENT

TOBACCO-FREE ENVIRONMENT CERTIFICATION

PROJECT/CONTRACT NO.: **VACAVILLE CLASSROOM BUILDING (ANNEX)
RENOVATION PROJECT/#18-005** between Solano Community College District
("District") and _____ ("Contractor"
or "Bidder") ("Contract" or "Project").

This Tobacco-Free Environment Certification form is required from the successful Bidder.

Pursuant to, without limitation, 20 U.S.C section 6083, Labor Code section 6400 et seq., Health & Safety Code section 104350 et seq. and District Board Policies, all District sites, including the Project site, are tobacco-free environments. Smoking and the use of tobacco products by all persons is prohibited on or in District property. District property includes school buildings, school grounds, school owned vehicles and vehicles owned by others while on District property.

I acknowledge that I am aware of the District's policy regarding tobacco-free environments at District sites, including the Project site and hereby certify that I will adhere to the requirements of that policy and not permit any of my firm's employees, agents, subcontractors, or my firm's subcontractors' employees or agents to use tobacco and/or smoke on the Project site.

Date: _____

Proper Name of Contractor: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

HAZARDOUS MATERIALS CERTIFICATION

PROJECT/CONTRACT NO.: **VACAVILLE CLASSROOM BUILDING (ANNEX) RENOVATION PROJECT/#18-005** between Solano Community College District ("District") and _____ ("Contractor" or "Bidder") ("Contract" or "Project").

1. Contractor hereby certifies that no Asbestos, or Asbestos-Containing Materials, polychlorinated biphenyl (PCB), or any material listed by the federal or state Environmental Protection Agency or federal or state health agencies as a hazardous material, or any other material defined as being hazardous under federal or state laws, rules, or regulations ("New Hazardous Material"), shall be furnished, installed, or incorporated in any way into the Project or in any tools, devices, clothing, or equipment used to affect any portion of Contractor's work on the Project for District.
2. Contractor further certifies that it has instructed its employees with respect to the above-mentioned standards, hazards, risks, and liabilities.
3. Asbestos and/or asbestos-containing material shall be defined as all items containing but not limited to chrysotile, crocidolite, amosite, anthophyllite, tremolite, and actinolite. Any or all material containing greater than one-tenth of one percent (0.1%) asbestos shall be defined as asbestos-containing material.
4. Any disputes involving the question of whether or not material is New Hazardous Material shall be settled by electron microscopy or other appropriate and recognized testing procedure, at the District's determination. The costs of any such tests shall be paid by Contractor if the material is found to be New Hazardous Material.
5. All Work or materials found to be New Hazardous Material or Work or material installed with equipment containing "New Hazardous Material" will be immediately rejected and this Work will be removed at Contractor's expense at no additional cost to the District.
6. Contractor has read and understood the document Hazardous Materials Procedures & Requirements, and shall comply with all the provisions outlined therein.

Date: _____

Proper Name of Contractor: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

LEAD-BASED MATERIALS CERTIFICATION

PROJECT/CONTRACT NO.: **VACAVILLE CLASSROOM BUILDING (ANNEX) RENOVATION PROJECT/#18-005** between Solano Community College District ("District") and _____ ("Contractor" or "Bidder") ("Contract" or "Project").

This certification provides notice to the Contractor that:

- (1) Contractor's work may disturb lead-containing building materials.
- (2) Contractor shall notify the District if any work may result in the disturbance of lead-containing building materials.
- (3) Contractor shall comply with the Renovation, Repair and Painting Rule, if lead-based paint is disturbed in a six-square-foot or greater area indoors or a 20-square-foot or greater area outdoors.

1. Lead as a Health Hazard

Lead poisoning is recognized as a serious environmental health hazard facing children today. Even at low levels of exposure, much lower than previously believed, lead can impair the development of a child's central nervous system, causing learning disabilities, and leading to serious behavioral problems. Lead enters the environment as tiny lead particles and lead dust disburse when paint chips, chalks, peels, wears away over time, or is otherwise disturbed. Ingestion of lead dust is the most common pathway of childhood poisoning; lead dust gets on a child's hands and toys and then into a child's mouth through common hand-to-mouth activity. Exposures may result from construction or remodeling activities that disturb lead paint, from ordinary wear and tear of windows and doors, or from friction on other surfaces.

Ordinary construction and renovation or repainting activities carried out without lead-safe work practices can disturb lead-based paint and create significant hazards. Improper removal practices, such as dry scraping, sanding, or water blasting painted surfaces, are likely to generate high volumes of lead dust.

Because the Contractor and its employees will be providing services for the District, and because the Contractor's work may disturb lead-containing building materials, CONTRACTOR IS HEREBY NOTIFIED of the potential presence of lead-containing materials located within certain buildings utilized by the District. All school buildings built prior to 1978 are presumed to contain some lead-based paint until sampling proves otherwise.

2. Overview of California Law

Education Code section 32240 et seq. is known as the Lead-Safe Schools Protection Act. Under this act, the Department of Health Services is to conduct a sample survey of schools in the State of California for the purpose of developing risk factors to predict lead contamination in public schools. (Ed. Code, § 32241.)

Any school that undertakes any action to abate existing risk factors for lead is required to utilize trained and state-certified contractors, inspectors, and workers. (Ed. Code, § 32243, subd. (b).) Moreover, lead-based paint, lead plumbing, and solders, or other potential sources of lead contamination, shall not be utilized in the construction of any new school facility or the modernization or renovation of any existing school facility. (Ed. Code, § 32244.)

Both the Federal Occupational Safety and Health Administration ("Fed/OSHA") and the California Division of Occupational Safety and Health ("Cal/OSHA") have implemented safety orders applicable to all construction work where a contractor's employee may be occupationally exposed to lead.

The OSHA Regulations apply to all construction work where a contractor's employee may be occupationally exposed to lead. The OSHA Regulations contain specific and detailed requirements imposed on contractors subject to that regulation. The OSHA Regulations define construction work as work for construction, alteration, and/or repair, including painting and decorating. It includes, but is not limited to, the following:

- a. Demolition or salvage of structures where lead or materials containing lead are present;
- b. Removal or encapsulation of materials containing lead;
- c. New construction, alteration, repair, or renovation of structures, substrates, or portions thereof, that contain lead, or materials containing lead;
- d. Installation of products containing lead;
- e. Lead contamination/emergency cleanup;
- f. Transportation, disposal, storage, or containment of lead or materials containing lead on the site or location at which construction activities are performed; and
- g. Maintenance operations associated with the construction activities described in the subsection.

Because it is assumed by the District that all painted surfaces (interior as well as exterior) within the District contain some level of lead, it is imperative that the Contractor, its workers and subcontractors fully and adequately comply with all applicable laws, rules and regulations governing lead-based materials (including title 8, California Code of Regulations, section 1532.1).

Contractor shall notify the District if any Work may result in the disturbance of lead-containing building materials. Any and all Work that may result in the disturbance of lead-containing building materials shall be coordinated through the District. A signed copy of this Certification shall be on file prior to beginning Work on the Project, along with all current insurance certificates.

3. Renovation, Repair and Painting Rule, Section 402(c)(3) of the Toxic Substances Control Act

The EPA requires lead safe work practices to reduce exposure to lead hazards created by renovation, repair and painting activities that disturb lead-based paint. Pursuant to the Renovation, Repair and Painting Rule (RRP), renovations in homes, childcare facilities, and schools built prior to 1978 must be conducted by certified renovations firms, using renovators with training by a EPA-accredited training provider, and fully and adequately complying with all applicable laws, rules and regulations governing lead-based materials, including those rules and regulations appearing within title 40 of the Code of Federal Regulations as part 745 (40 CFR 745).

The RRP requirements apply to all contractors who disturb lead-based paint in a six-square-foot or greater area indoors or a 20-square-foot or greater area outdoors. If a DPH-certified inspector or risk assessor determines that a home constructed before 1978 is lead-free, the federal certification is not required for anyone working on that particular building.

4. Contractor's Liability

If the Contractor fails to comply with any applicable laws, rules, or regulations, and that failure results in a site or worker contamination, the Contractor will be held solely responsible for all costs involved in any required corrective actions, and shall defend, indemnify, and hold harmless the District, pursuant to the indemnification provisions of the Contract, for all damages and other claims arising therefrom.

If lead disturbance is anticipated in the Work, only persons with appropriate accreditation, registrations, licenses, and training shall conduct this Work.

It shall be the responsibility of the Contractor to properly dispose of any and all waste products, including, but not limited to, paint chips, any collected residue, or any other visual material that may occur from the prepping of any painted surface. It will be the responsibility of the Contractor to provide the proper disposal of any hazardous waste by a certified hazardous waste hauler. This company shall be registered with the Department of Transportation (DOT) and shall be able to issue a current manifest number upon transporting any hazardous material from any school site within the District.

The Contractor shall provide the District with any sample results prior to beginning Work, during the Work, and after the completion of the Work. The District may request to examine, prior to the commencement of the Work, the lead training records of each employee of the Contractor.

THE CONTRACTOR HEREBY ACKNOWLEDGES, UNDER PENALTY OF PERJURY, THAT IT:

1. HAS RECEIVED NOTIFICATION OF POTENTIAL LEAD-BASED MATERIALS ON THE OWNER'S PROPERTY;

2. IS KNOWLEDGEABLE REGARDING AND WILL COMPLY WITH ALL APPLICABLE LAWS, RULES, AND REGULATIONS GOVERNING WORK WITH, AND DISPOSAL, OF LEAD.

THE UNDERSIGNED WARRANTS THAT HE/SHE HAS THE AUTHORITY TO SIGN ON BEHALF OF AND BIND THE CONTRACTOR. THE DISTRICT MAY REQUIRE PROOF OF SUCH AUTHORITY.

Date: _____

Proper Name of Contractor: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

IMPORTED MATERIALS CERTIFICATION

PROJECT/CONTRACT NO.: **VACAVILLE CLASSROOM BUILDING (ANNEX) RENOVATION PROJECT/#18-005** between Solano Community College District ("District") and _____ ("Contractor" or "Bidder") ("Contract" or "Project").

This form shall be executed by all entities that, in any way, provide or deliver and/or supply any soils, aggregate, or related materials ("Fill") to the Project Site. All Fill shall satisfy all requirements of any environmental review of the Project performed pursuant to the statutes and guidelines of the California Environmental Quality Act, section 21000 et seq. of the Public Resources Code ("CEQA"), and all requirements of section 17210 et seq. of the Education Code, including requirements for a Phase I environmental assessment acceptable to the State of California Department of Education and Department of Toxic Substances Control.

Certification of: Delivery Firm/Transporter Supplier Manufacturer
 Wholesaler Broker Retailer
 Distributor Other _____

Type of Entity Corporation General Partnership
 Limited Partnership Limited Liability Company
 Sole Proprietorship Other _____

Name of firm ("Firm"): _____

Mailing address: _____

Addresses of branch office used for this Project: _____

If subsidiary, name and address of parent company: _____

By my signature below, I hereby certify that I am aware of section 25260 of the Health and Safety Code and the sections referenced therein regarding the definition of hazardous material. I further certify on behalf of the Firm that all soils, aggregates, or related materials provided, delivered, and/or supplied or that will be provided, delivered, and/or supplied by this Firm to the Project Site are free of any and all hazardous material as defined in section 25260 of the Health and Safety Code. I further certify that I am authorized to make this certification on behalf of the Firm.

Date: _____

Proper Name of Firm: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

SEX OFFENDER REGISTRATION ACT CERTIFICATION

PROJECT/CONTRACT NO.: **VACAVILLE CLASSROOM BUILDING (ANNEX) RENOVATION PROJECT/#18-005** between the Solano Community College District ("District") and _____ ("Contract" or "Project").

This certification provides notice to the Contractor that:

- Penal Code section 290.01 requires every person required to register pursuant to sections 290 to 290.009, inclusive, of the Sex Offender Registration Act who is carrying on a vocation at the community college for more than fourteen (14) days, or for an aggregate period exceeding thirty (30) days in a calendar year, shall, in addition to the registration required by the Sex Offender Registration Act, register with the campus police department within five working days of commencing employment at that community college on a form as may be required by the Department of Justice. The terms "employed or carries on a vocation" include employment whether or not financially compensated, volunteered, or performed for government or educational benefit.
- The registrant shall also notify the campus police department within five (5) working days of ceasing to be employed, or ceasing to carry on a vocation, at the community college.

Contractor hereby acknowledges, under penalty of perjury, that it is aware of the provisions of section 290.01 of the Penal Code, and it will provide notice of the above provisions to all of its employees, subcontractors, and employees of subcontractors regardless of whether they are designated as employees or acting as independent contractors of the Contractor at least five (5) working days before commencing the performance of the Work of this Contract.

THE UNDERSIGNED WARRANTS THAT HE/SHE HAS THE AUTHORITY TO SIGN ON BEHALF OF AND BIND THE CONTRACTOR. THE DISTRICT MAY REQUIRE PROOF OF SUCH AUTHORITY.

Date: _____

Proper Name of Contractor: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

By my signature below, I hereby certify that, to the best of my knowledge, the contents of this disclosure are true, or are believed to be true. I further certify on behalf of the Firm that I am aware of section 3000 et seq. of the California Public Contract Code, and the sections referenced therein regarding the penalties for providing false information or failing to disclose a financial relationship in this disclosure. I further certify that I am authorized to make this certification on behalf of the Firm.

Date: _____

Proper Name of Firm: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

IRAN CONTRACTING ACT CERTIFICATION
(Public Contract Code sections 2202-2208)

PROJECT/CONTRACT NO.: **VACAVILLE CLASSROOM BUILDING (ANNEX)**
RENOVATION PROJECT/#18-005 between Solano Community College_District ("District")
 and _____ ("Contractor" or "Bidder")
 ("Contract" or "Project").

Prior to bidding on or submitting a proposal for a contract for goods or services of \$1,000,000 or more to the District, the Bidder must either: a) certify it is **not** on the current list of persons engaged in investment activities in Iran created by the California Department of General Services ("DGS") pursuant to Public Contract Code section 2203(b) and is not a financial institution extending twenty million dollars (\$20,000,000) or more in credit to another person, for 45 days or more, if that other person will use the credit to provide goods or services in the energy sector in Iran and is identified on the current list of persons engaged in investment activities in Iran created by DGS; or b) demonstrate it has been exempted from the certification requirement for that solicitation or contract pursuant to Public Contract Code section 2203(c) or (d).

To comply with this requirement, please insert your vendor or financial institution name and Federal ID Number (if available) and complete **one** of the options below. Please note: California law establishes penalties for providing false certifications, including civil penalties equal to the greater of \$250,000 or twice the amount of the contract for which the false certification was made; contract termination; and three-year ineligibility to bid on contracts. (Public Contract Code section 2205.)

OPTION #1 - CERTIFICATION

I, the official named below, certify I am duly authorized to execute this certification on behalf of the vendor/financial institution identified below, and the vendor/financial institution identified below is **not** on the current list of persons engaged in investment activities in Iran created by DGS and is not a financial institution extending twenty million dollars (\$20,000,000) or more in credit to another person/vendor, for 45 days or more, if that other person/vendor will use the credit to provide goods or services in the energy sector in Iran and is identified on the current list of persons engaged in investment activities in Iran created by DGS.

<i>Vendor Name/Financial Institution (Printed)</i>		<i>Federal ID Number (or n/a)</i>
<i>By (Authorized Signature)</i>		
<i>Printed Name and Title of Person Signing</i>		
<i>Date Executed</i>	<i>Executed in</i>	

OPTION #2 – EXEMPTION

Pursuant to Public Contract Code sections 2203(c) and (d), a public entity may permit a vendor/financial institution engaged in investment activities in Iran, on a case-by-case basis, to be eligible for, or to bid on, submit a proposal for, or to enter into or to renew, a contract for goods and services.

If you have obtained an exemption from the certification requirement under the Iran Contracting Act, please fill out the information below, and attach documentation demonstrating the exemption approval.

<i>Vendor Name/Financial Institution (Printed)</i>	<i>Federal ID Number (or n/a)</i>
<i>By (Authorized Signature)</i>	
<i>Printed Name and Title of Person Signing</i>	<i>Date Executed</i>

END OF DOCUMENT

TOBACCO-FREE ENVIRONMENT CERTIFICATION

PROJECT/CONTRACT NO.: **VACAVILLE CLASSROOM BUILDING (ANNEX)
RENOVATION PROJECT/#18-005** between Solano Community College District
("District") and _____ ("Contractor"
or "Bidder") ("Contract" or "Project").

This Tobacco-Free Environment Certification form is required from the successful Bidder.

Pursuant to, without limitation, 20 U.S.C section 6083, Labor Code section 6400 et seq., Health & Safety Code section 104350 et seq. and District Board Policies, all District sites, including the Project site, are tobacco-free environments. Smoking and the use of tobacco products by all persons is prohibited on or in District property. District property includes school buildings, school grounds, school owned vehicles and vehicles owned by others while on District property.

I acknowledge that I am aware of the District's policy regarding tobacco-free environments at District sites, including the Project site and hereby certify that I will adhere to the requirements of that policy and not permit any of my firm's employees, agents, subcontractors, or my firm's subcontractors' employees or agents to use tobacco and/or smoke on the Project site.

Date: _____

Proper Name of Contractor: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

POST BID INTERVIEW

PART 1 – GENERAL

1.01 SUMMARY

If requested by the District, this Section requires the apparent low bidder to attend and participate in a Post Bid Interview with the Construction Manager, prior to award of any contract by the District. The Post Bid Interview will be scheduled by the Construction Manager within three (3) calendar days after the date of bid.

1.02 REQUIRED ATTENDANCE

- A. A duly authorized representative of the apparent low bidder is required to attend the Post Bid Interview, in person.
- B. The apparent low bidder's authorized representative must have signatory authority on behalf of the apparent low bidder.
- C. Failure to attend the Post Bid Interview will be considered just cause for the District to reject the Bid.

1.03 POST BID INTERVIEW PROCEDURE

- A. The Construction Manager will review the Bid with the attendees.
- B. The Construction Manager will review the Contract Documents with the attendees, including but not limited to:
 - (1) Insurance
 - (2) Bonding
 - (3) Addenda
 - (4) Pre-Bid Clarifications
 - (5) Scope of Work
 - (6) Bid Alternates
 - (7) The Contract Plans
 - (8) The Contract Specifications
 - (9) The Project Schedule and Schedule Requirements
 - (10) Prevailing Wage Requirements

- (11) Liquidated Damages
- (12) Required Documentation for Contract Administration
- (13) Contract Coordination Requirements

1.04 POST BID INTERVIEW DOCUMENTATION

The Construction Manager will document the Post Bid Interview on the form attached to this Section. Both the Apparent Low Bidder and the Construction Manager are required to sign the Post Bid Interview Documentation.

POST BID INTERVIEW

CONSTRUCTION MANAGER

[Name]

[Address 1]

[Address 2]

[Phone]

[Fax]

BIDDER: _____

DATE: _____ TIME: _____ PHONE # _____

I. INTRODUCTIONS:

A. Present	_____	_____
	CONTRACTOR	CONTRACTOR
	_____	_____
	_____	_____
	[CM]	[CM]

II. PROPOSED CONTRACT: _____

III. PURPOSE OF INTERVIEW IS TO ASSURE:

- | | | | |
|----|---|-----|----|
| A. | Do you acknowledge submission of a complete and accurate bid? | Yes | No |
| B. | Do you acknowledge the Bid Document submittal timelines after NOA and NTP and can you meet those timelines? | Yes | No |
| C. | Do you acknowledge the requirements for the escrow of bid documents? | Yes | No |

IV. CONTRACTUAL REQUIREMENTS:

- | | | | |
|----|---|-----|----|
| A. | Do you understand you are a prime contractor? | Yes | No |
| B. | Can you meet specified insurance requirements? | Yes | No |
| 1. | Does any of your policies that require Additional Insured endorsements exceed the minimum coverage requirements? | Yes | No |
| 2. | Are you requesting that the District accept an Umbrella or Excess Liability Insurance Policy to meet the policy limit? | Yes | No |
| 3. | Will there be a gap between the per occurrence amount of any underlying policy and the start of the coverage under the Umbrella or Excess Liability Insurance Policy? | Yes | No |

- | | | | |
|----|---|-----|----|
| C. | Will you provide the Performance, and a Labor and Material Bond for 100% of the Contract Price as stipulated? | Yes | No |
| 1. | Cost for bond: _____% | | |
| 2. | Is the cost of your bond in your base bid? | Yes | No |
| 3. | Is your surety licensed to issue bonds in California? | Yes | No |

V. SCOPE OF WORK:

- | | | | |
|----|--|-----|----|
| A. | Acknowledged Receipt of Addenda (list all)_____ | Yes | No |
| B. | Are the costs for addenda items included in your bid? (if applicable) | Yes | No |
| C. | Do you have a complete understanding of your Scope of Work under the proposed Agreement? | Yes | No |
| D. | You have re-reviewed the documents and understand the Scope of the Work. Are there any items that require clarification? | Yes | No |

If yes, please identify them.

1. _____

2. _____

3. _____

4. _____

5. _____

Is (are) the cost(s) for above items?	Yes	No
---------------------------------------	-----	----

- | | | | |
|----|---|-----|----|
| C. | Review bid alternative (if applicable) (list all)_____ | | |
| D. | Are the plans and specifications clear and understandable to your satisfaction? | Yes | No |

VI. SCHEDULE:

- A. Do you acknowledge and agree to the stipulated completion dates and milestones in the contract? Yes No
1. Will you provide a detailed construction schedule to _____ within the required ten (10) days, per the contract? Yes No
2. It is understood that the Project schedule is critical and that that weekend and overtime work may be required to meet the milestones. Yes No
3. It is understood that if rain does occur, then all dewatering and And protection of work is required, per the contract. Yes No
- If not, what must change and why? _____
- _____
- _____

- B. Identify critical materials, deliveries, long lead items and other dependencies, including Owner Furnished items that could affect the completion of your work.
1. _____
2. _____
3. _____
4. _____
5. _____

VII. CONTRACTOR COMMENTS/SUGGESTIONS:

1. _____
2. _____
3. _____
4. _____
5. _____

VIII. CONTRACTOR

You agree the information contained herein is part of your contractual obligations. Your signature acknowledges your agreement to perform all Work in the Contract Documents, and that costs for all Work are included in your bid.

The foregoing information is true and accurate, and I am authorized to sign as an officer of the company I am representing.

[Company Name]

Signature _____ Title: _____

Date: _____

IX. CONSTRUCTION MANAGER

Signature _____ Title: _____

Date: _____

Title of Document: POST BID INTERVIEW

Number of Pages: _____

Date of Document: _____

END OF DOCUMENT

NOTICE OF AWARD

Dated: _____ 20__

To: _____
(Contractor)

To: _____
(Address)

From: Governing Board ("Board") of Solano Community College District ("District" or "Owner")

PROJECT: **VACAVILLE CLASSROOM BUILDING (ANNEX) RENOVATION PROJECT**

("Project" or "Contract").

Contractor has been awarded the referenced Contract on _____, 20__, by action of the District's Board.

The Contract Price is _____ Dollars (\$ _____), and includes alternates _____.

Three (3) copies of each of the Contract Documents (except Drawings) accompany this Notice of Award. Three (3) sets of the Drawings will be delivered separately or otherwise made available. Additional copies are available at cost of reproduction.

You must comply with the following conditions precedent within **SEVEN (7)** calendar days of the date of this Notice of Award.

The Bidder to whom Contract is awarded shall execute and submit the following documents by 5:00 p.m. of the **SEVENTH (7th)** calendar day following the date of the Notice of Award.

- a. Agreement: To be executed by successful Bidder. Submit four (4) copies, each bearing an original signature.
- b. Escrow of Bid Documentation: This must include all required documentation. See the document Escrow of Bid Documentation for more information.
- c. Performance Bond (100%): On the form provided in the Contract Documents and fully executed as indicated on the form.
- d. Payment Bond (Contractor's Labor & Material Bond) (100%): On the form provided in the Contract Documents and fully executed as indicated on the form.
- e. Insurance Certificates and Endorsements as required.
- f. Workers' Compensation Certification.

- g. Prevailing Wage and Related Labor Requirements Certification.
- h. Drug-Free Workplace Certification.
- i. Tobacco-Free Environment Certification.
- j. Hazardous Materials Certification.
- k. Lead-Based Paint Certification.
- l. Imported Materials Certification.
- m. Roofing Project Certification: from Contractor, Material Manufacturer and/or Vendor.

Failure to comply with these conditions within the time specified will entitle District to consider your bid abandoned, to annul this Notice of Award, and to declare your Bid Security forfeited, as well as any other rights the District may have against the Contractor.

After you comply with those conditions, District will return to you one fully signed counterpart of the Agreement.

SOLANO COMMUNITY COLLEGE SCHOOL DISTRICT

BY: _____

NAME: _____

TITLE: _____

END OF DOCUMENT

5. **Completion-Extension of Time:** Should the Contractor fail to complete this Contract, and the Work provided herein, within the time fixed for completion, due allowance being made for the contingencies provided for herein, the Contractor shall become liable to the District for all loss and damage that the District may suffer on account thereof. The Contractor shall coordinate its work with the Work of all other contractors. The District shall not be liable for delays resulting from Contractor's failure to coordinate its Work with other contractors in a manner that will allow timely completion of Contractor's Work. Contractor shall be liable for delays to other contractors caused by Contractor's failure to coordinate its Work with the work of other contractors.

6. **Liquidated Damages:** Time is of the essence for all work under this Agreement. It is hereby understood and agreed that it is and will be difficult and/or impossible to ascertain and determine the actual damage that the District will sustain in the event of and by reason of Contractor's delay; therefore, Contractor agrees that it shall pay to the District the sum of Two Thousand dollars (\$2,000.00) per day as liquidated damages for each and every day's delay beyond the time herein prescribed in finishing the Work.

It is hereby understood and agreed that this amount is not a penalty.

In the event that any portion of the liquidated damages is not paid to the District, the District may deduct that amount from any money due or that may become due the Contractor under this Agreement. The District's right to assess liquidated damages is as indicated herein and in the General Conditions.

The time during which the Contract is delayed for cause as hereinafter specified may extend the time of completion for a reasonable time as the District may grant. This provision does not exclude the recovery of damages for delay by either party under other provisions in the Contract Documents.

7. **Loss Or Damage:** The District and its authorized representatives shall not in any way or manner be answerable or suffer loss, damage, expense, or liability for any loss or damage that may happen to the Work, or any part thereof, or in or about the same during its construction and before acceptance, and the Contractor shall assume all liabilities of every kind or nature arising from the Work, either by accident, negligence, theft, vandalism, or any cause whatever; and shall hold the District and its authorized representatives harmless from all liability of every kind and nature arising from accident, negligence, or any cause whatever.

8. **Insurance and Bonds:** Before commencing the Work, Contractor shall provide all required certificates of insurance, and payment and performance bonds as evidence thereof.

9. **Prosecution of Work:** If the Contractor should neglect to prosecute the Work properly or fail to perform any provisions of this contract, the District, may, pursuant to the General Conditions and without prejudice to any other remedy it may have, make good such deficiencies and may deduct the cost thereof from the payment then or thereafter due the Contractor.

10. **Authority of Architect, Project Inspector, and DSA:** Contractor hereby acknowledges that the Architect(s), the Project Inspector(s), and the Division of the State Architect have authority to approve and/or stop Work if the Contractor's Work does not comply with the requirements of the Contract Documents, Title 24 of the California Code of Regulations, and all applicable laws. The Contractor shall be liable for any delay caused by its non-compliant Work.
11. **Assignment of Contract:** Neither the Contract, nor any part thereof, nor any moneys due or to become due thereunder, may be assigned by the Contractor without the written approval of the District, nor without the written consent of the Surety on the Contractor's Performance Bond (the "Surety"), unless the Surety has waived in writing its right to notice of assignment.
12. **Classification of Contractor's License:** Contractor hereby acknowledges that it currently holds valid Type B Contractor's license(s) issued by the State of California, Contractor's State Licensing Board, in accordance with division 3, chapter 9, of the Business and Professions Code and in the classification called for in the Contract Documents.
13. **Registration as Public Works Contractor:** The Contractor and all Subcontractors currently are registered as public works contractors with the Department of Industrial Relations, State of California, in accordance with Labor Code section 1771.4.
14. **Payment of Prevailing Wages:** The Contractor and all Subcontractors shall pay all workers on all Work performed pursuant to this Contract not less than the general prevailing rate of per diem wages and the general prevailing rate for holiday and overtime work as determined by the Director of the Department of Industrial Relations, State of California, for the type of work performed and the locality in which the work is to be performed within the boundaries of the District, pursuant to sections 1770 et seq. of the California Labor Code
15. This Project is subject to labor compliance monitoring and enforcement by the Department of Industrial Relations pursuant to Labor Code section 1771.4 and Title 8 of the California Code of Regulations. Contractor specifically acknowledges and understands that it shall perform the Work of this Agreement while complying with all the applicable provisions of Division 2, Part 7, Chapter 1, of the Labor Code, including, without limitation, the requirement that the Contractor and all of its Subcontractors shall timely submit complete and accurate electronic certified payroll records as required by the Contract Documents, or the District may not issue payment.
16. **Contract Price:** In consideration of the foregoing covenants, promises, and agreements on the part of the Contractor, and the strict and literal fulfillment of each and every covenant, promise, and agreement, and as compensation agreed upon for the Work and construction, erection, and completion as aforesaid, the District covenants, promises, and agrees that it will well and truly pay and cause to be paid to the Contractor in full, and as the full Contract Price and compensation for construction, erection, and completion of the Work hereinabove agreed to be performed by the Contractor, the following price:

Dollars

(\$ _____),

in lawful money of the United States, which sum is to be paid according to the schedule provided by the Contractor and accepted by the District and subject to additions and deductions as provided in the Contract. This amount supersedes any previously stated and/or agreed to amount(s).

- 17. **Severability:** If any term, covenant, condition, or provision in any of the Contract Documents is held by a court of competent jurisdiction to be invalid, void or unenforceable, the remainder of the provisions in the Contract Documents shall remain in full force and effect and shall in no way be affected, impaired, or invalidated thereby.

IN WITNESS WHEREOF, accepted and agreed on the date indicated above:

CONTRACTOR

DISTRICT

SOLANO COMMUNITY COLLEGE DISTRICT

By: _____

By: _____

Title: _____

Title: _____

NOTE: If the party executing this Contract is a corporation, a certified copy of the by-laws, or of the resolution of the Board of Directors, authorizing the officers of said corporation to execute the Contract and the bonds required thereby must be attached hereto.

END OF DOCUMENT

NOTICE TO PROCEED

Dated: _____, 20__

TO: _____
("Contractor")

ADDRESS: _____

PROJECT/CONTRACT NO.: **VACAVILLE CLASSROOM BUILDING (ANNEX) RENOVATION PROJECT/#18-005** between the Solano Community College District and Contractor ("Contract").

You are notified that the Contract Time under the above Contract will commence to run on _____, 20__. By that date, you are to start performing your obligations under the Contract Documents. In accordance with the Agreement executed by Contractor, the date of completion on or before July 13, 2018.

You must submit the following documents by 5:00 p.m. of the **(TENTH (10th))** calendar day following the date of this Notice to Proceed:

- a. Contractor's preliminary schedule of construction.
- b. Contractor's preliminary schedule of values for all of the Work.
- c. Contractor's preliminary schedule of submittals, including Shop Drawings, Product Data, and Samples submittals
- d. Contractor's Safety Plan specifically adapted for the Project.
- e. A complete subcontractors list, including the name, address, telephone number, facsimile number, California State Contractors License number, classification, and monetary value of all Subcontracts.

Thank you. We look forward to a very successful Project.

SOLANO COMMUNITY COLLEGE DISTRICT

BY: _____

NAME: Lucky Lofton

TITLE: Executive Bonds Manager

END OF DOCUMENT

ESCROW BID DOCUMENTATION

1. Requirement to Escrow Bid Documentation

- a. Contractor shall submit, within **SEVEN (7)** calendar days after the date of the Notice of Award, one copy of all documentary information received or generated by Contractor in preparation of bid prices for this Contract, as specified herein. This material is referred to herein as "Escrow Bid Documentation." The Escrow Bid Documentation of the Contractor will be held in escrow for the duration of the Contract.
- b. Contractor agrees, as a condition of award of the Contract, that the Escrow Bid Documentation constitutes all written information used in the preparation of its bid, and that no other written bid preparation information shall be considered in resolving disputes or claims. Contractor also agrees that nothing in the Escrow Bid Documentation shall change or modify the terms or conditions of the Contract Documents.
- c. The Escrow Bid Documentation will not be opened by District except as indicated herein. The Escrow Bid Documentation will be used only for the resolution of change orders and claims disputes.
- d. Contractor's submission of the Escrow Bid Documentation, as with the bonds and insurance documents required, is considered an essential part of the Contract award. Should the Contractor fail to make the submission within the allowed time specified above, District may deem the Contractor to have failed to enter into the Contract, and the Contractor shall forfeit the amount of its bid security, accompanying the Contractor's bid, and District may award the Contract to the next lowest responsive responsible bidder.
- e. NO PAYMENTS WILL BE MADE, NOR WILL DISTRICT ACCEPT PROPOSED CHANGE ORDERS UNTIL THE ABOVE REQUIRED INFORMATION IS SUBMITTED AND APPROVED.
- f. The Escrow Bid Documentation shall be submitted in person by an authorized representative of the Contractor to the District.

2. Ownership of Escrow Bid Documentation

- a. The Escrow Bid Documentation is, and shall always remain, the property of Contractor, subject to review by District, as provided herein.
- b. Escrow Bid Documentation constitute trade secrets, not known outside Contractor's business, known only to a limited extent and only by a limited number of employees of Contractor, safeguarded while in Contractor's possession, extremely valuable to Contractor, and could be extremely valuable to Contractor's competitors by virtue of it reflecting Contractor's contemplated techniques of construction. Subject to the provisions herein,

District agrees to safeguard the Escrow Bid Documentation, and all information contained therein, against disclosure to the fullest extent permitted by law.

3. Format and Contents of Escrow Bid Documentation

- a. Contractor may submit Escrow Bid Documentation in its usual cost-estimating format; a standard format is not required. The Escrow Bid Documentation shall be submitted in the language (e.g., English) of the specification.
- b. Escrow Bid Documentation must clearly itemize the estimated costs of performing the work of each bid item contained in the bid schedule, separating bid items into sub-items as required to present a detailed cost estimate and allow a detailed cost review. The Escrow Bid Documentation shall include all subcontractor bids or quotes, supplier bids or quotes, quantity takeoffs, crews, equipment, calculations of rates of production and progress, copies of quotes from subcontractors and suppliers, and memoranda, narratives, add/deduct sheets, and all other information used by the Contractor to arrive at the prices contained in the bid proposal. Estimated costs should be broken down into Contractor's usual estimate categories such as direct labor, repair labor, equipment ownership and operation, expendable materials, permanent materials, and subcontract costs as appropriate. Plant and equipment and indirect costs should be detailed in the Contractor's usual format. The Contractor's allocation of indirect costs, contingencies, markup, and other items to each bid item shall be identified.
- c. All costs shall be identified. For bid items amounting to less than \$10,000, estimated unit costs are acceptable without a detailed cost estimate, provided that labor, equipment, materials, and subcontracts, as applicable, are included and provided that indirect costs, contingencies, and markup, as applicable, are allocated.
- d. Bid Documentation provided by District should not be included in the Escrow Bid Documentation unless needed to comply with the following requirements.

4. Submittal of Escrow Bid Documentation

- a. The Escrow Bid Documentation shall be submitted by the Contractor in a sealed container within **SEVEN (7)** calendar days after the date of the Notice of Award. The container shall be clearly marked on the outside with the Contractor's name, date of submittal, project name and the words "Escrow Bid Documentation – Intended to be opened in the presence of Authorized Representatives of Both District and Contractor".
- b. By submitting Escrow Bid Documentation, Contractor represents that the material in the Escrow Bid Documentation constitutes all the documentary information used in preparation of the bid and that the Contractor has personally examined the contents of the Escrow Bid Documentation container and has found that the documents in the container are complete.

- c. If Contractor's proposal is based upon subcontracting any part of the work, each subcontractor whose total subcontract price exceeds 5 percent of the total contract price proposed by Contractor, shall provide separate Escrow Documents to be included with those of Contractor. Those documents shall be opened and examined in the same manner and at the same time as the examination described above for Contractor.
- d. If Contractor wishes to subcontract any portion of the Work after award, District retains the right to require Contractor to submit Escrow Documents for the Subcontractor before the subcontract is approved.

5. Storage, Examination and Final Disposition of Escrow Bid Documentation

- a. The Escrow Bid Documentation will be placed in escrow, for the life of the Contract, in a mutually agreeable institution. The cost of storage will be paid by Contractor for the duration of the project until final Contract payment. The storage facilities shall be the appropriate size for all the Escrow Bid Documentation and located conveniently to both District's and Contractor's offices.
- b. The Escrow Bid Documentation shall be examined by both District and Contractor, at any time deemed necessary by either District or Contractor, to assist in the negotiation of price adjustments and change orders or the settlement of disputes and claims. In the case of legal proceedings, Escrow Bid Documentation shall be used subject to the terms of an appropriate protective order if requested by Contractor and ordered by a court of competent jurisdiction. Examination of the Escrow Bid Documentation is subject to the following conditions:
 - (1) As trade secrets, the Escrow Bid Documentation is proprietary and confidential to the extent allowed by law.
 - (2) District and Contractor shall each designate, in writing to the other party **SEVEN (7)** calendar days prior to any examination, the names of representatives who are authorized to examine the Escrow Bid Documentation. No other person shall have access to the Escrow Bid Documentation.
 - (3) Access to the documents may take place only in the presence of duly designated representatives of the District and Contractor. If Contractor fails to designate a representative or appear for joint examination on **SEVEN (7)** calendar days notice, then the District representative may examine the Escrow Bid Documents alone upon an additional **THREE (3)** calendar days notice if a representative of the Contractor does not appear at the time set.
 - (4) If a subcontractor has submitted sealed information to be included in the Escrow Bid Documents, access to those documents may take place only in the presence of a duly designated representative of the District, Contractor and that subcontractor. If that subcontractor fails to designate a representative or appear for joint examination on **SEVEN**

(7) calendar days notice, then the District representative and/or the Contractor may examine the Escrow Bid Documentation without that subcontractor present upon an additional **THREE (3)** calendar days notice if a representative of that subcontractor does not appear at the time set.

- c. The Escrow Bid Documentation will be returned to Contractor at such time as the Contract has been completed and final settlement has been achieved.

END OF DOCUMENT

ESCROW AGREEMENT IN LIEU OF RETENTION
Public Contract Code Section 22300

(Note: Contractor must use this form.)

This Escrow Agreement ("Escrow Agreement") is made and entered into this _____ day of _____, 20____, by and between the Solano Community College District ("District"), whose address is 4000 Suisun Valley Road, _____ Fairfield, _____ California, _____ 94534 _____ and _____ ("Contractor"), whose address is _____, and _____ ("Escrow Agent"), a state or federally chartered bank in the 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"); **or**
 - 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 terms of Contract between District and Contractor.

Securities shall be held in name of Solano Community College Community College 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 retention 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.

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 \$ [REDACTED] 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.
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.
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 of Escrow Account is opened, District and Contractor shall deliver to Escrow Agent a fully executed of this Agreement.

IN WITNESS WHEREOF, the parties have executed this Agreement by their proper officers on the date first set forth above.

On behalf of District:

Title

Name

Signature

Address

On behalf of Contractor:

Title

Name

Signature

Address

END OF DOCUMENT

PERFORMANCE BOND
(100% of Contract Price)

(Note: Bidders must use this form, NOT a surety company form.)

KNOW ALL PERSONS BY THESE PRESENTS:

WHEREAS, the governing board ("Board") of the Solano Community College District, ("District") and _____ ("Principal") have entered into a contract for the furnishing of all materials and labor, services and transportation, necessary, convenient, and proper to perform the following project:

VACAVILLE CLASSROOM BUILDING (ANNEX) RENOVATION PROJECT

("Project" or "Contract") which Contract dated _____, 20____, and all of the Contract Documents attached to or forming a part of the Contract, are hereby referred to and made a part hereof; and

WHEREAS, said Principal is required under the terms of the Contract to furnish a bond for the faithful performance of the Contract.

NOW, THEREFORE, the Principal and _____ ("Surety") are held and firmly bound unto the Board of the District in the penal sum of _____

Dollars (\$_____), lawful money of the United States, for the payment of which sum well and truly to be made we bind ourselves, our heirs, executors, administrators, successors, and assigns jointly and severally, firmly by these presents, to:

- Perform all the work required to complete the Project; and
- Pay to the District all damages the District incurs as a result of the Principal's failure to perform all the Work required to complete the Project.

The condition of the obligation is such that, if the above bounden Principal, his or its heirs, executors, administrators, successors, or assigns, shall in all things stand to and abide by, and well and truly keep and perform the covenants, conditions, and agreements in the Contract and any alteration thereof made as therein provided, on his or its part to be kept and performed at the time and in the intent and meaning, including all contractual guarantees and warranties of materials and workmanship, and shall indemnify and save harmless the District, its trustees, officers and agents, as therein stipulated, then this obligation shall become null and void, otherwise it shall be and remain in full force and virtue.

Surety expressly agrees that the District may reject any contractor or subcontractor proposed by Surety to fulfill its obligations in the event of default by the Principal. Surety shall not utilize Principal in completing the Work nor shall Surety accept a Bid from Principal for completion of the Work if the District declares the Principal to be in default and notifies

Surety of the District's objection to Principal's further participation in the completion of the Work.

As a condition precedent to the satisfactory completion of the Contract, the above obligation shall hold good for a period equal to the warranty and/or guarantee period of the Contract, during which time Surety's obligation shall continue if Contractor shall fail to make full, complete, and satisfactory repair and replacements and totally protect the District from loss or damage resulting from or caused by defective materials or faulty workmanship. The obligations of Surety hereunder shall continue so long as any obligation of Contractor remains. Nothing herein shall limit the District's rights or the Contractor or Surety's obligations under the Contract, law or equity, including, but not limited to, California Code of Civil Procedure section 337.15.

The Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of the contract or to the work to be performed thereunder or the specifications accompanying the same shall in any way affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration, or addition to the terms of the Contract or to the work or to the specifications.

IN WITNESS WHEREOF, two (2) identical counterparts of this instrument, each of which shall for all purposes be deemed an original thereof, have been duly executed by the Principal and Surety above named, on the _____ day of _____, 20____.

(Affix Corporate Seal)

Principal

By

Surety

By

Name of California Agent of Surety

Address of California Agent of Surety

Telephone No. of California Agent of Surety

Bidder must attach a Notarial Acknowledgment for all Surety's signatures and a Power of Attorney and Certificate of Authority for Surety. The California Department of Insurance must authorize the Surety to be an admitted surety insurer.

END OF DOCUMENT

PAYMENT BOND
Contractor's Labor & Material Bond
(100% of Contract Price)

(Note: Bidders must use this form, NOT a surety company form.)

KNOW ALL PERSONS BY THESE PRESENTS:

WHEREAS, the governing board ("Board") of the Solano Community College District, (or "District") and _____, ("Principal") have entered into a contract for the furnishing of all materials and labor, services and transportation, necessary, convenient, and proper to perform the following project:

VACAVILLE CLASSROOM BUILDING (ANNEX) RENOVATION PROJECT

("Project" or "Contract") which Contract dated _____, 20____, and all of the Contract Documents attached to or forming a part of the Contract, are hereby referred to and made a part hereof; and

WHEREAS, pursuant to law and the Contract, the Principal is required, before entering upon the performance of the work, to file a good and sufficient bond with the body by which the Contract is awarded in an amount equal to one hundred percent (100%) of the Contract price, to secure the claims to which reference is made in sections 9000 through 9510 and 9550 through 9566 of the Civil Code, and division 2, part 7, of the Labor Code.

NOW, THEREFORE, the Principal and _____ ("Surety")

are held and firmly bound unto all laborers, material men, and other persons referred to in said statutes in the sum of _____ Dollars (\$_____), lawful money of the United States, being a sum not less than the total amount payable by the terms of Contract, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, or assigns, jointly and severally, by these presents.

The condition of this obligation is that if the Principal or any of his or its subcontractors, of the heirs, executors, administrators, successors, or assigns of any, all, or either of them shall fail to pay for any labor, materials, provisions, provender, or other supplies, used in, upon, for or about the performance of the work contracted to be done, or for any work or labor thereon of any kind, or for amounts required to be deducted, withheld, and paid over to the Employment Development Department from the wages of employees of the Principal or any of his or its subcontractors of any tier under Section 13020 of the Unemployment Insurance Code with respect to such work or labor, that the Surety will pay the same in an amount not exceeding the amount herein above set forth, and also in case suit is brought upon this bond, will pay a reasonable attorney's fee to be awarded and fixed by the Court, and to be taxed as costs and to be included in the judgment therein rendered.

It is hereby expressly stipulated and agreed that this bond shall inure to the benefit of any and all persons, companies, and corporations entitled to file claims under section 9100 of

the Civil Code, so as to give a right of action to them or their assigns in any suit brought upon this bond.

Should the condition of this bond be fully performed, then this obligation shall become null and void; otherwise it shall be and remain in full force and affect.

And the Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of Contract or the specifications accompanying the same shall in any manner affect its obligations on this bond, and it does hereby waive notice of any such change, extension, alteration, or addition.

IN WITNESS WHEREOF, two (2) identical counterparts of this instrument, each of which shall for all purposes be deemed an original thereof, have been duly executed by the Principal and Surety above named, on the _____ day of _____, 20__.

(Affix Corporate Seal)

Principal

By

Surety

By

Name of California Agent of Surety

Address of California Agent of Surety

Telephone No. of California Agent of Surety

Bidder must attach a Notarial Acknowledgment for all Surety's signatures and a Power of Attorney and Certificate of Authority for Surety. The California Department of Insurance must authorize the Surety to be an admitted surety insurer.

END OF DOCUMENT



Change Order

Solano Community College District
 4000 Suisun Valley Road
 Fairfield, CA 94534
 Tel: 707-864-7189 Fax: 707-646-7710

PM/CM

Change Order #	{NO}	DSA File No.:	<u>{FILE NO}</u>
Project No.:	{NO}	DSA App. No.:	<u>{DSA APPLICATION NO}</u>
Date:	{DATE}		
Project:	Solano Community College District {BUILDING/CAMPUS} {PROJECT}	{ARCHITECT}	
		{STREET ADDRESS}	
		{CITY, STATE ZIP}	
To:	{CONTRACTOR}		
	{STREET ADDRESS}		
	{CITY, STATE ZIP}		

The Contract is Changed as Follows:

PCO No.

{PCO NO} {PCO DESCRIPTION}	<input style="width: 100px;" type="text" value="{PCO AMT}"/>
----------------------------	--

{PCO NO} {PCO DESCRIPTION}	<input style="width: 100px;" type="text" value="{PCO AMT}"/>
----------------------------	--

{PCO NO} {PCO DESCRIPTION}	<input style="width: 100px;" type="text" value="{PCO AMT}"/>
----------------------------	--

TOTAL COST OF CHANGE ORDER	ADD	#VALUE!
FINAL CHANGE ORDER AMOUNT	Deduct	#VALUE!

Original Contract Sum:	{ORIG CONTRACT}
Total change By Previous Change Orders:	\$ -
Contract Sum Prior to This Change Order:	#VALUE!
Original Contract Sum will be Increased by This Change Order:	#VALUE!
The New Contract Sum Including This Change Order Will Be:	#VALUE!
The New Contract Completion Date Will Be:	{DATE}
Contract Time Will be Unchanged by This Change Order:	0 Days
The date of substantial completion as of the of this change order is	{DATE}

ARCHITECT: _____
{ARCHITECT REPRESENTATIVE}
{ARCHITECTURE FIRM NAME}

Date: _____

(Affix stamp here)

CONTRACTOR: _____
{CONTRACTOR REPRESENTATIVE}
{CONTRACTOR FIRM NAME}

Date: _____

(Affix stamp here)

OWNER: _____
Lucky Lofton
Executive Bonds Manager
Solano Community College District

Date: _____

AGREEMENT AND RELEASE OF ANY AND ALL CLAIMS

THIS AGREEMENT AND RELEASE OF CLAIMS ("Agreement and Release") IS MADE AND ENTERED INTO THIS _____ DAY OF _____, 20__ by and between the SOLANO COMMUNITY COLLEGE DISTRICT ("District") and _____ ("Contractor"), whose place of business is _____.

RECITALS:

- 1. District and Contractor entered into PROJECT/CONTRACT NO.: **VACAVILLE CLASSROOM BUILDING (ANNEX) RENOVATION PROJECT/#18-005** ("Contract" or "Project") in the County of Solano, California.
- 2. The Work under the Contract has been completed.

NOW, THEREFORE, it is mutually agreed between District and Contractor as follows:

AGREEMENT

- 3. Contractor will only be assessed liquidated damages as detailed below:

Original Contract Sum	\$ _____
Modified Contract Sum	\$ _____
Payment to Date	\$ _____
Liquidated Damages	\$ _____
Payment Due Contractor	\$ _____

- 4. Subject to the provisions hereof, District shall forthwith pay to Contractor the undisputed sum of _____ Dollars (\$_____) under the Contract, less any amounts represented by any notice to withhold funds on file with District as of the date of such payment.
- 5. Contractor acknowledges and hereby agrees that there are no unresolved or outstanding claims in dispute against District arising from the performance of work under the Contract, except for the claims described in Paragraph 6 and continuing obligations described in Paragraph 8. It is the intention of the parties in executing this Agreement and Release that this Agreement and Release shall be effective as a full, final and general release of all claims, demands, actions, causes of action, obligations, costs, expenses, damages, losses and liabilities of Contractor against District, all its respective agents, employees, inspectors, assignees and transferees except for the Disputed Claim is set forth in Paragraph 6 and continuing obligations described in Paragraph 8 hereof.

6. The following claims are disputed (hereinafter, the "Disputed Claims") and are specifically excluded from the operation of this Agreement and Release:

<u>Claim No.</u>	<u>Description of Claim</u>	<u>Amount of Claim</u>	<u>Date Claim Submitted</u>
_____	_____	\$ _____	_____
_____	_____	\$ _____	_____
_____	_____	\$ _____	_____

[If further space is required, attach additional sheets showing the required information.]

7. Consistent with California Public Contract Code section 7100, Contractor hereby agrees that, in consideration of the payment set forth in Paragraph 4 hereof, Contractor hereby releases and forever discharges District, all its agents, employees, inspectors, assignees, and transferees from any and all liability, claims, demands, actions, or causes of action of whatever kind or nature arising out of or in any way concerned with the Work under the Contract.
8. Guarantees and warranties for the Work, and any other continuing obligation of Contractor, shall remain in full force and effect as specified in the Contract Documents.
9. To the furthest extent permitted by California law, Contractor shall defend, indemnify, and hold harmless the District, its agents, representatives, officers, consultants, employees, trustees, and volunteers (the "indemnified parties") from any and all losses, liabilities, claims, suits, and actions of any kind, nature, and description, including, but not limited to, attorneys' fees and costs, directly or indirectly arising out of, connected with, or resulting from the performance of the Contract unless caused wholly by the sole negligence or willful misconduct of the indemnified parties.
10. Contractor hereby waives the provisions of California Civil Code section 1542 which provides as follows:
- A GENERAL RELEASE DOES NOT EXTEND TO CLAIMS WHICH THE CREDITOR DOES NOT KNOW OR SUSPECT TO EXIST IN HIS OR HER FAVOR AT THE TIME OF EXECUTING THE RELEASE, WHICH IF KNOWN BY HIM OR HER MUST HAVE MATERIALLY AFFECTED HIS OR HER SETTLEMENT WITH THE DEBTOR.
11. The provisions of this Agreement and Release are contractual in nature and not mere recitals and shall be considered independent and severable. If any such provision or any part thereof shall be at any time held invalid in whole or in part under any federal, state, county, municipal, or other law, ruling, or regulations, then such provision, or part thereof, shall remain in force and effect to the extent permitted by law, and the remaining provisions of this Agreement and Release shall also remain in full force and effect, and shall be enforceable.

12. All rights of District shall survive completion of the Work or termination of Contract, and execution of this Release.

* * * CAUTION: THIS IS A RELEASE - READ BEFORE EXECUTING * * *

SOLANO COMMUNITY COLLEGE DISTRICT

SIGNATURE: _____

PRINT NAME: _____

TITLE: _____

CONTRACTOR: _____

SIGNATURE: _____

PRINT NAME: _____

TITLE: _____

END OF DOCUMENT

GUARANTEE FORM

_____ ("Contractor") hereby agrees that the _____
_____ ("Work" of Contractor) which Contractor has installed for the Solano
Community College District ("District") for the following project:

PROJECT: **VACAVILLE CLASSROOM BUILDING (ANNEX) RENOVATION PROJECT**

("Project" or "Contract") has been performed in accordance with the requirements of the
Contract Documents and that the Work as installed will fulfill the requirements of the
Contract Documents.

The undersigned agrees to repair or replace any or all of such Work that may prove to be
defective in workmanship or material together with any other adjacent Work that may be
displaced in connection with such replacement within a period of _____
year(s) from the date of completion as defined in Public Contract Code section 7107,
subdivision (c), ordinary wear and tear and unusual abuse or neglect excepted. The date of
completion is _____, 20____.

In the event of the undersigned's failure to comply with the above-mentioned conditions
within a reasonable period of time, as determined by the District, but not later than seven
(7) days after being notified in writing by the District, the undersigned authorizes the
District to proceed to have said defects repaired and made good at the expense of the
undersigned. The undersigned shall pay the costs and charges therefor upon demand.

Date: _____

Proper Name of Contractor: _____

Signature: _____

Print Name: _____

Title: _____

Representatives to be contacted for service subject to terms of Contract:

NAME: _____

ADDRESS: _____

PHONE NO.: _____

END OF DOCUMENT

TABLE OF CONTENTS

GENERAL CONDITIONS..... 1

1. CONTRACT TERMS AND DEFINITIONS..... 1

1.1. Definitions..... 1

1.2. Laws Concerning The Contract..... 6

1.3. No Oral Agreements..... 6

1.4. No Assignment 6

1.5. Notice And Service Thereof 7

1.6. No Waiver..... 7

1.7. Substitutions For Specified Items 7

1.8. Materials and Work 7

2. [RESERVED] 9

3. ARCHITECT..... 9

4. CONSTRUCTION MANAGER 10

5. INSPECTOR, INSPECTIONS, AND TESTS..... 10

5.1. Project Inspector..... 10

5.2. Tests and Inspections..... 11

5.3. Costs for After Hours and/or Off Site Inspections..... 11

6. CONTRACTOR..... 11

6.1. Status of Contractor..... 12

6.2. Project inspection Card(s)..... 12

6.3. Contractor's Supervision..... 12

<u>6.4. Duty to Provide Fit Workers</u>	13
<u>6.5. Field Office</u>	13
<u>6.6. Purchase of Materials and Equipment</u>	13
<u>6.7. Documents On Work</u>	14
<u>6.8. Preservation of Records</u>	14
<u>6.9. Integration of Work</u>	15
<u>6.10. Notifications</u>	15
<u>6.11 Obtaining of Permits and Licenses</u>	16
<u>6.12. Royalties and Patents</u>	16
<u>6.13. Work to Comply With Applicable Laws and Regulations</u>	16
<u>6.14. Safety/Protection of Persons and Property</u>	17
<u>6.15. Working Evenings and Weekends</u>	20
<u>6.16. Cleaning Up</u>	20
<u>7. SUBCONTRACTORS</u>	21
<u>8. OTHER CONTRACTS/CONTRACTORS</u>	22
<u>9. DRAWINGS AND SPECIFICATIONS</u>	23
<u>10. CONTRACTOR’S SUBMITTALS AND SCHEDULES</u>	24
<u>10.1. Schedule of Work and Schedule of Values</u>	24
<u>10.2. Monthly Progress Schedule(s)</u>	27
<u>10.3. Material Safety Data Sheets (MSDS)</u>	27
<u>11. SITE ACCESS, CONDITIONS, AND REQUIREMENTS</u>	27
<u>11.1. Site Investigation</u>	27
<u>11.2. Soils Investigation Report</u>	27
<u>11.3. Access to Work</u>	28

<u>11.4. Layout and Field Engineering</u>	28
<u>11.5. Utilities</u>	28
<u>11.6. Sanitary Facilities</u>	29
<u>11.7. Surveys</u>	29
<u>11.8. Regional Notification Center</u>	29
<u>11.9. Existing Utility Lines</u>	29
<u>11.10. Notification</u>	30
<u>11.11. Hazardous Materials</u>	30
<u>11.12. No Signs</u>	30
<u>12. TRENCHES</u>	30
<u>12.1. Trenches Greater Than Five Feet</u>	30
<u>12.2. Excavation Safety</u>	30
<u>12.3. No Tort Liability of District</u>	30
<u>12.4. No Excavation Without Permits</u>	31
<u>12.5. Discovery of Hazardous Waste and/or Unusual Conditions</u>	31
<u>13. INSURANCE AND BONDS</u>	32
<u>13.1 Insurance</u>	32
<u>13.2 Contract Security - Bonds</u>	36
<u>14. WARRANTY/GUARANTEE/INDEMNITY</u>	36
<u>14.1. Warranty/Guarantee</u>	36
<u>14.2. Indemnity</u>	37
<u>15. TIME</u>	38
<u>15.1. Notice to Proceed</u>	38

<u>15.2. Computation of Time / Adverse Weather</u>	38
<u>15.3. Hours of Work</u>	39
<u>15.4. Progress and Completion</u>	39
<u>15.5. Schedule</u>	40
<u>15.6. Expeditious Completion</u>	40
<u>16. EXTENSIONS OF TIME – LIQUIDATED DAMAGES</u>	40
<u>16.1. Liquidated Damages</u>	40
<u>16.2. Excusable Delay</u>	40
<u>16.3. No Additional Compensation for Delays Within Contractor’s Control</u>	41
<u>16.4. Float or Slack in the Schedule</u>	41
<u>17. CHANGES IN THE WORK</u>	42
<u>17.1. No Changes Without Authorization</u>	42
<u>17.2. Architect Authority</u>	43
<u>17.3. Change Orders</u>	43
<u>17.4. Construction Change Directives</u>	43
<u>17.5. Force Account Directives</u>	43
<u>17.6. Price Request</u>	44
<u>17.7. Proposed Change Order</u>	45
<u>17.8. Format for Proposed Change Order</u>	46
<u>17.9. Change Order Certification</u>	49
<u>17.10. Determination of Change Order Cost</u>	49
<u>17.11. Deductive Change Orders</u>	49
<u>17.12. Addition or Deletion of Alternate Bid Item(s)</u>	49

<u>17.13. Discounts, Rebates, and Refunds</u>	50
<u>17.14. Accounting Records</u>	50
<u>17.15. Notice Required</u>	50
<u>17.16. Applicability to Subcontractors</u>	50
<u>17.17. Alteration to Change Order Language</u>	51
<u>17.18. Failure of Contractor to Execute Change Order</u>	51
<u>18. REQUEST FOR INFORMATION</u>	51
<u>19. PAYMENTS</u>	51
<u>19.1. Contract Price</u>	51
<u>19.2. Applications for Progress Payments</u>	51
<u>19.3. Progress Payments</u>	54
<u>19.4. Decisions to Withhold Payment</u>	56
<u>19.5. Subcontractor Payments</u>	58
<u>20. COMPLETION OF THE WORK</u>	59
<u>20.1. Completion</u>	59
<u>20.2. Close-Out Procedures</u>	Error! Bookmark not defined.
<u>20.3. Final Inspection</u>	60
<u>20.4. Costs of Multiple Inspections</u>	61
<u>20.5. Partial Occupancy or Use Prior to Completion</u>	62
<u>21. FINAL PAYMENT AND RETENTION</u>	62
<u>21.1. Final Payment</u>	62
<u>21.2. Prerequisites for Final Payment</u>	62
<u>21.3. Retention</u>	63
<u>21.4. Substitution of Securities</u>	64

<u>22. UNCOVERING OF WORK</u>	64
<u>23. NONCONFORMING WORK AND CORRECTION OF WORK</u>	64
<u>23.1. Nonconforming Work</u>	64
<u>23.2. Correction of Work</u>	64
<u>23.3 District's Right to Perform Work</u>	65
<u>24. TERMINATION AND SUSPENSION</u>	65
<u>24.1. District's Right to Terminate Contractor for Cause</u>	65
<u>24.2. Termination of Contractor for Convenience</u>	69
<u>24.3. Suspension of Work</u>	69
<u>25. CLAIMS AND DISPUTES</u>	70
<u>25.1. Performance During Dispute or Claim Process</u>	70
<u>25.2. Definition of Dispute</u>	70
<u>25.3. Dispute Presentation</u>	70
<u>25.4. Dispute Resolution</u>	71
<u>25.5. Definition of Claim</u>	71
<u>25.6. Claim Presentations</u>	71
<u>25.7. Claim Resolution</u>	72
<u>25.8. Dispute and Claim Resolution Non-Applicability</u>	75
<u>26. STATE LABOR, WAGE & HOUR, APPRENTICE, AND RELATED PROVISIONS</u>	75
26.1. [RESERVED]	Error! Bookmark not defined.
<u>26.2. Wage Rates, Travel, and Subsistence</u>	75
<u>26.3. Hours of Work</u>	77
<u>26.4. Payroll Records</u>	77

26.5. [RESERVED]	79
<u>26.6. Apprentices</u>	79
<u>26.7. Non-Discrimination</u>	80
<u>26.8. Labor First Aid</u>	80
27. [RESERVED]	80
28. MISCELLANEOUS	81
<u>28.1. Assignment of Antitrust Actions</u>	81
<u>28.2. Excise Taxes</u>	82
<u>28.3. Taxes</u>	82
<u>28.4. Shipments</u>	82
<u>28.5. Compliance with Government Reporting Requirements</u>	82

GENERAL CONDITIONS

1. CONTRACT TERMS AND DEFINITIONS

1.1. Definitions

Wherever used in the Contract Documents, the following terms shall have the meanings indicated, which shall be applicable to both the singular and plural thereof:

1.1.1. Adverse Weather: Shall be only weather that satisfies all of the following conditions: (1) unusually severe precipitation, sleet, snow, hail, heat, or cold conditions in excess of the norm for the location and time of year it occurred, (2) unanticipated, and (3) at the Project.

1.1.2. Approval, Approved, and/or Accepted: Refer to written authorization, unless stated otherwise.

1.1.3. Architect: The individual, partnership, corporation, joint venture, or any combination thereof, named as Architect, who will have the rights and authority assigned to the Architect in the Contract Documents. The term Architect means the Design Professional in General Responsible Charge as defined in DSA PR 13-02 on this Project or the Architect's authorized representative.

1.1.4. As-Built Drawings: Unless otherwise defined in the Special Conditions, reproducible blue line prints of drawings to be prepared on a monthly basis pursuant to the Contract Documents, that reflect changes made during the performance of the Work, recording differences between the original design of the Work and the Work as constructed since the preceding monthly submittal.

1.1.5. Bidder: A contractor who intends to provide a proposal to the District to perform the Work of this Contract.

1.1.6. Change Order: A written order to the Contractor authorizing an addition to, deletion from, or revision in the Work, and/or authorizing an adjustment in the Contract Price or Contract Time.

1.1.7. Claim: A Dispute that remains unresolved at the conclusion of the all the applicable Dispute Resolution requirements provided herein.

1.1.8. Construction Change Directive: A written order prepared and issued by the District, the Construction Manager, and/or the Architect and signed by the District and the Architect, directing a change in the Work.

1.1.9. Construction Manager: The individual, partnership, corporation, joint venture, or any combination thereof, or its authorized representative, named as such by the District. If no Construction Manager is used on the Project that is the subject of this Contract, then all references to Construction Manager herein shall be read to refer to District.

1.1.10. Construction Schedule: The progress schedule of construction of the Project as provided by Contractor and approved by District.

1.1.11. Contract, Contract Documents: The Contract consists exclusively of the documents evidencing the agreement of the District and Contractor, identified as the Contract Documents. The Contract Documents consist of the following documents:

- 1.1.11.1. Notice to Bidders
- 1.1.11.2. Instructions to Bidders
- 1.1.11.3. Bid Form and Proposal
- 1.1.11.4. Bid Bond
- 1.1.11.5. Designated Subcontractors List
- 1.1.11.6. Site-Visit Certification (if a site visit was required)
- 1.1.11.7. Noncollusion Declaration
- 1.1.11.8. Notice of Award
- 1.1.11.9. Notice to Proceed
- 1.1.11.10. Agreement
- 1.1.11.11. Escrow of Bid Documentation
- 1.1.11.12. Escrow Agreement for Security Deposits in Lieu of Retention
- 1.1.11.13. Performance Bond
- 1.1.11.14. Payment Bond (Contractor's Labor & Material Bond)
- 1.1.11.15. General Conditions
- 1.1.11.16. Special Conditions (if applicable)
- 1.1.11.17. Small, Local, Diverse Business Program (SLDSBE)
- 1.1.11.18. Hazardous Materials Procedures and Requirements
- 1.1.11.19. Workers' Compensation Certification
- 1.1.11.20. Prevailing Wage Certification
- 1.1.11.21. Drug-Free Workplace Certification
- 1.1.11.22. Tobacco-Free Environment Certification
- 1.1.11.23. Hazardous Materials Certification
- 1.1.11.24. Lead-Based Paint Certification
- 1.1.11.25. Imported Materials Certification

- 1.1.11.26. Roofing Project Certification
- 1.1.11.27. Iran Contracting Act Certification (if applicable)
- 1.1.11.28. All Plans, Technical Specifications, and Drawings
- 1.1.11.29. Any and all addenda to any of the above documents
- 1.1.11.30. Any and all change orders or written modifications to the above documents if approved in writing by the District

1.1.12. Contract Price: The total monies payable to the Contractor under the terms and conditions of the Contract Documents.

1.1.13. Contract Time: The time period stated in the Agreement for the completion of the Work.

1.1.14. Contractor: The person or persons identified in the Agreement as contracting to perform the Work to be done under this Contract, or the legal representative of such a person or persons.

1.1.15. Daily Job Report(s): Daily Project reports prepared by the Contractor's employee(s) who are present on Site, which shall include the information required herein.

1.1.16. Day(s): Unless otherwise designated, day(s) means calendar day(s).

1.1.17. Department of Industrial Relations (or "DIR"): is responsible, among other things, for labor compliance monitoring and enforcement of California prevailing wage laws and regulations for public works contracts.

1.1.18. Dispute: A separate demand by Contractor for a time extension; payment of money or damages arising from Work done by or on behalf of the Contractor pursuant to the Contract and payment of which is not otherwise expressly provided for or Contractor is not otherwise entitled to; or an amount of payment disputed by the District.

1.1.19. District: The public agency or the school district for which the Work is performed. The governing board of the District or its designees will act for the District in all matters pertaining to the Contract. The District may, at any time,

1.1.19.1. Direct the Contractor to communicate with or provide notice to the Construction Manager or the Architect on matters for which the Contract Documents indicate the Contractor will communicate with or provide notice to the District; and/or

1.1.19.2. Direct the Construction Manager or the Architect to communicate with or direct the Contractor on matters for which the Contract Documents indicate the District will communicate with or direct the Contractor.

1.1.20. Drawings (or "Plans"): The graphic and pictorial portions of the Contract Documents showing the design, location, scope and dimensions of the work, generally including plans, elevations, sections, details, schedules, sequence of operation, and diagrams.

1.1.21. DSA: Division of the State Architect.

1.1.22. Force Account Directive: A process that may be used when the District and the Contractor cannot agree on a price for a specific portion of work or before the Contractor prepares a prices for a specific portion of work and whereby the Contractor performs the work as indicated herein on a time and materials basis.

1.1.23. Labor Commissioner's Office (or "Labor Commissioner") also known as the Division of Labor Standards Enforcement ("DLSE"): Division of the DIR responsible for adjudicating wage claims, investigating discrimination and public works complaints, and enforcing Labor Code statutes and Industrial Welfare Commission orders.

1.1.24. Municipal Separate Storm Sewer System (or "MS4"): A system of conveyances used to collect and/or convey storm water, including, without limitation, catch basins, curbs, gutters, ditches, man-made channels, and storm drains.

1.1.25. Premises: The real property owned by the District on which the Site is located.

1.1.26. Product(s): New material, machinery, components, equipment, fixtures and systems forming the Work, including existing materials or components required and approved by the District for reuse.

1.1.27. Product Data: Illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate a material, product, or system for some portion of the Work.

1.1.28. Project: The planned undertaking as provided for in the Contract Documents.

1.1.29. Project Inspector (or "Inspector"): The individual(s) retained by the District in accordance with title 24 of the California Code of Regulations to monitor and inspect the Project.

1.1.30. The Bidder and all Subcontractors under the contract shall abide by the District's Small, Local, Diverse Business Program (SLDBE). This program has been established to ensure access, equity and inclusion of Solano County businesses in the area of construction contracting. The SLDBE program is innovative and inclusionary; defining and promoting diversity in contracting and procurement by extending Measure Q Bond Program opportunities to Solano County small businesses, minority-owned business, women-owned business and those of disabled veterans. The goal for SLDBE in construction projects is 15% contracting/subcontracting goal. The bidding contractor shall list their small, local and diverse subcontractors and/or suppliers on the SLDBE bid Form attached. Contractors who fail to meet the 15% goal must submit evidence of having made a Good Faith Effort (GFE checklist) to attempt to achieve the 15% goal. The bidding contractor shall submit the SLDBE list of subcontractor/supplier forms with their bid and/or the GFE checklist with their bid.

1.1.31. Program Manager: The individual, partnership, corporation, joint venture, or any combination thereof, or its authorized representative, named as such by the District. If no Program Manager is designated for Project that is the subject of this Contract, then all references to Project Manager herein shall be read to refer to District.

1.1.32. Provide: Shall include "provide complete in place," that is, "furnish and install," and "provide complete and functioning as intended in place" unless specifically stated otherwise.

1.1.33. Qualified SWPPP Practitioners ("QSP"): certified personnel that attended a State Water Resources Control Board sponsored or approved training class and passed the qualifying exam.

1.1.34. Record Drawings: Unless otherwise defined in the Special Conditions, Reproducible drawings (or Plans) prepared pursuant to the requirements of the Contract Documents, that reflect all changes made during the performance of the Work, recording differences between the original design of the Work and the Work as constructed upon completion of the Project.

1.1.35. Request for Information (or "RFI"): A written request prepared by the Contractor requesting that the Architect provide additional information necessary to clarify or amplify an item in the Contract Documents that the Contractor believes is not clearly shown or called for in the Drawings or Specifications or other portions of the Contract Documents, or to address problems that have arisen under field conditions.

1.1.36. Request for Substitution for Specified Item: A request by Contractor to substitute an equal or superior material, product, thing, or service for a specific material, product, thing, or service that has been designated in the Contract Documents by a specific brand or trade name.

1.1.37. Safety Orders: Written and/or verbal orders for construction issued by the California Division of Industrial Safety ("CalOSHA") or by the United States Occupational Safety and Health Administration ("OSHA").

1.1.38. Safety Plan: Contractor's safety plan specifically adapted for the Project. Contractor's Safety Plan shall comply with all provisions regarding Project safety, including all applicable provisions in these General Conditions.

1.1.39. Samples: Physical examples that illustrate materials, products, equipment, finishes, colors, or workmanship and that, when approved in accordance with the Contract Documents, establish standards by which portions of the Work will be judged.

1.1.40. Shop Drawings: All drawings, prints, diagrams, illustrations, brochures, schedules, and other data that are prepared by the Contractor, a subcontractor, manufacturer, supplier, or distributor, that illustrate how specific portions of the Work shall be fabricated or installed.

1.1.41. Site: The Project site as shown on the Drawings.

1.1.42. SLDB Program: District's policy, goals, and requirements for Small Local Diverse Business participation. The Bidder and all Subcontractors under the contract shall abide by the District's Small, Local, Diverse Business Program (SLDBE). This program has been established to ensure access, equity and inclusion of Solano County businesses in the area of construction contracting. The SLDBE program is innovative and inclusionary; defining and promoting diversity in contracting and procurement by extending Measure Q Bond Program opportunities to Solano County small businesses, minority-owned business, women-owned business and those of disabled veterans. The goal for SLDBE in construction projects is 15% contracting/subcontracting goal. The bidding contractor shall list their small, local and diverse subcontractors and/or suppliers on the SLDBE bid Form attached. Contractors who fail to meet the 15% goal must submit evidence of having made a

Good Faith Effort (GFE checklist) to attempt to achieve the 15% goal. The bidding contractor shall submit the SLDBE list of subcontractor/supplier forms with their bid and/or the GFE checklist with their bid.

1.1.43. Specifications: That portion of the Contract Documents, Division 1 through Division 17, and all technical sections, and addenda to all of these, if any, consisting of written descriptions and requirements of a technical nature of materials, equipment, construction methods and systems, standards, and workmanship.

1.1.44. State: The State of California.

1.1.45. Storm Water Pollution Prevention Plan (or "SWPPP"): A document which identifies sources and activities at a particular facility that may contribute pollutants to storm water and contains specific control measures and time frames to prevent or treat such pollutants.

1.1.46. Subcontractor: A contractor and/or supplier who is under contract with the Contractor or with any other subcontractor, regardless of tier, to perform a portion of the Work of the Project.

1.1.47. Submittal Schedule: The schedule of submittals as provided by Contractor and approved by District.

1.1.48. Surety: The person, firm, or corporation that executes as surety the Contractor's Performance Bond and Payment Bond, and must be a California admitted surety insurer as defined in the Code of Civil Procedure section 995.120.

1.1.49. Work: All labor, materials, equipment, components, appliances, supervision, coordination, and services required by, or reasonably inferred from, the Contract Documents, that are necessary for the construction and completion of the Project.

1.2. Laws Concerning The Contract

Contract is subject to all provisions of the Constitution and laws of California and the United States governing, controlling, or affecting District, or the property, funds, operations, or powers of District, and such provisions are by this reference made a part hereof. Any provision required by law to be included in this Contract shall be deemed to be inserted.

1.3. No Oral Agreements

No oral agreement or conversation with any officer, agent, or employee of District, either before or after execution of Contract, shall affect or modify any of the terms or obligations contained in any of the documents comprising the Contract.

1.4. No Assignment

Contractor shall not assign this Contract or any part thereof including, without limitation, any services or money to become due hereunder without the prior written

consent of the District. Assignment without District's prior written consent shall be null and void. Any assignment of money due or to be come due under this Contract shall be subject to a prior lien for services rendered or material supplied for performance of work called for under this Contract in favor of all persons, firms, or corporations rendering services or supplying material to the extent that claims are filed pursuant to the Civil Code, Code of Civil Procedure, Government Code, Labor Code, and/or Public Contract Code, and shall also be subject to deductions for liquidated damages or withholding of payments as determined by District in accordance with this Contract. Contractor shall not assign or transfer in any manner to a Subcontractor or supplier the right to prosecute or maintain an action against the District.

1.5. Notice And Service Thereof

1.5.1. Any notice from one party to the other or otherwise under Contract shall be in writing and shall be dated and signed by the party giving notice or by a duly authorized representative of that party. Any notice shall not be effective for any purpose whatsoever unless served in one of the following manners:

1.5.1.1. If notice is given by personal delivery thereof, it shall be considered delivered on the day of delivery.

1.5.1.2. If notice is given by overnight delivery service, it shall be considered delivered on (1) day after date deposited, as indicated by the delivery service.

1.5.1.3. If notice is given by depositing same in United States mail, enclosed in a sealed envelope, it shall be considered delivered three (3) days after date deposited, as indicated by the postmarked date.

1.5.1.4. If notice is given by registered or certified mail with postage prepaid, return receipt requested, it shall be considered delivered on the day the notice is signed for.

1.6. No Waiver

The failure of District in any one or more instances to insist upon strict performance of any of the terms of this Contract or to exercise any option herein conferred shall not be construed as a waiver or relinquishment to any extent of the right to assert or rely upon any such terms or option on any future occasion. No action or failure to act by the District, Architect, or Construction Manager shall constitute a waiver of any right or duty afforded the District under the Contract, nor shall any action or failure to act constitute an approval of or acquiescence in any breach thereunder, except as may be specifically agreed in writing.

1.7. Substitutions For Specified Items

Unless the Special Conditions contain different provisions, Contractor shall not substitute different items for any items identified in the Contract Documents without prior written approval of the District.

1.8. Materials and Work

1.8.1. Except as otherwise specifically stated in this Contract, Contractor shall provide and pay for all materials, labor, tools, equipment, transportation, supervision, temporary constructions of every nature, and all other services, management, and facilities of every nature whatsoever necessary to execute and complete this Contract within the Contract Time.

1.8.2. Unless otherwise specified, all materials shall be new and the best of their respective kinds and grades as noted or specified, and workmanship shall be of good quality.

1.8.3. Materials shall be furnished in ample quantities and at such times as to insure uninterrupted progress of Work and shall be stored properly and protected as required.

1.8.4. For all materials and equipment specified or indicated in the Drawings, the Contractor shall provide all labor, materials, equipment, and services necessary for complete assemblies and complete working systems, functioning as intended. Incidental items not indicated on Drawings, nor mentioned in the Specifications, that can legitimately and reasonably be inferred to belong to the Work described, or be necessary in good practice to provide a complete assembly or system, shall be furnished as though itemized here in every detail. In all instances, material and equipment shall be installed in strict accordance with each manufacturer's most recent published recommendations and specifications.

1.8.5. Contractor shall, after award of Contract by District and after relevant submittals have been approved, place orders for materials and/or equipment as specified so that delivery of same may be made without delays to the Work. Contractor shall, upon demand from District, present documentary evidence showing that orders have been placed.

1.8.6. District reserves the right but has no obligation, for any neglect in complying with the above instructions, to place orders for such materials and/or equipment as it may deem advisable in order that the Work may be completed at the date specified in the Agreement, and all expenses incidental to the procuring of said materials and/or equipment shall be paid for by Contractor or withheld from payment(s) to Contractor.

1.8.7. Contractor warrants good title to all material, supplies, and equipment installed or incorporated in Work and agrees upon completion of all Work to deliver the Site to District, together with all improvements and appurtenances constructed or placed thereon by it, and free from any claims, liens, or charges. Contractor further agrees that neither it nor any person, firm, or corporation furnishing any materials or labor for any work covered by the Contract shall have any right to lien any portion of the Premises or any improvement or appurtenance thereon, except that Contractor may install metering devices or other equipment of utility companies or of political subdivision, title to which is commonly retained by utility company or political subdivision. In the event of installation of any such metering device or equipment, Contractor shall advise District as to owner thereof.

1.8.7.1. If a lien or a claim based on a stop payment notice of any nature should at any time be filed against the Work or any District property, by any

entity that has supplied material or services at the request of the Contractor, Contractor and Contractor's Surety shall promptly, on demand by District and at Contractor's and Surety's own expense, take any and all action necessary to cause any such lien or a claim based on a stop payment notice to be released or discharged immediately therefrom.

1.8.7.2. If the Contractor fails to furnish to the District within ten (10) calendar days after demand by the District, satisfactory evidence that a lien or a claim based on a stop payment notice has been so released, discharged, or secured, the District may discharge such indebtedness and deduct the amount required therefor, together with any and all losses, costs, damages, and attorney's fees and expense incurred or suffered by District from any sum payable to Contractor under the Contract.

1.8.8. Nothing contained in this Article, however, shall defeat or impair the rights of persons furnishing materials or labor under any bond given by Contractor for their protection or any rights under any law permitting such protection or any rights under any law permitting such persons to look to funds due Contractor in hands of District (e.g., stop payment notices), and this provision shall be inserted in all subcontracts and material contracts and notice of its provisions shall be given to all persons furnishing material for work when no formal contract is entered into for such material.

1.8.9. Title to new materials and/or equipment for the Work of this Contract and attendant liability for its protection and safety shall remain with Contractor until incorporated in the Work of this Contract and accepted by District. No part of any materials and/or equipment shall be removed from its place of storage except for immediate installation in the Work of this Contract. Should the District, in its discretion, allow the Contractor to store materials and/or equipment for the Work off-site, Contractor will store said materials and/or equipment at a bonded warehouse and with appropriate insurance coverage at no cost to District. Contractor shall keep an accurate inventory of all materials and/or equipment in a manner satisfactory to District or its authorized representative and shall, at the District's request, forward it to the District.

2. [RESERVED]

3. ARCHITECT

3.1. The Architect shall represent the District during the Project and will observe the progress and quality of the Work on behalf of the District. Architect shall have the authority to act on behalf of District to the extent expressly provided in the Contract Documents and to the extent determined by District. Architect shall have authority to reject materials, workmanship, and/or the Work whenever rejection may be necessary, in Architect's reasonable opinion, to insure the proper execution of the Contract.

3.2. Architect shall, with the District and on behalf of the District, determine the amount, quality, acceptability, and fitness of all parts of the Work, and interpret the Specifications, Drawings, and shall, with the District, interpret all other Contract Documents.

3.3. Architect shall have all authority and responsibility established by law, including title 24 of the California Code of Regulations.

3.4. Contractor shall provide District and the Construction Manager with a copy of all written communication between Contractor and Architect at the same time as that communication is made to Architect, including, without limitation, all RFIs, correspondence, submittals, claims, and proposed change orders.

4. CONSTRUCTION MANAGER

4.1. If a construction manager is used on this Project ("Construction Manager" or "CM"), the Construction Manager will provide administration of the Contract on the District's behalf. After execution of the Contract and Notice to Proceed, all correspondence and/or instructions from Contractor and/or District shall be forwarded through the Construction Manager. The Construction Manager will not be responsible for and will not have control or charge of construction means, methods, techniques, sequences, or procedures or for safety precautions in connection with the Work, which shall all remain the Contractor's responsibility.

4.2. The Construction Manager, however, will have authority to reject materials and/or workmanship not conforming to the Contract Documents, as determined by the District, the Architect, and/or the Project Inspector. The Construction Manager shall also have the authority to require special inspection or testing of any portion of the Work, whether it has been fabricated, installed, or fully completed. Any decision made by the Construction Manager, in good faith, shall not give rise to any duty or responsibility of the Construction Manager to the Contractor, any Subcontractor, their agents, employees, or other persons performing any of the Work. The Construction Manager shall have free access to any or all parts of Work at any time.

4.3. If the District does not use a Construction Manager on this Project, all references to Construction Manager or CM shall be read as District.

5. INSPECTOR, INSPECTIONS, AND TESTS

5.1. Project Inspector

5.1.1. One or more Project Inspector(s), including special Project Inspector(s), as required, will be assigned to the Work by District, in accordance with requirements of title 24, part 1, of the California Code of Regulations, to enforce the building code and monitor compliance with Plans and Specifications for the Project previously approved by the DSA. Duties of Project Inspector(s) are specifically defined in section 4-342 of said part 1 of title 24.

5.1.2. No Work shall be carried on except with the knowledge and under the inspection of the Project Inspector(s). The Project Inspector(s) shall have free access to any or all parts of Work at any time. Contractor shall furnish Project Inspector(s) reasonable opportunities for obtaining such information as may be necessary to keep Project Inspector(s) fully informed respecting progress and manner of work and character of materials, including, but not limited to, submission of form DSA 156 (or the most current version) to the Project Inspector at least 48 hours in advance of the commencement and completion of construction of each and

every aspect of the Work. Forms are available on the DSA's website at: <http://www.dgs.ca.gov/dsa/Forms.aspx>. Inspection of Work shall not relieve Contractor from an obligation to fulfill this Contract. Project Inspector(s) and the DSA are authorized to stop work whenever the Contractor and/or its Subcontractor(s) are not complying with the Contract Documents. Any work stoppage by the Project Inspector(s) and/or DSA shall be without liability to the District. Contractor shall instruct its Subcontractors and employees accordingly.

5.1.3. If Contractor and/or any Subcontractor requests that the Project Inspector(s) perform any inspection off-site, this shall only be done if it is allowable pursuant to applicable regulations and DSA, if the Project Inspector(s) agree to do so, and at the expense of the Contractor.

5.2. Tests and Inspections

5.2.1. Tests and Inspections shall comply with title 24, part 1, California Code of Regulations, group 1, article 5, section 4-335, and with the provisions of the Specifications.

5.2.2. The District will select an independent testing laboratory to conduct the tests. Selection of the materials required to be tested shall be by the laboratory or the District's representative and not by the Contractor. The Contractor shall notify the District's representative a sufficient time in advance of its readiness for required observation or inspection.

5.2.3. The Contractor shall notify the District's representative a sufficient time in advance of the manufacture of material to be supplied under the Contract Documents, which must by terms of the Contract Documents be tested, in order that the District may arrange for the testing of same at the source of supply. This notice shall be, at a minimum, seventy-two (72) hours prior to the manufacture of the material that needs to be tested.

5.2.4. Any material shipped by the Contractor from the source of supply prior to having satisfactorily passed such testing and inspection or prior to the receipt of notice from said representative that such testing and inspection will not be required, shall not be incorporated into and/or onto the Project.

5.2.5. The District will select and pay testing laboratory costs for all tests and inspections. Costs of tests of any materials found to be not in compliance with the Contract Documents shall be paid for by the District and reimbursed by the Contractor or deducted from the Contract Price.

5.3. Costs for After Hours and/or Off Site Inspections

If the Contractor performs Work outside the Inspector's regular working hours or requests the Inspector to perform inspections off Site, costs of any inspections required outside regular working hours or off Site shall be borne by the Contractor and may be invoiced to the Contractor by the District or the District may deduct those expenses from the next Progress Payment.

6. CONTRACTOR

Contractor shall construct the Work for the Contract price including any adjustment(s) to the Contract Price pursuant to provisions herein regarding changes to the Contract Price. Except as otherwise noted, Contractor shall provide and pay for all labor, materials, equipment, permits, fees, licenses, facilities, transportation, taxes, and services necessary for the proper execution and completion of the Work, except as indicated herein.

6.1. Status of Contractor

6.1.1. Contractor is and shall at all times be deemed to be an independent contractor and shall be wholly responsible for the manner in which it and its Subcontractors perform the services required of it by the Contract Documents. Nothing herein contained shall be construed as creating the relationship of employer and employee, or principal and agent, between the District, or any of the District's employees or agents, and Contractor or any of Contractor's Subcontractors, agents or employees. Contractor assumes exclusively the responsibility for the acts of its employees as they relate to the services to be provided during the course and scope of their employment. Contractor, its Subcontractors, agents, and its employees shall not be entitled to any rights or privileges of District employees. District shall be permitted to monitor the Contractor's activities to determine compliance with the terms of this Contract.

6.1.2. As required by law, Contractor and all Subcontractors shall be properly licensed and regulated by the Contractor's State License Board 9821 Business Park Drive, Sacramento, California 95827, <http://www.cslb.ca.gov>.

6.1.3. As required by law, Contractor and all Subcontractors shall be properly registered as public works contractors by the Department of Industrial Relations at <https://efiling.dir.ca.gov/PWCR/ActionServlet?action=displayPWCRegistrationForm> or current URL.

6.2. Project Inspection Card(s)

Contractor shall verify that forms DSA 152 (or current version) are issued for the Project prior to the commencement of construction.

6.3. Contractor's Supervision

6.3.1. During progress of the Work, Contractor shall keep on the Premises, and at all other locations where any Work related to the Contract is being performed, a competent project manager and construction superintendent who are employees of the Contractor, to whom the District does not object and at least one of whom shall be fluent in English, written and verbal.

6.3.2. The project manager and construction superintendent shall both speak fluently the predominant language of the Contractor's employees.

6.3.3. Before commencing the Work herein, Contractor shall give written notice to District of the name of its project manager and construction superintendent. Neither the Contractor's project manager nor construction superintendent shall be

changed except with prior written notice to District, unless the Contractor's project manager and/or construction superintendent proves to be unsatisfactory to Contractor, District, any of the District's employees, agents, the Construction Manager, or the Architect, in which case, Contractor shall notify District in writing. The Contractor's project manager and construction superintendent shall each represent Contractor, and all directions given to Contractor's project manager and/or construction superintendent shall be as binding as if given to Contractor.

6.3.4. Contractor shall give efficient supervision to Work, using its best skill and attention. Contractor shall carefully study and compare all Contract Documents, Drawings, Specifications, and other instructions and shall at once report to District, Construction Manager, and Architect any error, inconsistency, or omission that Contractor or its employees and Subcontractors may discover, in writing, with a copy to District's Project Inspector(s). The Contractor shall have responsibility for discovery of errors, inconsistencies, or omissions.

6.4. Duty to Provide Fit Workers

6.4.1. Contractor and Subcontractor(s) shall at all times enforce strict discipline and good order among their employees and shall not employ or work any unfit person or anyone not skilled in work assigned to that person. It shall be the responsibility of Contractor to ensure compliance with this requirement. District may require Contractor to permanently remove unfit persons from Project Site.

6.4.2. Any person in the employ of Contractor or Subcontractor(s) whom District may deem incompetent or unfit shall be excluded from working on the Project and shall not again be employed on the Project except with the prior written consent of District.

6.4.3. The Contractor shall furnish labor that can work in harmony with all other elements of labor employed or to be employed in the Work.

6.4.4. If Contractor intends to make any change in the name or legal nature of the Contractor's entity, Contractor must first notify the District. The District shall determine if Contractor's intended change is permissible while performing this Contract.

6.5. Field Office

6.5.1. Contractor shall provide a temporary office on the Work Site for the District's use exclusively, during the term of the Contract.

6.6. Purchase of Materials and Equipment

The Contractor is required to order, obtain, and store materials and equipment sufficiently in advance of its Work at no additional cost or advance payment from District to assure that there will be no delays.

6.7. Documents On Work

6.7.1. Contractor shall at all times keep on the Work Site, or at another location as the District may authorize in writing, one legible copy of all Contract Documents, including Addenda and Change Orders, and Titles 19 and 24 of the California Code of Regulations, the specified edition(s) of the Uniform Building Code, all approved Drawings, Plans, Schedules, and Specifications, and all codes and documents referred to in the Specifications, and made part thereof. These documents shall be kept in good order and available to District, Construction Manager, Architect, Architect's representatives, the Project Inspector(s), and all authorities having jurisdiction. Contractor shall be acquainted with and comply with the provisions of these titles as they relate to this Project. (See particularly the duties of Contractor, Title 24, Part 1, California Code of Regulations, section 4-343.) Contractor shall also be acquainted with and comply with all California Code of Regulations provisions relating to conditions on this Project, particularly Titles 8 and 17. Contractor shall coordinate with Architect and Construction Manager and shall submit its verified report(s) according to the requirements of Title 24.

6.7.2. Daily Job Reports.

6.7.2.1. Contractor shall maintain, at a minimum, at least one (1) set of Daily Job Reports on the Project. These must be prepared by the Contractor's employee(s) who are present on Site, and must include, at a minimum, the following information:

- 6.7.2.1.1.** A brief description of all Work performed on that day.
- 6.7.2.1.2.** A summary of all other pertinent events and/or occurrences on that day.
- 6.7.2.1.3.** The weather conditions on that day.
- 6.7.2.1.4.** A list of all Subcontractor(s) working on that day,
- 6.7.2.1.5.** A list of each Contractor employee working on that day and the total hours worked for each employee.
- 6.7.2.1.6.** A complete list of all equipment on Site that day, whether in use or not.
- 6.7.2.1.7.** All complete list of all materials, supplies, and equipment delivered on that day.
- 6.7.2.1.8.** A complete list of all inspections and tests performed on that day.

6.7.2.2. Each day Contractor shall provide a copy of the previous day's Daily Job Report to the District or the Construction Manager.

6.8. Preservation of Records

The District shall have the right to examine and audit all Daily Job Reports or other Project records of Contractor's project manager(s), project superintendent(s), and/or project foreperson(s), all certified payroll records and/or related documents including, without limitation, payroll, payment, timekeeping and tracking documents; all books, estimates, records, contracts, documents, bid documents, bid cost data, subcontract job cost reports, and other data of the Contractor, any Subcontractor, and/or supplier, including computations and projections related to bidding, negotiating, pricing, or

performing the Work or Contract modification, in order to evaluate the accuracy, completeness, and currency of the cost, manpower, coordination, supervision, or pricing data at no additional cost to the District. These documents may be duplicative and/or be in addition to any Bid Documents held in escrow by the District. The Contractor shall make available at its office at all reasonable times the materials described in this paragraph for the examination, audit, or reproduction until three (3) years after final payment under this Contract. Notwithstanding the provisions above, Contractor shall provide any records requested by any governmental agency, if available, after the time set forth above.

The District's Project Management System is EADOCs and shall be utilized by the contractor for transmitting and permanent storage of all project data, including but not limited to, submittals, RFIs, meeting minutes, daily reports, as-built documents and correspondence of all kinds.

6.9. Integration of Work

6.9.1. Contractor shall do all cutting, fitting, patching, and preparation of Work as required to make its several parts come together properly, to fit it to receive or be received by work of other contractors, and to coordinate tolerances to various pieces of work, showing upon, or reasonably implied by, the Drawings and Specifications for the completed structure, and shall conform them as District and/or Architect may direct.

6.9.2. Contractor shall make its own layout of lines and elevations and shall be responsible for the accuracy of both Contractor's and Subcontractors' work resulting therefrom.

6.9.3. Contractor and all Subcontractors shall take all field dimensions required in performance of the Work, and shall verify all dimensions and conditions on the Site. All dimensions affecting proper fabrication and installation of all Work must be verified prior to fabrication by taking field measurements of the true conditions. If there are any discrepancies between dimensions in drawings and existing conditions which will affect the Work, Contractor shall bring such discrepancies to the attention of the District and Architect for adjustment before proceeding with the Work. In doing so, it is recognized that Contractor is not acting in the capacity of a licensed design professional, and that Contractor's examination is made in good faith to facilitate construction and does not create an affirmative responsibility to detect errors, omissions or inconsistencies in the Contract Documents or to ascertain compliance with applicable laws, building codes or regulations. Following receipt of written notice from Contractor, the District and/or Architect shall inform Contractor what action, if any, Contractor shall take with regard to such discrepancies

6.9.4. All cost caused by defective or ill-timed Work shall be borne by Contractor, inclusive of repair work.

6.9.5. Contractor shall not endanger any work performed by it or anyone else by cutting, excavating, or otherwise altering work and shall not cut or alter work of any other contractor except with consent of District.

6.10. Notifications

6.10.1. Contractor shall notify the Architect and Project Inspector, in writing, of the commencement of construction of each and every aspect of the Work at least 48 hours in advance by submitting form DSA 156 (or current version) to the Project Inspector. Forms are available on the DSA's website at:
<http://www.dgs.ca.gov/dsa/Forms.aspx>.

6.10.2. Contractor shall notify the Architect and Project Inspector, in writing, of the completion of construction of each and every aspect of the Work at least 48 hours in advance by submitting form DSA 156 (or current version) to the Project Inspector.

6.11. Obtaining of Permits, Licenses and Registration

Contractor shall secure and pay for all permits, licenses, registrations and certificates necessary for prosecution of Work, including but not limited to those listed in the Special Conditions, if any, before the date of the commencement of the Work or before the permits, licenses, registrations and certificates are legally required to continue the Work without interruption. The Contractor shall obtain and pay, only when legally required, for all licenses, registrations, permits, inspections, and inspection certificates required to be obtained from or issued by any authority having jurisdiction over any part of the Work included in the Contract. All final permits, licenses, and certificates shall be delivered to District before demand is made for final payment.

6.12. Royalties and Patents

6.12.1. Contractor shall obtain and pay, only when legally required, all royalties and license fees necessary for prosecution of Work before the earlier of the date of the commencement of the Work or the date that the license is legally required to continue the Work without interruption. Contractor shall defend suits or claims of infringement of patent, copyright, or other rights and shall hold the District, the Architect, and the Construction Manager harmless and indemnify them from loss on account thereof except when a particular design, process, or make or model of product is required by the Contract Documents. However, if the Contractor has reason to believe that the required design, process, or product is an infringement of a patent or copyright, the Contractor shall indemnify and defend the District, Architect and Construction Manager against any loss or damage unless the Contractor promptly informs the District of its information.

6.12.2. The review by the District or Architect of any method of construction, invention, appliance, process, article, device, or material of any kind shall be only its adequacy for the Work and shall not approve use by the Contractor in violation of any patent or other rights of any person or entity.

6.13. Work to Comply With Applicable Laws and Regulations

6.13.1. Contractor shall give all notices and comply with the following specific laws, ordinances, rules, and regulations and all other applicable laws, ordinances, rules, and regulations bearing on conduct of Work as indicated and specified, including but not limited to the appropriate statutes and administrative code sections. If Contractor observes that Drawings and Specifications are at variance

therewith, or should Contractor become aware of the development of conditions not covered by Contract Documents that will result in finished Work being at variance therewith, Contractor shall promptly notify District in writing and any changes deemed necessary by District shall be made as provided in Contract for changes in Work.

- 6.13.1.1. National Electrical Safety Code, U. S. Department of Commerce
- 6.13.1.2. National Board of Fire Underwriters' Regulations
- 6.13.1.3. Uniform Building Code, latest addition, and the California Code of Regulations, title 24, and other amendments
- 6.13.1.4. Manual of Accident Prevention in Construction, latest edition, published by A.G.C. of America
- 6.13.1.5. Industrial Accident Commission's Safety Orders, State of California
- 6.13.1.6. Regulations of the State Fire Marshall (title 19, California Code of Regulations) and Pertinent Local Fire Safety Codes
- 6.13.1.7. Americans with Disabilities Act
- 6.13.1.8. Education Code of the State of California
- 6.13.1.9. Government Code of the State of California
- 6.13.1.10. Labor Code of the State of California, division 2, part 7, Public Works and Public Agencies
- 6.13.1.11. Public Contract Code of the State of California
- 6.13.1.12. California Art Preservation Act
- 6.13.1.13. U. S. Copyright Act
- 6.13.1.14. U. S. Visual Artists Rights Act

6.13.2. Contractor shall comply with all applicable mitigation measures, if any, adopted by any public agency with respect to this Project pursuant to the California Environmental Quality Act (Public Resources Code section 21000 et seq.)

6.13.3. If Contractor performs any Work that it knew, or through exercise of reasonable care should have known, to be contrary to any applicable laws, ordinance, rules, or regulations, Contractor shall bear all costs arising therefrom.

6.13.4. Where Specifications or Drawings state that materials, processes, or procedures must be approved by the DSA, State Fire Marshall, or other body or agency, Contractor shall be responsible for satisfying requirements of such bodies or agencies.

6.14. Safety/Protection of Persons and Property

6.14.1. The Contractor will be solely and completely responsible for conditions of the Work Site, including safety of all persons and property during performance of the Work. This requirement will apply continuously and not be limited to normal working hours.

6.14.2. The wearing of hard hats and all other personnel protective equipment, such as vest, safety glasses and safety shoes, and will be mandatory at all times for all personnel on Site. Contractor shall supply sufficient hard hats to properly equip all employees and visitors.

6.14.3. Any construction review of the Contractor's performance is not intended to include review of the adequacy of the Contractor's safety measures in, on, or near the Work Site.

6.14.4. Implementation and maintenance of safety programs shall be the sole responsibility of the Contractor. The contractor's safety manual (s) shall be kept on site at all times

6.14.5. The Contractor shall furnish to the District a copy of the Contractor's site specific safety plan within the time frame indicated in the Contract Documents and specifically adapted for the Project.

6.14.6. Contractor shall be responsible for all damages to persons or property that occur as a result of its fault or negligence in connection with the prosecution of this Contract and shall take all necessary measures and be responsible for the proper care and completion and final acceptance by District. All Work shall be solely at Contractor's risk with the exception of damage to the Work caused by "acts of God" as defined in Public Contract Code section 7105.

6.14.7. Contractor shall take, and require Subcontractors to take, all necessary precautions for safety of workers on the Project and shall comply with all applicable federal, state, local, and other safety laws, standards, orders, rules, regulations, and building codes to prevent accidents or injury to persons on, about, or adjacent to premises where Work is being performed and to provide a safe and healthful place of employment. Contractor shall furnish, erect, and properly maintain at all times, all necessary safety devices, safeguards, construction canopies, signs, nets, barriers, lights, and watchmen for protection of workers and the public and shall post danger signs warning against hazards created by such features in the course of construction.

6.14.8. Hazards Control – Contractor shall store volatile wastes in covered metal containers and remove them from the Site daily. Contractor shall prevent accumulation of wastes that create hazardous conditions. Contractor shall provide adequate ventilation during use of volatile or noxious substances.

6.14.9. Contractor shall designate a responsible member of its organization on the Project, whose duty shall be to post information regarding protection and obligations of workers and other notices required under occupational safety and health laws, to comply with reporting and other occupational safety requirements, and to protect the life, safety, and health of workers. Name and position of person so designated shall be reported to District by Contractor.

6.14.10. Contractor shall correct any violations of safety laws, rules, orders, standards, or regulations. Upon the issuance of a citation or notice of violation by the Division of Occupational Safety and Health, Contractor shall correct such violation promptly.

6.14.11. Contractor shall comply with any District storm water requirements that are approved by the District and applicable to the Project, at no additional cost to the District.

6.14.12. In an emergency affecting safety of life or of work or of adjoining property, Contractor, without special instruction or authorization, shall act, at its discretion, to prevent such threatened loss or injury. Any compensation claimed by Contractor on account of emergency work shall be determined by agreement.

6.14.13. All salvage materials will become the property of the Contractor and shall be removed from the Site unless otherwise called for in the Contract Documents. However, the District reserves the right to designate certain items of value that shall be turned over to the District unless otherwise directed by District.

6.14.14. All connections to public utilities and/or existing on-site services shall be made and maintained in such a manner as to not interfere with the continuing use of same by the District during the entire progress of the Work.

6.14.15. Contractor shall provide such heat, covering, and enclosures as are necessary to protect all Work, materials, equipment, appliances, and tools against damage by weather conditions, such as extreme heat, cold, rain, snow, dry winds, flooding, or dampness.

6.14.16. The Contractor shall protect and preserve the Work from all damage or accident, providing any temporary roofs, window and door coverings, boxings, or other construction as required by the Architect. The Contractor shall be responsible for existing structures, walks, roads, trees, landscaping, and/or improvements in working areas; and shall provide adequate protection therefor. If temporary removal is necessary of any of the above items, or damage occurs due to the Work, the Contractor shall replace same at his expense with same kind, quality, and size of Work or item damaged. This shall include any adjoining property of the District and others.

6.14.17. Contractor shall take adequate precautions to protect existing roads, sidewalks, curbs, pavements, utilities, adjoining property, and structures (including, without limitation, protection from settlement or loss of lateral support), and to avoid damage thereto, and repair any damage thereto caused by construction operations.

6.14.18. Contractor shall confine apparatus, the storage of materials, and the operations of workers to limits indicated by law, ordinances, permits, or directions of Architect, and shall not interfere with the Work or unreasonably encumber Premises or overload any structure with materials. Contractor shall enforce all instructions of District and Architect regarding signs, advertising, fires, and smoking, and require that all workers comply with all regulations while on Project Site.

6.14.19. Contractor, Contractor's employees, Subcontractors, Subcontractors' employees, or any person associated with the Work shall conduct themselves in a manner appropriate for a school site. No verbal or physical contact with neighbors, students, and faculty, profanity, or inappropriate attire or behavior will be permitted. District may require Contractor to permanently remove non-complying persons from Project Site.

6.14.20. Contractor shall take care to prevent disturbing or covering any survey markers, monuments, or other devices marking property boundaries or corners. If

such markers are disturbed, Contractor shall have a civil engineer, registered as a professional engineer in California, replace them at no cost to District.

6.14.21. In the event that the Contractor enters into any agreement with owners of any adjacent property to enter upon the adjacent property for the purpose of performing the Work, Contractor shall fully indemnify, defend, and hold harmless each person, entity, firm, or agency that owns or has any interest in adjacent property. The form and content of the agreement of indemnification shall be approved by the District prior to the commencement of any Work on or about the adjacent property. The Contractor shall also indemnify the District as provided in the indemnification provision herein. These provisions shall be in addition to any other requirements of the owners of the adjacent property.

6.15. Working Evenings and Weekends

Contractor may be required to work evenings and/or weekends at no additional cost to the District. Contractor shall give the District seventy-two (72) hours notice prior to performing any evening and/or weekend work. Contractor shall perform all evening and/or weekend work only upon District's approval and in compliance with all applicable rules, regulations, laws, and local ordinances including, without limitation, all noise and light limitations. Contractor shall reimburse the District for any Inspector charges necessitated by the Contractor's evening and/or weekend work.

6.16. Cleaning Up

6.16.1. The Contractor shall provide all services, labor, materials, and equipment necessary for protecting the Work, all school occupants, furnishings, equipment, and building structure from damage until its completion and final acceptance by District. Dust barriers shall be provided to isolate dust and dirt from construction operations. At completion of the Work and portions thereof, Contractor shall clean to the original state any areas beyond the Work area that become dust laden as a result of the Work. The Contractor must erect the necessary warning signs and barricades to ensure the safety of all school occupants. The Contractor at all times must maintain good housekeeping practices to reduce the risk of fire damage and must make a fire extinguisher, fire blanket, and/or fire watch, as applicable, available at each location where cutting, braising, soldering, and/or welding is being performed or where there is an increased risk of fire.

6.16.2. Contractor at all times shall keep Premises free from debris such as waste, rubbish, and excess materials and equipment caused by the Work. Contractor shall not leave debris under, in, or about the Premises, but shall promptly remove same from the Premises on a daily basis. If Contractor fails to clean up, District may do so and the cost thereof shall be charged to Contractor. If Contract is for work on an existing facility, Contractor shall also perform specific clean-up on or about the Premises upon request by the District as it deems necessary for the continuing education process. Contractor shall comply with all related provisions of the Specifications.

6.16.3. If the Construction Manager, Architect, or District observes the accumulation of trash and debris, the District will give the Contractor a 24-hour written notice to mitigate the condition.

6.16.4. Should the Contractor fail to perform the required clean-up, or should the clean-up be deemed unsatisfactory by the District, the District will then perform the clean-up. All cost associated with the clean-up work (including all travel, payroll burden, and costs for supervision) will be deducted from the Contract Price, or District may withhold those amounts from payment(s) to Contractor.

7. SUBCONTRACTORS

7.1. Contractor shall provide the District with information for all Subcontracts as indicated in the Contractor's Submittals and Schedules Section herein.

7.2. No contractual relationship exists between the District and any Subcontractor, supplier, or sub-subcontractor by reason of this Contract.

7.3. Contractor agrees to bind every Subcontractor by terms of this Contract as far as those terms are applicable to Subcontractor's work including, without limitation, all labor, wage & hour, apprentice and related provisions and requirements. If Contractor shall subcontract any part of this Contract, Contractor shall be as fully responsible to District for acts and omissions of any Subcontractor and of persons either directly or indirectly employed by any Subcontractor, as it is for acts and omissions of persons directly employed by Contractor. The divisions or sections of the Specifications are not intended to control the Contractor in dividing the Work among Subcontractors or limit the work performed by any trade.

7.4. District's consent to, or approval of, or failure to object to, any Subcontractor under this Contract shall not in any way relieve Contractor of any obligations under this Contract and no such consent shall be deemed to waive any provisions of this Contract.

7.5. Contractor is directed to familiarize itself with sections 4100 through 4114 of the Public Contract Code of the State of California, as regards subletting and subcontracting, and to comply with all applicable requirements therein. In addition, Contractor is directed to familiarize itself with sections 1720 through 1861 of the Labor Code of the State of California, as regards the payment of prevailing wages and related issues, and to comply with all applicable requirements therein all including, without limitation, section 1775 and the Contractor's and Subcontractors' obligations and liability for violations of prevailing wage law and other applicable laws.

7.6. No Contractor whose Bid is accepted shall, without consent of the awarding authority and in full compliance with section 4100, et seq. of the Public Contract Code, and section 1771.1 of the Labor Code, including, without limitation, sections 4107, 4107.5, and 4109 of the Public Contract Code, either:

7.6.1. Substitute any person as a Subcontractor in place of the Subcontractor designated in the original Bid; or

7.6.2. Permit any Subcontract to be assigned or transferred, or allow any portion of the Work to be performed by anyone other than the original Subcontractor listed in the Bid; or

7.6.3. Sublet or subcontract any portion of the Work in excess of one-half of one percent (0.5%) of the Contractor's total bid as to which his original bid did not designate a Subcontractor.

7.7. The Contractor shall be responsible for the coordination of the trades, Subcontractors, sub-subcontractors, and material or equipment suppliers working on the Project.

7.7.1. Contractor is responsible for ensuring that all Subcontractors are properly registered as public works contractors by the Department of Industrial Relations.

7.8. Contractor is solely responsible for settling any differences between the Contractor and its Subcontractor(s) or between Subcontractors.

7.9. Contractor must include in all of its subcontracts the assignment provisions as indicated in the Termination section of these General Conditions.

8. OTHER CONTRACTS/CONTRACTORS

8.1. District reserves the right to let other contracts, and/or to perform work with its own forces, in connection with the Project. Contractor shall afford other contractors reasonable opportunity for introduction and storage of their materials and execution of their work and shall properly coordinate and connect Contractor's Work with the work of other contractors.

8.2. In addition to Contractor's obligation to protect its own Work, Contractor shall protect the work of any other contractor that Contractor encounters while working on the Project.

8.3. If any part of Contractor's Work depends for proper execution or results upon work of District or any other contractor, the Contractor shall inspect and promptly report to the District in writing before proceeding with its Work any defects in District's or any other contractor's work that render Contractor's Work unsuitable for proper execution and results. Contractor shall be held accountable for damages to District for District's or any other contractor's work that Contractor failed to inspect or should have inspected. Contractor's failure to inspect and report shall constitute Contractor's acceptance of all District's or any other contractor's work as fit and proper for reception of Contractor's Work, except as to defects that may develop in District's or any other contractor's work after execution of Contractor's Work.

8.4. To ensure proper execution of its subsequent work, Contractor shall measure and inspect work already in place and shall at once report to the District in writing any discrepancy between that executed work and the Contract Documents.

8.5. Contractor shall ascertain to its own satisfaction the scope of the Project and nature of District's or any other contracts that have been or may be awarded by District in prosecution of the Project to the end that Contractor may perform this Contract in light of the other contracts, if any.

8.6. Nothing herein contained shall be interpreted as granting to Contractor exclusive occupancy of the Site, the Premises, or of the Project. Contractor shall not

cause any unnecessary hindrance or delay to the use and/or school operation(s) of the Premises and/or to District or any other contractor working on the Project. If simultaneous execution of any contract or school operation is likely to cause interference with performance of Contractor's Contract, Contractor shall coordinate with those contractor(s), person(s), and/or entity(s) and shall notify the District of the resolution.

9. DRAWINGS AND SPECIFICATIONS

9.1. A complete list of all Drawings that form a part of the Contract is to be found as an index on the Drawings themselves, and/or may be provided to the Contractor and/or in the Table of Contents.

9.2. Materials or Work described in words that so applied have a well known technical or trade meaning shall be deemed to refer to recognized standards, unless noted otherwise.

9.3. Trade Name or Trade Term. It is not the intention of this Contract to go into detailed descriptions of any materials and/or methods commonly known to the trade under "trade name" or "trade term." The mere mention or notation of "trade name" or "trade term" shall be considered a sufficient notice to Contractor that it will be required to complete the work so named, complete, finished, and operable, with all its appurtenances, according to the best practices of the trade.

9.4. The naming of any material and/or equipment shall mean furnishing and installing of same, including all incidental and accessory items thereto and/or labor therefor, as per best practices of the trade(s) involved, unless specifically noted otherwise.

9.5. Contract Documents are complementary, and what is called for by one shall be binding as if called for by all. As such, Drawings and Specifications are intended to be fully cooperative and to agree. However, if Contractor observes that Drawings and Specifications are in conflict, Contractor shall promptly notify District and Architect in writing, and any necessary changes shall be made as provided in the Contract Documents.

9.6. In the case of discrepancy or ambiguity in the Contract Documents, the order of precedence in the Agreement shall prevail. However, in the case of discrepancy or ambiguity solely between and among the Drawings and Specifications, the discrepancy or ambiguity shall be resolved in favor of the interpretation that will provide District with the functionally complete and operable Project described in the Drawings and Specifications. In case of ambiguity, conflict, or lack of information, District will furnish clarifications with reasonable promptness.

9.7. Drawings and Specifications are intended to comply with all laws, ordinances, rules, and regulations of constituted authorities having jurisdiction, and where referred to in the Contract Documents, the laws, ordinances, rules, and regulations shall be considered as a part of the Contract within the limits specified. Contractor shall bear all expense of correcting work done contrary to said laws, ordinances, rules, and regulations.

9.8. Ownership of Drawings

All copies of Plans, Drawings, Designs, Specifications, and copies of other incidental architectural and engineering work, or copies of other Contract Documents furnished by District, are the property of District. They are not to be used by Contractor in other work and, with the exception of signed sets of Contract Documents, are to be returned to District on request at completion of Work, or may be used by District as it may require without any additional costs to District. Neither the Contractor nor any Subcontractor, or material or equipment supplier shall own or claim a copyright in the Drawings, Specifications, and other documents prepared by the Architect. District hereby grants the Contractor, Subcontractors, sub-subcontractors, and material or equipment suppliers a limited license to use applicable portions of the Drawings prepared for the Project in the execution of their Work under the Contract Documents.

10. CONTRACTOR'S SUBMITTALS AND SCHEDULES

Contractor's submittals shall comply with the provisions and requirements of the Specifications including, without limitation Submittals.

10.1. Schedule of Work, Schedule of Submittals, and Schedule of Values

10.1.1. Within **TEN (10)** calendar days after the date of the Notice to Proceed (unless otherwise specified in the Specifications), the Contractor shall prepare and submit to the District for review, in a form supported by sufficient data to substantiate its accuracy as the District may require:

10.1.1.1. Preliminary Schedule. A preliminary schedule of construction indicating the starting and completion dates of the various stages of the Work, including any information and following any form as may be specified in the Specifications. Once approved by District, this shall become the Construction Schedule. This schedule shall include and identify all tasks that are on the Project's critical path with a specific determination of the start and completion of each critical path task as well as all Contract milestones and each milestone's completion date(s) as may be required by the District.

10.1.1.2. Preliminary Schedule of Values. A preliminary schedule of values for all of the Work, which must include quantities and prices of items aggregating the Contract Price and must subdivide the Work into component parts in sufficient detail to serve as the basis for progress payments during construction. Unless the Special Conditions contain different limits, this preliminary schedule of values shall include, at a minimum, the following information and the following structure:

10.1.1.2.1. Divided into at least the following categories:

- 10.1.1.2.1.1.** Overhead and profit;
- 10.1.1.2.1.2.** Supervision;
- 10.1.1.2.1.3.** General conditions;
- 10.1.1.2.1.4.** Layout;
- 10.1.1.2.1.5.** Mobilization;
- 10.1.1.2.1.6.** Submittals;

- 10.1.1.2.1.7. Bonds and insurance;
- 10.1.1.2.1.8. Close-out/Certification documentation;
- 10.1.1.2.1.9. Demolition;
- 10.1.1.2.1.10. Installation;
- 10.1.1.2.1.11. Rough-in;
- 10.1.1.2.1.12. Finishes;
- 10.1.1.2.1.13. Testing;
- 10.1.1.2.1.14. Punchlist and acceptance.

10.1.1.2.2. Divided by each of the following areas:

- 10.1.1.2.2.1. Site work;
- 10.1.1.2.2.2. By each building;
- 10.1.1.2.2.3. By each floor.

10.1.1.2.3. The preliminary schedule of values shall not provide for values any greater than the following percentages of the Contract value:

- 10.1.1.2.3.1. Mobilization and layout combined to equal not more than 1%;
- 10.1.1.2.3.2. Submittals, samples and shop drawings combined to equal not more than 3%;
- 10.1.1.2.3.3. Bonds and insurance combined to equal not more than 2%.

10.1.1.2.4. Closeout documentation shall have a value in the preliminary schedule of not less than 5%.

10.1.1.2.5. Notwithstanding any provision of the Contract Documents to the contrary, payment of the Contractor's overhead, supervision, general conditions costs, and profit, as reflected in the Cost Breakdown, shall be paid based on percentage complete, with the disbursement of Progress Payments and the Final Payment.

10.1.1.2.6. Contractor shall certify that the preliminary schedule of values as submitted to the District is accurate and reflects the costs as developed in preparing Contractor's bid. The preliminary schedule of values shall be subject to the District's review and approval of the form and content thereof. In the event that the District objects to any portion of the preliminary schedule of values, the District shall notify the Contractor, in writing, of the District's objection(s) to the preliminary schedule of values. Within five (5) calendar days of the date of the District's written objection(s), Contractor shall submit a revised preliminary schedule of values to the District for review and approval. The foregoing procedure for the preparation, review and approval of the preliminary schedule of values shall continue until the District has approved the entirety of the preliminary schedule of values.

10.1.1.2.7. Once the preliminary schedule of values is approved by the District, this shall become the Schedule of Values. The Schedule of Values shall not be thereafter modified or amended by the Contractor without the

prior consent and approval of the District, which may be granted or withheld in the sole discretion of the District.

10.1.1.3. Preliminary Schedule of Submittals. A preliminary schedule of submittals, including Shop Drawings, Product Data, and Samples submittals. Once approved by District, this shall become the Submittal Schedule. All submittals shall be forwarded to the District by the date indicated on the approved Submittal Schedule, unless an earlier date is necessary to maintain the Construction Schedule, in which case those submittals shall be forwarded to the District so as not to delay the Construction Schedule. Upon request by the District, Contractor shall provide an electronic copy of all submittals to the District.

10.1.1.4. Safety Plan. Contractor's Safety Plan specifically adapted for the Project. Contractor's Safety Plan shall comply with the following requirements:

10.1.1.4.1. All applicable requirements of California Division of Industrial Safety ("CalOSHA") and/or of the United States Occupational Safety and Health Administration ("OSHA").

10.1.1.4.2. All provisions regarding Project safety, including all applicable provisions in these General Conditions.

10.1.1.4.3. Contractor's Safety Plan shall be in English and in the language(s) of the Contractor's and its Subcontractors' employees.

10.1.1.5. Complete Subcontractor List. The name, address, telephone number, facsimile number, California State Contractors License number, classification, and monetary value of all Subcontracts for parties furnishing labor, material, or equipment for completion of the Project.

10.1.2. Contractor must provide all schedules both in hard copy and electronically, in a format (e.g., Microsoft Project or Primavera) approved in advance by the District.

10.1.3. The District will review the schedules submitted and the Contractor shall make changes and corrections in the schedules as requested by the District and resubmit the schedules until approved by the District.

10.1.4. The District shall have the right at any time to revise the schedule of values if, in the District's sole opinion, the schedule of values does not accurately reflect the value of the Work performed.

10.1.5. All submittals and schedules must be approved by the District before Contractor can rely on them as a basis for payment.

10.2. Monthly Progress Schedule(s)

10.2.1. Contractor shall provide Monthly Progress Schedule(s) to the District. A Monthly Progress Schedule shall update the approved Construction Schedule or the last Monthly Progress Schedule, showing all work completed and to be completed. The monthly Progress Schedule shall be sent within the timeframe requested by the District and shall be in a format acceptable to the District and contain a written narrative of the progress of work that month and any changes, delays, or events that may affect the work. The process for District approval of the Monthly Progress Schedule shall be the same as the process for approval of the Construction Schedule.

10.2.2. Contractor shall submit Monthly Progress Schedule(s) with all payment applications.

10.3. Material Safety Data Sheets (MSDS)

Contractor is required to ensure Material Safety Data Sheets are available in a readily accessible place at the Work Site for any material requiring a Material Safety Data Sheet per the Federal "Hazard Communication" standard, or employees right to know law. The Contractor is also required to ensure proper labeling on substance brought onto the job site and that any person working with the material or within the general area of the material is informed of the hazards of the substance and follows proper handling and protection procedures. Two additional copies of the Material Safety Data Sheets shall also be submitted directly to the District.

11. SITE ACCESS, CONDITIONS, AND REQUIREMENTS

11.1. Site Investigation

Before bidding on this Work, Contractor shall make a careful investigation of the Site and thoroughly familiarize itself with the requirements of the Contract. By the act of submitting a bid for the Work included in this Contract, Contractor shall be deemed to have made a complete study and investigation, and to be familiar with and accepted the existing conditions of the Site.

Prior to commencing the Work, Contractor and the District's representative shall survey the Site to document the condition of the Site. Contractor will record the survey in digital videotape format and provide an electronic copy to the District within fourteen (14) days of the survey. This electronic record shall serve as a basis for determining any damages caused by the Contractor during the Project. The Contractor may also document any pre-existing conditions in writing, provided that both the Contractor and the District's representative agree on said conditions and sign a memorandum documenting the same.

11.2. Soils Investigation Report

11.2.1. When a soils investigation report obtained from test holes at Site is available, that report shall be available to the Contractor but shall not be a part of this Contract. Any information obtained from that report or any information given on Drawings as to subsurface soil condition or to elevations of existing grades or elevations of underlying rock is approximate only, is not guaranteed, does not form a

part of this Contract, and Contractor may not rely thereon. By submitting its bid, Contractor acknowledges that it has made visual examination of Site and has made whatever tests Contractor deems appropriate to determine underground condition of soil.

11.2.2. Contractor agrees that no claim against District will be made by Contractor for damages and hereby waives any rights to damages if, during progress of Work, Contractor encounters subsurface or latent conditions at Site materially differing from those shown on Drawings or indicated in Specifications, or for unknown conditions of an unusual nature that differ materially from those ordinarily encountered in the work of the character provided for in Plans and Specifications, except as indicated in the provisions of these General Conditions regarding trenches, trenching, and/or existing utility lines.

11.3. Access to Work

District and its representatives shall at all times have access to Work wherever it is in preparation or progress, including storage and fabrication. Contractor shall provide safe and proper facilities for such access so that District's representatives may perform their functions.

11.4. Layout and Field Engineering

11.4.1. All field engineering required for layout of this Work and establishing grades for earthwork operations shall be furnished by Contractor at its expense. This Work shall be done by a qualified, California-registered civil engineer approved in writing by District and Architect. Any required Record and/or As-Built Drawings of Site development shall be prepared by the approved civil engineer.

11.4.2. The Contractor shall be responsible for having ascertained pertinent local conditions such as location, accessibility, and general character of the Site and for having satisfied itself as to the conditions under which the Work is to be performed. Contractor shall follow best practices, including but not limited to pot holing to avoid utilities. District shall not be liable for any claim for allowances because of Contractor's error, failure to follow best practices, or negligence in acquainting itself with the conditions at the Site.

11.4.3. Contractor shall protect and preserve established benchmarks and monuments and shall make no changes in locations without the prior written approval of District. Contractor shall replace any benchmarks or monuments that are lost or destroyed subsequent to proper notification of District and with District's approval.

11.5. Utilities

Utilities shall be provided as indicated in the Specifications.

11.6. Sanitary Facilities

Sanitary facilities shall be provided as indicated in the Specifications.

11.7. Surveys

Contractor shall provide surveys done by a California-licensed civil engineer surveyor to determine locations of construction, grading, and site work as required to perform the Work.

11.8. Regional Notification Center

The Contractor, except in an emergency, shall contact the appropriate regional notification center at least two (2) days prior to commencing any excavation if the excavation will be conducted in an area or in a private easement that is known, or reasonably should be known, to contain subsurface installations other than the underground facilities owned or operated by the District, and obtain an inquiry identification number from that notification center. No excavation shall be commenced and/or carried out by the Contractor unless an inquiry identification number has been assigned to the Contractor or any Subcontractor and the Contractor has given the District the identification number. Any damages arising from Contractor's failure to make appropriate notification shall be at the sole risk and expense of the Contractor. Any delays caused by failure to make appropriate notification shall be at the sole risk of the Contractor and shall not be considered for an extension of the Contract time.

11.9. Existing Utility Lines

11.9.1. Pursuant to Government Code section 4215, District assumes the responsibility for removal, relocation, and protection of main or trunk utility lines and facilities located on the construction Site at the time of commencement of construction under this Contract with respect to any such utility facilities that are not identified in the Plans and Specifications. Contractor shall not be assessed for liquidated damages for delay in completion of the Project caused by failure of District or the owner of a utility to provide for removal or relocation of such utility facilities.

11.9.2. Locations of existing utilities provided by District shall not be considered exact, but approximate within reasonable margin and shall not relieve Contractor of responsibilities to exercise reasonable care costs of repair due to Contractor's failure to do so. District shall compensate Contractor for the costs of locating, repairing damage not due to the failure of Contractor to exercise reasonable care, and removing or relocating such utility facilities not indicated in the Plans and Specifications with reasonable accuracy, and for equipment necessarily idle during such work.

11.9.3. No provision herein shall be construed to preclude assessment against Contractor for any other delays in completion of the Work. Nothing in this Article shall be deemed to require District to indicate the presence of existing service laterals, appurtenances, or other utility lines, within the exception of main or trunk utility lines. Whenever the presence of these utilities on the Site of the construction Project can be inferred from the presence of other visible facilities, such as buildings, meter junction boxes, on or adjacent to the Site of the construction.

11.9.4. If Contractor, while performing Work under this Contract, discovers utility facilities not identified by District in Contract Plans and Specifications, Contractor shall immediately notify the District and the utility in writing. The cost of repair for damage to above-mentioned visible facilities without prior written notification to the District shall be borne by the Contractor.

11.10. Notification

Contractor understands, acknowledges and agrees that the purpose for prompt notification to the District pursuant to these provisions is to allow the District to investigate the condition(s) so that the District shall have the opportunity to decide how the District desires to proceed as a result of the condition(s). Accordingly, failure of Contractor to promptly notify the District in writing, pursuant to these provisions, shall constitute Contractor's waiver of any claim for damages or delay incurred as a result of the condition(s).

11.11. Hazardous Materials

Contractor shall comply with all provisions and requirements of the Contract Documents related to hazardous materials including, without limitation, Hazardous Materials Procedures and Requirements.

11.12. No Signs

Neither the Contractor nor any other person or entity shall display any signs not required by law or the Contract Documents at the Site, fences trailers, offices, or elsewhere on the Site without specific prior written approval of the District.

12. TRENCHES

12.1. Trenches Greater Than Five Feet

Pursuant to Labor Code section 6705, if the Contract Price exceeds \$25,000 and involves the excavation of any trench or trenches five (5) feet or more in depth, the Contractor shall, in advance of excavation, promptly submit to the District and/or a registered civil or structural engineer employed by the District or Architect, a detailed plan, stamped by a licensed engineer retained by the Contractor, showing the design of shoring for protection from the hazard of caving ground during the excavation of such trench or trenches.

12.2. Excavation Safety

If such plan varies from the Shoring System Standards established by the Construction Safety Orders, the plan shall be prepared by a registered civil or structural engineer, but in no case shall such plan be less effective than that required by the Construction Safety Orders. No excavation of such trench or trenches shall be commenced until said plan has been accepted by the District or by the person to whom authority to accept has been delegated by the District.

12.3. No Tort Liability of District

Pursuant to Labor Code section 6705, nothing in this Article shall impose tort liability upon the District or any of its employees.

12.4. No Excavation Without Permits

The Contractor shall not commence any excavation Work until it has secured all necessary permits including the required CAL OSHA excavation/shoring permit. Any permits shall be prominently displayed on the Site prior to the commencement of any excavation.

12.5. Discovery of Hazardous Waste and/or Unusual Conditions

12.5.1. Pursuant to Public Contract Code section 7104, if the Work involves digging trenches or other excavations that extend deeper than four feet below the Surface, the Contractor shall promptly, and before the following conditions are disturbed, notify the District, in writing, of any:

12.5.1.1. Material that the Contractor believes may be material that is hazardous waste, as defined in section 25117 of the Health and Safety Code, is required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law.

12.5.1.2. Subsurface or latent physical conditions at the Site differing from those indicated.

12.5.1.3. Unknown physical conditions at the Site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract.

12.5.2. The District shall promptly investigate the conditions, and if it finds that the conditions do materially so differ, or do involve hazardous waste, and cause a decrease or increase in the Contractor's cost of, or the time required for, performance of any part of the Work, shall issue a Change Order under the procedures described herein.

12.5.3. In the event that a dispute arises between District and the Contractor whether the conditions materially differ, or involve hazardous waste, or cause a decrease or increase in the Contractor's cost of, or time required for, performance of any part of the Work, the Contractor shall not be excused from any scheduled completion date provided for by the Contract, but shall proceed with all work to be performed under the Contract. The Contractor shall retain any and all rights provided either by Contract or by law that pertain to the resolution of disputes and protests.

13. INSURANCE AND BONDS

13.1. Insurance

Unless different provisions and/or limits are indicated in the Special Conditions, all insurance required of Contractor and/or its Subcontractor(s) shall be in the amounts and include the provisions set forth herein.

13.1.1. Commercial General Liability and Automobile Liability Insurance

13.1.1.1. Contractor shall procure and maintain, during the life of this Contract, Commercial General Liability Insurance and Automobile Liability Insurance that shall protect Contractor, District, State, Construction Manager(s), Project Inspector(s), and Architect(s) from all claims for bodily injury, property damage, personal injury, death, advertising injury, and medical payments arising from operations under this Contract. This coverage shall be provided in a form at least as broad as Insurance Services (ISO) Form CG 0001 11188. Contractor shall ensure that Products Liability and Completed Operations coverage, Fire Damage Liability, and Any Auto including owned, non-owned, and hired, are included within the above policies and at the required limits, or Contractor shall procure and maintain these coverages separately.

13.1.1.2. Contractor's deductible or self-insured retention for its Commercial General Liability Insurance policy shall not exceed \$25,000 unless approved in writing by District.

13.1.1.3. All such policies shall be written on an occurrence form.

13.1.2. Excess Liability Insurance

13.1.2.1. Contractor may procure and maintain, during the life of this Contract, an Excess Liability Insurance Policy to meet the policy limit requirements of the required policies if Contractor's underlying policy limits are less than required.

13.1.2.2. There shall be no gap between the per occurrence amount of any underlying policy and the start of the coverage under the Excess Liability Insurance Policy. Any Umbrella or Excess Liability Insurance Policy shall be written on a following form and shall protect Contractor, District, State, Construction Manager(s), Project Manager(s), and Architect(s) in amounts and including the provisions as set forth in the Supplementary Conditions (if any) and/or Special Conditions, and that complies with all requirements for Commercial General Liability and Automobile Liability and Employers' Liability Insurance.

13.1.3. Subcontractor(s): Contractor shall require its Subcontractor(s), if any, to procure and maintain Commercial General Liability Insurance, Automobile Liability Insurance, and Excess Liability Insurance (if Subcontractor elects to satisfy, in part the insurance required herein by procuring and maintaining an Excess Liability Insurance Policy) with forms of coverage and limits equal to the amounts required of the Contractor.

13.1.4. Workers' Compensation and Employers' Liability Insurance

13.1.4.1. In accordance with provisions of section 3700 of the California Labor Code, the Contractor and every Subcontractor shall be required to secure the payment of compensation to its employees.

13.1.4.2. Contractor shall procure and maintain, during the life of this Contract, Workers' Compensation Insurance and Employers' Liability Insurance for all of its employees engaged in work under this Contract, on/or at the Site of the Project. This coverage shall cover, at a minimum, medical and surgical treatment, disability benefits, rehabilitation therapy, and survivors' death benefits. Contractor shall require its Subcontractor(s), if any, to procure and maintain Workers' Compensation Insurance and Employers' Liability Insurance for all employees of Subcontractor(s). Any class of employee or employees not covered by a Subcontractor's insurance shall be covered by Contractor's insurance. If any class of employee or employee engaged in Work under this Contract, on or at the Site of the Project, is not protected under the Workers' Compensation Insurance, Contractor shall provide, or shall cause a Subcontractor to provide, adequate insurance coverage for the protection of any employee(s) not otherwise protected before any of those employee(s) commence work.

13.1.5. Builder's Risk Insurance: Builder's Risk "All Risk" Insurance

Contractor shall procure and maintain, during the life of this Contract, Builder's Risk (Course of Construction), or similar first party property coverage acceptable to the District, issued on a replacement cost value basis. The cost shall be consistent with the total replacement cost of all insurable Work of the Project included within the Contract Documents. Coverage is to insure against all risks of accidental physical loss and shall include without limitation the perils of vandalism and/or malicious mischief (both without any limitation regarding vacancy or occupancy), sprinkler leakage, civil authority, theft, sonic disturbance, earthquake, flood, collapse, wind, fire, war, terrorism, lightning, smoke, and rioting. Coverage shall include debris removal, demolition, increased costs due to enforcement of all applicable ordinances and/or laws in the repair and replacement of damaged and undamaged portions of the property, and reasonable costs for the Architect's and engineering services and expenses required as a result of any insured loss upon the Work and Project, including completed Work and Work in progress, to the full insurable value thereof.

13.1.6. Pollution Liability Insurance

13.1.6.1. Contractor shall procure and maintain Pollution Liability Insurance that shall protect Contractor, District, State, Construction Manager(s), Project Inspector(s), and Architect(s) from all claims for bodily injury, property damage, including natural resource damage, cleanup costs, removal, storage, disposal, and/or use of the pollutant arising from operations under this Contract, and defense, including costs and expenses incurred in the investigation, defense, or settlement of claims. Coverage shall apply to sudden and/or gradual pollution conditions resulting from the escape or release of smoke, vapors, fumes, acids, alkalis, toxic chemicals, liquids, or gases, natural gas, waste materials, or other irritants, contaminants, or pollutants, including asbestos. This coverage shall be

provided in a form at least as broad as Insurance Services (ISO) Form CG 2415, or Contractor shall procure and maintain these coverages separately.

13.1.6.2. Contractor shall warrant that any retroactive date applicable to coverage under the policy predates the effective date of the Contract and that continuous coverage will be maintained or an extended reporting or discovery period will be exercised for a period of three (3) years, beginning from the time that the Work under the Contract is completed.

13.1.6.3. If Contractor is responsible for removing any pollutants from a site, then Contractor shall ensure that Any Auto, including owned, non-owned, and hired, are included within the above policies and at the required limits, to cover its automobile exposure from transporting the pollutants from the site to an approved disposal site. This coverage shall include the Motor Carrier Act Endorsement, MCS 90.

13.1.7. Proof of Carriage of Insurance and Other Requirements: Endorsements and Certificates

13.1.7.1. Contractor shall not commence Work nor shall it allow any Subcontractor to commence Work under this Contract, until Contractor and its Subcontractor(s) have procured all required insurance and Contractor has delivered in duplicate to the District complete endorsements (or entire insurance policies) and certificates indicating the required coverages have been obtained, and the District has approved these documents.

13.1.7.2. Endorsements, certificates, and insurance policies shall include the following:

13.1.7.2.1. A clause stating:

“This policy shall not be amended, canceled or modified and the coverage amounts shall not be reduced until notice has been mailed to District, Architect, and Construction Manager stating date of amendment, modification, cancellation or reduction. Date of amendment, modification, cancellation or reduction may not be less than thirty (30) days after date of mailing notice.”

13.1.7.2.2. Language stating in particular those insured, extent of insurance, location and operation to which insurance applies, expiration date, to whom cancellation and reduction notice will be sent, and length of notice period.

13.1.7.3. All endorsements, certificates and insurance policies shall state that District, its trustees, employees and agents, the State of California, Construction Manager(s), Project Manager(s), Inspector(s) and Architect(s) are named additional insureds under all policies except Workers' Compensation Insurance and Employers' Liability Insurance.

13.1.7.4. Insurance written on a “claims made” basis is to be renewed by the Contractor and all Subcontractors for a period of five (5) years following

completion of the Work or termination of this Agreement. Such insurance must have the same coverage and limits as the policy that was in effect during the term of this Agreement, and will cover the Contractor and all Subcontractors for all claims made.

13.1.7.5. Contractor’s and Subcontractors’ insurance policy(s) shall be primary and non-contributory to any insurance or self-insurance maintained by District, its trustees, employees and/or agents, the State of California, Construction Manager(s), Project Manager(s), Inspector(s), and/or Architect(s).

13.1.7.6. All endorsements shall waive any right to subrogation against any of the named additional insureds.

13.1.7.7. Unless otherwise stated in the Special Conditions, all of Contractor’s insurance shall be with insurance companies with an A.M. Best rating of no less than **A: VII.**

13.1.7.8. The insurance requirements set forth herein shall in no way limit the Contractor’s liability arising out of or relating to the performance of the Work or related activities.

13.1.7.9. Failure of Contractor and/or its Subcontractor(s) to comply with the insurance requirements herein shall be deemed a material breach of the Agreement.

13.1.8. Insurance Policy Limits

Unless different limits are indicated in the Special Conditions, the limits of insurance shall not be less than the following amounts:

Commercial General Liability	Product Liability and Completed Operations, Fire Damage Liability – Split Limit	\$2,000,000 per occurrence; \$4,000,000 aggregate
Automobile Liability – Any Auto	Combined Single Limit	\$1,000,000
Workers Compensation		Statutory limits pursuant to State law
Employers’ Liability		\$1,000,000
Builder’s Risk (Course of Construction)		Issued for the value and scope of Work indicated herein.
Pollution Liability		\$1,000,000 per claim; \$2,000,000 aggregate

13.2. Contract Security - Bonds

13.2.1. Contractor shall furnish two surety bonds issued by a California admitted surety insurer as follows:

13.2.1.1. Performance Bond: A bond in an amount at least equal to one hundred percent (100%) of Contract Price as security for faithful performance of this Contract.

13.2.1.2. Payment Bond: A bond in an amount at least equal to one hundred percent (100%) of the Contract Price as security for payment of persons performing labor and/or furnishing materials in connection with this Contract.

13.2.2. Cost of bonds shall be included in the Bid and Contract Price.

13.2.3. All bonds related to this Project shall be in the forms set forth in these Contract Documents and shall comply with all requirements of the Contract Documents, including, without limitation, the bond forms.

14. WARRANTY/GUARANTEE/INDEMNITY

14.1. Warranty/Guarantee

14.1.1. The Contractor shall obtain and preserve for the benefit of the District, manufacturer's warranties on materials, fixtures, and equipment incorporated into the Work.

14.1.2. In addition to guaranties required elsewhere, Contractor shall, and hereby does guarantee and warrant all Work furnished on the job against all defects for a period of **ONE (1)** year after the later of the following dates:

14.1.2.1. The date of completion as defined in Public Contract Code section 7107, subdivision (c), or

14.1.2.2. The commissioning date for the Project, if any.

At the District's sole option, Contractor shall repair or replace any and all of that Work, together with any other Work that may be displaced in so doing, that may prove defective in workmanship and/or materials within a **ONE (1)** year period from date of completion as defined above without expense whatsoever to District. In the event of failure of Contractor and/or Surety to commence and pursue with diligence said replacements or repairs within ten (10) days after being notified in writing, Contractor and Surety hereby acknowledge and agree that District is authorized to proceed to have defects repaired and made good at expense of Contractor and/or Surety who hereby agree to pay costs and charges therefore immediately on demand.

14.1.3. If, in the opinion of District, defective work creates a dangerous condition or requires immediate correction or attention to prevent further loss to District or to prevent interruption of operations of District, District will attempt to give the notice required above. If Contractor or Surety cannot be contacted or neither complies with

District's request for correction within a reasonable time as determined by District, District may, notwithstanding the above provision, proceed to make any and all corrections and/or provide attentions the District believes are necessary. The costs of correction or attention shall be charged against Contractor and Surety of the guarantees provided in this Article or elsewhere in this Contract.

14.1.4. The above provisions do not in any way limit the guarantees on any items for which a longer guarantee is specified or on any items for which a manufacturer gives a guarantee for a longer period. Contractor shall furnish to District all appropriate guarantee or warranty certificates as indicated in the Specifications or upon request by District.

14.1.5. Nothing herein shall limit any other rights or remedies available to District.

14.2. Indemnity

14.2.1. To the furthest extent permitted by California law, the Contractor shall indemnify, defend with legal counsel reasonably acceptable to the District, keep and hold harmless the District, the Architect, and the Construction Manager, their consultants and separate contractors, and their respective board members, officers, representatives, contractors, agents, and employees, in both individual and official capacities ("Indemnitees"), against all suits, claims, damages, losses, and expenses, including but not limited to attorney's fees, caused by, arising out of, resulting from, or incidental to, the performance of the Work under this Contract by the Contractor, its Subcontractors, vendors, or suppliers, except to the extent caused by the sole negligence, active negligence, or willful misconduct of the Indemnitees, and/or to any extent that would render these provisions void or unenforceable. This agreement and obligation of the Contractor shall not be construed to negate, abridge, or otherwise reduce any right or obligation of indemnity that would otherwise exist as to any party or person described herein. This indemnification, defense, and hold harmless obligation includes any failure or alleged failure by Contractor to comply with any provision of law, any failure or alleged failure to timely and properly fulfill all of its obligations under the Contract Documents in strict accordance with their terms, and without limitation, any stop payment notice actions or liens, including Civil Wage and Penalty Assessments and/or Orders by the California Department of Industrial Relations.

14.2.2. The Contractor shall give prompt notice to the District in the event of any injury (including death), loss, or damage included herein. Without limitation of the provisions herein, if the Contractor's agreement to indemnify, defend, and hold harmless the Indemnitees as provided herein shall be determined to be void or unenforceable, in whole or in part, it is the intention of the parties that these circumstances shall not otherwise affect the validity or enforceability of the Contractor's agreement to indemnify, defend, and hold harmless the rest of the Indemnitees, as provided herein. Further, the Contractor shall be and remain fully liable on its agreements and obligations herein to the full extent permitted by law.

14.2.3. In any and all claims against any of the Indemnitees by any employee of the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the Contractor's indemnification obligation herein shall not be limited in any way by any limitation on

the amount or type of damages, compensation, or benefits payable by or for the Contractor or any Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

14.2.4. The District may retain so much of the moneys due the Contractor as shall be considered necessary, until disposition of any such suit, claims or actions for damages or until the District, Architect and Construction Manager have received written agreement from the Contractor that they will unconditionally defend the District, Architect and Construction Manager, their officers, agents and employees, and pay any damages due by reason of settlement or judgment.

14.2.5. The defense and indemnification obligations hereunder shall survive the completion of Work, including the warranty/guarantee period, and/or the termination of the Agreement.

15. TIME

15.1. Notice to Proceed

15.1.1. District may issue a Notice to Proceed within three (3) months from the date of the Notice of Award. Once Contractor has received the Notice to Proceed, Contractor shall complete the Work within the period of time indicated in the Contract Documents.

15.1.2. In the event that the District desires to postpone issuing the Notice to Proceed beyond this 3-month period, it is expressly understood that with reasonable notice to the Contractor, the District may postpone issuing the Notice to Proceed. It is further expressly understood by Contractor that Contractor shall not be entitled to any claim of additional compensation as a result of the postponement of the issuance of the Notice to Proceed.

15.1.3. If the Contractor believes that a postponement of issuance of the Notice to Proceed will cause a hardship to Contractor, Contractor may terminate the Contract. Contractor's termination due to a postponement shall be by written notice to District within ten (10) days after receipt by Contractor of District's notice of postponement. It is further understood by Contractor that in the event that Contractor terminates the Contract as a result of postponement by the District, the District shall only be obligated to pay Contractor for the Work that Contractor had performed at the time of notification of postponement. Should Contractor terminate the Contract as a result of a notice of postponement, District shall have the authority to award the Contract to the next lowest responsive responsible bidder.

15.2. Computation of Time / Adverse Weather

15.2.1. The Contractor will only be allowed a time extension for Adverse Weather conditions if requested by Contractor and only if all of the following conditions are met:

15.2.1.1. The weather conditions constitute Adverse Weather, as defined herein and further specified in the Special Conditions;

15.2.1.2. Contractor can verify that the Adverse Weather caused delays in excess of five hours of the indicated labor required to complete the scheduled tasks of Work on the day affected by the Adverse Weather;

15.2.1.3. The Contractor's crew is dismissed as a result of the Adverse Weather;

15.2.1.4. Said delay adversely affects the critical path in the Construction Schedule; and

15.2.1.5. The number of days of delay for the month exceeds those indicated in the Special Conditions.

15.2.2. If the aforementioned conditions are met, a day-for-day extension will only be allowed for those days in excess of those indicated in the Special Conditions.

15.2.3. The Contractor shall work seven (7) days per week, if necessary, irrespective of inclement weather, to maintain access and the Construction Schedule, and to protect the Work under construction from the effects of Adverse Weather, all at no further cost to the District.

15.2.4. The Contract Time has been determined with consideration given to the average climate weather conditions prevailing in the County in which the Project is located.

15.3. Hours of Work

15.3.1. Sufficient Forces

Contractor and Subcontractors shall continuously furnish sufficient forces to ensure the prosecution of the Work in accordance with the Construction Schedule.

15.3.2. Performance During Working Hours

Work shall be performed during regular working hours as permitted by the appropriate governmental agency except that in the event of an emergency, or when required to complete the Work in accordance with job progress, Work may be performed outside of regular working hours with the advance written consent of the District and approval of any required governmental agencies.

15.4. Progress and Completion

15.4.1. Time of the Essence

Time limits stated in the Contract Documents are of the essence to the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

15.4.2. No Commencement Without Insurance or Bonds

The Contractor shall not commence operations on the Project or elsewhere prior to the effective date of insurance and bonds. The date of commencement of the Work shall not be changed by the effective date of such insurance or bonds. If Contractor commences Work without insurance and bonds, all Work is performed at Contractor's peril and shall not be compensable until and unless Contractor secures bonds and insurance pursuant to the terms of the Contract Documents and subject to District claim for damages.

15.5. Schedule

Contractor shall provide to District, Construction Manager, and Architect a schedule in conformance with the Contract Documents and as required in the Notice to Proceed and the Contractor's Submittals and Schedules section of these General Conditions.

15.6. Expeditious Completion

The Contractor shall proceed expeditiously with adequate forces and shall achieve Completion within the Contract Time.

16. EXTENSIONS OF TIME – LIQUIDATED DAMAGES

16.1. Liquidated Damages

Contractor and District hereby agree that the exact amount of damages for failure to complete the Work within the time specified is extremely difficult or impossible to determine. If the Work is not completed within the time specified in the Contract Documents, it is understood that the District will suffer damage. It being impractical and unfeasible to determine the amount of actual damage, it is agreed the Contractor shall pay to District as fixed and liquidated damages, and not as a penalty, the amount set forth in the Agreement for each calendar day of delay in completion. Contractor and its Surety shall be liable for the amount thereof pursuant to Government Code section 53069.85.

16.2. Excusable Delay

16.2.1. Contractor shall not be charged for liquidated damages because of any delays in completion of Work which are not the fault of Contractor or its Subcontractors, including acts of God as defined in Public Contract Code section 7105, acts of enemy, epidemics, and quarantine restrictions. Contractor shall, within five (5) calendar days of beginning of any delay, notify District in writing of causes of delay including documentation and facts explaining the delay. District shall review the facts and extent of any delay and shall grant extension(s) of time for completing Work when, in its judgment, the findings of fact justify an extension. Extension(s) of time shall apply only to that portion of Work affected by delay, and shall not apply to other portions of Work not so affected. An extension of time may only be granted if Contractor has timely submitted the Construction Schedule as required herein.

16.2.2. Contractor shall notify the District pursuant to the claims provisions in these General Conditions of any anticipated delay and its cause. Following

submission of a claim, the District may determine whether the delay is to be considered avoidable or unavoidable, how long it continues, and to what extent the prosecution and completion of the Work might be delayed thereby.

16.2.3. In the event the Contractor requests an extension of Contract Time for unavoidable delay, such request shall be submitted in accordance with the provisions in the Contract Documents governing changes in Work. When requesting time, requests must be submitted with full justification and documentation. If the Contractor fails to submit justification, it waives its right to a time extension at a later date. Such justification must be based on the official Construction Schedule as updated at the time of occurrence of the delay or execution of Work related to any changes to the Scope of Work. Any claim for delay must include the following information as support, without limitation:

16.2.3.1. The duration of the activity relating to the changes in the Work and the resources (manpower, equipment, material, etc.) required to perform the activities within the stated duration.

16.2.3.2. Specific logical ties to the Contract Schedule for the proposed changes and/or delay showing the activity/activities in the Construction Schedule that are affected by the change and/or delay. (A portion of any delay of seven (7) days or more must be provided.)

16.2.3.3. A recovery schedule must be submitted within twenty (20) calendar days of written notification to the District of causes of delay.

16.3. No Additional Compensation for Delays Within Contractor's Control

16.3.1. Contractor is aware that governmental agencies, including, without limitation, the Division of the State Architect, the Department of General Services, gas companies, electrical utility companies, water districts, and other agencies may have to approve Contractor-prepared drawings or approve a proposed installation. Accordingly, Contractor shall include in its bid, time for possible review of its drawings and for reasonable delays and damages that may be caused by such agencies. Thus, Contractor is not entitled to make a claim for damages or delays arising from the review of Contractor's drawings.

16.3.2. Contractor shall only be entitled to compensation for delay when all of the following conditions are met:

16.3.2.1. The District is responsible for the delay;

16.3.2.2. The delay is unreasonable under the circumstances involved;

16.3.2.3. The delay was not within the contemplation of the District and Contractor; and

16.3.2.4. Contractor complies with the claims procedure of the Contract Documents.

16.4. Float or Slack in the Schedule

Float or slack is the amount of time between the early start date and the late start date, or the early finish date and the late finish date, of any of the activities in the schedule. Float or slack is not for the exclusive use of or benefit of either the District or the Contractor, but its use shall be determined solely by the District.

17. CHANGES IN THE WORK

17.1. No Changes Without Authorization

17.1.1. There shall be no change whatsoever in the Drawings, Specifications, or in the Work without an executed Change Order or a written Construction Change Directive authorized by the District as herein provided. District shall not be liable for the cost of any extra work or any substitutions, changes, additions, omissions, or deviations from the Drawings and Specifications unless the District's governing board has authorized the same and the cost thereof has been approved in writing by Change Order or Construction Change Directive. No extension of time for performance of the Work shall be allowed hereunder unless claim for such extension is made at the time changes in the Work are ordered, and such time duly adjusted in writing in the Change Order or Construction Change Directive. Contractor shall be responsible for any costs incurred by the District for professional services and DSA fees and/or delay to the Project Schedule, if any, for DSA to review any request for changes to the DSA approved plans and specifications for the convenience of the Contractor and/or to accommodate the Contractor's means and methods. The provisions of the Contract Documents shall apply to all such changes, additions, and omissions with the same effect as if originally embodied in the Drawings and Specifications.

17.1.2. Contractor shall perform immediately all work that has been authorized by a fully executed Change Order or Construction Change Directive. Contractor shall be fully responsible for any and all delays and/or expenses caused by Contractor's failure to expeditiously perform this Work.

17.1.3. Should any Change Order result in an increase in the Contract Price, the cost of that Change Order shall be agreed to, in writing, in advance by Contractor and District and be subject to the monetary limitations set forth in Public Contract Code section 20118.4. In the event that Contractor proceeds with any change in Work without a Change Order executed by the District or Construction Change Directive, Contractor waives any claim of additional compensation or time for that additional work.

17.1.4. Contractor understands, acknowledges, and agrees that the reason for District authorization is so that District may have an opportunity to analyze the Work and decide whether the District shall proceed with the Change Order or alter the Project so that a change in Work becomes unnecessary.

17.2. Architect Authority

The Architect will have authority to order minor changes in the Work not involving any adjustment in the Contract Price, or an extension of the Contract Time, or a change that is inconsistent with the intent of the Contract Documents. These changes shall be effected by written Change Order, Construction Change Directive, or by Architect's response(s) to RFI(s)) by Architect's Supplemental Instructions ("ASI").

17.3. Change Orders

17.3.1. A Change Order is a written instrument prepared and issued by the District and/or the Architect and signed by the District (as authorized by the District's Board of Trustees), the Contractor, the Architect, and approved by the Project Inspector (if necessary) and DSA (if necessary), stating their agreement regarding all of the following:

17.3.1.1. A description of a change in the Work;

17.3.1.2. The amount of the adjustment in the Contract Price, if any; and

17.3.1.3. The extent of the adjustment in the Contract Time, if any.

17.4. Construction Change Directives

17.4.1. A Construction Change Directive is a written order prepared and issued by the District, the Construction Manager, and/or the Architect and signed by the District and the Architect, directing a change in the Work. The District may as provided by law, by Construction Change Directive and without invalidating the Contract, order changes in the Work consisting of additions, deletions, or other revisions. The adjustment to the Contract Price or Time, if any, is subject to the provisions of this section regarding Changes in the Work. If all or a portion of the Project is being funded by funds requiring approval by the State Allocation Board (SAB), these revisions may be subject to compensation once approval of same is received and funded by the SAB, and funds are released by the Office of Public School Construction (OPSC). Any dispute as to the adjustment in the Contract Price, if any, of the Construction Change Directive or timing of payment shall be resolved pursuant to the Payment and Claims and Disputes provisions herein.

17.4.2. The District may issue a Construction Change Directive in the absence of agreement on the terms of a Change Order.

17.5. Force Account Directives

17.5.1. When work, for which a definite price has not been agreed upon in advance, is to be paid for on a force account basis, all direct costs necessarily incurred and paid by the Contractor for labor, material, and equipment used in the performance of that Work, shall be subject to the approval of the District and compensation will be determined as set forth herein.

17.5.2. The District will issue a Force Account Directive to proceed with the Work on a force account basis, and a not-to-exceed budget will be established by the District.

17.5.3. All requirements regarding direct cost for labor, labor burden, material, equipment, and markups on direct costs for overhead and profit described in this section shall apply to Force Account Directives. However, the District will only pay for actual costs verified in the field by the District or its authorized representative(s) on a daily basis.

17.5.4. The Contractor shall be responsible for all cost related to the administration of Force Account Directive. The markup for overhead and profit for Contractor modifications shall be full compensation to the Contractor to administer Force Account Directive.

17.5.5. The Contractor shall notify the District or its authorized representative(s) at least twenty-four (24) hours prior to proceeding with any of the force account work. Furthermore, the Contractor shall notify the District when it has consumed eighty percent (80%) of the budget, and shall not exceed the budget unless specifically authorized in writing by the District. The Contractor will not be compensated for force account work in the event that the Contractor fails to timely notify the District regarding the commencement of force account work, or exceeding the force account budget.

17.5.6. The Contractor shall diligently proceed with the work, and on a daily basis, submit a daily force account report on a form supplied by the District no later than 5:00 p.m. each day. The report shall contain a detailed itemization of the daily labor, material, and equipment used on the force account work only. The names of the individuals performing the force account work shall be included on the daily force account reports. The type and model of equipment shall be identified and listed. The District will review the information contained in the reports, and sign the reports no later than the next work day, and return a copy of the report to the Contractor for their records. The District will not sign, nor will the Contractor receive compensation for work the District cannot verify. The Contractor will provide a weekly force account summary indicating the status of each Force Account Directive in terms of percent complete of the not-to-exceed budget and the estimated percent complete of the work

17.5.7. In the event the Contractor and the District reach a written agreement on a set cost for the work while the work is proceeding based on a Force Account Directive, the Contractor's signed daily force account reports shall be discontinued and all previously signed reports shall be invalid.

17.6. Price Request

17.6.1. Definition of Price Request

A Price Request ("PR") is a written request prepared by the Architect requesting the Contractor to submit to the District and the Architect an estimate of the effect of a proposed change in the Work on the Contract Price and the Contract Time.

17.6.2. Scope of Price Request

A Price Request shall contain adequate information, including any necessary Drawings and Specifications, to enable Contractor to provide the cost breakdowns required herein. The Contractor shall not be entitled to any additional compensation for preparing a response to a Price Request, whether ultimately accepted or not.

17.7. Proposed Change Order

17.7.1. Definition of Proposed Change Order

A Proposed Change Order ("PCO") is a written request prepared by the Contractor requesting that the District and the Architect issue a Change Order based upon a proposed change to the Work.

17.7.2. Changes in Contract Price

A PCO shall include breakdowns pursuant to the revisions herein to validate any change in Contract Price. In no case shall Contractor or any of its Subcontractors be permitted to reserve rights for additional compensation for Change Order Work.

17.7.3. Changes in Time

A PCO shall also include any changes in time required to complete the Project. Any additional time requested shall not be the number of days to make the proposed change, but must be based upon the impact to the Construction Schedule as defined in the Contract Documents. If Contractor fails to request a time extension in a PCO, then the Contractor is thereafter precluded from requesting time and/or claiming a delay. In no case shall Contractor or any of its Subcontractors be permitted to reserve rights for additional time for Change Order Work.

17.7.4. Unknown and/or Unforeseen Conditions

If Contractor submits a PCO requesting an increase in Contract Price and/or Contract Time that is based at least partially on Contractor's assertion that Contractor has encountered unknown and/or unforeseen condition(s) on the Project, then Contractor shall base the PCO on provable information that, beyond a reasonable doubt and to the District's satisfaction, demonstrates that the unknown and/or unforeseen condition(s) were actually unknown and/or unforeseen and that the condition(s) were reasonably unknown and/or unforeseen. If not, the District shall deny the PCO and the Contractor shall complete the Project without any increase in Contract Price and/or Contract Time based on that PCO.

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17.8. Format for Proposed Change Order

17.8.1. The following format shall be used as applicable by the District and the Contractor (e.g. Change Orders, PCO's) to communicate proposed additions and deductions to the Contract, supported by attached documentation. Any spaces left blank will be deemed no change to cost or time.

	<u>WORK PERFORMED OTHER THAN BY CONTRACTOR</u>	<u>ADD</u>	<u>DEDUCT</u>
(a)	<u>Material</u> (attach itemized quantity and unit cost plus sales tax)		
(b)	<u>Add Labor</u> (attach itemized hours and rates, fully encumbered)		
(c)	<u>Add Equipment</u> (attach suppliers' invoice)		
(d)	<u>Subtotal</u>		
(e)	<u>Add overhead and profit for any and all tiers of Subcontractor</u> , the total not to exceed ten percent (10%) of Item (d)		
(f)	<u>Subtotal</u>		
(g)	<u>Add overhead and profit for Contractor</u> , not to exceed five percent (5%) of Item (f)		
(h)	<u>Subtotal</u>		
(i)	<u>Add Bond and Insurance</u> , not to exceed one and a half percent (1.5%) of Item (h)		
(j)	<u>TOTAL</u>		
(k)	<u>Time</u> (zero unless indicated)		____ Calendar Days

	<u>WORK PERFORMED BY CONTRACTOR</u>	<u>ADD</u>	<u>DEDUCT</u>
(a)	<u>Material</u> (attach itemized quantity and unit cost plus sales tax)		
(b)	<u>Add Labor</u> (attach itemized hours and rates, fully encumbered)		
(c)	<u>Add Equipment</u> (attach suppliers' invoice)		
(d)	<u>Subtotal</u>		
(e)	<u>Add overhead and profit for Contractor</u> , not to exceed fifteen percent (15%) of Item (d)		
(f)	<u>Subtotal</u>		
(g)	<u>Add Bond and Insurance</u> , not to exceed one and a half percent (1.5%) of Item (f)		
(h)	<u>TOTAL</u>		
(i)	<u>Time</u> (zero unless indicated)		____ Calendar Days

	<u>WORK PERFORMED OTHER THAN BY CONTRACTOR</u>	<u>ADD</u>	<u>DEDUCT</u>
(a)	<u>Material</u> (attach itemized quantity and unit cost		

	plus sales tax)		
(b)	Add Labor (attach itemized hours and rates, fully encumbered)		
(c)	Add Equipment (attach suppliers' invoice)		
(d)	Subtotal		
(e)	Add overhead and profit for any and all tiers of Subcontractor , the total not to exceed ten percent (10%) of Item (d)		
(f)	Subtotal		
(g)	Add overhead and profit for Contractor , not to exceed five percent (5%) of Item (f)		
(h)	Subtotal		
(i)	Add Bond and Insurance , not to exceed one and a half percent (1.5%) of Item (h)		
(j)	TOTAL		
(k)	Time (zero unless indicated)		_____ Calendar Days

	WORK PERFORMED BY CONTRACTOR	ADD	DEDUCT
(a)	Material (attach itemized quantity and unit cost plus sales tax)		
(b)	Add Labor (attach itemized hours and rates, fully encumbered)		
(c)	Add Equipment (attach suppliers' invoice)		
(d)	Subtotal		
(e)	Add overhead and profit for Contractor , not to exceed fifteen percent (15%) of Item (d)		
(f)	Subtotal		
(g)	Add Bond and Insurance , not to exceed one and a half percent (1.5%) of Item (f)		
(h)	TOTAL		
(i)	Time (zero unless indicated)		_____ Calendar Days

17.8.2. Labor. Contractor shall be compensated for the costs of labor actually and directly utilized in the performance of the Work. Such labor costs shall be limited to field labor for which there is a prevailing wage rate classification. Wage rates for labor shall not exceed the prevailing wage rates in the locality of the Site and shall be in the labor classification(s) necessary for the performance of the Work. Labor costs shall exclude costs incurred by the Contractor in preparing estimate(s) of the costs of the change in the Work, in the maintenance of records relating to the costs of the change in the Work, coordination and assembly of materials and information relating to the change in the Work or performance thereof, or the supervision and other overhead and general conditions costs associated with the change in the Work or performance thereof, including but not limited to the cost for the job superintendent.

17.8.3. Materials. Contractor shall be compensated for the costs of materials necessarily and actually used or consumed in connection with the performance of the change in the Work. Costs of materials may include reasonable costs of transportation from a source closest to the Site of the Work and delivery to the Site. If discounts by material suppliers are available for materials necessarily used in the performance of the change in the Work, they shall be credited to the District. If materials necessarily used in the performance of the change in the Work are obtained from a supplier or source owned in whole or in part by the Contractor, compensation therefor shall not exceed the current wholesale price for such materials. If, in the reasonable opinion of the District, the costs asserted by the Contractor for materials in connection with any change in the Work are excessive, or if the Contractor fails to provide satisfactory evidence of the actual costs of such materials from its supplier or vendor of the same, the costs of such materials and the District's obligation to pay for the same shall be limited to the then lowest wholesale price at which similar materials are available in the quantities required to perform the change in the Work. The District may elect to furnish materials for the change in the Work, in which event the Contractor shall not be compensated for the costs of furnishing such materials or any mark-up thereon.

17.8.4. Equipment. As a precondition for the District's duty to pay for Equipment rental or loading and transportation, Contractor shall provide satisfactory evidence of the actual costs of Equipment from the supplier, vendor or rental agency of same. Contractor shall be compensated for the actual cost of the necessary and direct use of Equipment in the performance of the change in the Work. Use of such Equipment in the performance of the change in the Work shall be compensated in increments of fifteen (15) minutes. Rental time for Equipment moved by its own power shall include time required to move such Equipment to the site of the Work from the nearest available rental source of the same. If Equipment is not moved to the Site by its own power, Contractor will be compensated for the loading and transportation costs in lieu of rental time. The foregoing notwithstanding, neither moving time or loading and transportation time shall be allowed if the Equipment is used for performance of any portion of the Work other than the change in the Work. Unless prior approval in writing is obtained by the Contractor from the Architect, the Project Inspector and the District, no costs or compensation shall be allowed for time while Construction Equipment is inoperative, idle or on standby, for any reason. Contractor shall not be entitled to an allowance or any other compensation for Equipment or tools used in the performance of change in the Work where such Equipment or tools have a replacement value of **\$500.00** or less. Equipment costs claimed by the Contractor in connection with the performance of any Work shall not exceed rental rates established by distributors or construction equipment rental agencies in the locality of the Site; any costs asserted which exceed such rental rates shall not be allowed or paid. Unless otherwise specifically approved in writing by the Architect, the Project Inspector and the District, the allowable rate for the use of Equipment in connection with the Work shall constitute full compensation to the Contractor for the cost of rental, fuel, power, oil, lubrication, supplies, necessary attachments, repairs or maintenance of any kind, depreciation, storage, insurance, labor (exclusive of labor costs of the Equipment operator), and any and all other costs incurred by the Contractor incidental to the use of such Equipment.

17.9. Change Order Certification

17.9.1. All Change Orders and PCOs must include the following certification by the Contractor:

17.9.1.1. The undersigned Contractor approves the foregoing as to the changes, if any, and the Contract Price specified for each item and as to the extension of time allowed, if any, for completion of the entire Work as stated herein, and agrees to furnish all labor, materials, and service, and perform all work necessary to complete any additional work specified for the consideration stated herein. Submission of sums which have no basis in fact or which Contractor knows are false are at the sole risk of Contractor and may be a violation of the False Claims Act set forth under Government Code section 12650 et seq. It is understood that the changes herein to the Contract shall only be effective when approved by the governing board of the District.

17.9.1.2. It is expressly understood that the value of the extra Work or changes expressly includes any and all of the Contractor's costs and expenses, direct and indirect, resulting from additional time required on the Project or resulting from delay to the Project. Any costs, expenses, damages, or time extensions not included are deemed waived.

17.10. Determination of Change Order Cost

17.10.1. The amount of the increase or decrease in the Contract Price from a Change Order, if any, shall be determined in one or more of the following ways as applicable to a specific situation and at the District's discretion:

17.10.1.1. District acceptance of a PCO;

17.10.1.2. By unit prices contained in Contractor's original bid;

17.10.1.3. By agreement between District and Contractor.

17.11. Deductive Change Orders

All deductive Change Order(s) must be prepared pursuant to the provisions herein. Where a portion of the Work is deleted from the Contract, the reasonable value of the deducted work less the value of work performed shall be considered the appropriate deduction. The value submitted on the Schedule of Values shall be used to calculate the credit amount unless the bid documentation is being held in escrow as part of the Contract Documents. If Contractor offers a proposed amount for a deductive Change Order(s), Contractor shall include a minimum of five percent (5%) total profit and overhead to be deducted with the amount of the work of the Change Order(s). If Subcontractor work is involved, Subcontractors shall also include a minimum of five percent (5%) profit and overhead to be deducted with the amount of its deducted work. Any deviation from this provision shall not be allowed.

17.12. Addition or Deletion of Alternate Bid Item(s)

If the Bid Form and Proposal includes proposal(s) for Alternate Bid Item(s), during Contractor's performance of the Work, the District may elect to add or delete any such Alternate Bid Item(s) if not included in the Contract at the time of award. If the District elects to add or delete Alternate Bid Item(s) after Contract award, the cost or credit for such Alternate Bid Item(s) shall be as set forth in the Bid Form and Proposal unless the parties agree to a different price and the Contract Time shall be adjusted by the number of days allocated in the Contract Documents. If days are not allocated in the Contract Documents, the Contract Time shall be equitably adjusted.

17.13. Discounts, Rebates, and Refunds

For purposes of determining the cost, if any, of any change, addition, or omission to the Work hereunder, all trade discounts, rebates, refunds, and all returns from the sale of surplus materials and equipment shall accrue and be credited to the Contractor, and the Contractor shall make provisions so that such discounts, rebates, refunds, and returns may be secured, and the amount thereof shall be allowed as a reduction of the Contractor's cost in determining the actual cost of construction for purposes of any change, addition, or omission in the Work as provided herein.

17.14. Accounting Records

With respect to portions of the Work performed by Change Orders and Construction Change Directives, the Contractor shall keep and maintain cost-accounting records satisfactory to the District, which shall be available to the District on the same terms as any other books and records the Contractor is required to maintain under the Contract Documents. Such records shall include without limitation hourly records for Labor and Equipment and itemized records of materials and Equipment used that day in connection with the performance of any Work. All records maintained hereunder shall be subject to inspection, review and/or reproduction by the District, the Architect or the Project Inspector upon request. In the event that the Contractor fails or refuses, for any reason, to maintain or make available for inspection, review and/or reproduction such records, the District's reasonable good faith determination of the extent of adjustment to the Contract Price shall be final, conclusive, dispositive and binding upon Contractor.

17.15. Notice Required

If the Contractor desires to make a claim for an increase in the Contract Price, or any extension in the Contract Time for completion, it shall notify the District pursuant to the provisions herein, including the Article on Claims and Disputes. No claim shall be considered unless made in accordance with this subparagraph. Contractor shall proceed to execute the Work even though the adjustment may not have been agreed upon. Any change in the Contract Price or extension of the Contract Time resulting from such claim shall be authorized by a Change Order.

17.16. Applicability to Subcontractors

Any requirements under this Article shall be equally applicable to Change Orders or Construction Change Directives issued to Subcontractors by the Contractor to the extent as required by the Contract Documents.

17.17. Alteration to Change Order Language

Contractor shall not alter Change Orders or reserve time in Change Orders. Contractor shall execute finalized Change Orders and proceed under the provisions herein with proper notice.

17.18. Failure of Contractor to Execute Change Order

Contractor shall be in default of the Contract if Contractor fails to execute a Change Order when the Contractor agrees with the addition and/or deletion of the Work in that Change Order.

18. REQUEST FOR INFORMATION

18.1. Any Request for Information shall reference all applicable Contract Document(s), including Specification section(s), detail(s), page number(s), drawing number(s), and sheet number(s), etc. The Contractor shall make suggestions and interpretations of the issue raised by each Request for Information. A Request for Information cannot modify the Contract Price, Contract Time, or the Contract Documents. Upon request by the District, Contractor shall provide an electronic copy of the Request for Information in addition to the hard copy.

18.2. The Contractor shall be responsible for any costs incurred for professional services that District may deduct from any amounts owing to the Contractor, if a Request for Information requests an interpretation or decision of a matter where the information sought is equally available to the party making the request. District, at its sole discretion, shall deduct from and/or invoice Contractor for all the professional services arising herein.

19. PAYMENTS

19.1. Contract Price

The Contract Price is stated in the Agreement and, including authorized adjustments, is the total amount payable by the District to the Contractor for performance of the Work under the Contract Documents.

19.2. Applications for Progress Payments

19.2.1. Procedure for Applications for Progress Payments

19.2.1.1. Application for Progress Payment

19.2.1.1.1. Not before the fifth (5th) day of each calendar month during the progress of the Work, Contractor shall submit to the District and the Architect an itemized Application for Payment for operations completed in accordance with the Schedule of Values. Such application shall be notarized, if required, and supported by the following or each portion thereof unless waived by the District in writing:

- 19.2.1.1.1.1.** The amount paid to the date of the Application to the Contractor, to all its Subcontractors, and all others furnishing labor, material, or equipment for its Contract;
- 19.2.1.1.1.2.** The amount being requested under the Application for Payment by the Contractor on its own behalf and separately stating the amount requested on behalf of each of the Subcontractors and all others furnishing labor, material, and equipment under the Contract;
- 19.2.1.1.1.3.** The balance that will be due to each of such entities after said payment is made;
- 19.2.1.1.1.4.** A certification that the As-Built Drawings and annotated Specifications are current;
- 19.2.1.1.1.5.** Itemized breakdown of work done for the purpose of requesting partial payment;
- 19.2.1.1.1.6.** An updated and acceptable construction schedule in conformance with the provisions herein;
- 19.2.1.1.1.7.** The additions to and subtractions from the Contract Price and Contract Time;
- 19.2.1.1.1.8.** A total of the retentions held;
- 19.2.1.1.1.9.** Material invoices, evidence of equipment purchases, rentals, and other support and details of cost as the District may require from time to time;
- 19.2.1.1.1.10.** The percentage of completion of the Contractor's Work by line item;
- 19.2.1.1.1.11.** Schedule of Values updated from the preceding Application for Payment;
- 19.2.1.1.1.12.** A duly completed and executed conditional waiver and release upon progress payment compliant with Civil Code section 8132 from the Contractor and each subcontractor of any tier and supplier to be paid from the current progress payment;
- 19.2.1.1.1.13.** A duly completed and executed unconditional waiver and release upon progress payment compliant with Civil Code section 8134 from the Contractor and each subcontractor of any tier and supplier that was paid from the previous progress payment(s); and
- 19.2.1.1.1.14.** A certification by the Contractor of the following:

The Contractor warrants title to all Work performed as of the date of this payment application has been completed in accordance with the Contract Documents for the Project. The Contractor further warrants

that all amounts have been paid for work which previous Certificates for Payment were issued and payments received and all Work performed as of the date of this payment application is free and clear of liens, claims, security interests, or encumbrances in favor of the Contractor, Subcontractors, material and equipment suppliers, workers, or other persons or entities making a claim by reason of having provided labor, materials, and equipment relating to the Work, except those of which the District has been informed.

19.2.1.1.1.15. The Contractor shall be subject to the False Claims Act set forth in Government Code section 12650 et seq. for information provided with any Application for Progress Payment.

19.2.1.1.1.16. All remaining certified payroll records ("CPR(s)") for each journeyman, apprentice, worker, or other employee employed by the Contractor and/or each Subcontractor in connection with the Work for the period of the Application for Payment. As indicated herein, the District shall not make any payment to Contractor until:

19.2.1.1.1.16.1 Contractor and/or its Subcontractor(s) provide electronic CPRs weekly for all weeks any journeyman, apprentice, worker or other employee was employed in connection with the Work directly to the DIR, or within ten (10) days of any request by the District or the DIR, and

19.2.1.1.1.16.2 Any delay in Contractor and/or its Subcontractor(s) providing CPRs in a timely manner may directly delay the Contractor's payment.

19.2.2. Prerequisites for Progress Payments

19.2.2.1. First Payment Request: The following items, if applicable, must be completed before the District will accept and/or process the Contractor's first payment request:

19.2.2.1.1. Installation of the Project sign;

19.2.2.1.2. Installation of field office;

19.2.2.1.3. Installation of temporary facilities and fencing;

19.2.2.1.4. Schedule of Values;

19.2.2.1.5. Contractor's Construction Schedule;

19.2.2.1.6. Schedule of unit prices, if applicable;

19.2.2.1.7. Submittal Schedule;

19.2.2.1.8. Receipt by Architect of all submittals due as of the date of the payment application;

19.2.2.1.9. Copies of necessary permits;

19.2.2.1.10. Copies of authorizations and licenses from governing authorities;

19.2.2.1.11. Initial progress report;

19.2.2.1.12. Surveyor qualifications;

19.2.2.1.13. Written acceptance of District's survey of rough grading, if applicable;

19.2.2.1.14. List of all Subcontractors, with names, license numbers, telephone numbers, and Scope of Work;

19.2.2.1.15. All bonds and insurance endorsements; and

19.2.2.1.16. Resumes of Contractor's project manager, and if applicable, job site secretary, record documents recorder, and job site superintendent.

19.2.2.2. Second Payment Request The District will not process the second payment request until and unless all submittals and Shop Drawings have been accepted for review by the Architect.

19.2.2.3. No Waiver of Criteria Any payments made to Contractor where criteria set forth herein have not been met shall not constitute a waiver of said criteria by District. Instead, such payment shall be construed as a good faith effort by District to resolve differences so Contractor may pay its Subcontractors and suppliers. Contractor agrees that failure to submit such items may constitute a breach of contract by Contractor and may subject Contractor to termination.

19.3. Progress Payments

19.3.1. District's Approval of Application for Payment

19.3.1.1. Upon receipt of a Application for Payment, The District shall act in accordance with both of the following:

19.3.1.1.1. Each Application for Payment shall be reviewed by the District as soon as practicable after receipt for the purpose of determining that the Application for Payment is a proper Application for Payment.

19.3.1.1.2. Any Application for Payment determined not to be a proper Application for Payment suitable for payment shall be returned to the Contractor as soon as practicable, but not later than seven (7) days, after receipt. An Application for Payment returned pursuant to this paragraph shall be accompanied by a document setting forth in writing the reasons why the Application for Payment is not proper. The number of days available to the District to make a payment without incurring interest pursuant to this section

shall be reduced by the number of days by which the District exceeds this seven-day return requirement.

19.3.1.1.3. An Application for Payment shall be considered properly executed if funds are available for payment of the Application for Payment, and payment is not delayed due to an audit inquiry by the financial officer of the District.

19.3.1.2. The District's review of the Contractor's Application for Payment will be based on the District's and the Architect's observations at the Site and the data comprising the Application for Payment that the Work has progressed to the point indicated and that, to the best of the District's and the Architect's knowledge, information, and belief, the quality of the Work is in accordance with the Contract Documents. The foregoing representations are subject to:

19.3.1.2.1. Observation of the Work for general conformance with the Contract Documents,

19.3.1.2.2. Results of subsequent tests and inspections,

19.3.1.2.3. Minor deviations from the Contract Documents correctable prior to completion, and

19.3.1.2.4. Specific qualifications expressed by the Architect.

19.3.1.3. District's approval of the certified Application for Payment shall be based on Contractor complying with all requirements for a fully complete and valid certified Application for Payment.

19.3.2. Payments to Contractor

19.3.2.1. Within thirty (30) days after approval of the Application for Payment, Contractor shall be paid a sum equal to ninety-five percent (95%) of the value of the Work performed (as verified by Architect and Inspector and certified by Contractor) up to the last day of the previous month, less the aggregate of previous payments and amount to be withheld. The value of the Work completed shall be Contractor's best estimate. No inaccuracy or error in said estimate shall operate to release the Contractor, or any Surety upon any bond, from damages arising from such Work, or from the District's right to enforce each and every provision of this Contract, and the District shall have the right subsequently to correct any error made in any estimate for payment.

19.3.2.2. The Contractor shall not be entitled to have any payment requests processed, or be entitled to have any payment made for Work performed, so long as any lawful or proper direction given by the District concerning the Work, or any portion thereof, remains incomplete.

19.3.2.3. If the District fails to make any progress payment within thirty (30) days after receipt of an undisputed and properly submitted Application for Payment from the Contractor, the District shall pay interest to the Contractor

equivalent to the legal rate set forth in subdivision (a) of Section 685.010 of the Code of Civil Procedure.

19.3.3. No Waiver

No payment by District hereunder shall be interpreted so as to imply that District has inspected, approved, or accepted any part of the Work. Notwithstanding any payment, the District may enforce each and every provision of this Contract. The District may correct or require correction of any error subsequent to any payment.

19.4. Decisions to Withhold Payment

19.4.1. Reasons to Withhold Payment

The District may withhold payment in whole, or in part, to the extent reasonably necessary to protect the District if, in the District's opinion, the representations to the District required herein cannot be made. The District may withhold payment, in whole, or in part, to such extent as may be necessary to protect the District from loss because of, but not limited to:

19.4.1.1. Defective Work not remedied within **FORTY-EIGHT (48)** hours of written notice to Contractor.

19.4.1.2. Stop Payment Notices or other liens served upon the District as a result of the Contract. Contractor agrees that the District may withhold up to 125% of the amount claimed in the Stop Payment Notice to answer the claim and to provide for the District's reasonable cost of any litigation pursuant to the stop payment notice.

19.4.1.3. Liquidated damages assessed against the Contractor.

19.4.1.4. The cost of completion of the Contract if there exists reasonable doubt that the Work can be completed for the unpaid balance of the Contract Price or by the completion date.

19.4.1.5. Damage to the District or other contractor(s).

19.4.1.6. Unsatisfactory prosecution of the Work by the Contractor.

19.4.1.7. Failure to store and properly secure materials.

19.4.1.8. Failure of the Contractor to submit, on a timely basis, proper, sufficient, and acceptable documentation required by the Contract Documents, including, without limitation, a Construction Schedule, Schedule of Submittals, Schedule of Values, Monthly Progress Schedules, Shop Drawings, Product Data and samples, Proposed product lists, executed Change Orders, and/or verified reports.

19.4.1.9. Failure of the Contractor to maintain As-Built Drawings.

19.4.1.10. Erroneous estimates by the Contractor of the value of the Work performed, or other false statements in an Application for Payment.

19.4.1.11. Unauthorized deviations from the Contract Documents.

19.4.1.12. Failure of the Contractor to prosecute the Work in a timely manner in compliance with the Construction Schedule, established progress schedules, and/or completion dates.

19.4.1.13. Failure to provide acceptable electronic certified payroll records, as required by the Labor Code, by these Contract Documents, or by written request; for each journeyman, apprentice, worker, or other employee employed by the Contractor and/or by each Subcontractor in connection with the Work for the period of the Application for Payment or if payroll records are delinquent or inadequate.

19.4.1.14. Failure to properly pay prevailing wages as required in Labor Code section 1720 et seq., failure to comply with any other Labor Code requirements, and/or failure to comply with labor compliance monitoring and enforcement by the DIR.

19.4.1.15. Failure to properly pay prevailing wages as required in Labor Code section 1720 et seq., failure to comply with any other Labor Code requirements, and/or failure to comply with State labor compliance monitoring and enforcement, if applicable.

19.4.1.16. Failure to comply with any applicable federal statutes and regulations regarding minimum wages, withholding, payrolls and basic records, apprentice and trainee employment requirements, equal employment opportunity requirements, Copeland Act requirements, Davis-Bacon Act and related requirements, Contract Work Hours and Safety Standards Act requirements, if applicable.

19.4.1.17. Failure to properly maintain or clean up the Site.

19.4.1.18. Failure to timely indemnify, defend, or hold harmless the District.

19.4.1.19. Any payments due to the District, including but not limited to payments for failed tests, utilities changes, or permits.

19.4.1.20. Failure to pay Subcontractor(s) or supplier(s) as required by law and by the Contract Documents.

19.4.1.21. Failure to pay any royalty, license or similar fees.

19.4.1.22. Contractor is otherwise in breach, default, or in substantial violation of any provision of this Contract.

19.4.1.23. Failure to perform any implementation and/or monitoring required by any SWPPP for the Project and/or the imposition of any penalties or fines therefore whether imposed on the District or Contractor.

19.4.2. Reallocation of Withheld Amounts

19.4.2.1. District may, in its discretion, apply any withheld amount to pay outstanding claims or obligations as defined herein. In so doing, District shall make such payments on behalf of Contractor. If any payment is so made by District, then that amount shall be considered a payment made under Contract by District to Contractor and District shall not be liable to Contractor for any payment made in good faith. These payments may be made without prior judicial determination of claim or obligation. District will render Contractor an accounting of funds disbursed on behalf of Contractor.

19.4.2.2. If Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents or fails to perform any provision thereof, District may, after **FORTY-EIGHT (48)** hours written notice to the Contractor and, without prejudice to any other remedy, make good such deficiencies. The District shall adjust the total Contract Price by reducing the amount thereof by the cost of making good such deficiencies. If District deems it inexpedient to correct Work that is damaged, defective, or not done in accordance with Contract provisions, an equitable reduction in the Contract Price (of at least one hundred fifty percent (150%) of the estimated reasonable value of the nonconforming Work) shall be made therefor.

19.4.3. Payment After Cure

When Contractor removes the grounds for declining approval, payment shall be made for amounts withheld because of them. No interest shall be paid on any retainage or amounts withheld due to the failure of the Contractor to perform in accordance with the terms and conditions of the Contract Documents.

19.5. Subcontractor Payments

19.5.1. Payments to Subcontractors

No later than seven (7) days after receipt, or pursuant to Business and Professions Code section 7108.5 and Public Contract Code section 7107, the Contractor shall pay to each Subcontractor, out of the amount paid to the Contractor on account of such Subcontractor's portion of the Work, the amount to which said Subcontractor is entitled. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to its Sub-subcontractors in a similar manner.

19.5.2. No Obligation of District for Subcontractor Payment

The District shall have no obligation to pay, or to see to the payment of, money to a Subcontractor except as may otherwise be required by law.

19.5.3. Joint Checks

District shall have the right in its sole discretion, if necessary for the protection of the District, to issue joint checks made payable to the Contractor and Subcontractors and/or material or equipment suppliers. The joint check payees shall be responsible for the allocation and disbursement of funds included as part of any such joint payment. In no event shall any joint check payment be construed to create any contract between the District and a Subcontractor of any tier, or a material or equipment supplier, any obligation from the District to such Subcontractor or a material or equipment supplier, or rights in such Subcontractor or a material or equipment supplier against the District.

20. COMPLETION OF THE WORK

20.1. Completion

20.1.1. District will accept completion of Contract and have the Notice of Completion recorded when the entire Work shall have been completed to the satisfaction of District.

20.1.2. The Work may only be accepted as complete by action of the governing board of the District.

20.1.3. District, at its sole option, may accept completion of Contract and have the Notice of Completion recorded when the entire Work shall have been completed to the satisfaction of District, except for minor corrective items, as distinguished from incomplete items. If Contractor fails to complete all minor corrective items within fifteen (15) days after the date of the District's acceptance of completion, District shall withhold from the final payment one hundred fifty percent (150%) of an estimate of the amount sufficient to complete the corrective items, as determined by District, until the item(s) are completed.

20.1.4. At the end of the 15-day period, if there are any items remaining to be corrected, District may elect to proceed as provided herein related to adjustments to Contract Price, and/or District's right to perform the Work of the Contractor.

20.2. Close-Out/Certification Procedures

20.2.1. Punch List

The Contractor shall notify the Architect when Contractor considers the Work complete. Upon notification, Architect will prepare a list of minor items to be completed or corrected ("Punch List"). The Contractor and/or its Subcontractors shall proceed promptly to complete and correct items on the Punch List. Failure to include an item on Punch List does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

20.2.2. Close-Out/Certification Requirements

20.2.2.1. Utility Connections

Buildings shall be connected to water, gas, sewer, and electric services, complete and ready for use. Service connections shall be made and existing services reconnected.

20.2.2.2. Record Drawings

20.2.2.2.1. Contractor shall provide exact Record Drawings of the Work upon completion of the Project as indicated in the Specifications.

20.2.2.2.2. Contractor is liable and responsible for any and all inaccuracies in the Record Drawings, even if inaccuracies become evident at a future date.

20.2.2.2.3. Upon completion of the Work and as a condition precedent to approval of final payment, Contractor shall obtain the Inspector's approval of the corrected prints and employ a competent draftsman to transfer the Record Drawings information to the most current version of Autocad that is, at that time, currently utilized for plan check submission by either the District, the Architect, OPSC, and/or DSA, and print a complete set of transparent sepias. When completed, Contractor shall deliver corrected sepias and diskette/CD/other data storage device acceptable to District with Autocad file to the District.

20.2.2.3. Maintenance Manuals: Contractor shall prepare all operation and maintenance manuals and date as indicated in the Specifications.

20.2.2.4. Source Programming: Contractor shall provide all source programming for all items in the Project.

20.2.2.5. Verified Reports: Contractor shall completely and accurately fill out and file forms DSA 6-C or DSA 152 (or current form), as appropriate. Refer to section 4-336 and section 4-343 of Part 1, Title 24 of the California Code of Regulations.

20.3. Final Inspection

20.3.1. Contractor shall comply with Punch List procedures as provided herein, and maintain the presence of a Project Superintendent and Project Manager until the Punch List is complete to ensure proper and timely completion of the Punch List. Under no circumstances shall Contractor demobilize its forces prior to completion of the Punch List. Upon receipt of Contractor's written notice that all of the Punch List items have been fully completed and the Work is ready for final inspection and acceptance, Architect and Project Inspector will inspect the Work and shall submit to Contractor and District a final inspection report noting the Work, if any, required in order to complete in accordance with the Contract Documents. Absent unusual circumstances, this report shall consist of the Punch List items not yet satisfactorily completed.

20.3.2. Upon Contractor's completion of all items on the Punch List and any other uncompleted portions of the Work, the Contractor shall notify the District and Architect, who shall again inspect such Work. If the Architect finds the Work complete and acceptable under the Contract Documents, the Architect will notify

Contractor, who shall then jointly submit to the Architect and the District its final Application for Payment.

20.3.3. Final Inspection Requirements

20.3.3.1. Before calling for final inspection, Contractor shall determine that the following have been performed:

- 20.3.3.1.1.** The Work has been completed.
- 20.3.3.1.2.** All life safety items are completed and in working order.
- 20.3.3.1.3.** Mechanical and electrical Work are complete and tested, fixtures are in place, connected, and ready for tryout.
- 20.3.3.1.4.** Electrical circuits scheduled in panels and disconnect switches labeled.
- 20.3.3.1.5.** Painting and special finishes complete.
- 20.3.3.1.6.** Doors complete with hardware, cleaned of protective film, relieved of sticking or binding, and in working order.
- 20.3.3.1.7.** Tops and bottoms of doors sealed.
- 20.3.3.1.8.** Floors waxed and polished as specified.
- 20.3.3.1.9.** Broken glass replaced and glass cleaned.
- 20.3.3.1.10.** Grounds cleared of Contractor's equipment, raked clean of debris, and trash removed from Site.
- 20.3.3.1.11.** Work cleaned, free of stains, scratches, and other foreign matter, of damaged and broken material replaced.
- 20.3.3.1.12.** Finished and decorative work shall have marks, dirt, and superfluous labels removed.
- 20.3.3.1.13.** Final cleanup, as provided herein.

20.4. Costs of Multiple Inspections

More than two (2) requests of the District to make a final inspection shall be considered an additional service of District, Architect, Construction Manager, and/or Project Inspector, and all subsequent costs will be invoiced to Contractor and if funds are available, withheld from remaining payments.

20.5. Partial Occupancy or Use Prior to Completion

20.5.1. District's Rights to Occupancy

The District may occupy or use any completed or partially completed portion of the Work at any stage, and such occupancy shall not constitute the District's Final Acceptance of any part of the Work. Neither the District's Final Acceptance, the making of Final Payment, any provision in Contract Documents, nor the use or occupancy of the Work, in whole or in part, by District shall constitute acceptance of Work not in accordance with the Contract Documents nor relieve the Contractor or the Contractor's Performance Bond Surety from liability with respect to any warranties or responsibility for faulty or defective Work or materials, equipment and workmanship incorporated therein. In the event that the District occupies or uses any completed or partially completed portion of the Work, the Contractor shall remain responsible for payments, security, maintenance, heat, utilities, damage to the Work, insurance, the period for correction of the Work, and the commencement of warranties required by the Contract Documents unless the Contractor requests in writing, and the District agrees, to otherwise divide those responsibilities. Any dispute as to responsibilities shall be resolved pursuant to the Claims and Disputes provisions herein, with the added provision that during the dispute process, the District shall have the right to occupy or use any portion of the Work that it needs or desires to use.

20.5.2. Inspection Prior to Occupancy or Use

Immediately prior to partial occupancy or use, the District, the Contractor, and the Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

20.5.3. No Waiver

Unless otherwise agreed upon, partial or entire occupancy or use of a portion or portions of the Work shall not constitute beneficial occupancy or acceptance of the Work not complying with the requirements of the Contract Documents.

21. FINAL PAYMENT AND RETENTION

21.1. Final Payment

Upon receipt and approval of a valid and final Application for Payment, the Architect will issue a final Certificate of Payment. The District shall thereupon jointly inspect the Work and either accept the Work as complete or notify the Architect and the Contractor in writing of reasons why the Work is not complete. Upon acceptance of the Work of the Contractor as fully complete by the Governing Board of the District (that, absent unusual circumstances, will occur when the Punch List items have been satisfactorily completed), the District shall record a Notice of Completion with the County Recorder, and the Contractor shall, upon receipt of final payment from the District, pay the amount due Subcontractors.

21.2. Prerequisites for Final Payment The following conditions must be fulfilled prior to Final Payment:

21.2.1. A full release of all Stop Payment Notices served in connection with the Work shall be submitted by Contractor.

21.2.2. A duly completed and executed conditional waiver and release upon final payment compliant with Civil Code section 8136, from the Contractor and each subcontractor of any tier and supplier to be paid from the final payment.

21.2.3. A duly completed and executed unconditional waiver and release upon progress payment compliant with Civil Code section 8134, from the Contractor and each subcontractor of any tier and supplier that was paid from the previous progress payments.

21.2.4. A duly completed and executed Document 00880, "AGREEMENT AND RELEASE OF ANY AND ALL CLAIMS" from the Contractor.

21.2.5. The Contractor shall have made all corrections to the Work that are required to remedy any defects therein, to obtain compliance with the Contract Documents or any requirements of applicable codes and ordinances, or to fulfill any of the orders or directions of District required under the Contract Documents.

21.2.6. Each Subcontractor shall have delivered to the Contractor all written guarantees, warranties, applications, and bonds required by the Contract Documents for its portion of the Work.

21.2.7. Contractor must have completed all requirements set forth under "Close-Out/Certification Procedures," including, without limitation, submission of an approved set of complete Record Drawings.

21.2.8. Architect shall have issued its written approval that final payment can be made.

21.2.9. The Contractor shall have delivered to the District all manuals and materials required by the Contract Documents.

21.2.10. The Contractor shall have completed final clean-up as provided herein.

21.3. Retention

21.3.1. The retention, less any amounts disputed by the District or that the District has the right to withhold pursuant to provisions herein, shall be paid:

21.3.1.1. After approval of the District by the Architect's Certificate of Payment,

21.3.1.2. After the satisfaction of the conditions set forth herein, and

21.3.1.3. After forty-five (45) days after the recording of the Notice of Completion by District.

21.3.2. No interest shall be paid on any retention, or on any amounts withheld due to a failure of the Contractor to perform, in accordance with the terms and conditions of the Contract Documents, except as provided to the contrary in any Escrow Agreement between the District and the Contractor pursuant to Public Contract Code section 22300.

21.4. Substitution of Securities The District will permit the substitution of securities in accordance with the provisions of Public Contract Code section 22300.

22. UNCOVERING OF WORK

If a portion of the Work is covered without Inspector or Architect approval or not in compliance with the Contract Documents, it must, if required in writing by the District, the Project Inspector, or the Architect, be uncovered for the Project Inspector's or the Architect's observation and be replaced at the Contractor's expense without change in the Contract Price or Contract Time.

23. NONCONFORMING WORK AND CORRECTION OF WORK

23.1. Nonconforming Work

23.1.1. Contractor shall promptly remove from Premises all Work identified by District as failing to conform to the Contract Documents whether incorporated or not. Contractor shall promptly replace and re-execute its own Work to comply with the Contract Documents without additional expense to the District and shall bear the expense of making good all work of other contractors destroyed or damaged by any removal or replacement pursuant hereto and/or any delays to the District or other Contractors caused thereby.

23.1.2. If Contractor does not remove Work that District has identified as failing to conform to the Contract Documents within a reasonable time, not to exceed **FORTY-EIGHT (48)** hours, District may remove it and may store any material at Contractor's expense. If Contractor does not pay expense(s) of that removal within ten (10) days' time thereafter, District may, upon ten (10) days' written notice, sell any material at auction or at private sale and shall deduct all costs and expenses incurred by the District and/or District may withhold those amounts from payment(s) to Contractor.

23.2. Correction of Work

23.2.1. Correction of Rejected Work

Pursuant to the notice provisions herein, the Contractor shall immediately correct the Work rejected by the District, the Architect, or the Project Inspector as failing to conform to the requirements of the Contract Documents, whether observed before or after Completion and whether or not fabricated, installed, or completed. The Contractor shall bear costs of correcting the rejected Work, including delay costs, additional testing, inspections, and compensation for the Inspector's or the Architect's services and expenses made necessary thereby.

23.2.2. One-Year Warranty Corrections

If, within one (1) year after the date of Completion of the Work or a designated portion thereof, or after the date for commencement of warranties established hereunder, or by the terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the District to do so. This period of one (1) year shall be extended with respect to portions of the Work first performed after Completion by the period of time between Completion and the actual performance of the Work. This obligation hereunder shall survive acceptance of the Work under the Contract and termination of the Contract. The District shall give such notice promptly after discovery of the condition.

23.3. District's Right to Perform Work

23.3.1. If the Contractor should neglect to prosecute the Work properly or fail to perform any provisions of this contract, the District, after **FORTY-EIGHT (48)** hours written notice to the Contractor, may, without prejudice to any other remedy it may have, make good such deficiencies and may deduct the cost thereof from the payment then or thereafter due the Contractor.

23.3.2. If it is found at any time, before or after completion of the Work, that Contractor has varied from the Drawings and/or Specifications, including, but not limited to, variation in material, quality, form, or finish, or in the amount or value of the materials and labor used, District may require at its option:

23.3.2.1. That all such improper Work be removed, remade or replaced, and all work disturbed by these changes be made good by Contractor at no additional cost to the District;

23.3.2.2. That the District deduct from any amount due Contractor the sum of money equivalent to the difference in value between the work performed and that called for by the Drawings and Specifications; or

23.3.2.3. That the District exercise any other remedy it may have at law or under the Contract Documents, including but not limited to the District hiring its own forces or another contractor to replace the Contractor's nonconforming Work, in which case the District shall either issue a deductive Change Order, a Construction Change Directive, or invoice the Contractor for the cost of that work. Contractor shall pay any invoices within thirty (30) days of receipt of same or District may withhold those amounts from payment(s) to Contractor.

24. TERMINATION AND SUSPENSION

24.1. District's Right to Terminate Contractor for Cause

24.1.1. Grounds for Termination The District, in its sole discretion, may terminate the Contract and/or terminate the Contractor's right to perform the work of the Contract based upon the following:

24.1.1.1. Contractor refuses or fails to execute the Work or any separable part thereof with sufficient diligence as will ensure its completion within the time specified or any extension thereof, or

24.1.1.2. Contractor fails to complete said Work within the time specified or any extension thereof, or

24.1.1.3. Contractor persistently fails or refused to perform Work or provide material of sufficient quality as to be in compliance with Contract Documents; or

24.1.1.4. Contractor files a petition for relief as a debtor, or a petition is filed against the Contractor without its consent, and the petition not dismissed within sixty (60) days; or

24.1.1.5. Contractor makes a general assignment for the benefit of its creditors, or a receiver is appointed on account of its insolvency; or

24.1.1.6. Contractor persistently or repeatedly refuses fails, except in cases for which extension of time is provided, to supply enough properly skilled workers or proper materials to complete the Work in the time specified; or

24.1.1.7. Contractor fails to make prompt payment to Subcontractors, or for material, or for labor; or

24.1.1.8. Contractor persistently disregards laws, or ordinances, or instructions of District; or

24.1.1.9. Contractor fails to supply labor, including that of Subcontractors, that can work in harmony with all other elements of labor employed or to be employed on the Work; or

24.1.1.10. Contractor or its Subcontractor(s) is/are otherwise in breach, default, or in substantial violation of any provision of this Contract, including but not limited to a lapse in licensing or registration.

24.1.2. Notification of Termination

24.1.2.1. Upon the occurrence at District's sole determination of any of the above conditions, District may, without prejudice to any other right or remedy, serve written notice upon Contractor and its Surety of District's termination of this Contract and/or the Contractor's right to perform the work of the Contract. This notice will contain the reasons for termination. Unless, within three (3) days after the service of the notice, any and all condition(s) shall cease, and any and all violation(s) shall cease, or arrangement satisfactory to District for the correction of the condition(s) and/or violation(s) be made, this Contract shall cease and terminate. Upon Determination, Contractor shall not be entitled to receive any further payment until the entire Work is finished.

24.1.2.2. Upon Termination, District may immediately serve written notice of tender upon Surety whereby Surety shall have the right to take over and perform this Contract only if Surety:

24.1.2.2.1. Within three (3) days after service upon it of the notice of tender, gives District written notice of Surety's intention to take over and perform this Contract; and

24.1.2.2.2. Commences performance of this Contract within (three (3) days from date of serving of its notice to District.

24.1.2.3. Surety shall not utilize Contractor in completing the Project if the District notifies Surety of the District's objection to Contractor's further participation in the completion of the Project. Surety expressly agrees that any contractor which Surety proposes to fulfill Surety's obligations is subject to District's approval. District's approval shall not be unreasonably withheld, conditioned or delayed.

24.1.2.4. If Surety fails to notify District or begin performance as indicated herein, District may take over the Work and execute the Work to completion by any method it may deem advisable at the expense of Contractor and/or its Surety. Contractor and/or its Surety shall be liable to District for any excess cost or other damages the District incurs thereby. Time is of the essence in this Contract. If the District takes over the Work as herein provided, District may, without liability for so doing, take possession of and utilize in completing the Work such materials, appliances, plan, and other property belonging to Contractor as may be on the Site of the Work, in bonded storage, or previously paid for.

24.1.3. Effect of Termination

24.1.3.1. Contractor shall, only if ordered to do so by the District, immediately remove from the Site all or any materials and personal property belonging to Contractor that have not been incorporated in the construction of the Work, or which are not in place in the Work. The District retains the right, but not the obligation, to keep and use any materials and personal property belonging to Contractor that have not been incorporated in the construction of the Work, or which are not in place in the Work. The Contractor and its Surety shall be liable upon the performance bond for all damages caused the District by reason of the Contractor's failure to complete the Contract.

24.1.3.2. In the event that the District shall perform any portion of, or the whole of the Work, pursuant to the provisions of the General Conditions, the District shall not be liable nor account to the Contractor in any way for the time within which, or the manner in which, the Work is performed by the District or for any changes the District may make in the Work or for the money expended by the District in satisfying claims and/or suits and/or other obligations in connection with the Work.

24.1.3.3. In the event that the Contract is terminated for any reason, no allowances or compensation will be granted for the loss of any anticipated profit by the Contractor or any impact or impairment of Contractor's bonding capacity.

24.1.3.4. If the expense to the District to finish the Work exceeds the unpaid Contract Price, Contractor and Surety shall pay difference to District within twenty-one (21) days of District's request.

24.1.3.5. The District shall have the right (but shall have no obligation) to assume and/or assign to a general contractor or construction manager or other third party who is qualified and has sufficient resources to complete the Work, the rights of the Contractor under its subcontracts with any or all Subcontractors. In the event of an assumption or assignment by the District, no Subcontractor shall have any claim against the District or third party for Work performed by Subcontractor or other matters arising prior to termination of the Contract. The District or any third party, as the case may be, shall be liable only for obligations to the Subcontractor arising after assumption or assignment. Should the District so elect, the Contractor shall execute and deliver all documents and take all steps, including the legal assignment of its contractual rights, as the District may require, for the purpose of fully vesting in the District the rights and benefits of it Subcontractor under Subcontracts or other obligations or commitments. All payments due the Contractor hereunder shall be subject to a right of offset by the District for expenses and damages suffered by the District as a result of any default, acts, or omissions of the Contractor. Contractor must include this assignment provision in all of its contracts with its Subcontractors.

24.1.3.6. The foregoing provisions are in addition to and not in limitation of any other rights or remedies available to District.

24.1.4. Emergency Termination of Public Contracts Act of 1949

24.1.4.1. This Contract is subject to termination as provided by sections 4410 and 4411 of the Government Code of the State of California, being a portion of the Emergency Termination of Public Contracts Act of 1949.

24.1.4.1.1. Section 4410 of the Government Code states:

In the event a national emergency occurs, and public work, being performed by contract, is stopped, directly or indirectly, because of the freezing or diversion of materials, equipment or labor, as the result of an order or a proclamation of the President of the United States, or of an order of any federal authority, and the circumstances or conditions are such that it is impracticable within a reasonable time to proceed with a substantial portion of the work, then the public agency and the contractor may, by written agreement, terminate said contract.

24.1.4.1.2. Section 4411 of the Government Code states:

Such an agreement shall include the terms and conditions of the termination of the contract and provision for the payment of compensation or money, if any, which either party shall pay to the other or any other person, under the facts and circumstances in the case.

24.1.4.2. Compensation to the Contractor shall be determined at the sole discretion of District on the basis of the reasonable value of the Work done,

including preparatory work. As an exception to the foregoing and at the District's discretion, in the case of any fully completed separate item or portion of the Work for which there is a separate previously submitted unit price or item on the accepted schedule of values, that price shall control. The District, at its sole discretion, may adopt the Contract Price as the reasonable value of the work done or any portion thereof.

24.2. Termination of Contractor for Convenience

24.2.1. District in its sole discretion may terminate the Contract upon three (3) days written notice to the Contractor. Under a termination for convenience, the District retains the right to all the options available to the District if there is a termination for cause. In case of a termination for convenience, the Contractor shall have no claims against the District except:

24.2.1.1. The actual cost for labor, materials, and services performed that is unpaid and can be documented through timesheets, invoices, receipts, or otherwise, and

24.2.1.2. Five percent (5%) of the total cost of work performed as of the date of termination, or five percent (5%) of the value of the Work yet to be performed, whichever is less. This five percent (5%) amount shall be full compensation for all Contractor's and Subcontractor(s)' mobilization and/or demobilization costs and any anticipated loss profits resulting from termination of the Contractor for convenience.

24.3. Suspension of Work

24.3.1. District in its sole discretion may suspend, delay or interrupt the Work in whole or in part for such period of time as the District may determine upon three (3) days written notice to the Contractor.

24.3.1.1. An adjustment may be made for changes in the cost of performance of the Work caused by any such suspension, delay or interruption. No adjustment shall be made to the extent:

24.3.1.1.1. That performance is, was or would have been so suspended, delayed or interrupted by another cause for which Contractor is responsible; or

24.3.1.1.2. That an equitable adjustment is made or denied under another provision of the Contract; or

24.3.1.1.3. That the suspension of Work was the direct or indirect result of Contractor's failure to perform any of its obligations hereunder.

24.3.1.2. Any adjustments in cost of performance may have a fixed or percentage fee as provided in the section on Format for Proposed Change Order herein. This amount shall be full compensation for all Contractor's and its Subcontractor(s)' changes in the cost of performance of the Contract caused by any such suspension, delay or interruption.

25. CLAIMS AND DISPUTES

25.1. Performance During Dispute or Claim Process

Contractor shall continue to perform its Work under the Contract and shall not cause a delay of the Work during any dispute, claim, negotiation, mediation, or arbitration proceeding, except by written agreement by the District.

25.2. Definition of Dispute

25.2.1. The term "Dispute" means a separate demand by the Contractor for:

25.2.1.1. A time extension;

25.2.1.2. Payment of money or damages arising from Work done by or on behalf of the Contractor pursuant to the Contract and payment of which is not otherwise expressly provided for or Contractor is not otherwise entitled to; or

25.2.1.3. An amount of payment disputed by the District.

25.3. Dispute Presentation

25.3.1. If Contractor intends to apply for an increase in the Contract Price or Contract Time for any reason including, without limitation, the acts of District or its agents, Contractor shall, within ten (10) days after the event giving rise to the Dispute, give notice of the Dispute in writing and submit to the District a written statement of the damage sustained or time requested. On or before twenty (20) days after Contractor's written Notice of Dispute, Contractor shall file with the District an itemized statement of the details and amounts of its Dispute for any increase in the Contract Price or Contract Time. Otherwise, Contractor shall have waived and relinquished its dispute against the District and Contractor's claims for compensation or an extension of time shall be forfeited and invalidated. Contractor shall not be entitled to consideration for payment or time on account.

25.3.2. The Notice of Dispute shall identify:

25.3.2.1. The issues, events, conditions, circumstances and/or causes giving rise to the dispute;

25.3.2.2. The pertinent dates and/or durations and actual and/or anticipated effects on the Contract Price, Contract Schedule milestones and/or Contract Time adjustments; and

25.3.2.3. The line-item costs for labor, material, and/or equipment, if applicable.

25.3.3. The Notice of Dispute shall include the following certification by the Contractor:

25.3.3.1. The undersigned Contractor certifies under penalty of perjury that the attached dispute is made in good faith; that the supporting data is accurate and complete to the best of my knowledge and belief; that the amount requested accurately reflects the adjustment for which Contractor believes the District is liable; and that I am duly authorized to certify the dispute on behalf of the Contractor.

25.3.3.2. Furthermore, Contractor understands that the value of the attached dispute expressly includes any and all of the Contractor's costs and expenses, direct and indirect, resulting from the Work performed on the Project, additional time required on the Project and/or resulting from delay to the Project. Any costs, expenses, damages, or time extensions not included are deemed waived.

25.3.4. If a Dispute, or any portion thereof, remains unresolved upon satisfaction of all applicable Dispute Resolution requirements, the Contractor shall comply with all claim resolution requirements as provided in Public Contract Code section 20104.

25.3.5. Contractor shall bind its Subcontractors to the provisions of this section and will hold the District harmless against disputes by Subcontractors.

25.4. Dispute Resolution

25.4.1. Contractor shall file with the District the Notice of Dispute, including the documents necessary to substantiate it, on or before the day of submitting the application for final payment.

25.4.2. District shall respond in writing within forty-five (45) days of receipt of the Dispute or may request in writing within thirty (30) days of receipt of the Dispute any additional documentation supporting the Dispute or relating to defenses or claims District may have against the Contractor.

25.4.2.1. If additional information is required, it shall be requested and provided by mutual agreement of the parties.

25.4.2.2. District's written response to the documented Dispute shall be submitted to the Contractor within fifteen (15) days after receipt of the further documentation or within a period of time no greater than that taken by the Contractor to produce the additional information, whichever is greater.

25.4.3. If Contractor disputes the District's written response, Contractor may file a claim pursuant to the Claim Resolution requirements provided herein.

25.5. Definition of Claim

25.5.1. The term "Claim" means a dispute that remains unresolved at the conclusion of the Dispute Resolution requirements as provided herein.

25.6. Claim Presentations

25.6.1. Contractor must timely submit the Notice of Claim and all documents necessary to substantiate any Claim. Otherwise, Contractor shall have waived and

relinquished its Claim against the District and Contractor's Claims for compensation or an extension of time shall be forfeited and invalidated, and Contractor shall not be entitled to consideration for payment or time on account of the instant matter. No Claim shall be presented prior to Project completion. Any statute that might otherwise govern the presentation of an unresolved Dispute, including but not limited to Government Code section 900 et seq. and Public Contract Code section 20104 et seq. shall be tolled for all purposes during the course of construction on the Project.

25.6.1.1. All Claims shall include the following certification by the Contractor:

25.6.1.1.1. The undersigned Contractor certifies under penalty of perjury that the attached claim is made in good faith; that the supporting data is accurate and complete to the best of my knowledge and belief; that the amount requested accurately reflects the adjustment for which Contractor believes the District is liable; and that I am duly authorized to certify the claim on behalf of the Contractor.

25.6.1.1.2. Furthermore, Contractor understands that the value of the attached claim expressly includes any and all of the Contractor's costs and expenses, direct and indirect, resulting from the Work performed on the Project, additional time required on the Project and/or resulting from delay to the Project. Any costs, expenses, damages, or time extensions not included are deemed waived.

25.6.2. The attention of the Contractor is drawn to Government Code section 12650, et seq. regarding penalties for false claims.

25.6.3. If a Claim, or any portion thereof, remains in dispute upon satisfaction of all applicable Dispute and Claim Resolution requirements, the Contractor shall comply with all claims presentation requirements as provided in Chapter 1 (commencing with section 900) and Chapter 2 (commencing with section 910) of Part 3 of Division 3.6 of Title 1 of Government Code as a condition precedent to the Contractor's right to bring a civil action against the District. For purposes of those provisions, the running of the time within which a Dispute or Claim must be presented to the District shall be tolled from the time the Contractor submits its written Dispute or Claim until the time the Dispute or Claim is denied, including any time utilized by any applicable meet and confer process.

25.6.4. The Contractor shall bind all its Subcontractors to the provisions of this section and will hold the District harmless against claims by Subcontractors.

25.7. Claim Resolution

25.7.1. In the event of a disagreement between the parties as to performance of the Work, the interpretation of this Contract, or payment or nonpayment for Work performed or not performed, the parties shall, after the conclusion of the Dispute Resolution requirements, attempt to resolve the Claim by those procedures set forth herein.

25.7.2. Claims of \$375,000 or Less

25.7.2.1. For all Claims of three hundred seventy-five thousand dollars (\$375,000) or less which arise between Contractor and District, the procedure set forth in Public Contract Code section 20104 et seq. shall apply:

25.7.2.1.1. Contractor shall file with the District any written Claim, including the documents necessary to substantiate it, upon the application for final payment.

25.7.2.1.2. For claims of less than fifty thousand dollars (\$50,000), the District shall respond in writing within forty-five (45) days of receipt of the Claim or may request in writing within thirty (30) days of receipt of the Claim any additional documentation supporting the claim or relating to defenses or claims the District may have against the Contractor.

25.7.2.1.2.1. If additional information is required, it shall be requested and provided by mutual agreement of the parties.

25.7.2.1.2.2. District's written response to the documented Claim shall be submitted to the Contractor within fifteen (15) days after receipt of the further documentation or within a period of time no greater than that taken by the Contractor to produce the additional information, whichever is greater.

25.7.2.1.3. For claims of over fifty thousand dollars (\$50,000) and less than or equal to three hundred seventy-five thousand dollars (\$375,000), the District shall respond in writing to all written Claims within sixty (60) days of receipt of the claim, or may request, in writing, within thirty (30) days of receipt of the Claim any additional documentation supporting the Claim or relating to defenses or claims the District may have against the Contractor.

25.7.2.1.3.1. If additional information is required, it shall be requested and provided upon mutual agreement of the District and the Contractor.

25.7.2.1.3.2. The District's written response to the claim, as further documented, shall be submitted to the Contractor within thirty (30) days after receipt of the further documentation, or within a period of time no greater than that taken by the Contractor to produce the additional information or requested documentation, whichever is greater.

25.7.2.2. If Contractor disputes the District's written response, or the District fails to respond within the time prescribed, Contractor may so notify the District, in writing, either within fifteen (15) days of receipt of the District's response or within fifteen (15) days of the District's failure to respond within the time prescribed, respectively, and demand an informal conference to meet and confer for settlement of the issues in dispute. Upon a demand, the District shall schedule a meet and confer conference within thirty (30) days for settlement of the dispute.

25.7.2.3. Following the meet and confer conference, if the claim or any portion of it remains in dispute, the Contractor may file a claim as provided in Chapter 1 (commencing with Section 900) and Chapter 2 (commencing with Section 910) of

Part 3 of Division 3.6 of Title 1 of the Government Code. For purposes of those provisions the running of the time within which a claim must be filed shall be tolled from the time the Contractor submits its written Claim until the time the Claim is denied, including any period of time utilized by the meet and confer process.

25.7.2.4. For any civil action filed to resolve claims filed pursuant to this section, within sixty (60) days, but no earlier than thirty (30) days, following the filing of responsive pleadings, the court shall submit the matter to nonbinding mediation unless waived by mutual stipulation of both parties. The mediation process shall provide for the selection within fifteen (15) days by both parties of a disinterested third person as mediator, shall be commenced within thirty (30) days of the submittal, and shall be concluded within fifteen (15) days from the commencement of the mediation unless a time requirement is extended upon a good cause showing to the court or by stipulation of both parties. If the parties fail to select a mediator within the 15-day period, any party may petition the court to appoint the mediator.

25.7.2.5. If the matter remains in dispute, the case shall be submitted to judicial arbitration pursuant to Chapter 2.5 (commencing with Section 1141.10) of the Title 3 of Part 3 of the Code of Civil Procedure, notwithstanding Section 1141.11 of that code. The Civil Discovery Act of 1986, (Article 3 (commencing with Section 2016) of Chapter 3 of Title 3 of part 4 of the Code of Civil Procedure) shall apply to any proceeding brought under this subdivision consistent with the rules pertaining to judicial arbitration.

25.7.2.6. The District shall not fail to pay money as to any portion of a Claim which is undisputed except as otherwise provided in the Contract Documents. In any suit filed pursuant to this section, the District shall pay interest at the legal rate on any arbitration award or judgment. Interest shall begin to accrue on the date the suit is filed in a court of law.

25.7.3. Claims Over \$375,000

25.7.3.1. For all Claims of over three hundred seventy-five thousand dollars (\$375,000) which arise between a Contractor and the District, the following procedure shall apply:

25.7.3.1.1. The parties agree to first endeavor to settle the dispute in an amicable manner by mediation before having recourse to a judicial forum. The Claim shall be identified in writing to the District within thirty (30) days from the date of Contractor's application for final payment of all Contract balances not in dispute and shall be mediated within one hundred and twenty (120) days from the submission of the Claim to the District. For purposes of filing a Claim to mediation, the running of the time within which mediation must be filed shall be tolled from the time the Contractor submits its written Claim until the time the Claim is denied. Mediator fees and administrative costs of the mediation shall be shared equally by the parties.

25.7.3.1.2. District may assert any counter-claims it has for damages against Contractor, including, but not limited to, defective Work, delay damages, and liquidated damages.

25.7.4. Contractor shall bind its Subcontractors to the provisions of this section and will hold the District harmless against disputes by Subcontractors.

25.8. Dispute and Claim Resolution Non-Applicability

25.8.1. The procedures for dispute and claim resolutions set forth in this Article shall not apply to the following:

25.8.1.1. Personal injury, wrongful death or property damage claims;

25.8.1.2. Latent defect or breach of warranty or guarantee to repair;

25.8.1.3. Stop payment notices;

25.8.1.4. District's rights set forth in the Article on Suspension and Termination;

25.8.1.5. Disputes arising out of State labor compliance, if applicable; or

25.8.1.6. District rights and obligations as a public entity set forth in applicable statutes; provided, however, that penalties imposed against a public entity by statutes, including, but not limited to, Public Contract Code sections 20104.50 and 7107, shall be subject to the Dispute and Claim Resolution requirements provided in this Article.

25.9. Contractor's costs incurred in seeking relief under this Article are not recoverable from the District.

26. STATE LABOR, WAGE & HOUR, APPRENTICE, AND RELATED PROVISIONS

26.1. Labor Compliance and Enforcement

Since this Project is subject to labor compliance and enforcement by the Department of Industrial Relations ("DIR"), Contractor specifically acknowledges and understands that it shall perform the Work of this Agreement while complying with all the applicable provisions of Division 2, Part 7, Chapter 1, of the Labor Code and Title 8 of the California Code of Regulations, including, without limitation, the requirement that the Contractor and all Subcontractors shall timely furnish complete and accurate electronic certified payroll records directly to the DIR. The District may not issue payment if this requirement is not met.

26.2. Wage Rates, Travel, and Subsistence

26.2.1. Pursuant to the provisions of article 2 (commencing at section 1770), chapter 1, part 7, division 2, of the Labor Code of California, the general prevailing rate of per diem wages and the general prevailing rate for holiday and overtime work in the locality in which this public work is to be performed for each craft,

classification, or type of worker needed to execute this Contract are on file at the District's principal office and copies will be made available to any interested party on request. Contractor shall obtain and post a copy of these wage rates at the job site.

26.2.2. Holiday and overtime work, when permitted by law, shall be paid for at the general prevailing rate of per diem wages for holiday and overtime work on file with the Director of the Department of Industrial Relations, unless otherwise specified. The holidays upon which those rates shall be paid need not be specified by the District, but shall be all holidays recognized in the applicable collective bargaining agreement. If the prevailing rate is not based on a collectively bargained rate, the holidays upon which the prevailing rate shall be paid shall be as provided in Section 6700 of the Government Code.

26.2.3. Contractor shall pay and shall cause to be paid each worker engaged in Work on the Project the general prevailing rate of per diem wages determined by the Director of the Department of Industrial Relations, regardless of any contractual relationship which may be alleged to exist between Contractor or any Subcontractor and such workers.

26.2.4. If during the period this bid is required to remain open, the Director of the Department of Industrial Relations determines that there has been a change in any prevailing rate of per diem wages in the locality in which the Work under the Contract is to be performed, such change shall not alter the wage rates in the Notice to Bidders or the Contract subsequently awarded.

26.2.5. Pursuant to Labor Code section 1775, Contractor shall, as a penalty to District, forfeit the statutory amount (believed by the District to be currently up to two hundred dollars (\$200) for each calendar day, or portion thereof, for each worker paid less than the prevailing rates, determined by the District and/or the Director, for the work or craft in which that worker is employed for any public work done under Contract by Contractor or by any Subcontractor under it. The difference between such prevailing wage rates and the amount paid to each worker for each calendar day or portion thereof for which each worker was paid less than the prevailing wage rate shall be paid to each worker by Contractor.

26.2.6. Any worker employed to perform Work on the Project, which Work is not covered by any classification listed in the general prevailing wage rate of per diem wages determined by the Director, shall be paid not less than the minimum rate of wages specified therein for the classification which most nearly corresponds to Work to be performed by him, and such minimum wage rate shall be retroactive to time of initial employment of such person in such classification.

26.2.7. Pursuant to Labor Code section 1773.1, per diem wages are deemed to include employer payments for health and welfare, pension, vacation, travel time, subsistence pay, and apprenticeship or other training programs authorized by Labor Code section 3093, and similar purposes.

26.2.8. Contractor shall post at appropriate conspicuous points on the Site of Project, a schedule showing all determined minimum wage rates and all authorized deductions, if any, from unpaid wages actually earned. In addition, Contractor shall

post a sign-in log for all workers and visitors to the Site, a list of all subcontractors of any tier on the Site, and the required Equal Employment Opportunity poster(s).

26.3. Hours of Work

26.3.1. As provided in article 3 (commencing at section 1810), chapter 1, part 7, division 2, of the Labor Code, eight (8) hours of labor shall constitute a legal days work. The time of service of any worker employed at any time by Contractor or by any Subcontractor on any subcontract under this Contract upon the Work or upon any part of the Work contemplated by this Contract shall be limited and restricted by Contractor to eight (8) hours per day, and forty (40) hours during any one week, except as hereinafter provided. Notwithstanding the provisions hereinabove set forth, Work performed by employees of Contractor in excess of eight (8) hours per day and forty (40) hours during any one week, shall be permitted upon this public work upon compensation for all hours worked in excess of eight (8) hours per day at not less than one and one-half times the basic rate of pay.

26.3.2. Contractor shall keep and shall cause each Subcontractor to keep an accurate record showing the name of and actual hours worked each calendar day and each calendar week by each worker employed by Contractor in connection with the Work or any part of the Work contemplated by this Contract. The record shall be kept open at all reasonable hours to the inspection of District and to the Division of Labor Standards Enforcement of the DIR.

26.3.3. Pursuant to Labor Code section 1813, Contractor shall as a penalty to the District forfeit the statutory amount (believed by the District to be currently twenty-five dollars (\$25)) for each worker employed in the execution of this Contract by Contractor or by any Subcontractor for each calendar day during which such worker is required or permitted to work more than eight (8) hours in any one calendar day and forty (40) hours in any one calendar week in violation of the provisions of article 3 (commencing at section 1810), chapter 1, part 7, division 2, of the Labor Code.

26.3.4. Any Work necessary to be performed after regular working hours, or on Sundays or other holidays shall be performed without additional expense to the District.

26.4. Payroll Records

26.4.1. Contractor shall upload, and shall cause each Subcontractor performing any portion of the Work under this Contract to upload, an accurate and complete certified payroll record ("CPR") using the Public Works Payroll Reporting Form, including certification (DIR [Form A-1-131](#) or current version), and Statement of Employer Payments (DIR Form PW 26) through the eCPR application using PDF to the DIR at <https://apps.dir.ca.gov/ecpr/DAS/AltLogin> or current application and URL, showing the name, address, social security number, work classification, straight time, and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker, or other employee employed by the Contractor and/or each Subcontractor in connection with the Work.

26.4.1.1. The CPRs enumerated hereunder shall be filed directly with the DIR on a weekly basis or to the requesting party, whether the District or DIR, within ten

(10) days after receipt of each written request. The CPRs from the Contractor and each Subcontractor for each week shall be provided on or before Wednesday of the week following the week covered by the CPRs. District may not make any payment to Contractor until:

26.4.1.1.1. Contractor and/or its Subcontractor(s) provide CPRs acceptable to the DIR; and

26.4.1.1.2. Any delay in Contractor and/or its Subcontractor(s) providing CPRs to the DIR in a timely manner may directly delay Contractor's payment.

26.4.2. All CPRs shall be available for inspection at all reasonable hours at the principal office of Contractor on the following basis:

26.4.2.1. A certified copy of an employee's CPR shall be made available for inspection or furnished to the employee or his/her authorized representative on request.

26.4.2.2. CPRs shall be made available for inspection or furnished upon request to a representative of District, Division of Labor Standards Enforcement, Division of Apprenticeship Standards, and/or the DIR.

26.4.2.3. CPRs shall be made available upon request by the public for inspection or copies thereof made; provided, however, that a request by the public shall be made through the District, Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement. If the requested CPRs have not been provided pursuant to the provisions herein, the requesting party shall, prior to being provided the records reimburse the costs of preparation by Contractor, Subcontractors, and the entity through which the request was made. The public shall not be given access to the records at the principal office of Contractor.

26.4.3. Any copy of records made available for inspection as copies and furnished upon request to the public or any public agency by District, Division of Apprenticeship Standards, or Division of Labor Standards Enforcement shall be marked or obliterated in such a manner as to prevent disclosure of an individual's name, address, and social security number. The name and address of Contractor awarded Contract or performing Contract shall not be marked or obliterated.

26.4.4. Contractor shall inform District of the location of the records enumerated hereunder, including the street address, city, and county, and shall, within five (5) working days, provide a notice of change of location and address.

26.4.5. In the event of noncompliance with the requirements of this section, Contractor shall have ten (10) days in which to comply subsequent to receipt of written notice specifying in what respects Contractor must comply with this section. Should noncompliance still be evident after the ten (10) day period, Contractor shall, as a penalty to District, forfeit up to one hundred dollars (\$100) for each calendar day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of Division of Apprenticeship Standards or Division of Labor Standards Enforcement, these penalties shall be withheld from progress payments then due.

26.5. [RESERVED]

26.6. Apprentices

26.6.1. Contractor acknowledges and agrees that, if this Contract involves a dollar amount greater than or a number of working days greater than that specified in Labor Code section 1777.5, then this Contract is governed by the provisions of Labor Code Section 1777.5. It shall be the responsibility of Contractor to ensure compliance with this Article and with Labor Code section 1777.5 for all apprenticeship occupations.

26.6.2. Apprentices of any crafts or trades may be employed and, when required by Labor Code section 1777.5, shall be employed provided they are properly registered in full compliance with the provisions of the Labor Code.

26.6.3. Every such apprentice shall be paid the standard wage paid to apprentices under the regulations of the craft or trade at which he/she is employed, and shall be employed only at the work of the craft or trade to which she/he is registered.

26.6.4. Only apprentices, as defined in section 3077 of the Labor Code, who are in training under apprenticeship standards and written apprentice agreements under chapter 4 (commencing at section 3070), division 3, of the Labor Code, are eligible to be employed. The employment and training of each apprentice shall be in accordance with the provisions of the apprenticeship standards and apprentice agreements under which he/she is training.

26.6.5. Pursuant to Labor Code section 1777.5, if that section applies to this Contract as indicated above, Contractor and any Subcontractors employing workers in any apprenticeable craft or trade in performing any Work under this Contract shall apply to the applicable joint apprenticeship committee for a certificate approving the Contractor or Subcontractor under the applicable apprenticeship standards and fixing the ratio of apprentices to journeymen employed in performing the Work.

26.6.6. Pursuant to Labor Code section 1777.5, if that section applies to this Contract as indicated above, Contractor and any Subcontractor may be required to make contributions to the apprenticeship program.

26.6.7. If Contractor or Subcontractor willfully fails to comply with Labor Code section 1777.5, then, upon a determination of noncompliance by the Administrator of Apprenticeship, it shall:

26.6.7.1. Be denied the right to bid on any subsequent project for one (1) year from the date of such determination;

26.6.7.2. Forfeit as a penalty to District the full amount as stated in Labor Code section 1777.7. Interpretation and enforcement of these provisions shall be in accordance with the rules and procedures of the California Apprenticeship Council and under the authority of the Chief of the Division of Apprenticeship Standards.

26.6.8. Contractor and all Subcontractors shall comply with Labor Code section 1777.6, which section forbids certain discriminatory practices in the employment of apprentices.

26.6.9. Contractor shall become fully acquainted with the law regarding apprentices prior to commencement of the Work. Special attention is directed to sections 1777.5, 1777.6, and 1777.7 of the Labor Code, and title 8, California Code of Regulations, section 200 et seq. Questions may be directed to the State Division of Apprenticeship Standards, 455 Golden Gate Avenue, San Francisco, California 94102.

26.7. Non-Discrimination

26.7.1. Contractor herein agrees not to discriminate in its recruiting, hiring, promotion, demotion, or termination practices on the basis of race, religious creed, national origin, ancestry, sex, age, or physical handicap in the performance of this Contract and to comply with the provisions of the California Fair Employment and Housing Act as set forth in part 2.8 of division 3 of the California Government Code, commencing at section 12900; the Federal Civil Rights Act of 1964, as set forth in Public Law 88-352, and all amendments thereto; Executive Order 11246, and all administrative rules and regulations found to be applicable to Contractor and Subcontractor.

26.7.2. Special requirements for Federally Assisted Construction Contracts: During the performance of this Contract, Contractor agrees to incorporate in all subcontracts the provisions set forth in Chapter 60-1.4(b) of Title 41 published in Volume 33 No. 104 of the Federal Register dated May 28, 1968.

26.8. Labor First Aid

Contractor shall maintain emergency first aid treatment for Contractor's workers on the Project which complies with the Federal Occupational Safety and Health Act of 1970 (29 U.S.C. § 651 et seq.) and the California Occupational Safety and Health Act of 1973 (8 Cal. Code of Regs., §1 et seq.).

27. [RESERVED]

28. MISCELLANEOUS

28.1. Assignment of Antitrust Actions

28.1.1. Section 7103.5(b) of the Public Contract Code states:

In entering into a public works contract or subcontract to supply goods, services, or materials pursuant to a public works contract, the Contractor or subcontractor offers and agrees to assign to the awarding body all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Sec. 15) or under the Cartwright Act (Chapter 2 (commencing with Section 16700) of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, made and become effective at the time the awarding body tenders final payment to the Contractor, without further acknowledgment by the parties.

28.1.2. Section 4552 of the Government Code states:

In submitting a bid to a public purchasing body, the bidder offers and agrees that if the bid is accepted, it will assign to the purchasing body all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Sec. 15) or under the Cartwright Act (Chapter 2 (commencing with Section 16700) of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, materials, or services by the bidder for sale to the purchasing body pursuant to the bid. Such assignment shall be made and become effective at the time the purchasing body tenders final payment to the bidder.

28.1.3. Section 4553 of the Government Code states:

If an awarding body or public purchasing body receives, either through judgment or settlement, a monetary recovery for a cause of action assigned under this chapter, the assignor shall be entitled to receive reimbursement for actual legal costs incurred and may, upon demand, recover from the public body any portion of the recovery, including treble damages, attributable to overcharges that were paid by the assignor but were not paid by the public body as part of the bid price, less the expenses incurred in obtaining that portion of the recovery.

28.1.4. Section 4554 of the Government Code states:

Upon demand in writing by the assignor, the assignee shall, within one year from such demand, reassign the cause of action assigned under this part if the assignor has been or may have been injured by the violation of law for which the cause of action arose and (a) the assignee has not been injured thereby, or (b) the assignee declines to file a court action for the cause of action.

28.1.5. Under this Article, "public purchasing body" is District and "bidder" is Contractor.

28.2. Excise Taxes

If, under Federal Excise Tax Law, any transaction hereunder constitutes a sale on which a Federal Excise Tax is imposed and the sale is exempt from such Federal Excise Tax because it is a sale to a State or Local Government for its exclusive use, District, upon request, will execute documents necessary to show (1) that District is a political subdivision of the State for the purposes of such exemption, and (2) that the sale is for the exclusive use of District. No Federal Excise Tax for such materials shall be included in any Contract Price.

28.3. Taxes

Contract Price is to include any and all applicable sales taxes or other taxes that may be due in accordance with section 7051 of the Revenue and Taxation Code; Regulation 1521 of the State Board of Equalization or any other tax code that may be applicable.

28.4. Shipments

All shipments must be F.O.B. destination to Site, as indicated in the Contract Documents. There must be no charge for containers, packing, unpacking, drayage, or insurance. The total Contract Price shall be all inclusive (including sales tax) and no additional costs of any type will be considered.

28.5. Compliance with Government Reporting Requirements

If this Contract is subject to federal or other governmental reporting requirements because of federal or other governmental financing in whole or in part for the Project of which it is part, or for any other reason, Contactor shall comply with those reporting requirements at the request of the District at no additional cost.

END OF DOCUMENT

SPECIAL CONDITIONS

1. Mitigation Measures

Contractor shall comply with all applicable mitigation measures, if any, adopted by any public agency with respect to this Project pursuant to the California Environmental Quality Act. (Public Resources Code section 21000 et seq.)

2. Modernization Projects

2.1. Access. Access to the school buildings and entry to buildings, classrooms, restrooms, mechanical rooms, electrical rooms, or other rooms, for construction purposes, must be coordinated with District and onsite District personnel before Work is to start. Unless agreed to otherwise in writing, only a school custodian will be allowed to unlock and lock doors in existing building(s). The custodian will be available only while school is in session. If a custodian is required to arrive before 7:00 a.m. or leave after 3:30 p.m. to accommodate Contractor's Work, the overtime wages for the custodian will be paid by the Contractor, unless at the discretion of the District, other arrangements are made in advance.

2.2. Master Key. Upon request, the District may, at its own discretion, provide a master key to the school site for the convenience of the Contractor. The Contractor agrees to pay all expenses to re-key the entire school site and all other affected District buildings if the master key is lost or stolen or if any unauthorized party obtains a copy of the key or access to the school.

2.3. Maintaining Services. The Contractor is advised that Work is to be performed in spaces regularly scheduled for instruction. Interruption and/or periods of shutdown of public access, electrical service, water service, lighting, or other utilities shall be only as arranged in advance with the District. Contractor shall provide temporary services to all facilities interrupted by Contractor's Work.

2.4. Maintaining Utilities. The Contractor shall maintain in operation during duration of Contract, drainage lines, storm drains, sewers, water, gas, electrical, steam, and other utility service lines within working area.

2.5. Confidentiality. Contractor shall maintain the confidentiality of all information, documents, programs, procedures and all other items that Contractor encounters while performing the Work. This requirement shall be ongoing and shall survive the expiration or termination of this Contract and specifically includes, without limitation, all student, parent, and employee disciplinary information and health information.

2.6. Work During Instructional Time. By submitting its bid, Contractor affirms that Work may be performed during ongoing instruction in existing facilities. If so, Contractor agrees to cooperate to the best of its ability to minimize any disruption to the school up to, and including, rescheduling specific work activities, at no additional cost to District.

2.7. No Work During Student Testing. Contractor shall, at no additional cost to the District and at the District's request, coordinate its Work to not disturb District students including, without limitation, not performing any Work when students at the Site are taking State-required tests.

3. Badge Policy For Contractors

All Contractors doing work for the District will provide their workers with identification badges. These badges will be worn by all members of the Contractor's staff who are working in a District facility.

3.1. Badges must be filled out in full and contain the following information:

3.1.1. Name of Contractor

3.1.2. Name of Employee

3.1.3. Contractor's address and phone number

3.2. Badges are to be worn when the Contractor or his/her employees are on site and must be visible at all times. Contractors must inform their employees that they are required to allow District employees, the Architect, the Construction Manager, the Program Manager, or the Project Inspector to review the information on the badges upon request.

3.3. Failure to display identification badges as required by this policy may result in the assessment of fines against the Contractor.

4. Substitution for Specified Items

4.1. Whenever in the Specifications any materials, process, or article is indicated or specified by grade, patent, or proprietary name, or by name of manufacturer, that Specification shall be deemed to be followed by the words "or equal." Contractor may, unless otherwise stated, offer any material, process, or article that shall be substantially equal or better in every respect to that so indicated or specified.

4.1.1. If the material, process, or article offered by Contractor is not, in the opinion of the District, substantially equal or better in every respect to that specified, then Contractor shall furnish the material, process, or article specified in the Specifications without any additional compensation or change order.

4.1.2. This provision shall not be applicable with respect to any material, product, thing or service for which District made findings and gave notice in accordance with Public Contract Code section 3400(c); therefore, Contractor shall not be entitled to request a substitution with respect to those materials, products or services.

4.2. A request for a substitution shall be submitted as follows:

4.2.1. Contractor shall notify the District in writing of any request for a substitution at least ten (10) days prior to bid opening as indicated in the Instructions to Bidders.

4.2.2. Requests for Substitutions after award of the Contract shall be submitted within fifteen (15) days of the date of the Notice of Award.

4.3. Within 15 days after the date of the Notice of Award, Contractor shall provide data substantiating a request for substitution of "an equal" item, including but not limited to the following:

4.3.1. All variations of the proposed substitute from the material specified including, but not limited to, principles of operation, materials, or construction finish, thickness or gauge of materials, dimensions, weight, and tolerances;

4.3.2. Available maintenance, repair or replacement services;

4.3.3. Increases or decreases in operating, maintenance, repair, replacement, and spare parts costs;

4.3.4. Whether or not acceptance of the substitute will require other changes in the Work (or in work performed by the District or others under Contract with the District); and

4.3.5. The time impact on any part of the Work resulting directly or indirectly from acceptance of the proposed substitute.

4.4. No substitutions shall be made until approved, in writing, by the District. The burden of proof as to equality of any material, process, or article shall rest with Contractor. The Contractor warrants that if substitutes are approved:

4.4.1. The proposed substitute is equal or superior in all respects to that specified, and that such proposed substitute is suitable and fit for the intended purpose and will perform adequately the function and achieve the results called for by the general design and the Contract Documents;

4.4.2. The Contractor provides the same warranties and guarantees for the substitute that would be provided for that specified;

4.4.3. The Contractor shall be fully responsible for the installation of the substitute and any changes in the Work required, either directly or indirectly, because of the acceptance of such substitute, with no increase in Contract Price or Contract Time. Incidental changes or extra component parts required to accommodate the substitute will be made by the Contractor without a change in the Contract Price or Contract Time;

4.4.4. The Contractor shall be responsible for any re-design costs occasioned by District's acceptance and/or approval of any substitute; and

4.4.5. The Contractor shall, in the event that a substitute is less costly than that specified, credit the District with one hundred percent (100%) of the net difference between the substitute and the originally specified material. In this event, the Contractor agrees to execute a deductive Change Order to reflect that credit.

4.5. In the event Contractor furnishes a material, process, or article more expensive than that specified, the difference in the cost of that material, process, or article so furnished shall be borne by Contractor.

4.6. In no event shall the District be liable for any increase in Contract Price or Contract Time due to any claimed delay in the evaluation of any proposed substitute or in the acceptance or rejection of any proposed substitute.

4.7. Contractor shall be responsible for any costs the District incurs for professional services and/or DSA fees or delay to the Project Schedule, if applicable, while DSA reviews changes for the convenience of Contractor and/or to accommodate Contractor's means and methods. District may deduct those costs from any amounts owing to the Contractor for the review of the request for substitution, even if the request for substitution is not approved. District, at its sole discretion, shall deduct from the payments due to and/or invoice Contractor for all the professional services and/or DSA fees or delay to the Project Schedule, if applicable, while DSA reviews changes for the convenience of Contractor and/or to accommodate Contractor's means and methods arising herein.

5. Weather Days

Delays due to Adverse Weather conditions will only be permitted in compliance with the provisions in the General Conditions and only if the number of days of Adverse Weather exceeds the following parameters and Contractor can verify that the excess days of Adverse Weather caused delays:

Total weather days allowed for this project is 10 days

EXHIBIT A

6. **Insurance Policy Limits** [CHECK WITH DISTRICT'S RISK MANAGER OR INSURANCE ADVISOR. COVERAGES AND AMOUNTS BELOW ARE PLACEHOLDERS ONLY.]

All of Contractor's insurance shall be with insurance companies with an A.M. Best rating of no less than _____ [E.G. **A: IX.**] The limits of insurance shall not be less than:

Commercial General Liability	Product Liability and Completed Operations, Fire Damage Liability – Split Limit	[E.G. Low Risk: \$1,000,000 per occurrence; \$2,000,000 aggregate
		Intermediate Risk: \$2,000,000 per occurrence; \$4,000,000 aggregate
		High Risk: \$5,000,000 per occurrence; \$10,000,000 aggregate] [E.G.
Automobile Liability – Any Auto	Combined Single Limit	[E.G. Personal vehicles: \$500,000 Commercial vehicles: \$1,000,000
		Personal vehicles: \$100,000 per person/ \$300,000 per accident] [E.G.
Workers Compensation		Statutory limits pursuant to State law
Employers' Liability		[E.G. \$0]
Builders Risk (Course of Construction)		Issued for the value and scope of Work indicated herein.
Pollution Liability		[E.G. \$0]

7. **Permits, Certificates, Licenses, Fees, Approval**

7.1. **Payment of Fees for Permits, Certificates, Licenses, and Registrations.**

As required in the General Conditions, the Contractor shall secure and pay for all permits, licenses, registrations, and certificates necessary for the prosecution of the Work with the exception of the following:

7.1.1. [E.G. (WATER CONNECTION FEES)]

7.1.2. [E.G. (SEWER CONNECTION FEES)]

With respect to the above listed items, Contractor shall be responsible for securing such items; however, District will be responsible for payment of these charges or fees. Contractor shall notify the District of the amount due with respect to such items and to whom the amount is payable. Contractor shall provide the District with an invoice and receipt with respect to such charges or fees.

7.2. General Permit For Storm Water Discharges Associated With Construction and Land Disturbance Activities

7.2.1. Contractor acknowledges that all California community college districts are obligated to develop and implement the following requirements for the discharge of storm water to surface waters from its construction and land disturbance activities (storm water requirements), without limitation:

7.2.1.1. Municipal Separate Storm Sewer System (MS4) is a system of conveyances used to collect and/or convey storm water, including, without limitation, catch basins, curbs, gutters, ditches, man-made channels, and storm drains.

7.2.1.2. Storm Water Pollution Prevention Plan (SWPPP) contains specific best management practices (BMPs) and establishes numeric effluent limitations at:

7.2.1.2.1. Sites where the District engages in maintenance (e.g., fueling, cleaning, repairing) for transportation activities.

7.2.1.2.2. Construction sites where:

7.2.1.2.2.1. One (1) or more acres of soil will be disturbed, or

7.2.1.2.2.2. The project is part of a larger common plan of development that disturbs more than one (1) acre of soil.

7.2.2. Contractor shall comply with any District storm water requirements that are approved by the District and applicable to the Project, at no additional cost to the District.

7.2.3. At no additional cost to the District, Contractor shall provide a Qualified Storm Water Practitioner who shall be onsite and implement and monitor any and all SWPPP requirements applicable to the Project, including but not limited to:

7.2.3.1. At least forty eight (48) hours prior to a forecasted rain event, implementing the Rain Event Action Plan (REAP) for any rain event requiring implementation of the REAP, including any erosion and sediment control measures needed to protect all exposed portions of the site; and

7.2.3.2. Monitoring any Numeric Action Levels (NALs), if applicable.

8. As-Builts and Record Drawings

8.1. When called for by Division 1, Contractor shall submit As Built Drawings pursuant to the Contract Documents consisting of one set of computer-aided design and drafting ("CADD") files in the following format (describe), plus one set of As Built Drawings on mylar.

8.2. Contractor shall submit Record Drawings pursuant to the Contract Documents consisting of one set of computer-aided design and drafting ("CADD") files in the following format (describe), plus one set of Record Drawings on mylar].

9. Disabled Veterans Business Enterprise [INSERT IF PROJECT FUNDED IN PART OR IN WHOLE BY THE STATE SCHOOL FACILITY PROGRAM.]

This Project uses funds allocated pursuant to the State of California School Facility Program ("Program") for the construction and/or modernization of school buildings. Therefore, Section 71028 of the Education Code and Public Contract Code section 10115 require the District to have a participation goal for disabled veteran business enterprises ("DVBE") of at least three percent (3%), per year, of the overall dollar amount expended each year by the District on projects that receive state funding and the Contractor must submit the Disabled Veteran Business Enterprise Participation Certification to the District with its executed Agreement, identifying the steps contractor took to solicit DVBE participation in conjunction with this Contract.

10. Construction Manager

The District will use a Construction Manager on the Project that is the subject of this Contract. Swinerton Management & Consulting, Bob Collins, is the Construction Manager for this Project.

11. Program Manager

Kitchell, Pam Kinzie, is the Program Manager designated for the Project that is the subject of this Contract.

**HAZARDOUS MATERIALS
PROCEDURES & REQUIREMENTS**

1. Summary

This document includes information applicable to hazardous materials and hazard waste abatement.

2. Notice of Hazardous Waste or Materials Conditions

- a. Contractor shall give notice in writing to the District, the Construction Manager, and the Architect promptly, before any of the following conditions are disturbed, and in no event later than twenty-four (24) hours after first observance, of any:
 - (1) Material that Contractor believes may be material that is hazardous waste or hazardous material, as defined in section 25117 of the Health and Safety Code, that is required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law;
 - (2) Other material that may present a substantial danger to persons or property exposed thereto in connection with Work at the site.
- b. Contractor's written notice shall indicate whether the hazardous waste or material was shown or indicated in the Contract Documents to be within the scope of Work, and whether the materials were brought to the site by Contractor, its Subcontractors, suppliers, or anyone else for whom Contractor is responsible. As used in this section the term "hazardous materials" shall include, without limitation, asbestos, lead, Polychlorinated biphenyl (PCB), petroleum and related hydrocarbons, and radioactive material.
- c. In response to Contractor's written notice, the District shall investigate the identified conditions.
- d. If the District determines that conditions do not involve hazardous materials or that no change in terms of Contract is justified, the District shall so notify Contractor in writing, stating reasons. If the District and Contractor cannot agree on whether conditions justify an adjustment in Contract Price or Contract Time, or on the extent of any adjustment, Contractor shall proceed with the Work as directed by the District.
- e. If after receipt of notice from the District, Contractor does not agree to resume Work based on a reasonable belief it is unsafe, or does not agree to resume Work under special conditions, then District may order such portion of Work that is in connection with such hazardous condition or such affected area to be deleted from the Work, or performed by others, or District may invoke its rights to terminate the Contract in whole or in part. District will determine entitlement to or the amount or extent of an adjustment, if any, in

Contract Price or Contract Time as a result of deleting such portion of Work, or performing the Work by others.

- f. If Contractor stops Work in connection with any hazardous condition and in any area affected thereby, Contractor shall immediately redeploy its workers, equipment, and materials, as necessary, to other portions of the Work to minimize delay and disruption.

3. Additional Warranties and Representations

- a. Contractor represents and warrants that it, its employees, and its subcontractors and their employees, shall at all times have the required levels of familiarity with the Site and the Work, training, and ability to comply fully with all applicable law and contract requirements for safe and expeditious performance of the Work, including whatever training is or may be required regarding the activities to be performed (including, but not limited to, all training required to address adequately the actual or potential dangers of Contract performance).
- b. Contractor represents and warrants that it, its employees, and its subcontractors and their employees, shall at all times have and maintain in good standing any and all certifications and licenses required by applicable federal, state, and other governmental and quasi-governmental requirements applicable to the Work.
- c. Contractor represents and warrants that it has studied carefully all requirements of the Specifications regarding procedures for demolition, hazardous waste abatement, or safety practices, specified in the Contract, and prior to submitting its bid, has either (a) verified to its satisfaction that the specified procedures are adequate and sufficient to achieve the results intended by the Contract Documents, or (b) by way of approved "or equal" request or request for clarification and written Addenda, secured changes to the specified procedures sufficient to achieve the results intended by the Contract Documents. Contractor accepts the risk that any specified procedure will result in a completed Project in full compliance with the Contract Documents.

4. Monitoring and Testing

- a. District reserves the right, in its sole discretion, to conduct air monitoring, earth monitoring, Work monitoring, and any other tests (in addition to testing required under the agreement or applicable law), to monitor Contract requirements of safe and statutorily compliant work methods and (where applicable) safe re-entry level air standards under state and federal law upon completion of the job, and compliance of the work with periodic and final inspection by public and quasi-public entities having jurisdiction.
- b. Contractor acknowledges that District has the right to perform, or cause to be performed, various activities and tests including, but not limited to, pre-abatement, during abatement, and post-abatement air monitoring, that District shall have no obligation to perform said activities and tests, and that

a portion of said activities and tests may take place prior to the completion of the Work by Contractor. In the event District elects to perform these activities and tests, Contractor shall afford District ample access to the Site and all areas of the Work as may be necessary for the performance of these activities and tests. Contractor will include the potential impact of these activities or tests by District in the Contract Price and the Scheduled Completion Date.

- c. Notwithstanding District's rights granted by this paragraph, Contractor may retain its own industrial hygiene consultant at Contractor's own expense and may collect samples and may perform tests including, but not limited to, pre-abatement, during abatement, and post-abatement personal air monitoring, and District reserves the right to request documentation of all such activities and tests performed by Contractor relating to the Work and Contractor shall immediately provide that documentation upon request.

5. Compliance with Laws

- a. Contractor shall perform safe, expeditious, and orderly work in accordance with the best practices and the highest standards in the hazardous waste abatement, removal, and disposal industry, the applicable law, and the Contract Documents, including, but not limited to, all responsibilities relating to the preparation and return of waste shipment records, all requirements of the law, delivering of all requisite notices, and obtaining all necessary governmental and quasi-governmental approvals.
- b. Contractor represents that it is familiar with and shall comply with all laws applicable to the Work or completed Work including, but not limited to, all federal, state, and local laws, statutes, standards, rules, regulations, and ordinances applicable to the Work relating to:
 - (1) The protection of the public health, welfare and environment;
 - (2) Storage, handling, or use of asbestos, PCB, lead, petroleum based products or other hazardous materials;
 - (3) The generation, processing, treatment, storage, transport, disposal, destruction, or other management of asbestos, PCB, lead, petroleum, or hazardous waste materials or other waste materials of any kind; and
 - (4) The protection of environmentally sensitive areas such as wetlands and coastal areas.

6. Disposal

- a. Contractor has the sole responsibility for determining current waste storage, handling, transportation, and disposal regulations for the job Site and for each waste disposal facility. Contractor must comply fully at its sole cost and expense with these regulations and any applicable law. District may, but is

not obligated to, require submittals with this information for it to review consistent with the Contract Documents.

- b. Contractor shall develop and implement a system acceptable to District to track hazardous waste from the Site to disposal, including appropriate "Hazardous Waste Manifests" on the EPA form, so that District may track the volume of waste it put in each landfill and receive from each landfill a certificate of receipt.
- c. Contractor shall provide District with the name and address of each waste disposal facility prior to any disposal, and District shall have the express right to reject any proposed disposal facility. Contractor shall not use any disposal facility to which District has objected. Contractor shall document actual disposal or destruction of waste at a designated facility by completing a disposal certificate or certificate of destruction forwarding the original to the District.

7. Permits

- a. Before performing any of the Work, and at such other times as may be required by applicable law, Contractor shall deliver all requisite notices and obtain the approval of all governmental and quasi-governmental authorities having jurisdiction over the Work. Contractor shall submit evidence satisfactory to District that it and any disposal facility
 - (1) have obtained all required permits, approvals, and the like in a timely manner both prior to commencement of the Work and thereafter as and when required by applicable law, and
 - (2) are in compliance with all such permits, approvals and the regulations.

For example, before commencing any work in connection with the Work involving asbestos-containing materials, or PCBs, or other hazardous materials subject to regulation, Contractor agrees to provide the required notice of intent to renovate or demolish to the appropriate state or federal agency having jurisdiction, by certified mail, return receipt requested, or by some other method of transmittal for which a return receipt is obtained, and to send a copy of that notice to District. Contractor shall not conduct any Work involving asbestos-containing materials or PCBs unless Contractor has first confirmed that the appropriate agency having jurisdiction is in receipt of the required notification. All permits, licenses, and bonds that are required by governmental or quasi-governmental authorities, and all fees, deposits, tap fees, offsite easements, and asbestos and PCB disposal facilities expenses necessary for the prosecution of the Work, shall be procured and paid for by Contractor. Contractor shall give all notices and comply with the all applicable laws bearing on the conduct of the Work as drawn and specified. If Contractor observes or reasonably should have observed that Plans and Specifications and other Contract Documents are at variance therewith, it shall be responsible for promptly notifying District in writing of such fact. If Contractor performs any Work contrary to applicable laws, it shall bear all costs arising therefrom.

- b. In the case of any permits or notices held in District's name or of necessity to be made in District's name, District shall cooperate with Contractor in securing the permit or giving the notice, but the Contractor shall prepare for District review and execution upon approval, all necessary applications, notices, and other materials.

8. Indemnification

To the extent permitted by law, the indemnities and limitations of liability expressed throughout the Contract Documents apply with equal force and effect to any claims or liabilities imposed or existing by virtue of the removal, abatement, and disposal of hazardous waste. This includes, but is not limited to, liabilities connected to the selection and use of a waste disposal facility, a waste transporter, personal injury, property damage, loss of use of property, damage to the environment or natural resources, or "disposal" and "release" of materials associated with the Work (as defined in 42 U.S.C. § 9601 et seq.).

9. Termination

District shall have an absolute right to terminate for default immediately without notice and without an opportunity to cure should Contractor knowingly or recklessly commit a material breach of the terms of the Contract Documents, or any applicable law, on any matter involving the exposure of persons or property to hazardous waste. However, if the breach of contract exposing persons or property to hazardous waste is due solely to an ordinary, unintentional, and non-reckless failure to exercise reasonable care, then the procedures for termination for cause shall apply without modification.

END OF DOCUMENT

SUMMARY OF WORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Site Access Conditions and Requirements;
- B. Special Conditions.

1.02 SUMMARY OF WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of this Contract may consist of the following:

Selective demolition and construction necessary for the renovation of existing classroom building, including associated civil, architectural, structural, plumbing, mechanical and/or electrical work as indicated in the Drawings and Specifications. Generally, these categories of work involve new finishes, adaptive re-use and modification of certain selected areas, new cabinetry, handicap accessibility retrofits, re-roofing, and adding HVAC. Renovation consists of approximately 16,400sf in a one story building

1.03 CONTRACTS

- A. Perform the Work under a single, fixed-price Contract.

1.04 WORK BY OTHERS

- A. Work on the Project that will be performed and completed prior to the start of the Work of this Contract:

(1) None.

- B. Work on the Project that will be performed by others concurrent with the Work of this Contract:

(1) None.

1.05 CODES, REGULATIONS, AND STANDARDS

- A. The codes, regulations, and standards adopted by the state and federal agencies having jurisdiction shall govern minimum requirements for this project. Where codes, regulations, and standards conflict with the Contract Documents, these conflicts shall be brought to the immediate attention of the District and the Architect.

- B. Codes, regulations, and standards shall be as published effective as of date of bid opening, unless otherwise specified or indicated.

1.06 PROJECT RECORD DOCUMENTS:

- A. Contractor shall maintain on Site one set of the following record documents; Contractor shall record actual revisions to the Work:
 - (1) Contract Drawings.
 - (2) Specifications.
 - (3) Addenda.
 - (4) Change Orders and other modifications to the Contract.
 - (5) Reviewed shop drawings, product data, and samples.
 - (6) Field test records.
 - (7) Inspection certificates.
 - (8) Manufacturer's certificates.
- B. Contractor shall store Record Documents separate from documents used for construction. Provide files, racks, and secure storage for Record Documents and samples.
- C. Contractor shall record information concurrent with construction progress.
- D. Specifications: Contractor shall legibly mark and record at each product section of the Specifications the description of the actual product(s) installed, including the following:
 - (1) Manufacturer's name and product model and number.
 - (2) Product substitutions or alternates utilized.
 - (3) Changes made by Addenda and Change Orders and written directives.

1.07 EXAMINATION OF EXISTING CONDITIONS

- A. Contractor shall be held to have examined the Project Site and acquainted itself with the conditions of the Site or of the streets or roads approaching the Site.
- B. Prior to commencement of Work, Contractor shall survey the Site and existing buildings and improvements to observe existing damage and defects such as cracks, sags, broken, missing or damaged glazing, other building elements and Site improvements, and other damage.

- C. Should Contractor observe cracks, sags, and other damage to and defects of the Site and adjacent buildings, paving, and other items not indicated in the Contract Documents, Contractor shall immediately report same to the District and the Architect.

1.08 CONTRACTOR'S USE OF PREMISES

- A. The building is unoccupied and Contractor may use the building at the Project Site without limitation for its operations, storage, and office facilities for the performance of the Work. If the District chooses to beneficially occupy any portion of the building, Contractor must obtain the District's written approval for Contractor's use of spaces and types of operations to be performed within the building while so occupied. Contractor's access to the building shall be limited to the areas indicated.
- B. If the space at the Project Site is not sufficient for Contractor's operations, storage, office facilities and/or parking, Contractor shall arrange and pay for any additional facilities needed by Contractor.
- C. Contractor shall not interfere with use of or access to occupied portions of the building or adjacent property.
- D. Contractor shall maintain corridors, halls, and other exit-ways of building clear and free of debris and obstructions at all times.
- E. No one other than those directly involved in the demolition and construction, or specifically designated by the District or the Architect shall be permitted in the areas of work during demolition and construction activities.
- F. The Contractor shall install the construction security fence and maintain that it will be locked when not in use. Keys to this fencing will be provided to the District.

1.09 PROTECTION OF EXISTING STRUCTURES AND UTILITIES

- A. The Drawings show above-grade and below-grade structures, utility lines, and other installations that are known or believed to exist in the area of the Work. Contractor shall locate these existing installations before proceeding with excavation and other operations that could damage same; maintain them in service, where appropriate; and repair damage to them caused by the performance of the Work. Should damage occur to these existing installations, the costs of repair shall be at the Contractor's expense and made to the District's satisfaction.
- B. Contractor shall be alert to the possibility of the existence of additional structures and utilities. If Contractor encounters additional structures and utilities, Contractor will immediately report to the District for disposition of same as indicated in the General Conditions.

1.10 UTILITY SHUTDOWNS AND INTERRUPTIONS

- A. Contractor shall give the District a minimum of three (3) days written notice in advance of any need to shut off existing utility services or to effect equipment interruptions. The District will set exact time and duration for shutdown, and will assist Contractor with shutdown. Work required to re-establish utility services shall be performed by the Contractor.
- B. Contractor shall obtain District's written approval as indicated in the General Conditions in advance of deliveries of material or equipment or other activities that may conflict with District's use of the building or adjacent facilities.

1.11 STRUCTURAL INTEGRITY

- A. Contractor shall be responsible for and supervise each operation and work that could affect structural integrity of various building elements, both permanent and temporary.
- B. Contractor shall include structural connections and fastenings as indicated or required for complete performance of the Work.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

ALTERNATES AND UNIT PRICING

PART 1 – ALTERNATES

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions;
- C. Bid Form and Proposal;
- D. Instruction to Bidders.

1.02 DESCRIPTION

The items of work indicated below propose modifications to, substitutions for, additions to and/or deletions from the various parts of the Work specified in other Sections of the Specifications. The acceptance or rejection of any of the alternates is strictly at the option of the District subject to District's acceptance of Contractor's stated prices contained in this Proposal.

1.03 GENERAL

Where an item is omitted, or scope of Work is decreased, all Work pertaining to the item whether specifically stated or not, shall be omitted and where an item is added or modified or where scope of Work is increased, all Work pertaining to that required to render same ready for use on the Project in accordance with intention of Drawings and Specifications shall be included in an agreed upon price amount.

1.04 BASE BID

The Base Bid includes all work required to construct the Project completely and in accordance with the Contract Documents.

1.05 ALTERNATES

- A. Add Alternate 1. Replace built-up roofing system.**
- B. Add Alternate 2. Renovation of restrooms within building**

The above Alternate descriptions are general in nature and for reference purposes only. The Contract Documents, including, without limitation, the Drawings and Specifications, must be referred to for the complete scope of Work.

PART 2 - UNIT PRICING

2.01 GENERAL – Not used.

2.02 UNIT PRICES – Not used.

END OF DOCUMENT

PRODUCT OPTIONS AND SUBSTITUTIONS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. Instructions to Bidders;
- B. General Conditions, including, without limitation, Substitutions For Specified Items;
- C. Special Conditions.

1.02 SUBSTITUTIONS OF MATERIALS AND EQUIPMENT:

- A. Catalog numbers and specific brands or trade names followed by the designation "or equal" are used in conjunction with material and equipment required by the Specifications to establish the standards of quality, utility, and appearance required. Substitutions which are equal in quality, utility, and appearance to those specified may be reviewed subject to the provisions of the General Conditions.
- B. Wherever more than one manufacturer's product is specified, the first-named product is the basis for the design used in the work and the use of alternative-named manufacturers' products or substitutes may require modifications in that design. If such alternatives are proposed by Contractor and are approved by the District and/or the Architect, Contractor shall assume all costs required to make necessary revisions and modifications of the design resulting from the substitutions requested by the Contractor.
- C. When materials and equipment are specified by first manufacturer's name and product number, second manufacturer's name and "or approved equal," supporting data for the second product, if proposed by Contractor, shall be submitted in accordance with the requirements for substitutions.
- D. If the District and/or Architect, in reviewing proposed substitute materials and equipment, require revisions or corrections to be made to previously accepted Shop Drawings and supplemental supporting data to be resubmitted, Contractor shall promptly do so. If any proposed substitution is judged by the District and/or Architect to be unacceptable, the specified material or equipment shall be provided.
- E. Samples may be required. Tests required by the District and/or Architect for the determination of quality and utility shall be made at the expense of Contractor, with acceptance of the test procedure first given by the District.

- F. In reviewing the supporting data submitted for substitutions, the District and/or Architect will use for purposes of comparison all the characteristics of the specified material or equipment as they appear in the manufacturer's published data even though all the characteristics may not have been particularly mentioned in the Contract Documents. If more than two (2) submissions of supporting data are required, the cost of reviewing the additional supporting data shall be borne by Contractor, and the District will deduct the costs from the Contract Price.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

DOCUMENT 01 26 00

CHANGES IN THE WORK

**CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE PROVISIONS IN THE
GENERAL CONDITIONS RELATED TO CHANGES AND/OR REQUESTS FOR CHANGES**

END OF DOCUMENT

DOCUMENT 01 29 00

**APPLICATION FOR PAYMENT AND
CONDITIONAL AND UNCONDITIONAL WAIVER AND RELEASE FORMS**

**CONTRACTOR SHALL COMPLY WITH ALL PROVISIONS IN THE GENERAL
CONDITIONS RELATED TO APPLICATIONS FOR PAYMENT AND/OR PAYMENTS.**

**VACAVILLE CLASSROOM BUILDING (ANNEX)
RENOVATION PROJECT**

SOLANO COMMUNITY COLLEGE DISTRICT

**APPLICATION FOR PAYMENT AND
CONDITIONAL AND UNCONDITIONAL
WAIVER AND RELEASE FORMS
DOCUMENT 00 29 00-1**

**CONDITIONAL WAIVER AND RELEASE
ON PROGRESS PAYMENT**
(Civil Code Section 8132)

NOTICE: THIS DOCUMENT WAIVES THE CLAIMANT'S LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS EFFECTIVE ON RECEIPT OF PAYMENT. A PERSON SHOULD NOT RELY ON THIS DOCUMENT UNLESS SATISFIED THAT THE CLAIMANT HAS RECEIVED PAYMENT.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Through Date: _____

Conditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job through the Through Date of this document. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. This document is effective only on the claimant's receipt of payment from the financial institution on which the following check is drawn:

Maker of Check: _____

Amount of Check: \$ _____

Check Payable to: _____

Exceptions

This document does not affect any of the following:

- (1) Retentions.
- (2) Extras for which the claimant has not received payment.
- (3) The following progress payments for which the claimant has previously given a conditional waiver and release but has not received payment:

Date(s) of waiver and release: _____

Amount(s) of unpaid progress payment(s): \$ _____

- (4) Contract rights, including (A) a right based on rescission, abandonment, or breach of contract, and (B) the right to recover compensation for work not compensated by the payment.

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

**UNCONDITIONAL WAIVER AND RELEASE
ON PROGRESS PAYMENT**
(Civil Code Section 8134)

NOTICE TO CLAIMANT: THIS DOCUMENT WAIVES AND RELEASES LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS UNCONDITIONALLY AND STATES THAT YOU HAVE BEEN PAID FOR GIVING UP THOSE RIGHTS. THIS DOCUMENT IS ENFORCEABLE AGAINST YOU IF YOU SIGN IT, EVEN IF YOU HAVE NOT BEEN PAID. IF YOU HAVE NOT BEEN PAID, USE A CONDITIONAL WAIVER AND RELEASE FORM.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Through Date: _____

Unconditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job through the Through Date of this document. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. The claimant has received the following progress payment: \$_____.

Exceptions

This document does not affect any of the following:

- (1) Retentions.
- (2) Extras for which the claimant has not received payment.
- (3) Contract rights, including (A) a right based on rescission, abandonment, or breach of contract, and (B) the right to recover compensation for work not compensated by the payment.

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

**CONDITIONAL WAIVER AND RELEASE
ON FINAL PAYMENT**
(Civil Code Section 8136)

NOTICE: THIS DOCUMENT WAIVES THE CLAIMANT'S LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS EFFECTIVE ON RECEIPT OF PAYMENT. A PERSON SHOULD NOT RELY ON THIS DOCUMENT UNLESS SATISFIED THAT THE CLAIMANT HAS RECEIVED PAYMENT.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Conditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. This document is effective only on the claimant's receipt of payment from the financial institution on which the following check is drawn:

Maker of Check: _____

Amount of Check: \$ _____

Check Payable to: _____

Exceptions

This document does not affect any of the following: _____

Disputed claims for extras in the amount of: \$ _____

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

**UNCONDITIONAL WAIVER AND RELEASE
ON FINAL PAYMENT**
(Civil Code Section 8138)

NOTICE TO CLAIMANT: THIS DOCUMENT WAIVES AND RELEASES LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS UNCONDITIONALLY AND STATES THAT YOU HAVE BEEN PAID FOR GIVING UP THOSE RIGHTS. THIS DOCUMENT IS ENFORCEABLE AGAINST YOU IF YOU SIGN IT, EVEN IF YOU HAVE NOT BEEN PAID. IF YOU HAVE NOT BEEN PAID, USE A CONDITIONAL WAIVER AND RELEASE FORM.

Name of Claimant: _____

Name of Customer: _____

Job Location: _____

Owner: _____

Unconditional Waiver and Release

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for all labor and service provided, and equipment and material delivered, to the customer on this job. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. The claimant has been paid in full.

Exceptions

This document does not affect any of the following: _____

Disputed claims for extras in the amount of: \$_____

Claimant's Signature: _____

Claimant's Title: _____

Date of Signature: _____

**VACAVILLE CLASSROOM BUILDING (ANNEX)
RENOVATION PROJECT**

SOLANO COMMUNITY COLLEGE DISTRICT

**APPLICATION FOR PAYMENT AND
CONDITIONAL AND UNCONDITIONAL
WAIVER AND RELEASE FORMS
DOCUMENT 00 29 00-6**

PROJECT MEETINGS

PART I – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions;
- C. Summary of Work; and
- D. Submittals.

1.02 SECTION INCLUDES:

- A. Scheduling of Work under this Contract shall be performed by Contractor in accordance with requirements of this Section.
 - (1) Development of schedule, cost and resource loading of the schedule, monthly payment requests, and project status reporting requirements of the Contract shall employ computerized Critical Path Method (“CPM”) scheduling (“CPM Schedule”).
 - (2) CPM Schedule shall be cost loaded based on Schedule of Values as approved by District.
 - (3) Submit schedules and reports as specified in the General Conditions.
- B. Upon Award of Contract, Contractor shall immediately commence development of Initial and Original CPM Schedules to ensure compliance with CPM Schedule submittal requirements.

1.03 CONSTRUCTION SCHEDULE:

- A. Within ten (10) days of being awarded the Contract and before request for first progress payment, the Contractor shall prepare and submit to the Project Manager a construction progress schedule conforming to the Milestone Schedule below.
- B. The Construction Schedule shall be continuously updated, and an updated schedule shall be submitted with each application for progress payment. Each revised schedule shall indicate the work actually accomplished during the previous period and the schedule for completion of the remaining work.

C. Milestone Schedule:

<u>ACTIVITY DESCRIPTION</u>	<u>REQUIRED COMPLETION</u>
NTP/CONSTRUCTION START FINAL PROJECT COMPLETION	TBD July 13, 2017

1.04 QUALIFICATIONS

- A. Contractor shall employ experienced scheduling personnel qualified to use the latest version of **Primavera Project Planner**. Experience level required is set forth below. Contractor may employ such personnel directly or may employ a consultant for this purpose.
- (1) The written statement shall identify the individual who will perform CPM scheduling.
 - (2) Capability and experience shall be verified by description of construction projects on which individual has successfully applied computerized CPM.
 - (3) Required level of experience shall include at least two (2) projects of similar nature and scope with value not less than three-fourths ($\frac{3}{4}$) of the Total Bid Price of this Project. The written statement shall provide contact persons for referenced projects with current telephone and address information.
- B. District reserves the right to approve or reject Contractor's scheduler or consultant at any time. District reserves the right to refuse replacing Contractor's scheduler or consultant, if District believes replacement will negatively affect the scheduling of Work under this Contract.

1.05 GENERAL

- A. Progress Schedule shall be based on and incorporate milestone and completion dates specified in Contract Documents.
- B. Overall time of completion and time of completion for each milestone shown on Progress Schedule shall adhere to times in the Contract, unless an earlier (advanced) time of completion is requested by Contractor and agreed to by District. Any such agreement shall be formalized by a Change Order.
- (1) District is not required to accept an early completion schedule, i.e., one that shows earlier completion date than the Contract Time.
 - (2) Contractor shall not be entitled to extra compensation in event agreement is reached on an early completion schedule and Contractor completes its Work, for whatever reason, beyond completion date shown in its early completion schedule but within the Contract Time.

- (3) A schedule showing the work completed in less than the Contract Time, and that has been accepted by District, shall be considered to have Project Float. The Project Float is the time between the scheduled completion of the work and the Completion Date. Project Float is a resource available to both District and the Contractor.
- C. Ownership Project Float: Neither the District nor Contractor owns Project Float. The Project owns the Project Float. As such, liability for delay of the Completion Date rests with the party whose actions, last in time, actually cause delay to the Completion Date.
- (1) For example, if Party A uses some, but not all of the Project Float and Party B later uses remainder of the Project Float as well as additional time beyond the Project Float, Party B shall be liable for the time that represents a delay to the Completion Date.
 - (2) Party A would not be responsible for the time since it did not consume the entire Project Float and additional Project Float remained; therefore, the Completion Date was unaffected by Party A.
- D. Progress Schedule shall be the basis for evaluating job progress, payment requests, and time extension requests. Responsibility for developing Contract CPM Schedule and monitoring actual progress as compared to Progress Schedule rests with Contractor.
- E. Failure of Progress Schedule to include any element of the Work, or any inaccuracy in Progress Schedule, will not relieve Contractor from responsibility for accomplishing the Work in accordance with the Contract. District's acceptance of schedule shall be for its use in monitoring and evaluating job progress, payment requests, and time extension requests and shall not, in any manner, impose a duty of care upon District, or act to relieve Contractor of its responsibility for means and methods of construction.
- F. Software: Use **Primavera P6**. Such software shall be compatible with Windows operating system. Contractor shall transmit contract file to District on compact disk at times requested by District.
- G. Transmit each item under the form approved by District.
- (1) Identify Project with District Project Name and Contract Number and name of Contractor.
 - (2) Provide space for Contractor's approval stamp and District's review stamps.
 - (3) Submittals received from sources other than Contractor will be returned to the Contractor without District's review.

1.06 INITIAL CPM SCHEDULE

- A. Initial CPM Schedule submitted for review at the pre-construction conference shall serve as Contractor's schedule for up to ninety (90) calendar days after the Notice to Proceed.
- B. Indicate detailed plan for the Work to be completed in first ninety (90) days of the Contract; details of planned mobilization of plant and equipment; sequence of early operations; procurement of materials and equipment. Show Work beyond ninety (90) calendar days in summary form.
- C. Initial CPM Schedule shall be time-scaled.
- D. Initial CPM Schedule shall be cost and resource loaded. Accepted cost and resource loaded schedule will be used as basis for monthly progress payments until acceptance of the Original CPM Schedule. Use of Initial CPM Schedule for progress payments shall not exceed ninety (90) calendar days.
- E. District and Contractor shall meet to review and discuss the Initial CPM Schedule within seven (7) calendar days after it has been submitted to District.
 - (1) District's review and comment on the schedule shall be limited to Contract conformance (with sequencing, coordination, and milestone requirements).
 - (2) Contractor shall make corrections to schedule necessary to comply with Contract requirements and shall adjust schedule to incorporate any missing information requested by District. Contractor shall resubmit Initial CPM Schedule if requested by District.
- F. If, during the first ninety (90) days after Notice to Proceed, the Contractor is of the opinion that any of the Work included on its Initial CPM Schedule has been impacted, the Contractor shall submit to District a written Time Impact Evaluation ("TIE") in accordance with Article 1.12 of this Section. The TIE shall be based on the most current update of the Initial CPM Schedule.

1.07 ORIGINAL CPM SCHEDULE

- A. Submit a detailed proposed Original CPM Schedule presenting an orderly and realistic plan for completion of the Work in conformance with requirements as specified herein.
- B. Progress Schedule shall include or comply with following requirements:
 - (1) Time scaled, cost and resource (labor and major equipment) loaded CPM schedule.

- (2) No activity on schedule shall have duration longer than fifteen (15) work days, with exception of submittal, approval, fabrication and procurement activities, unless otherwise approved by District.
 - (a) Activity durations shall be total number of actual work days required to perform that activity.
- (3) The start and completion dates of all items of Work, their major components, and milestone completion dates, if any.
- (4) District -furnished materials and equipment, if any, identified as separate activities.
- (5) Activities for maintaining Project Record Documents.
- (6) Dependencies (or relationships) between activities.
- (7) Processing/approval of submittals and shop drawings for all material and equipment required per the Contract. Activities that are dependent on submittal acceptance or material delivery shall not be scheduled to start earlier than expected acceptance or delivery dates.
 - (a) Include time for submittals, re-submittals and reviews by District. Coordinate with accepted schedule for submission of Shop Drawings, samples, and other submittals.
 - (b) Contractor shall be responsible for all impacts resulting from re-submittal of Shop Drawings and submittals.
- (8) Procurement of major equipment, through receipt and inspection at jobsite, identified as separate activity.
 - (a) Include time for fabrication and delivery of manufactured products for the Work.
 - (b) Show dependencies between procurement and construction.
- (9) Activity description; what Work is to be accomplished and where.
- (10) The total cost of performing each activity shall be total of labor, material, and equipment, excluding overhead and profit of Contractor. Overhead and profit of the General Contractor shall be shown as a separate activity in the schedule. Sum of cost for all activities shall equal total Contract value.
- (11) Resources required (labor and major equipment) to perform each activity.
- (12) Responsibility code for each activity corresponding to Contractor or Subcontractor responsible for performing the Work.

- (13) Identify the activities which constitute the controlling operations or critical path. No more than twenty-five (25%) of the activities shall be critical or near critical. Near critical is defined as float in the range of one (1) to (10) days.
 - (14) Twenty (20) workdays for developing punch list(s), completion of punch-list items, and final clean up for the Work or any designated portion thereof. No other activities shall be scheduled during this period.
 - (15) Interface with the work of other contractors, District, and agencies such as, but not limited to, utility companies.
 - (16) Show detailed Subcontractor Work activities. In addition, furnish copies of Subcontractor schedules upon which CPM was built.
 - (a) Also furnish for each Subcontractor, as determined by District, submitted on Subcontractor letterhead, a statement certifying that Subcontractor concurs with Contractor's Original CPM Schedule and that Subcontractor's related schedules have been incorporated, including activity duration, cost and resource loading.
 - (b) Subcontractor schedules shall be independently derived and not a copy of Contractor's schedule.
 - (c) In addition to Contractor's schedule and resource loading, obtain from electrical, mechanical, and plumbing Subcontractors, and other Subcontractors as required by District, productivity calculations common to their trades, such as units per person day, feet of pipe per day per person, feet of wiring per day per person, and similar information.
 - (d) Furnish schedule for Contractor/Subcontractor CPM schedule meetings which shall be held prior to submission of Original CPM schedule to District. District shall be permitted to attend scheduled meetings as an observer.
 - (17) Activity durations shall be in Work days.
 - (18) Submit with the schedule a list of anticipated non-Work days, such as weekends and holidays. The Progress Schedule shall exclude in its Work day calendar all non-Work days on which Contractor anticipates critical Work will not be performed.
- C. Original CPM Schedule Review Meeting: Contractor shall, within sixty (60) days from the Notice to Proceed date, meet with District to review the Original CPM Schedule submittal.
- (1) Contractor shall have its Project Manager, Project Superintendent, Project Scheduler, and key Subcontractor representatives, as required by District, in attendance. The meeting will take place over a continuous one (1) day period.

- (2) District's review will be limited to submittal's conformance to Contract requirements including, but not limited to, coordination requirements. However, review may also include:
 - (a) Clarifications of Contract Requirements.
 - (b) Directions to include activities and information missing from submittal.
 - (c) Requests to Contractor to clarify its schedule.
- (3) Within five (5) days of the Schedule Review Meeting, Contractor shall respond in writing to all questions and comments expressed by District at the Meeting.

1.08 ADJUSTMENTS TO CPM SCHEDULE

- A. Adjustments to Original CPM Schedule: Contractor shall have adjusted the Original CPM Schedule submittal to address all review comments from original CPM Schedule review meeting and resubmit network diagrams and reports for District's review.
- (1) District, within ten (10) days from date that Contractor submitted the revised schedule, will either:
 - (a) Accept schedule and cost and resource loaded activities as submitted, or
 - (b) Advise Contractor in writing to review any part or parts of schedule which either do not meet Contract requirements or are unsatisfactory for District to monitor Project's progress, resources, and status or evaluate monthly payment request by Contractor.
 - (2) District may accept schedule with conditions that the first monthly CPM Schedule update be revised to correct deficiencies identified.
 - (3) When schedule is accepted, it shall be considered the "Original CPM Schedule" which will then be immediately updated to reflect the current status of the work.
 - (4) District reserves right to require Contractor to adjust, add to, or clarify any portion of schedule which may later be discovered to be insufficient for monitoring of Work or approval of partial payment requests. No additional compensation will be provided for such adjustments, additions, or clarifications.

- B. Acceptance of Contractor's schedule by District will be based solely upon schedule's compliance with Contract requirements.
 - (1) By way of Contractor assigning activity durations and proposing sequence of Work, Contractor agrees to utilize sufficient and necessary management and other resources to perform work in accordance with the schedule.
 - (2) Upon submittal of schedule update, updated schedule shall be considered "current" CPM Schedule.
 - (3) Submission of Contractor's schedule to District shall not relieve Contractor of total responsibility for scheduling, sequencing, and pursuing Work to comply with requirements of Contract Documents, including adverse effects such as delays resulting from ill-timed Work.
- C. Submittal of Original CPM Schedule, and subsequent schedule updates, shall be understood to be Contractor's representation that the Schedule meets requirements of Contract Documents and that Work shall be executed in sequence indicated on the schedule.
- D. Contractor shall distribute Original CPM Schedule to Subcontractors for review and written acceptance, which shall be noted on Subcontractors' letterheads to Contractor and transmitted to District for the record.

1.09 MONTHLY CPM SCHEDULE UPDATE SUBMITTALS

- A. Following acceptance of Contractor's Original CPM Schedule, Contractor shall monitor progress of Work and adjust schedule each month to reflect actual progress and any anticipated changes to planned activities.
 - (1) Each schedule update submitted shall be complete, including all information requested for the Original CPM Schedule submittal.
 - (2) Each update shall continue to show all Work activities including those already completed. These completed activities shall accurately reflect "as built" information by indicating when activities were actually started and completed.
- B. A meeting will be held on approximately the twenty-fifth (25th) of each month to review the schedule update submittal and progress payment application.
 - (1) At this meeting, at a minimum, the following items will be reviewed: Percent (%) complete of each activity; Time Impact Evaluations for Change Orders and Time Extension Request; actual and anticipated activity sequence changes; actual and anticipated duration changes; and actual and anticipated Contractor delays.
 - (2) These meetings are considered a critical component of overall monthly schedule update submittal and Contractor shall have appropriate

personnel attend. At a minimum, these meetings shall be attended by Contractor's General Superintendent and Scheduler.

- (3) Contractor shall plan on the meeting taking no less than one (1) hour.
- C. Within five (5) working days after monthly schedule update meeting, Contractor shall submit the updated CPM Schedule update.
- D. Within five (5) work days of receipt of above noted revised submittals, District will either accept or reject monthly schedule update submittal.
 - (1) If accepted, percent (%) complete shown in monthly update will be basis for Application for Payment by the Contractor. The schedule update shall be submitted as part of the Contractor's Application for Payment.
 - (2) If rejected, update shall be corrected and resubmitted by Contractor before the Application for Payment is submitted.
- E. Neither updating, changing or revising of any report, curve, schedule, or narrative submitted to District by Contractor under this Contract, nor District's review or acceptance of any such report, curve, schedule or narrative shall have the effect of amending or modifying in any way the Completion Date or milestone dates or of modifying or limiting in any way Contractor's obligations under this Contract.

1.10 SCHEDULE REVISIONS

- A. Updating the Schedule to reflect actual progress shall not be considered revisions to the Schedule. Since scheduling is a dynamic process, revisions to activity durations and sequences are expected on a monthly basis.
- B. To reflect revisions to the schedule, the Contractor shall provide District with a written narrative with a full description and reasons for each Work activity revised. For revisions affecting the sequence of work, the Contractor shall provide a schedule diagram which compares the original sequence to the revised sequence of work. The Contractor shall provide the written narrative and schedule diagram for revisions two (2) working days in advance of the monthly schedule update meeting.
- C. Schedule revisions shall not be incorporated into any schedule update until the revisions have been reviewed by District. District may request further information and justification for schedule revisions and Contractor shall, within three (3) days, provide District with a complete written narrative response to District's request.
- D. If the Contractor's revision is still not accepted by District, and the Contractor disagrees with District's position, the Contractor has seven (7) calendar days from receipt of District's letter rejecting the revision to provide a written narrative providing full justification and explanation for the revision. The Contractor's failure to respond in writing within seven (7) calendar days of

District's written rejection of a schedule revision shall be contractually interpreted as acceptance of District's position, and the Contractor waives its rights to subsequently dispute or file a claim regarding District's position.

- E. At District's discretion, the Contractor can be required to provide Subcontractor certifications of performance regarding proposed schedule revisions affecting said Subcontractors.

1.11 RECOVERY SCHEDULE

- A. If the Schedule Update shows a completion date twenty-one (21) calendar days beyond the Contract Completion Date, or individual milestone completion dates, the Contractor shall submit to District the proposed revisions to recover the lost time within seven (7) calendar days. As part of this submittal, the Contractor shall provide a written narrative for each revision made to recapture the lost time. If the revisions include sequence changes, the Contractor shall provide a schedule diagram comparing the original sequence to the revised sequence of work.
- B. The revisions shall not be incorporated into any schedule update until the revisions have been reviewed by District.
- C. If the Contractor's revisions are not accepted by District, District and the Contractor shall follow the procedures in paragraph 1.09.C, 1.09.D and 1.09.E above.
- D. At District's discretion, the Contractor can be required to provide Subcontractor certifications for revisions affecting said Subcontractors.

1.12 TIME IMPACTS EVALUATION ("TIE") FOR CHANGE ORDERS, AND OTHER DELAYS

- A. When Contractor is directed to proceed with changed Work, the Contractor shall prepare and submit within fourteen (14) calendar days from the Notice to Proceed a TIE which includes both a written narrative and a schedule diagram depicting how the changed Work affects other schedule activities. The schedule diagram shall show how the Contractor proposes to incorporate the changed Work in the schedule and how it impacts the current schedule-update critical path. The Contractor is also responsible for requesting time extensions based on the TIE's impact on the critical path. The diagram must be tied to the main sequence of schedule activities to enable District to evaluate the impact of changed Work to the scheduled critical path.
- B. Contractor shall be required to comply with the requirements of Paragraph 1.09.A for all types of delays such as, but not limited to, Contractor/Subcontractor delays, adverse weather delays, strikes, procurement delays, fabrication delays, etc.
- C. Contractor shall be responsible for all costs associated with the preparation of TIEs, and the process of incorporating them into the current schedule update. The Contractor shall provide District with four (4) copies of each TIE.

- D. Once agreement has been reached on a TIE, the Contract Time will be adjusted accordingly. If agreement is not reached on a TIE, the Contract Time may be extended in an amount District allows, and the Contractor may submit a claim for additional time claimed by contractor.

1.13 TIME EXTENSIONS

- A. The Contractor is responsible for requesting time extensions for time impacts that, in the opinion of the Contractor, impact the critical path of the current schedule update. Notice of time impacts shall be given in accord with the General Conditions.
- B. Where an event for which District is responsible impacts the projected Completion Date, the Contractor shall provide a written mitigation plan, including a schedule diagram, which explains how (e.g., increase crew size, overtime, etc.) the impact can be mitigated. The Contractor shall also include a detailed cost breakdown of the labor, equipment, and material the Contractor would expend to mitigate District-caused time impact. The Contractor shall submit its mitigation plan to District within fourteen (14) calendar days from the date of discovery of the impact. The Contractor is responsible for the cost to prepare the mitigation plan.
- C. Failure to request time, provide TIE, or provide the required mitigation plan will result in Contractor waiving its right to a time extension and cost to mitigate the delay.
- D. No time will be granted under this Contract for cumulative effect of changes.
- E. District will not be obligated to consider any time extension request unless the Contractor complies with requirements of Contract Documents.
- F. Failure of the Contractor to perform in accordance with the current schedule update shall not be excused by submittal of time extension requests.
- G. If the Contractor does not submit a TIE within the required fourteen (14) calendar days for any issue, it is mutually agreed that the Contractor does not require a time extension for said issue.

1.14 SCHEDULE REPORTS

- A. Submit four (4) hard copies and one (1) electronic file of the following reports with the Initial CPM Schedule, the Original CPM Schedule, and each monthly update.
- B. Required Reports:
 - (1) Two activity listing reports: one sorted by activity number and one by total Project Float. These reports shall also include each activity's early/late and actual start and finish dates, original and remaining

duration, Project Float, responsibility code, and the logic relationship of activities.

- (2) Cost report sorted by activity number including each activity's associated cost, percentage of Work accomplished, earned value-to-date, previous payments, and amount earned for current update period.**Error! Bookmark not defined.**
- (3) Schedule plots presenting time-scaled network diagram showing activities and their relationships with the controlling operations or critical path clearly highlighted.
- (4) Cash flow report calculated by early start, late start, and indicating actual progress. Provide an exhibit depicting this information in graphic form.
- (5) Planned versus actual resource (i.e., labor) histogram calculated by early start and late start.

C. Other Reports

In addition to above reports, District may request, from month-to-month, any two of the following reports. Submit four (4) hard copies and one (1) electronic file of all reports.

- (1) Activities by early start.
- (2) Activities by late start.
- (3) Activities grouped by Subcontractors or selected trades.
- (4) Activities with scheduled early start dates in a given time frame, such as fifteen (15) or thirty (30) day outlook.

D. If requested, furnish District with report files on compact disks containing all schedule files for each report generated.

1.15 PROJECT STATUS REPORTING

- A. In addition to submittal requirements for CPM scheduling identified in this Section, Contractor shall provide a monthly project status report (i.e., written narrative report) to be submitted in conjunction with each CPM Schedule as specified herein. Status reporting shall be in form specified below.
- B. Contractor shall prepare monthly written narrative reports of status of Project for submission to District. Written status reports shall include:
 - (1) Status of major Project components (percent (%) complete, amount of time ahead or behind schedule) and an explanation of how Project will be brought back on schedule if delays have occurred.

- (2) Progress made on critical activities indicated on CPM Schedule.
- (3) Explanations for any lack of work on critical path activities planned to be performed during last month.
- (4) Explanations for any schedule changes, including changes to logic or to activity durations.
- (5) List of critical activities scheduled to be performed next month.
- (6) Status of major material and equipment procurement.
- (7) Any delays encountered during reporting period.
- (8) Contractor shall provide printed report indicating actual versus planned resource loading for each trade and each activity. This report shall be provided on weekly and monthly basis.
 - (a) Actual resource shall be accumulated in field by Contractor, and shall be as noted on Contractor's daily reports. These reports will be basis for information provided in computer-generated monthly and weekly printed reports.
 - (b) Contractor shall explain all variances and mitigation measures.
- (9) Contractor may include any other information pertinent to status of Project. Contractor shall include additional status information requested by District at no additional cost.
- (10) Status reports, and the information contained therein, shall not be construed as claims, notice of claims, notice of delay, or requests for changes or compensation.

1.16 WEEKLY SCHEDULE REPORT

At the Weekly Progress Meeting, the Contractor shall provide and present a time-scaled three (3) week look-ahead schedule that is based and correlated by activity number to the current schedule (i.e., Initial, Original CPM, or Schedule Update).

1.17 DAILY CONSTRUCTION REPORTS

On a daily basis, Contractor shall submit a daily activity report to District for each workday, including weekends and holidays when worked. Contractor shall develop the daily construction reports on a computer-generated database capable of sorting daily Work, manpower, and manhours by Contractor, Subcontractor, area, sub-area, and Change Order Work. Daily reports shall be entered into the EADOC Project Management system provided by the District.

- A. Project name and Project number.

- B. Contractor's name and address.
- C. Weather, temperature, and any unusual site conditions.
- D. Brief description and location of the day's scheduled activities and any special problems and accidents, including Work of Subcontractors. Descriptions shall be referenced to CPM scheduled activities.
- E. Worker quantities for its own Work force and for Subcontractors of any tier.
- F. Equipment, other than hand tools, utilized by Contractor and Subcontractors.

1.18 PERIODIC VERIFIED REPORTS

Contractor shall complete and verify construction reports on a form prescribed by the Division of the State Architect and file reports on the first day of February, May, August, and November during the preceding quarter year; at the completion of the Contract; at the completion of the Work; at the suspension of Work for a period of more than one (1) month; whenever the services of Contractor or any of Contractor's Subcontractors are terminated for any reason; and at any time a special verified report is required by the Division of the State Architect. Refer to section 4-336 and section 4-343 of Part 1, Title 24 of the California Code of Regulations.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

SUBMITTALS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Contractor's Submittals and Schedules, Drawings and Specifications;
- B. Special Conditions.

1.02 SECTION INCLUDES:

- A. Definitions:
 - (1) Shop Drawings and Product Data are as indicated in the General Conditions and include, but are not limited to, fabrication, erection, layout and setting drawings, formwork and falsework drawings, manufacturers' standard drawings, descriptive literature, catalogues, brochures, performance and test data, wiring and control diagrams. In addition, there are other drawings and descriptive data pertaining to materials, equipment, piping, duct and conduit systems, and methods of construction as may be required to show that the materials, equipment or systems and all positions conform to the requirement of the Contract Documents, including, without limitation, the Drawings.
 - (2) "Manufactured" applies to standard units usually mass-produced; "fabricated" means specifically assembled or made out of selected materials to meet design requirements. Shop Drawings shall establish the actual detail of manufactured or fabricated items, indicated proper relation to adjoining work and amplify design details of mechanical and electrical equipment in proper relation to physical spaces in the structure.
 - (3) Manufacturer's Instructions: Where any item of Work is required by the Contract Documents to be furnished, installed, or performed, at a minimum, in accordance with a specified product manufacturer's instructions, the Contractor shall procure and distribute copies of these to the District, the Architect, and all other concerned parties and shall furnish, install, or perform the work, at a minimum, in accordance with those instructions.
- B. Samples, Shop Drawings, Product Data, and other items as specified, in accordance with the following requirements:

- (1) Contractor shall submit all Shop Drawings, Product Data, and Samples to the District, the Architect, the Project Inspector, and the Construction Manager utilizing the District's Project Management Software EADOCs.
- (2) Contractor shall comply with all time frames herein and in the General Conditions and, in any case, shall submit required information in sufficient time to permit proper consideration and action before ordering any materials or items represented by such Shop Drawings, Product Data, and/or Samples.
- (3) Contractor shall comply with all time frames herein and in the General Conditions and, in any case, shall allow sufficient time so that no delay occurs due to required lead time in ordering or delivery of any item to the Site. Contractor shall be responsible for any delay in progress of Work due to its failure to observe these requirements.
- (4) Time for completion of Work shall not be extended on account of Contractor's failure to promptly submit Shop Drawings, Product Data, and/or Samples.
- (5) Reference numbers on Shop Drawings shall have Architectural and/or Engineering Contract Drawings reference numbers for details, sections, and "cuts" shown on Shop Drawings. These reference numbers shall be in addition to any numbering system that Contractor chooses to use or has adopted as standard.
- (6) When the magnitude or complexity of submittal material prevents a complete review within the stated time frame, Contractor shall make this submittal in increments to avoid extended delays.
- (7) Contractor shall certify on submittals for review that submittals conform to Contract requirements. In event of any variance, Contractor shall specifically state in transmittal and on Shop Drawings, portions vary and require approval of a substitute. Also certify that Contractor-furnished equipment can be installed in allocated space.
- (8) Unless specified otherwise, sampling, preparation of samples, and tests shall be in accordance with the latest standard of the American Society for Testing and Materials.
- (9) Upon demand by Architect or District, Contractor shall submit samples of materials and/or articles for tests or examinations and consideration before Contractor incorporates same in Work. Contractor shall be solely responsible for delays due to sample(s) not being submitted in time to allow for tests. Acceptance or rejection will be expressed in writing. Work shall be equal to approved samples in every respect. Samples that are of value after testing will remain the property of Contractor.

C. Submittal Schedule:

- (1) Contractor shall prepare its proposed submittal schedule that is coordinated with its proposed construction schedule and submit both to the District within ten (10) days after the date of the Notice to Proceed. Contractor's proposed schedules shall become the Project Construction Schedule and the Project Submittal Schedule after each is approved by the District.
- (2) Contractor is responsible for all lost time should the initial submittal be rejected, marked "revised and resubmit", etc.
- (3) All Submittals shall be forwarded to the District by the date indicated on the approved Submittal Schedule, unless an earlier date is necessary to maintain the Construction Schedule, in which case those Submittals shall be forwarded to the District so as not to delay the Construction Schedule.

1.03 SHOP DRAWINGS:

- A. Contractor shall submit one electronic and six (6) opaque reproductions in color. The District will review and return the reproducible copy and one (1) opaque reproduction to Contractor.
- B. Before commencing installation of any Work, the Contractor shall submit and receive approval of all drawings, descriptive data, and material list(s) as required to accomplish Work.
- C. Review of Shop Drawings is regarded as a service to assist Contractor and in all cases original Contract Documents shall take precedence as outlined under General Conditions.
- D. No claim for extra time or payment shall be based on work shown on Shop Drawings unless the claim is (1) noted on Contractor's transmittal letter accompanying Shop Drawings and (2) Contractor has complied with all applicable provisions of the General Conditions, including, without limitation, provisions regarding changes and payment, and all required written approvals.
- E. District shall not review Shop Drawings for quantities of materials or number of items supplied.
- F. District's and/or Architect's review of Shop Drawing will be general. District and/or Architect review does not relieve Contractor of responsibility for accuracy, proper fitting, construction of Work, furnishing of materials, or Work required by Contract Documents and not indicated on Shop Drawings. Shop Drawing reviewed by District and/or Architect is not to be construed as approving departures from Contract Documents.
- G. Review of Shop Drawings and Schedules does not relieve Contractor from responsibility for any aspect of those Drawings or Schedules that is a violation of local, County, State, or Federal laws, rules, ordinances, or rules and regulations of commissions, boards, or other authorities or utilities having jurisdiction.

- H. Before submitting Shop Drawings for review, Contractor shall check Shop Drawings of its subcontractors for accuracy, and confirm that all Work contiguous with and having bearing on other work shown on Shop Drawings is accurately drawn and in conformance with Contract Documents.
- I. Submitted drawings and details must bear stamp of approval of Contractor:
 - (1) Stamp and signature shall clearly certify that Contractor has checked Shop Drawings for compliance with Drawings.
 - (2) If Contractor submits a Shop Drawing without an executed stamp of approval, or whenever it is evident (despite stamp) that Drawings have not been checked the District and/or Architect will not consider them and will return them to the Contractor for revision and resubmission. In that event, it will be deemed that Contractor has not complied with this provision and Contractor shall bear risk of all delays to same extent as if it had not submitted any Shop Drawings or details.
- J. Submission of Shop Drawings (in either original submission or when resubmitted with correction) constitutes evidence that Contractor has checked all information thereon and that it accepts and is willing to perform Work as shown.
- K. Contractor shall pay for cost of any changes in construction due to improper checking and coordination. Contractor shall be responsible for all additional costs, including coordination. Contractor shall be responsible for costs incurred by itself, the District, the Architect, the Project Inspector, the Construction Manager, any other Subcontractor or contractor, etc., due to improperly checked and/or coordination of submittals.
- L. Shop Drawings must clearly delineate the following information:
 - (1) Project name and address.
 - (2) Architect's name and project number.
 - (3) Shop Drawing title, number, date, and scale.
 - (4) Names of Contractor, Subcontractor(s) and fabricator.
 - (5) Working and erection dimensions.
 - (6) Arrangements and sectional views.
 - (7) Necessary details, including complete information for making connections with other Work.
 - (8) Kinds of materials and finishes.
 - (9) Descriptive names of materials and equipment, classified item numbers, and locations at which materials or equipment are to be installed in the

Work. Contractor shall use same reference identification(s) as shown on Contract Drawings.

- M. Contractor shall prepare composite drawings and installation layouts when required to solve tight field conditions.
 - (1) Shop Drawings shall consist of dimensioned plans and elevations and must give complete information, particularly as to size and location of sleeves, inserts, attachments, openings, conduits, ducts, boxes, structural interferences, etc.
 - (2) Contractor shall coordinate these composite Shop Drawings and installation layouts in the field between itself and its Subcontractor(s) for proper relationship to the Work, the work of other trades, and the field conditions. The Contractor shall check and approve all submittal(s) before submitting them for final review.

1.04 PRODUCT DATA OR NON REPRODUCIBLE SUBMITTALS:

- A. Contractor shall submit manufacturer's printed literature in original form. Any fading type of reproduction will not be accepted. Contractor shall utilize the EADOC Project Management system for submitting and tracking of submittals. Contract must submit a minimum of six (6) each, to the District. District shall return one (1) to the Contractor, who shall reproduce whatever additional copies it requires for distribution.
- B. Contractor shall submit six (6) copies of a complete list of all major items of mechanical, plumbing, and electrical equipment and materials in accordance with the approved Submittal Schedule, except as required earlier to comply with the approved Construction Schedule. Other items specified are to be submitted prior to commencing Work. Contractor shall submit items of like kind at one time in a neat and orderly manner. Partial lists will not be acceptable.
- C. Submittals shall include manufacturer's specifications, physical dimensions, and ratings of all equipment. Contractor shall furnish performance curves for all pumps and fans. Where printed literature describes items in addition to that item being submitted, submitted item shall be clearly marked on sheet and superfluous information shall be crossed out. If highlighting is used, Contractor shall mark all copies.
- D. Equipment submittals shall be complete and include space requirements, weight, electrical and mechanical requirements, performance data, and supplemental information that may be requested.

1.05 SAMPLES:

- A. Contractor shall submit for approval Samples as required and within the time frame in the Contract Documents. Materials such as concrete, mortar, etc., which require on-site testing will be obtained from Project Site.

- B. Contractor shall submit four (4) samples except where greater or lesser number is specifically required by Contract Documents including, without limitation, the Specifications.
 - (1) Samples must be of sufficient size and quality to clearly illustrate functional characteristics, with integrally related parts and attachment devices.
 - (2) Samples must show full range of texture, color, and pattern.
- C. Contractor shall make all Submittals, unless it has authorized Subcontractor(s) to submit and Contractor has notified the District in writing to this effect.
- D. Samples to be shipped prepaid or hand-delivered to the District.
- E. Contractor shall mark samples to show name of Project, name of Contractor submitting, Contract number and segment of Work where representative Sample will be used, all applicable Specifications Sections and documents, Contract Drawing Number and detail, and ASTM or FS reference, if applicable.
- F. Contractor shall not deliver any material to Site prior to receipt of District's and/or Architect's completed written review and approval. Contractor shall furnish materials equal in every respect to approved Samples and execute Work in conformance therewith.
- G. District's and/or Architect's review, acceptance, and/or approval of Sample(s) will not preclude rejections of any material upon discovery of defects in same prior to final acceptance of completed Work.
- H. After a material has been approved, no change in brand or make will be permitted.
- I. Contractor shall prepare its Submittal Schedule and submit Samples of materials requiring laboratory tests to specified laboratory for testing not less than ninety (90) days before such materials are required to be used in Work.
- J. Samples which are rejected must be resubmitted promptly after notification of rejection and be marked "Resubmitted Sample" in addition to other information required.
- K. Field Samples and Mock-Ups are to be removed by Contractor at District's direction:
 - (1) Size: As Specified.
 - (2) Furnish catalog numbers and similar data, as requested.

1.06 REVIEW AND RESUBMISSION REQUIREMENTS:

- A. The District will arrange for review of Sample(s), Shop Drawing(s), Product Data, and other submittal(s) by appropriate reviewer and return to Contractor

as provided below within twenty-one (21) days after receipt or within twenty-one (21) days after receipt of all related information necessary for such review, whichever is later.

- B. One (1) copy of product or materials data will be returned to Contractor with the review status.
- C. Samples to be incorporated into the Work will be returned to Contractor, together with a written notice designating the Sample with the appropriate review status and indicating errors discovered on review, if any. Other Samples will not be returned, but the same notice will be given with respect thereto, and that notice shall be considered a return of the Sample.
- D. Contractor shall revise and resubmit any Sample(s), Shop Drawing(s), Product Data, and other submittal(s) as required by the reviewer. Such resubmittals will be reviewed and returned in the same manner as original Sample(s), Shop Drawing(s), Product Data, and other submittal(s), within fourteen (14) days after receipt thereof or within fourteen (14) days after receipt of all related information necessary for such review.
- E. Contractor may proceed with any of the Work covered by Sample(s), Shop Drawing(s), Product Data, and other submittal(s) upon its return if designated as no exception taken, or revise as noted, provided the Contractor proceeds in accordance with the District and/or the Architect's notes and comments.
- F. Contractor shall not begin any of the work covered by a Sample(s), Shop Drawing(s), Product Data, and other submittal(s), designated as revise and resubmit or rejected, until a revision or correction thereof has been reviewed and returned to Contractor.
- G. Sample(s), Shop Drawing(s), Product Data, and other submittal(s) designated as revise and resubmit or rejected and requiring resubmittal, shall be revised or corrected and resubmitted to the District no later than fourteen (14) days or a shorter period as required to comply with the approved Construction Schedule, after its return to Contractor.
- H. Neither the review nor the lack of review of any Sample(s), Shop Drawing(s), Product Data, and other submittal(s) shall waive any of the requirements of the Contract Documents, or relieve Contractor of any obligation thereunder.
- I. District's and/or Architect's review of Shop Drawings does not relieve the Contractor of responsibility for any errors that may exist. Contractor is responsible for the dimensions and design of adequate connections and details and for satisfactory construction of all the Work.

PART 2 – PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

SITE STANDARDS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including without limitation, Site Access, Conditions, and Regulations;
- B. Special Conditions;
- C. Drug-Free Workplace Certification;
- D. Tobacco-Free Environment Certification;
- E. Criminal Background Investigation/Fingerprinting Certification;
- F. Temporary Facilities and Controls.

1.02 REQUIREMENTS OF THE DISTRICT:

- A. Drug-Free Schools and Safety Requirements:
 - (1) All school sites and other District Facilities have been declared "Drug-Free Zones." No drugs, alcohol and/or smoking are allowed at any time in any buildings and/or grounds on District property. No students, staff, visitors, or contractors are to use drugs on these sites.
 - (2) Smoking and the use of tobacco products by all persons is prohibited on or in District property. District property includes school buildings, school grounds, school owned vehicles and vehicles owned by others while on District property. Contractor shall be post: "Non-Smoking Area" in a highly visible location on Site. Contractor may designate a smoking area outside of District property within the public right-of-way, provided that this area remains quiet and unobtrusive to adjacent neighbors. This smoking area is to be kept clean at all times.
 - (3) Contractor shall ensure that no alcohol, firearms, weapons, or controlled substances enter or are used at the Site. Contractor shall immediately remove from the Site and terminate the employment of any employee(s) found in violation of this provision.
- B. Language: Unacceptable and/or loud language will not be tolerated, "Cat calls" or other derogatory language toward students or public will not be allowed.
- C. Disturbing the Peace (Noise and Lighting):

- (1) Contractor shall observe the noise ordinance of the Site at all times including, without limitation, all applicable local, city, and/or state laws, ordinances, and/or regulations regarding noise and allowable noise levels.
- (2) The use of radios, etc., shall be controlled to keep all sound at a level that cannot be heard beyond the immediate area of use. District reserves the right to prohibit the use of radios at the Site, except for handheld communication radios (e.g., Nextel phones or radios).
- (3) If portable lights are used after dark, all light must be located so as not to direct light into neighboring property.

D. Traffic:

- (1) Building will be unoccupied during the planned construction period and it is the only building on this Site. Once occupancy is authorized, driving on the Premises shall be limited to periods when students and public are not present. If driving or deliveries must be made during the school hours, two (2) or more flagmen shall lead the vehicle across the area of travel. In no case shall driving take place across pedestrian paths during lunch and/or class period changes. The speed limit on-the Premises shall be five (5) miles per hour (maximum) or less if conditions require.
- (2) All paths of travel for deliveries, including without limitation, material, equipment, and supply deliveries, shall be reviewed and approved by District in advance. Any damage will be repaired to the pre-damaged condition by the Contractor.
- (3) There is only one (1) entry driveway to the Site. Contractor and District shall agree upon and designate a staging area in the parking lot. Location of gates and fencing shall be approved in advance with District and at Contractor's expense.
- (4) Parking areas shall be reviewed and approved by District in advance. No parking is to occur on unpaved areas.

E. All of the above shall be observed and complied with by the Contractor and all workers on the Site. Failure to follow these directives could result in individual(s) being suspended or removed from the work force at the discretion of the District. The same rules and regulations shall apply equally to delivery personnel, inspectors, consultants, and other visitors to the Site.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

REGULATORY REQUIREMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Obtaining of Permits and Licenses and Work to Comply with All Applicable Regulations;
- B. Special Conditions;
- C. Quality Control.

1.02 DESCRIPTION:

This section covers the general requirements for regulatory requirements pertaining to the Work and is supplementary to all other regulatory requirements mentioned or referenced elsewhere in the Contract Documents.

1.03 REQUIREMENTS OF REGULATORY AGENCIES:

- A. All statutes, ordinances, laws, rules, codes, regulations, standards, and the lawful orders of all public authorities having jurisdiction of the Work, are hereby incorporated into these Contract Documents as if repeated in full herein and are intended to be included in any reference to Code or Building Code, unless otherwise specified, including, without limitation, the references in the list below. Contractor shall make available at the Site copies of all the listed documents applicable to the Work as the District and/or Architect may request, including, without limitation, applicable portions of the California Code of Regulations ("CCR").
- B. This Project shall be governed by applicable regulations, including, without limitation, the State of California's Administrative Regulations for the Division of the State Architect-Structural Safety (DSA/SS), Chapter 4, Part 1, Title 24, CCR, and the most current version on the date the bids are opened and as it pertains to school construction including, without limitation:
 - (1) Test and testing laboratory per Section 4-335 (District shall pay for the testing laboratory.)
 - (2) Special inspections per Section 4-333(c).
 - (3) Verified reports per Section 4-365 & 4-343(c).
 - (4) Duties of the Architect & Engineers shall be per Section 4-333(a) and 4-341.

- (5) Duties of the Contractor shall be per Section 4-343.
- (6) Addenda and Change Orders per Section 4-338.

Contractor shall keep and make available a copy of Part 1 and 2 of the most current version of Title 24 at the Site during construction.

C. Items of deferred approval shall be clearly marked on the first sheet of the Architect's and/or Engineer's approved Drawings. All items later submitted for approval shall be per Title 24 requirements to the DSA.

- (1) Building Standards Administrative Code, Part 1, Title 24, CCR
- (2) California Building Code (CBC), Part 2, Title 24, CCR; (Uniform Building code volumes 1-3 and California Amendments).
- (3) California Electrical Code (CEC), Part 3, Title 24, CCR; (National Electrical Code and California Amendments).
- (4) California Mechanical Code (CMC), Part 4, Title 24, CCR; (Uniform Mechanical Code and California Amendments).
- (5) California Plumbing Code (CPC), Part 5, Title 24, CCR; (Uniform Plumbing Code and California Amendments).
- (6) California Fire Code (CFC), Part 9, Title 24, CCR; (Fire Plumbing Code and California Amendments).
- (7) California Referenced Standards Code, Part 12, Title 24, CCR.
- (8) State Fire Marshal Regulations, Public Safety, Title 19, CCR.
- (9) Partial List of Applicable NFPA Standards:
 - (a) NFPA 13 - Automatic Sprinkler System.
 - (b) NFPA 14 - Standpipes Systems.
 - (c) NFPA 17A - Wet Chemical System
 - (d) NFPA 24 - Private Fire Mains.
 - (e) (California Amended) NFPA 72 - National Fire Alarm Codes.
 - (f) NFPA 253 - Critical Radiant Flux of Floor Covering System.
 - (g) NFPA 2001 - Clean Agent Fire Extinguishing Systems.
- (10) California Division of the State Architect interpretation of Regulations.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

ABBREVIATIONS AND ACRONYMS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions including without limitation, Definitions;
- B. Special Conditions.

1.02 DOCUMENT INCLUDES:

- A. Abbreviations used throughout the Contract Documents.
- B. Reference to a technical society, organization, or body is by abbreviation, as follows:

1.	AA	Aluminum Association
2.	AAMA	Architectural Aluminum Manufacturers Association
3.	AASHTO	American Association of State Highway and Transportation Officials
4.	ABPA	Acoustical and Board Products Association
5.	ACI	American Concrete Institute
6.	AGA	American Gas Association
7.	AGC	Associated General Contractors
8.	AHC	Architectural Hardware Consultant
9.	AI	Asphalt Institute
10.	AIA	American Institute of Architects
11.	AIEE	American Institute of Electrical Engineers
12.	AISC	American Institute of Steel Construction
13.	AISI	American Iron and Steel Institute
14.	AMCA	Air Moving and Conditioning Association
15.	ANSI	American National Standards Institute
16.	APA	American Plywood Association
17.	ARI	Air Conditioning and Refrigeration Institute
18.	ASHRAE	American Society of Heating, Refrigeration and Air Conditioning Engineers
19.	ASME	American Society of Mechanical Engineers
20.	ASSE	American Society of Structural Engineers
21.	ASTM	American Society of Testing and Materials
22.	AWPB	American Wood Preservers Bureau
23.	AWPI	American Wood preservers Institute
24.	AWS	American Welding Society
25.	AWSC	American Welding Society Code
26.	AWI	Architectural Woodwork Institute

27.	AWWA	American Water Works Association
28.	BIA	Brick Institute of America
29.	CCR	California Code of Regulations
30.	CLFMI	Chain Link Fence Manufacturers Institute
31.	CMG	California Masonry Guild
32.	CRA	California Redwood Association
33.	CRSI	Concrete Reinforcing Steel Institute
34.	CS	Commercial Standards
35.	CSI	Construction Specifications Institute
36.	CTI	Cooling Tower Institute
37.	FGMA	Flat Glass Manufacturer's Association
38.	FIA	Factory Insurance Association
39.	FM	Factory Mutual
40.	FS	Federal Specification
41.	FTI	Facing Title Institute
42.	GA	Gypsum Association
43.	ICC	International Code Council
44.	IEEE	Institute of Electrical and Electronic Engineers
45.	IES	Illumination Engineering Society
46.	LIA	Lead Industries Association
47.	MIA	Marble Institute of America
48.	MLMA	Metal Lath Manufacturers Association
49.	MS	Military Specifications
50.	NAAMM	National Association of Architectural Metal Manufacturers
51.	NBHA	National Builders Hardware Association
52.	NBFU	National Board of Fire Underwriters
53.	NBS	National Bureau of Standards
54.	NCMA	National Concrete Masonry Association
55.	NEC	National Electrical Code
56.	NEMA	National Electrical Manufacturers Association
57.	NFPA	National Fire Protection Association/National Forest Products Association
58.	NMWIA	National Mineral Wool Insulation Association
59.	NTMA	National Terrazzo and Mosaic Association
60.	NWMA	National Woodwork Manufacturer's Association
61.	ORS	Office of Regulatory Services (California)
62.	OSHA	Occupational Safety and Health Act
63.	PCI	Precast Concrete Institute
64.	PCA	Portland Cement Association
65.	PDCA	Painting and Decorating Contractors of America
66.	PDI	Plumbing Drainage Institute
67.	PEI	Porcelain Enamel Institute
68.	PG&E	Pacific Gas & Electric Company
69.	PS	Product Standards
70.	SDI	Steel Door Institute; Steel Deck Institute
71.	SJI	Steel Joist Institute
72.	SSPC	Steel Structures Painting Council
73.	TCA	Tile Council of America
74.	TPI	Truss Plate Institute
75.	UBC	Uniform Building Code

76.	UL	Underwriters Laboratories Code
77.	UMC	Uniform Mechanical Code
78.	USDA	United States Department of Agriculture
79.	VI	Vermiculite Institute
80.	WCLA	West Coast Lumberman's Association
81	WCLB	West Coast Lumber Bureau
82.	WEUSER	Western Electric Utilities Service Engineering Requirements
83.	WIC	Woodwork Institute of California
84.	WPOA	Western Plumbing Officials Association

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

DEFINITIONS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISION

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions including without limitation, Definitions;
- B. Special Conditions.

1.02 QUALITY ASSURANCE:

- A. For products or workmanship specified by association, trade, or Federal Standards, Contractor shall comply with requirements of the standard, except when more rigid requirements are specified in the Contract Documents, or are required by applicable codes.
- B. Contractor shall conform to current reference standard publication date in effect on the date of bid opening.
- C. Contractor shall obtain copies of standards unless specifically required not to by the Contract Documents.
- D. Contractor shall maintain a copy of all standards at jobsite during submittals, planning, and progress of the specific Work, until final completion, unless specifically required not to by the Contract Documents.
- E. Should specified reference standards conflict with Contract Documents, Contractor shall request clarification from the District and./or the Architect before proceeding.
- F. The contractual relationship of the parties to the Contract shall not be altered from the contractual relationship as indicated in the Contract Documents by mention or inference otherwise in any referenced document.
- G. Governing Codes shall be as shown in the Contract Documents including, without limitation, the Specifications.

END OF DOCUMENT

REFERENCES**PART 1 - GENERAL****1.01 SCHEDULE OF REFERENCES:**

The following information is intended only for the general assistance of the Contractor, and the District does not represent that all of the information is current. It is the Contractor's responsibility to verify the correct information for each of the entities listed.

AA	Aluminum Association 1525 Wilson Blvd., Suite 600 Arlington, VA 22209 www.aluminum.org	703/358-2960
AABC	Associated Air Balance Council 1518 K Street, NW, Suite 503 Washington, DC 20005 www.aabchq.com	202/737-0202
AAMA	American Architectural Manufacturers Association 1827 Walden Office Sq., Suite 550 Schaumburg, IL 60173-4268 www.aamanet.org	847/303-5664
AASHTO	American Association of State Highway and Transportation Officials 444 N Capitol St. NW - Suite 249 Washington, DC 20001 www.transportation.org	202/624-5800
AATCC	American Association of Textile Chemists and Colorists P.O. Box 12215 One Davis Drive Research Triangle Park, NC 27709 2215 www.aatcc.org	919/549-8141
ACA	American Coatings Association 1500 Rhode Island Ave., NW Washington DC, 20005 www.paint.org	202/462-6272
ACI	American Concrete Institute 38800 Country Club Dr. Farmington Hills, MI 48331-3439 www.aci-int.org	248/848-3700
ACPA	American Concrete Pipe Association 8445 Freeport Parkway, Suite 350 Irving, TX 75063-2595 www.concrete-pipe.org	972/506-7216

ADC	Air Diffusion Council 1901 N. Roselle Road, Suite 800 Schaumburg, Illinois 60195 www.flexibleduct.org	847/706-6750
AF&PA	American Forest and Paper Association 1111 Nineteenth Street, NW, Suite 800 Washington, DC 20036 www.afandpa.org	202/463-2700
AGA	American Gas Association 400 North Capitol Street, NW Washington, DC 20001 www.aga.org	202/824-7000
AGC	Associate General Contractors of America 2300 Wilson Blvd., Suite 400 Arlington, VA 22201 www.agc.org	703/548-3118
AHA	American Hardboard Association 1210 West Northwest Highway Palatine, IL 60067 domensino.com/AHA/default.htm	847/934-8800
AI	Asphalt Institute 2696 Research Park Drive Lexington, KY 40511-8480 www.asphaltinstitute.org	859/288-4960
AIA	The American Institute of Architects 1735 New York Ave., NW Washington, DC 20006-5292 www.aia.org	202/626-7300
AISC	American Institute of Steel Construction One East Wacker Drive Suite 700 Chicago, IL 60601-1802 www.aisc.org	312.670.2400
AIA	American Insurance Association (formerly the National Board of Fire Underwriters) 2101 L Street, NW, Suite 400 Washington, DC 20037 www.aiadc.org	202/828-7100
AISI	American Iron and Steel Institute 25 Massachusetts Ave., NW, Suite 800 Washington, DC 20001 www.steel.org	202/452.7100
AITC	American Institute of Timber Construction 7012 S. Revere Parkway Suite 140 Centennial, CO 80112 www.aitc-glulam.org	303/792.9559

ALI	Associated Laboratories, Inc. P.O. Box 152837 Dallas, TX 75315 www.assoc-labs.com	214/565-0593
ALSC	American Lumber Standards Committee, Inc. P.O. Box 210 Germantown, MD 20875 www.alsc.org	301/972-1700
AMCA	Air Movement and Control Association International, Inc. 30 W. University Drive Arlington Heights, IL 60004 www.amca.org	847/394-0150
ANLA	American Nursery & Landscape Association 1200 G Street NW, Suite 800 Washington, DC 20005 www.anla.org	202/789-2900
ANSI	American National Standards Institute 1899 L Street, NW, 11th Floor Washington, DC, 20036 www.ansi.org	202/293.8020
APA	APA-The Engineered Wood Association 7011 S. 19th Street Tacoma, WA 98466-5333 www.apawood.org	253/565-6600
APA	Architectural Precast Association 6710 Winkler Road, Suite 8 Fort Myers, Florida 33919 www.archprecast.org	239/454-6989
ARI	Air Conditioning and Refrigeration Institute 4100 N. Fairfax Drive, Suite 200 Arlington, VA 22203 www.lightindustries.com/ARI	703/524-8800
ARMA	Asphalt Roofing Manufacturers Association Public Information Department 750 National Press Building 529 14th Street, NW Washington, DC 20045 www.asphaltroofing.org	202/591-2450
ASA	The Acoustical Society of America ASA Office Manager Suite 1N01 2 Huntington Quadrangle Melville, NY 11747-4502 http://asa.aip.org	516/576-2360

ASCE	American Society of Civil Engineers 1801 Alexander Bell Drive Reston, VA 20191 www.asce.org	800/548-2723 703/295-6300
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers 1791 Tullie Circle, NE Atlanta, GA 30329-2305 www.ashrae.org	800/527-4723 404/636-8400
ASLA	American Society of Landscape Architects 636 Eye Street, NW Washington, DC 20001-3736 www.asla.org	202/898-2444
ASME	American Society of Mechanical Engineers Three Park Avenue New York, NY 10016-5990 www.asme.org	800/434-2763
ASPE	American Society of Plumbing Engineers 2980 S River Rd. Des Plaines, IL 60018 http://aspe.org	847/296-0002
ASQ	American Society for Quality P.O. Box 3005 Milwaukee, WI 53201-3005 or 600 North Plankinton Avenue Milwaukee, WI 53203 http://asq.org	800/248-1946 414/272-8575
ASSE	American Society of Sanitary Engineering 901 Canterbury, Suite A Westlake, Ohio 44145 www.asse-plumbing.org	440/835-3040
ASTM	ASTM International 100 Barr Harbor Drive PO Box C700 West Conshohocken, PA, 19428-2959 www.astm.org	610/832-9500
AWCI	Association of the Wall and Ceiling Industry 513 West Broad Street, Suite 210 Falls Church, VA 22046 www.awci.org	703/538-1600
AWPA	American Wood Protection Association P.O. Box 361784 Birmingham, AL 35236-1784 www.awpa.com	205/733-4077

AWPI	American Wood Preservers Institute 2750 Prosperity Ave. Suite 550 Fairfax, VA 22031-4312 www.arcata.com	800/356-AWPI 703/204-0500
AWS	American Welding Society 8669 Doral Boulevard, Suite 130 Doral, Florida 33166 www.aws.org	800/443-9353 305/443-9353
AWI	Architectural Woodwork Institute 46179 Westlake Drive, Suite 120 Potomac Falls, VA 20165-5874 www.awinet.org	571/323-3636
AWWA	American Water Works Association 6666 West Quincy Avenue Denver, CO 80235 www.awwa.org	800/926-7337 303/794 7711
BHMA	Builders Hardware Manufacturers Association 355 Lexington Avenue, 15th floor New York, NY 10017 www.buildershardware.com	212/297-2122
BIA	The Brick Industry Association 1850 Centennial Park Drive, Suite 301 Reston, VA 20191 www.gobrick.com	703/620-0010
CGA	Compressed Gas Association 14501 George Carter Way, Suite 103 Chantilly VA 20151-2923 www.cganet.com	703/788-2700
CISCA	Ceilings & Interior Systems Construction Association 1010 Jorie Blvd, Suite 30 Oak Brook, IL 60523 www.cisca.org	630/584-1919
CISPI	Cast Iron Soil Pipe Institute 1064 Delaware Avenue SE Atlanta, GA 30316 www.cispi.org	404/622-0073
CLFMI	Chain Link Fence Manufacturers Institute 10015 Old Columbia Road, Suite B-215 Columbia, MD 21046 www.associationsites.com/main- pub.cfm?usr=clfma	410/290-6267
CPA	Composite Panel Association 19465 Deerfield Avenue, Suite 306 Leesburg, VA 20176	703/724-1128

	www.compositepanel.org	
CPSC	Consumer Product Safety Commission 4330 East West Highway Bethesda, MD 20814 www.cpsc.gov	301/504-7923 800/638-2772
CRA	California Redwood Association 405 Enfrente Drive, Suite 200 Novato, CA 94949 www.calredwood.org	415/382-0662
CRI	Carpet and Rug Institute P.O. Box 2048 Dalton, Georgia 30722-2048 www.carpet-rug.org	706/278-3176
CRSI	Concrete Reinforcing Steel Institute 933 N. Plum Grove Road Schaumburg, IL 60173 4758 www.crsi.org	847/517-1200
CSI	The Construction Specifications Institute 110 South Union Street, Suite 100 Alexandria VA 22314 www.csinet.org	800/689-2900
CTIOA	Ceramic Tile Institute of America 12061 Jefferson Blvd. Culver City, CA 90230-6219 www.ctioa.org	310/574-7800
DHI	Door and Hardware Institute (formerly National Builders Hardware Association) 14150 Newbrook Dr. Chantilly, VA 20151 www.dhi.org	703/222-2010
DIPRA	Ductile Iron Pipe Research Association 2000 2nd Avenue, South Suite 429 Birmingham, AL 35233 www.dipra.org	205/402-8700
DOC	U.S. Department of Commerce 1401 Constitution Ave., NW Washington, D.C. 20230 www.commerce.gov	202/482-2000
DOT	U.S. Department of Transportation 1200 New Jersey Avenue, SE Washington, DC 20590 www.dot.gov	855/368-4200
EJMA	Expansion Joint Manufacturers Association, Inc. 25 North Broadway Tarrytown, NY 10591	914/332-0040

	www.ejma.org	
EPA	Environmental Protection Agency Ariel Rios Building 1200 Pennsylvania Avenue, N.W. Washington, DC 20460 www.epa.gov	202/272-0167
FCICA	Floor Covering Installation Contractors Association 7439 Millwood Drive West Bloomfield, MI 48322 www.fcica.com	248/661-5015 877/TO-FCICA
FM Global	Factory Mutual Insurance Company Mary Breighner Global Practice Leader Education, Public Entities, Health Care FM Global 9 Woodcrest Court Cincinnati, OH 45246 www.fmglobal.com	513/742-9516
FS	General Services Administration (GSA) Index of Federal Specifications, Standards and Commercial Item Descriptions 470 East L'Enfant Plaza, SW, Suite 8100 Washington, DC 20407 www.gsa.gov	202/619-8925
GA	The Gypsum Association 6525 Belcrest Road, Suite 480 Hyattsville, MD 20782 www.gypsum.org	301/277-8686
GANA	Glass Association of North America 800 SW Jackson St., Suite 1500 Topeka, KS 66612-1200 www.glasswebsite.com	785/271-0208
HMA	Hardwood Manufacturers Association 665 Rodi Road, Suite 305 Pittsburgh, PA 15235 http://hmamembers.org	412/244-0440
HPVA	Hardwood Plywood & Veneer Association 1825 Michael Faraday Drive Reston, Virginia 20190 www.hpva.org	703/435-2900

IAPMO	International Association of Plumbing and Mechanical Officials (formerly the Western Plumbing Officials Association) 4755 E. Philadelphia St. Ontario, CA 91761 www.iapmo.org	909/472-4100
ICC	International Code Council 500 New Jersey Avenue, NW, 6th Floor Washington, DC 20001 www.iccsafe.org	888/422-7233
IEEE	Institute of Electrical and Electronics Engineers 3 Park Avenue, 17th Floor New York, NY 10016-5997 www.ieee.org	212/419-7900
IES	Illuminating Engineering Society 120 Wall Street, Floor 17 New York, NY 10005-4001 www.ies.org	212/248-5000
ITRK	Intertek Testing Services 3933 US Route 11 Cortland, NY 13045 www.intertek.com	607/753-6711
MCAA	Mechanical Contractors Association of America 1385 Piccard Drive Rockville, MD 20850 www.mcaa.org	301/869-5800
MIA	Marble Institute of America 28901 Clemens Rd, Ste 100 Cleveland, OH 44145 www.marble-institute.com	440/250-9222
MMPA (formerly WMMPA)	Moulding & Millwork Producers Association (formerly Wood Moulding & Millwork Producers Association) 507 First Street Woodland, CA 95695 www.wmmpa.com	530/661-9591 800/550-7889
MSS	Manufacturers Standardization Society (MSS) of the Valve and Fittings Industry 127 Park Street, NE Vienna, VA 22180-4602 http://mss-hq.org	703/281-6613
NAAMM	National Association of Architectural Metal Manufacturers 800 Roosevelt Rd. Bldg. C, Suite 312 Glen Ellyn, IL 60137 www.naamm.org	630/942-6591

NAIMA	North American Insulation Manufacturers Association 44 Canal Center Plaza, Suite 310 Alexandria, VA 22314 www.naima.org	703/684-0084
NAPA	National Asphalt Pavement Association 5100 Forbes Blvd. Lanham, MD USA 20706-4407 www.asphaltpavement.org	888/468-6499 301/731-4748
NCSPA	National Corrugated Steel Pipe Association 14070 Proton Road, Suite 100 LB9 Dallas, TX 75244 www.ncspa.org	972/850-1907
NCMA	National Concrete Masonry Association 13750 Sunrise Valley Drive Herndon, VA 20171-4662 www.ncma.org	703/713-1900
NEBB	National Environmental Balancing Bureau 8575 Grovemont Circle Gaithersburg, MD 20877 www.nebb.org	301/977-3698
NECA	National Electrical Contractors Association 3 Bethesda Metro Center, Suite 1100 Bethesda, MD 20814 www.necanet.org	301/657-3110
	National Electrical Manufacturers Association 1300 North 17th Street, Suite 1752 Rosslyn, Virginia 22209 www.nema.org	703/841-3200
NEII	National Elevator Industry, Inc. 1677 County Route 64 P.O. Box 838 Salem, New York 12865-0838 www.neii.org	518/854-3100
NFPA	National Fire Protection Association 1 Batterymarch Park Quincy, Massachusetts USA 02169-7471 www.nfpa.org	617/770-3000
NHLA	National Hardwood Lumber Association PO Box 34518 Memphis, TN 38184 www.nhla.com	901/377-1818

NIA	National Insulation Association 12100 Sunset Hills Road, Suite 330 Reston, VA 20190 www.insulation.org	703/464-6422
NRCA	National Roofing Contractors Association 10255 W. Higgins Road, Suite 600 Rosemont, IL 60018-5607 www.nrca.net	847/299-9070
NSF	NSF International P.O. Box 130140 789 N. Dixboro Road Ann Arbor, MI 48113-0140, USA www.nsf.org	800/673-6275 734/769-8010
NTMA	National Terrazzo and Mosaic Association PO Box 2605 Fredericksburg, TX 78624 www.ntma.com	800/323-9736
OSHA	Occupational Safety and Health Act U.S. Department of Labor Occupational Safety & Health Administration 200 Constitution Ave., NW Washington, D.C. 20210 www.osha.gov	800/321-OSHA (6742)
PCA	Portland Cement Association 5420 Old Orchard Road Skokie, IL 60077 or 500 New Jersey Ave., N.W. 7 th Floor Washington, D.C. 20001 www.cement.org	847/966-6200 202/408-9494
PCI	Precast/Prestressed Concrete Institute 200 W. Adams St. #2100 Chicago, IL 60606 www.pci.org	312/786-0300
PDCA	Painting and Decorating Contractors of America 2316 Millpark Drive, Ste 220 Maryland Heights, MO 63043 www.pdca.com	800/332-PDCA (7322) 314/514-7322
PDI	Plumbing & Drainage Institute 800 Turnpike Street, Suite 300 North Andover, MA 01845 http://pdionline.org	978/557-0720 800/589-8956
PEI	Porcelain Enamel Institute, Inc. P.O. Box 920220 Norcross, GA 30010 www.porcelainenamel.com	770/676-9366

PG&E	Pacific Gas & Electric Company www.pge.com	800/743-5000
PLANET	Professional Landcare Network 950 Herndon Parkway, Suite 450 Herndon, Virginia 20170 www.landcarenetwork.org	703/736-9666 800/395-2522 703/736-9668
RFCI	Resilient Floor Covering Institute 115 Broad Street, Suite 201 La Grange GA 30240 www.rfci.com	706/882-3833
RIS	Redwood Inspection Service 818 Grayson Road, Suite 201 Pleasant Hill, CA 94523 www.redwoodinspection.com	925/935-1499
SDI	Steel Deck Institute P.O. Box 25 Fox River Grove, IL 60021 www.sdi.org	847/458-4647
SDI	Steel Door Institute 30200 Detroit Road Westlake, Ohio 44145 www.steeldoor.org	440/899-0010
SJI	Steel Joist Institute 234 W. Cheves Street Florence, SC 29501 http://steeljoist.org	843/407-4091
SMA	Stucco Manufacturers Association 500 East Yale Loop Irvine, CA 92614 www.stuccomfgassoc.com	949/387.7611
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association 4201 Lafayette Center Drive Chantilly, Virginia 20151-1219 www.smacna.org	703/803-2980
SPI	SPI: The Plastics Industry Trade Association, Inc. 1667 K St., NW, Suite 1000 Washington, DC 20006 www.plasticsindustry.org	202/974-5200
SSPC	Society for Protective Coatings (formerly the Steel Structures Painting Council) 40 24th St 6th Fl Pittsburgh, PA 15222 www.sspc.org	412/281-2331 877/281-7772

TCA	The Tile Council of North America 100 Clemson Research Blvd. Anderson, SC 29625 www.tcnatile.com	864/646-8453
TPI	Truss Plate Institute 218 North Lee Street, Suite 312 Alexandria, VA 22314 www.tpinst.org	703/683-1010
TPI	Turfgrass Producers International 2 East Main Street East Dundee, IL 60118 www.turfgrasssod.org	800/405-8873 847/649-5555
TCIA	Tree Care Industry Association (formerly the National Arborist Association) 136 Harvey Road, Suite 101 Londonderry, NH 03053 www.tcia.org	800/733-2622
TVI	The Vermiculite Institute c/o The Schundler Company 150 Whitman Avenue Edison, NJ. 08817 www.vermiculiteinstitute.org	732/287-2244
UL	Underwriters Laboratories Inc. 333 Pfingsten Road Northbrook, IL 60062-2096 www.ul.com	847/272-8800 877/854-3577
UNI	Uni-Bell PVC Pipe Association 2711 LBJ Freeway, Suite 1000 Dallas, TX 75234 www.uni-bell.org	972/243-3902
USDA	U.S. Department of Agriculture 1400 Independence Ave., S.W. Washington, DC 20250 www.usda.gov	202/720-2791
WA	Wallcoverings Association 401 North Michigan Avenue Suite 2200 Chicago, IL 60611 www.wallcoverings.org	312/321-5166

WCLIB	West Coast Lumber Inspection Bureau P.O. Box 23145 Portland, OR 97281 or 6980 S.W. Varns Tigard, OR 97223 www.wclib.org	503/639-0651
WCMA	Window Covering Manufacturers Association 355 Lexington Avenue 15th Floor New York, New York 10017 www.wcmanet.org	212/297-2122
WDMA	Window & Door Manufacturers Association 401 N. Michigan Avenue, Suite 2200 Chicago, IL 60611 or 2025 M Street, NW, Ste. 800 Washington, D.C. 20036-3309 www.wdma.com	312/321-6802 202/367-1157
WI	Woodwork Institute P.O. Box 980247 West Sacramento, CA 95798 www.wicnet.org	916/372-9943
WRI	Wire Reinforcement Institute 942 Main Street Hartford, CT 06103 www.wirereinforcementinstitute.org	860/240-9545
WWCA	Western Wall & Ceiling Contractors Association 1910 N. Lime St. Orange, California 92865 www.wwcca.org	714/221-5520
WWPA	Western Wood Products Association 522 SW Fifth Ave., Suite 500 Portland, OR 97204-2122 www2.wwpa.org	503/224-3930

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

MATERIALS AND EQUIPMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Purchase of Materials and Equipment;
- B. Special Conditions;
- C. Imported Materials Certification.

1.02 MATERIAL AND EQUIPMENT

- A. Only items approved by the District and/or Architect shall be used.
- B. Contractor shall submit lists of products and other product information in accordance with the Contract Documents, including, without limitation, the provisions regarding the submittals.

1.03 MATERIAL AND EQUIPMENT COLORS

- A. The District and/or Architect will provide a schedule of colors.
- B. No individual color selections will be made until after approval of all pertinent materials and equipment and after receipt of appropriate samples in accordance with the Contract Documents, including, without limitation, the provisions regarding the submittals.
- C. Contractor shall request priority in writing for any item requiring advance ordering to maintain the approved Construction Schedule.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Contractor shall deliver manufactured materials in original packages, containers, or bundles (with seals unbroken), bearing name or identification mark of manufacturer.
- B. Contractor shall deliver fabrications in as large assemblies as practicable; where specified as shop-primed or shop-finished, package or crate as required to preserve such priming or finish intact and free from abrasion.
- C. Contractor shall store materials in such a manner as necessary to properly protect them from damage. Materials or equipment damaged by handling, weather, dirt, or from any other cause will not be accepted.

- D. Materials are not be acceptable that have been warehoused for long periods of time, stored or transported in improper environment, improperly packaged, inadequately labeled, poorly protected, excessively shipped, deviated from normal distribution pattern, or reassembled.
- E. Contractor shall store material so as to cause no obstructions of sidewalks, roadways, and underground services. Contractor shall protect material and equipment furnished under Contract.
- F. Contractor may store materials on Site with prior written approval by the District, all material shall remain under Contractor's control and Contractor shall remain liable for any damage to the materials. Should the Project Site not have storage area available, the Contractor shall provide for off-site storage at a bonded warehouse and with appropriate insurance coverage at no cost to District.
- G. When any room in Project is used as a shop or storeroom, the Contractor shall be responsible for any repairs, patching, or cleaning necessary due to that use. Location of storage space shall be subject to prior written approval by District.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers listed in various sections of Contract Documents are names of those manufacturers that are believed to be capable of supplying one or more of items specified therein.
- B. The listing of a manufacturer does not imply that every product of that manufacturer is acceptable as meeting the requirements of the Contract Documents.

2.02 FACILITIES AND EQUIPMENT

Contractor shall provide, install, maintain, and operate a complete and adequate facility for handling, the execution, disposal, and distribution of material and equipment as required for proper and timely performance of Work connected with Contract.

2.03 MATERIAL REFERENCE STANDARDS

Where material is specified solely by reference to "standard specifications" and if requested by District, Contractor shall submit for review data on actual material proposed to be incorporated into Work of Contract listing name and address of vendor, manufacturer, or producer, and trade or brand names of those materials, and data substantiating compliance with standard specifications.

PART 3 - EXECUTION

3.01 WORKMANSHIP

- A. Where not more specifically described in any other Contract Documents, workmanship shall conform to methods and operations of best standards and accepted practices of trade or trades involved and shall include items of fabrication, construction, or installation regularly furnished or required for completion (including finish and for successful operation, as intended).
- B. Work shall be executed by tradespersons skilled in their respective lines of Work. When completed, parts shall have been durably and substantially built and present a neat appearance.

3.02 COORDINATION

- A. Contractor shall coordinate installation of Work so as to not interfere with installation of others. Adjustment or rework because of Contractor's failure to coordinate will be at no additional cost to District.
- B. Contractor shall examine in-place work for readiness, completeness, fitness to be concealed or to receive other work, and in compliance with Contract Documents. Concealing or covering Work constitutes acceptance of additional cost which will result should in-place Work be found unsuitable for receiving other Work or otherwise deviating from the requirements of the Contract Documents.

3.03 COMPLETENESS

Contractor shall provide all portions of the Work, unless clearly stated otherwise, installed complete and operational with all elements, accessories, anchorages, utility connections, etc., in manner to assure well-balanced performance, in accordance with manufacturer's recommendations and by Contract Documents. For example, electric water coolers require water, electricity, and drain services; roof drains require drain system; sinks fit within countertop, etc. Terms such as "installed complete," "operable condition," "for use intended," "connected to all utilities," "terminate with proper cap," "adequately anchored," "patch and refinish," "to match similar," should be assumed to apply in all cases, except where completeness of functional or operable condition is specifically stated as not required.

3.04 APPROVED INSTALLER OR APPLICATOR

Installation by a manufacturer's approved installer or applicator is an understood part of Specifications and only approved installer or applicator is to provide on-site Work where specified manufacturer has on-going program of approving (i.e. certifying, bonding, re-warranting) installers or applicators. Newly established relationships between a manufacturer and an installer or applicator who does not have other approved applicator work in progress or completed is not approved for this Project.

3.05 MANUFACTURER'S RECOMMENDATIONS

All installations shall be in accordance with manufacturer's published recommendations and specific written directions of manufacturer's representative. Should Contract Documents differ from recommendations of manufacturer or directions of his representative, Contractor shall analyze differences, make recommendations to the District and the Architect in writing, and shall not proceed until interpretation or clarification has been issued by the District and/or the Architect.

END OF DOCUMENT

QUALITY CONTROL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Inspector, Inspections and Tests, Uncovering of Work and Non-conforming of Work and Correction of Work;
- B. Special Conditions.

1.02 RELATED CODES:

- A. The Work is governed by requirements of Title 24, California Code of Regulations ("CCR"), and the Contractor shall keep a copy of these available at the job Site for ready reference during construction.
- B. The Division of the State Architect ("DSA") shall be notified at or before the start of construction.

1.03 OBSERVATION AND SUPERVISION:

- A. The District and Architect or their appointed representatives will review the Work and the Contractor shall provide facilities and access to the Work at all times as required to facilitate this review. Administration by the Architect and any consulting Structural Engineer will be in accordance with applicable regulations, including, without limitation, CCR, Part 1, Title 24, Section 4-341.
- B. One or more Project Inspector(s) approved by DSA and employed by or in contract with the District, referred to hereinafter as the "Project Inspector", will observe the work in accordance with CCR, Part 1, Title 24, Sections 4-333(b) and 4-342:
 - (1) The Project Inspector shall have access to the Work wherever it is in preparation or progress for ascertaining that the Work is in accordance with the Contract Documents and all applicable code sections.. The Contractor shall provide facilities and access as required and shall provide assistance for sampling or measuring materials.
 - (2) The Project Inspector will notify the District and Architect and call the attention of the Contractor to any observed failure of Work or material to conform to Contract Documents.
 - (3) The Project Inspector shall observe and monitor all testing and inspection activities required.

The Contractor shall conform with all applicable laws as indicated in the Contract Documents, including, without limitation, to CCR, Part 1, Title 24, Section 4-343. The Contractor shall supervise and direct the Work and maintain a competent superintendent on the job who is authorized to act in all matters pertaining to the Work. The Contractor's superintendent shall also inspect all materials, as they arrive, for compliance with the Contract Documents. Contractor shall reject defective Work or materials immediately upon delivery or failure of the Work or material to comply with the Contract Documents. The Contractor shall submit verified reports as indicated in the Contract Documents, including, without limitation, the Specifications and as required by Part 1, Title 24, Section 4-336.

1.04 TESTING AGENCIES:

- A. Testing agencies and tests shall be in conformance with the General Documents and the requirements of Part 1, Title 24, Section 4- 335.
- B. Testing and inspection in connection with earthwork shall be under the direction of the District's consulting soils engineer, if any, referred to hereinafter as the "Soils Engineer."
- C. Testing and inspection of construction materials and workmanship shall be performed by a qualified laboratory, referred to hereinafter as the "Testing Laboratory." The Testing Laboratory shall be under direction of an engineer registered in the State of California, shall conform to requirements of ASTM E329, and shall be employed by or in contract with the District.

1.05 TESTS AND INSPECTIONS:

- A. The Contractor shall be responsible for notifying the District and Project Inspector of all required tests and inspections. Contractor shall notify the District and Project Inspector at least seventy-two hours (72) hours in advance of performing any Work requiring testing or inspection.
- B. The Contractor shall provide access to Work to be tested and furnish incidental labor, equipment, and facilities to facilitate all inspections and tests.
- C. The District will pay for first inspections and tests required by the "CCR", and other inspections or tests that the District and/or the Architect may direct to have made, including the following principal items:
 - (1) Tests and observations for earthwork and paving.
 - (2) Tests for concrete mix designs, including tests of trial batches.
 - (3) Tests and inspections for structural steel work.
 - (4) Field tests for framing lumber moisture content.
 - (5) Additional tests directed by the District that establish that materials and installation comply with the Contract Documents.

- (6) Test and observation of welding and expansion anchors.
- D. The District may at its discretion, pay and back charge the Contractor for:
 - (1) Retests or reinspections, if required, and tests or inspections required due to Contractor error or lack of required identifications of material.
 - (2) Uncovering of work in accordance with Contract Documents.
 - (3) Testing done on weekends, holidays, and overtime will be chargeable to the Contractor for the overtime portion.
 - (4) Testing done off Site.
- E. Testing and inspection reports and certifications:
 - (1) If initially received by Contractor, Contractor shall provide to each of the following a copy of the agency or laboratory report of each test or inspection or certification.
 - a. The District;
 - b. The Construction Manager;
 - c. The Architect;
 - d. The Consulting Engineer, if any;
 - e. Other engineers on the Project, as appropriate;
 - f. The Project Inspector; and
 - g. The Contractor.
 - (2) When the test or inspection is one required by the CCR, a copy of the report shall also be provided to the DSA.

PART 2 - PRODUCTS

2.01 TYPE OF TEST AND INSPECTIONS:

- A. Slump Test
ASTM C 143

B. Concrete Tests

Testing agency shall test concrete used in the work per the following paragraphs:

- (1) Compressive Strength:
 - a. Minimum number of tests required: One (1) set of three (3) cylinders for each 100 cubic yards (Sec. 2604(h) 01) of concrete or major fraction thereof, placed in one (1) day. See Title 24, Section 2605(g).
 - b. Two cylinders of each set shall be tested at twenty-eight (28) days. One (1) cylinder shall be held in reserve and tested only when directed by the Architect or District.
 - c. Concrete shall test the minimum ultimate compressive strength in 28 days, as specified on the structural drawings.
 - d. In the event that the twenty-eight (28) day test falls below the minimum specified strength, the effective concrete in place shall be tested by taking cores in accordance with UBC Standard No. 26-13 and tested as required for cylinders.
 - e. In the event that the test on core specimens falls below the minimum specified strength, the concrete will be deemed defective and shall be removed and replaced upon such direction of the Architect, and in a manner acceptable to the Division of the State Architect.

C. Reinforcing, Steel

D. Structural Steel Per Title 24 and as noted:

- (1) Material: Steel per Table in Title 24, Section 2712.
- (2) Qualification of Welders (UBC Std. 27-6).
- (3) Shop fabrication (Section 2712(d). Structural steel only).
- (4) Shop and field welding (Section 2712(e)).

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

TEMPORARY FACILITIES AND CONTROLS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions;
- C. Site Standards.

1.02 TEMPORARY UTILITIES:

- A. Electric Power and Lighting
 - (1) Contractor will pay for power during the course of the Work. To the extent power is available in the building or on the Site, Contractor may use the District's existing utilities. Contractor shall be responsible for providing temporary facilities required to deliver that power service from its existing location in the building or on the Site to point of intended use.
 - (2) Contractor shall verify characteristics of power available in building or on the Site. Contractor shall take all actions required to make modifications where power of higher voltage or different phases of current are required. Contractor shall be fully responsible for providing that service and shall pay all costs required therefor.
 - (3) Contractor shall furnish, wire for, install, and maintain temporary electrical lights wherever it is necessary to provide illumination for the proper performance and/or observation of the Work: a minimum of 20 foot-candles for rough work and 50 foot-candles for finish work.
 - (4) Contractor shall be responsible for maintaining existing lighting levels in the project vicinity should temporary outages or service interruptions occur.

B. Heat and Ventilation

- (1) Contractor shall provide temporary heat to maintain environmental conditions to facilitate progress of the Work, to meet specified minimum conditions for the installation and curing of materials, and to protect materials and finishes from damage due to improper temperature and humidity conditions. Portable heaters shall be standard units complete with controls.
- (2) Contractor shall provide forced ventilation and dehumidification, as required, of enclosed areas for proper installation and curing of materials, to disperse humidity, and to prevent hazardous accumulations of dust, fumes, vapors, and gases.
- (3) Contractor shall pay the costs of installation, maintenance, operation, and removal of temporary heat and ventilation, including costs for fuel consumed, required for the performance of the Work.

C. Water

- (1) Contractor will pay for water during the course of the Work. To the extent water is then available in the building or on the Site, Contractor may use the District's existing utilities. Contractor shall be responsible for providing temporary facilities required to deliver such utility service from its existing location in the building or on the Site to point of intended use.
- (2) Contractor shall use backflow preventers on water lines at point of connection to District's water supply. Backflow preventers shall comply with requirements of Uniform Plumbing Code.
- (3) Contractor shall make potable water available for human consumption.

D. Sanitary Facilities

- (1) Contractor shall provide sanitary temporary facilities in no fewer numbers than required by law and such additional facilities as may be directed by the Inspector for the use of all workers. The facilities shall be maintained in a sanitary condition at all times and shall be left at the Site until removal is directed by the Inspector or Contractor completes all other work at the Site.
- (2) Use of toilet facilities in the Work under construction shall not be permitted except by consent of the Inspector and the District.

E. Internet and Telephone Service

- (1) Telephone and High-speed Internet Service: Contractor shall install and pay for all telephone (voice and facsimile) and High-speed Internet service use and maintenance charges and insure that such

utilities are available for use by all entities engaged in construction activities at Project site.

- (2) Contractor shall pay the costs for Internet, telephone and fax lines installation, maintenance, service, and removal.

F. District Field Office

District Field Office: Provide an insulated, weathertight, air-conditioned field office for use as by the District, District's Representative, Inspector of Record, and Architect; of sufficient size to accommodate required office personnel. District field office to contain office for IOR, office for Construction Manager (CM), Project Manager (PM), Architect and common meeting area as detailed below. Office to have internal restroom. Provide and maintain all new equipment below, including all ancillary supplies required to operate equipment provided under contract. (Such as; copier toner, copy paper, drinking cups, etc). Janitorial service shall be weekly.

- (2) IOR Office Requirements as follows:

Provide a minimum 140 sq. ft. (13 sq. m) office with lockable door.

One desk and one ergonomic chair, two four-drawer file cabinets, a plan table, a plan rack, and one bookcase.
One plain paper fax, copier, scanner, copier model HP Laser Jet M1522n MFP or approved equal with capability to fax multiple pages at a time and print a confirmation page.

- (3) CM/PM Office Requirements as follows:

Provide a minimum 140 sq. ft. (13 sq. m) office with lockable door.

One desk and one ergonomic chair, two four-drawer file cabinets, a plan table, a plan rack, and one bookcase.
Provide one (1) new digital camera with minimum 1 gigabyte storage card.
One plain paper fax, copier, scanner, copier model HP Laser Jet M1522n MFP or approved equal with capability to fax multiple pages at a time and print a confirmation page.

- (4) Common Meeting Area:

Provide a room of not less than 240 sq. ft. (22.5 sq. m) for Project meetings. Furnish room with conference table suitable for 14 people, 14 folding chairs, 4-foot-by-6-foot- tack board, and 4-foot-by-6-foot- white board.

- a. One desk and one ergonomic chair, one four-drawer file cabinet.
- b. Water cooler with hot and cold spigot.

One paper fax, scanner, commercial grade copier model Toshiba e-studio 2500c or approved equal capable of printing in color, faxing, high speed copying, stapling, collating, and networking. Provide technical support as required to ensure

that copier is fully operational for all user on the network. Provide paper, toner, and other sundries required for operation and use.

b. 3' smart level and electronic door pressure gauge for District use

a. Fire Protection:

- i. Contractor shall provide and maintain fire extinguishers and other equipment for fire protection. Such equipment shall be designated for use for fire protection only and shall comply with all requirements of the California Fire, State Fire Marshall and/or its designee.
- ii. Where on-site welding and burning of steel is unavoidable, Contractor shall provide protection for adjacent surfaces.

b. Trash Removal:

- i. Contractor shall provide trash removal on a weekly basis.

c. Temporary Facilities:

- i.

1.03 CONSTRUCTION AIDS:

A. Plant and Equipment:

- (1) Contractor shall furnish, operate, and maintain a complete plant for fabricating, handling, conveying, installing, and erecting materials and equipment; and for conveyances for transporting workmen. Include elevators, hoists, debris chutes, and other equipment, tools, and appliances necessary for performance of the Work.
- (2) Contractor shall maintain plant and equipment in safe and efficient operating condition. Damages due to defective plant and equipment, and uses made thereof, shall be repaired by Contractor at no expense to the District.

B. None of the District's tools and equipment shall be used by Contractor for the performance of the Work.

1.04 BARRIERS AND ENCLOSURES:

- A. Contractor shall obtain the District's written permission for locations and types of temporary barriers and enclosures, including fire-rated materials proposed for use, prior to their installation.
- B. Contractor shall provide and maintain temporary enclosures to prevent public entry and to protect persons using other portions of the Site and/or Premises, the public, and workers. Contractor shall also protect the Work and existing facilities from the elements, and adjacent construction and improvements, persons, and trees and plants from damage and injury from demolition and construction operations.
- C. Contractor shall provide site access to existing facilities for persons using other portions of the Site, the public, and for deliveries and other services and activities.
- D. Tree and Plant Protection:
 - (1) Contractor shall preserve and protect existing trees and plants on the Premises that are not designated or required to be removed, and those adjacent to the Premises.
 - (2) Contractor shall provide barriers to a minimum height of 4'-0" around drip line of each tree and plant, around each group of trees and plants, as applicable, in the proximity of demolition and construction operations.
 - (3) Contractor shall not park trucks, store materials, perform Work or cross over landscaped areas. Contractor shall not dispose of paint thinners, water from cleaning, plastering or concrete operations, or other deleterious materials in landscaped areas, storm drain systems, or sewers. Plant materials damaged as a result of the performance of the Work shall, at the option of the District and at Contractor's expense, either be replaced with new plant materials equal in size to those damaged or by payment of an amount representing the value of the damaged materials as determined by the District.
 - (4) Contractor shall remove soil that has been contaminated during the performance of the Work by oil, solvents, and other materials which could be harmful to trees and plants, and replace with good soil, at Contractor's expense.
 - (5) Excavation Around Trees:
 - (a) Excavation within drip lines of trees shall be done only where absolutely necessary and with written permission from the District.
 - (b) Where trenching for utilities is required within drip lines, tunneling under and around roots shall be by hand digging and shall be approved by the District. Main lateral roots and taproots shall not be cut. All roots 2 inches in diameter and

larger shall be tunneled under and heavily wrapped with wet burlap so as to prevent scarring or excessive drying. Smaller roots that interfere with installation of new work may be cut with prior approval by the District. Roots must first be cut with a Vermeer, or equivalent, root cutter prior to any trenching.

- (c) Where excavation for new construction is required within drip line of trees, hand excavation shall be employed to minimize damage to root system. Roots shall be relocated in backfill areas wherever possible. If encountered immediately adjacent to location of new construction, roots shall be cut approximately 6 inches back from new construction.
- (d) Approved excavations shall be carefully backfilled with the excavated materials approved for backfilling. Backfill shall conform to adjacent grades without dips, sunken areas, humps, or other surface irregularities. Do not use mechanical equipment to compact backfill. Tamp carefully using hand tools, refilling and tamping until Final Acceptance as necessary to offset settlement.
- (e) Exposed roots shall not be allowed to dry out before permanent backfill is placed. Temporary earth cover shall be provided, or roots shall be wrapped with four layers of wet, untreated burlap and temporarily supported and protected from damage until permanently relocated and covered with backfill.
- (f) Accidentally broken roots should be sawed cleanly 3 inches behind ragged end.

1.05 SECURITY:

The Contractor shall be responsible for project security for materials, tools, equipment, supplies, and completed and partially completed Work.

1.06 TEMPORARY CONTROLS:

A. Noise Control

- (1) Contractor acknowledges that adjacent facilities may remain in operation during all or a portion of the Work period, and it shall take all reasonable precautions to minimize noise as required by applicable laws and the Contract Documents.
- (2) Notice of proposed noisy operations, including without limitation, operation of pneumatic demolition tools, concrete saws, and other equipment, shall be submitted to the District a minimum of forty-eight (48) hours in advance of their performance.

B. Noise and Vibration

- (1) Equipment and impact tools shall have intake and exhaust mufflers.
- (2) Contractor shall cooperate with District to minimize and/or cease the use of noisy and vibratory equipment if that equipment becomes objectionable by its longevity.

C. Dust and Dirt

- (1) Contractor shall protect all existing floor finishes.
- (2) Contractor shall conduct demolition and construction operations to minimize the generation of dust and dirt, and prevent dust and dirt from interfering with the progress of the Work and from accumulating in the Work and adjacent areas including, without limitation, occupied facilities.
- (3) Contractor shall periodically water exterior demolition and construction areas to minimize the generation of dust and dirt.
- (4) Contractor shall ensure that all hauling equipment and trucks carrying loads of soil and debris shall have their loads sprayed with water or covered with tarpaulins, and as otherwise required by local and state ordinance.
- (5) Contractor shall prevent dust and dirt from accumulating on walks, roadways, parking areas, and planting, and from washing into sewer and storm drain lines.

D. Water

Contractor shall not permit surface and subsurface water, and other liquids, to accumulate in or about the vicinity of the Premises. Should accumulation develop, Contractor shall control the water or other liquid, and suitably dispose of it by means of temporary pumps, piping, drainage lines, troughs, ditches, dams, or other methods.

E. Pollution

- (1) No burning of refuse, debris, or other materials shall be permitted on or in the vicinity of the Premises.
- (2) Contractor shall comply with applicable regulatory requirements and anti-pollution ordinances during the conduct of the Work including, without limitation, demolition, construction, and disposal operations.

F. Lighting

- (1) If portable lights are used after dark, all light must be located so as not to direct light into neighboring property.

1.07 JOB SIGN(S):

A. General:

- (1) Contractor shall provide and maintain a Project identification sign with the design, text, and colors designated by the District and/or the Architect; locate sign as approved by the District.
- (2) Signs other than the specified Project sign and or signs required by law, for safety, or for egress, shall not be permitted, unless otherwise approved in advance by the District.

B. Materials:

- (1) Structure and Framing: Structurally sound, new or used wood or metal; wood shall be nominal 3/4-inch exterior grade plywood.
- (2) Sign Surface: Minimum 3/4-inch exterior grade plywood.
- (3) Rough Hardware: Galvanized.
- (4) Paint: Exterior quality, of type and colors selected by the District and/or the Architect.

C. Fabrication:

- (1) Contractor shall fabricate to provide smooth, even surface for painting.
- (2) Size: 4'-0" x 8'-0", unless otherwise indicated.
- (3) Contractor shall paint exposed surfaces of supports, framing, and surface material with exterior grade paint: one coat of primer and one coat of finish paint.
- (4) Text and Graphics: As indicated.

1.08 PUBLICITY RELEASES:

- A. Contractor shall not release any information, story, photograph, plan, or drawing relating information about the Project to anyone, including press and other public communications medium, including, without limitation, on website(s).

PART 2 – PRODUCTS Not used.

PART 3 – EXECUTION Not used.

END OF DOCUMENT

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions;
- C. Document 01 50 00.

1.02 SECTION INCLUDES:

- A. Administrative and procedural requirements for the following:
 - (1) Salvaging non-hazardous construction waste.
 - (2) Recycling non-hazardous construction waste.
 - (3) Disposing of non-hazardous construction waste.

1.03 DEFINITIONS:

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.04 PERFORMANCE REQUIREMENTS:

- A. General: Develop waste management plan that results in end-of Project rates for salvage/recycling of fifty percent (50%) by weight (or by volume, but not a combination) of total waste generated by the Work.

1.05 SUBMITTALS:

- A. Waste Management Plan: Submit waste management plan within 30 days of date established for commencement of the Work.
- B. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit copies of report. Include the following information:
 - (1) Material category.
 - (2) Generation point of waste.
 - (3) Total quantity of waste in tons or cubic yards.
 - (4) Quantity of waste salvaged, both estimated and actual in tons or cubic yards.
 - (5) Quantity of waste recycled, both estimated and actual in tons or cubic yards.
 - (6) Total quantity of waste recovered (salvaged plus recycled) in tons or cubic yards.
 - (7) Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.
- C. Waste Reduction Calculations: Before request for final payment, submit copies of calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.
- D. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.
- E. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.
- F. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

- G. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- H. CHPS Submittal: CHPS letter template for Credit ME2.0 and ME2.1, signed by Contractor, tabulating total waste material, quantities diverted and means by which it is diverted, and statement that requirements for the credit have been met.
- I. Qualification Data: For Waste Management Coordinator.
- J. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.
- K. Submittal procedures and quantities are specified in Document 01300.

1.06 QUALITY ASSURANCE:

- A. Waste Management Coordinator Qualifications: LEED Accredited Professional by U.S. Green Building Council.
- B. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.
- C. Waste Management Conference: Conduct conference at Project site to comply with requirements. Review methods and procedures related to waste management including, but not limited to, the following:
 - (1) Review and discuss waste management plan including responsibilities of Waste Management Coordinator.
 - (2) Review requirements for documenting quantities of each type of waste and its disposition.
 - (3) Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
 - (4) Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
 - (5) Review waste management requirements for each trade.

1.07 WASTE MANAGEMENT PLAN:

- A. General: Develop plan consisting of waste identification, waste reduction work plan, and cost/revenue analysis. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.
- B. Waste Identification: Indicate anticipated types and quantities of site-clearing and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.
- C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.
 - (1) Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.
 - (2) Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
 - (3) Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
 - (4) Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
 - (5) Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
 - (6) Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on Project site where materials separation will be located.

PART 2 - PRODUCTS Not Used.

PART 3 - EXECUTION

2.01 PLAN IMPLEMENTATION:

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
 - (1) Comply with Document 01500 for operation, termination, and removal requirements.
- B. Waste Management Coordinator: Engage a waste management coordinator to be responsible for implementing, monitoring, and reporting status of waste management work plan. Coordinator shall be present at Project site full time for duration of Project.
- C. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.
 - (1) Distribute waste management plan to everyone concerned within 3 days of submittal return.
 - (2) Distribute waste management plan to entities when they first begin work on site. Review plan procedures and locations established for salvage, recycling, and disposal.
- D. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 - (1) Designate and label specific areas of Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
 - (2) Comply with Document 01500 for controlling dust and dirt, environmental protection, and noise control.

2.02 RECYCLING CONSTRUCTION WASTE:

- A. General: Recycle paper and beverage containers used by on-site workers.
- B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to the Contractor.
- C. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical.

- (1) Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project Site. Include list of acceptable and unacceptable materials at each container and bin.
 - (a) Inspect containers and bins for contamination and remove contaminated materials if found.
 - (2) Stockpile processed materials on site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - (3) Stockpile materials away from construction area. Do not store within drip line of remaining trees.
 - (4) Store components off the ground and protect from the weather.
 - (5) Remove recyclable waste off District property and transport to recycling receiver or processor.
- D. Packaging:
- (1) Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
 - (2) Polystyrene Packaging: Separate and bag material.
 - (3) Pallets: As much as possible, require deliveries using pallets to remove pallets from Project Site. For pallets that remain on Site, break down pallets into component wood pieces and comply with requirements for recycling wood.
 - (4) Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.
- E. Site-Clearing Wastes: Chip brush, branches, and trees on site.
- F. Wood Materials:
- (1) Clean Cut-Offs of Lumber: Grind or chip into small pieces.
 - (2) Clean Sawdust: Bag sawdust that does not contain painted or treated wood.
- G. Gypsum Board: Stack large clean pieces on wood pallets and store in a dry location.
- (1) Clean Gypsum Board: Grind scraps of clean gypsum board using small mobile chipper or hammer mill. Screen out paper after grinding.

2.03 DISPOSAL OF WASTE:

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project Site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
 - (1) Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on site.
 - (2) Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn waste materials.
- C. Disposal: Transport waste materials off District property and legally dispose of them.

END OF SECTION

FIELD OFFICES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions; and
- C. Temporary Facilities and Controls.

1.02 SECTION INCLUDES:

- A. Requirements for Field Offices and Field Office Trailers.

1.03 SUMMARY:

- A. General: Contractor shall provide on site Field Office Trailer and contents, and shall provide office space for District's Construction Manager and for DSA Inspector of Record, during the term of the Contract.
- B. Property: Office trailer, furniture, furnishings, equipment, and the like, supplied by the Contractor shall remain the property of the Contractor; District property items installed, delivered, and the like by District within the Office Trailer will remain District's property.
- C. Modifications: District reserves the right to modify the trailer or contents, or both, as may be deemed proper by District to accommodate District's Construction Manager and DSA Inspector.
- D. Condition: Trailer and contents shall be clean, neat, substantially finished, in good, proper, and safe condition for use, operation, and the like; the trailer and contents shall not be required to be new.
- E. Installation Timing: Provide safe, fully furnished, functional, proper, complete, and finished trailer properly ready for entire use, within fourteen (14) calendar days of District's notification of the issuance of Notice to Proceed.

1.04 SUBMITTALS:

- A. General: Submit submittals to District in quantity, format, type, and the like, as specified herein.

- B. Office Trailer Data: One (1) copy of manufacturer's descriptive data, technical descriptions, regulatory compliance, industry standards, installation, removal, and maintenance instructions.
- C. Equipment Data: Two (2) copies of manufacturer data for each type of equipment, if directed by District.
- D. Furniture and Furnishings Data: Two (2) copies of manufacturer data for each type of equipment, if directed by District.
- E. Plans: One (1) reproducible copy of appropriately scaled plans of trailer layout. Plans shall include, but not be limited to: lighting; furniture; equipment; telephone and electrical outlets; and the like.
- F. Product Samples: One (1) complete and entire unit of each type, if directed by District.

1.05 QUALITY ASSURANCE

- A. Standards: In the event that provisions of codes, regulations, safety orders, Contract Documents, referenced manufacturer's specifications, manufacturer's instructions, industry standards, and the like, are in conflict, the more restrictive and higher quality shall govern.
- B. Installer: Installer or Installers engaged by Contractor must have a minimum of five (5) years of documented and properly authenticated successful experience of specialization in the installation of the items or systems, or both, specified herein.
- C. Manufacturer: Contractor shall obtain products from nationally and industry recognized Manufacturer with five (5) years minimum, of immediately recent, continuous, documented and properly authenticated successful experience of specialization in the manufacture of the product specified herein.
- D. State Personnel Training: Provide proper training for maintenance and operations, including emergency procedures, and the like, as directed by District.
- E. Units: Shall be sound and free of defects, and shall not include any damage or defect that will impair the safety, installation, performance, or the durability of the entire Office Trailer and appurtenant systems.

1.06 REGULATORY REQUIREMENTS

- A. General: Work shall be executed in accordance with applicable Codes, Regulations, Statutes, Enactment's, Rulings, Laws, each authority having jurisdiction, and including, but not limited to, Regulatory Requirements specified herein.
- B. California Building Standards Code ("CBSC").
- C. California Code of Regulations, Title 25, Chapter 3, Sub Chapter 2, Article 3 ("CCR").
- D. Coach Insignia: Trailer shall display California Commercial Coach Insignia; such insignia shall be deemed to show that the trailer is in accordance with the Construction and Fire Safety requirements of CCR.

PART 2 – PRODUCTS

2.01 FIELD OFFICE TRAILER

A. General: Provide entire Field Office Trailer of type, function, operation, capacity, size, complete with controls, safety devices, accessories, and the like, for proper and durable installation. Partitions, walls, ceiling, and other interior and exterior surfaces shall be appropriately finished, including, but not limited to, trim, painting, wall base, floor covering, suspended or similar ceiling, and the like; provide systems, components, units, nuts, bolts, screws, anchoring devices, fastening devices, washers, accessories, adhesives, sealants, and other items of type, grade, and class required for the particular use, not identified but required for a complete, weather-tight, appropriately operating, and finished installation.

~~C-B.~~ Program: Provide a wheel-mounted trailer with stairs, landings, platforms, ramps, stairs, platforms, and the like, in good, proper, safe, clean, and properly finished condition; with proper heavy duty locks, and other proper and effective security at all doors, windows, and the like. Trailer shall be maintained in good, proper, safe, clean, and properly finished condition during the Contract.

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- (1) Stairs, Platform: Properly finished stairs, platforms, and ramps.
- (3) Doors: Two (2), three (3) foot wide exterior doors with locksets; finished ramp, steps, and entry platform at each exterior door.
- (4) Keys: Submit five (5) keys for each door, window, furniture unit, and the like, there shall be no other key copies or originals available; each key shall be identified for District; and shall be labeled, or tagged or both, as directed by District.
- (5) HVAC: Provide heating and cooling
- (6) Lighting: Sixty-five (65) foot-candles illumination minimum at any point, at thirty (30) inches above finished floor throughout from fluorescent light source, exclusively, or as directed by District.
- (7) Electrical Outlets: One (1) duplex outlet evenly spaced every twelve (12) linear horizontal feet of wall face, and electrical service ready for use.

2.02 FIELD OFFICE TRAILER ITEMS

- (8) Maintenance: Contractor shall purchase service agreements for each unit of equipment for the duration of the project plus two (2) months, and shall maintain all equipment in proper working condition. Service agreements shall include provision for replacement of toner cartridges and other items required to effect proper unit use. Service agreements shall also provide for:
 - (a) Unlimited Service Calls.
 - (b) Same Day Response.

- (c) All parts, labor, preventative maintenance and mileage.
- (d) All chemicals, such as toner, fixing agent, and the like.
- (e) System training and setup.

2.03 UTILITY AND SERVICES

- A. Telephone Service: Contractor shall provide and interface the entire telephone service, and shall properly and timely pay for telephone service for District's non-long-distance use.
- B. Electrical Service: Provide all proper connections and continuously pay for service for the duration of the Work.

2.04 FINISHES

- A. General: Manufacturer standard finish system over surfaces properly cleaned, pretreated, and prepared to obtain proper bond; all visible surfaces shall be coated.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. General: Properly prepare area and affected items to receive the Work. Set Work accurately in location, alignment, and elevation; rigidly, securely, and firmly anchor to appropriate structure; install plumb, straight, square, level, true, without racking, rigidly anchored to proper solid blocking, substrate, and the like; provide appropriate type and quantity of reinforcements, fasteners, adhesives, self-adhesive and other tapes; lubricants, coatings, accessories, and the like, as required for a complete, structurally rigid, stable, sound, and appropriately finished installation, in accordance with manufacturer's published instructions, and as indicated. The more restrictive and higher quality requirement shall govern. Moving parts shall be properly secured, without binding, looseness, noise, and the like.
- B. Installation: Install in accordance with 25 CCR 3.2.3 and as directed by District; jack up trailer and level both ways; mount on proper concrete piers with all load off wheels; provide required tie down and accessories per Section 4368 of referenced CCR, and as directed by District.
- C. Rejected Work: Work, materials, unit, items, systems, and the like, not accepted by District shall be deemed rejected, and shall forthwith be removed and replaced with proper and new Work, materials, unit, items, systems, and the like at no cost to District.
- D. Standard: Comply with manufacturer's published instructions, or with instructions as shown or indicated; the more restrictive and higher quality requirement shall govern.
- E. Location: As directed by District.
- F. Fire Resistance: Construct and install in accordance with UL requirements.

- G. Maintenance: Contractor shall maintain trailer and adjacent areas in a safe, clean and hygienic condition throughout the duration of the Work, and as directed by District. Properly repair or replace furniture or other items, as directed by District. Properly remove unsafe, damaged, or broken furniture, or similar items, and replace with safe and proper items. Contractor shall pay cost of all services, repair, and maintenance, or replacement of each item.

- H. Janitorial Service: Provide professional janitorial services, including, but not limited to, trash, waste paper baskets, fill paper dispensers; clean and dust all furniture, files, and the like; sweep and mop resilient and similar flooring; and vacuum carpeting and similar flooring.
 - (1) Frequency: Two (2) times per week, minimum.

- I. Removal: Properly remove the Office Trailer and contents from the Site upon completion of the Contract, or as directed by District in writing. Forthwith properly patch and repair affected areas; replace damaged items with new items. Carefully and properly inventory, clean, pack, store, and protect District property; submit District property to District at a date, time and location as directed by District.

END OF DOCUMENT

DOCUMENT 01 64 00

OWNER-FURNISHED PRODUCTS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions;
- B. Special Conditions; and
- C. Materials and Equipment.

1.02 SECTION INCLUDES:

- A. Requirements for the following:
 - (1) Installing Owner-furnished materials and equipment.
 - (2) Providing necessary utilities, connections and rough-ins.

1.03 DEFINITIONS

- A. Owner: District, who is providing/furnishing materials and equipment.
- B. Installer Contactor: Contractor, who is installing the materials and equipment furnished by the Owner.

1.04 PRODUCT DELIVERY, STORAGE, AND HANDLING:

- A. Receive, store and handle products in accordance with the manufacturer's instructions.
- B. Protect equipment items as required to prevent damage during storage and construction.

PART 2 – PRODUCTS

2.01 GENERAL PRODUCT REQUIREMENTS:

- A. Installer Contractor's Responsibilities:
 - (1) Verify mounting and utility requirements for Owner-furnished materials and equipment items.

- (2) Provide mounting and utility rough in for all items where required.
 - (a) Rough in locations, sizes, capacities, and similar type items shall be as indicated and required by product manufacturer.

B. Owner and Installer Contractor(s) Responsibilities:

- (1) Owner-Furnished/Contractor Installed ("OFICI"): Furnished by the Owner; installed by the Installer Contractor.
 - (a) General: Owner and Installer Contractor(s) will coordinate deliveries of materials and equipment to coincide with the construction schedule.
 - (b) Owner will furnish specified materials and equipment delivered to the site. Owner/vendor's representative shall be present on Site at the time of delivery to comply with the contract requirements and Specifications Section 01600, Materials and Equipment, Article 1.04.
 - (c) The Owner furnishing specified materials and equipment is responsible to provide manufacturer guarantees as required by the Contract to the Installer Contractor.
 - (d) The Installer Contractor shall:
 - 1) Review, verify and accept the approved manufacturer's submittal/Shop Drawings for all materials and equipment required to be installed by the Installer Contractor and furnished by the Owner. Any discrepancies, including but not limited to possible space conflicts, should be brought to the attention of the Project Manager and/or Program Manager, if applicable.
 - 2) Coordinate timely delivery. Installer Contractor shall receive materials and equipment at Site when delivered and give written receipt at time of delivery, noting visible defects or omissions; if such declaration is not given, the Installer Contractor shall assume responsibility for such defects and omissions.
 - 3) Store materials and equipment until ready for installation and protect from loss and damage. Installer Contractor is responsible for providing adequate storage space.
 - 4) Coordinate with other bid package contractors and field measurement to ensure complete installation.
 - 5) Uncrate, assemble, and set in place.
 - 6) Provide adequate supports.

- 7) Install materials and equipment in accordance with manufacturer's recommendations, instructions, and Shop Drawings, supplying labor and material required and making mechanical, plumbing, and electrical connections required to operate equipment.
- 8) Be certified by equipment manufacturer for installation of the specific equipment supplied by the Owner.
- 9) Provide anchorage and/or bracing as required for seismic restraint per Title 24, UBC Standard 27-11 and all other applicable codes.
- 10) Provide the contract-required warranty/guarantee for all work, materials/equipment and installation upon its completion and acceptance by the District. Guarantee includes all costs associated with the removal, shipping to and from the Site, and re-installation of any equipment found to be defective.

C. Compatibility with Space and Service Requirements:

- (1) Equipment items shall be compatible with space limitations indicated and as shown on the Contract Documents and specified in other sections of the Specifications.
- (2) Modifications to equipment items required to conform to space limitations specified for rough in shall not cause additional cost to the District.

D. Manufacturer's printed descriptions, specifications, and instructions shall govern the Work unless specifically indicated or specified otherwise.

2.02 FURNISHED MATERIALS AND EQUIPMENT

- A. All furnished materials and equipment are indicated or scheduled on the Contract Documents.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Install equipment items in accordance with the manufacturer's instructions.
- B. Set equipment items securely in place, rigidly or flexibly mounted in accordance with manufacturers' directions.
- C. Make electrical and mechanical connections as indicated and required.
- D. Touch-up and restore damaged or defaced finishes to the District's satisfaction.

3.02 CLEANING AND PROTECTION

- A. Repair or replace items not acceptable to the Architect.
- B. Upon completion of installation, clean equipment items in accordance with manufacturer's recommendations, and protect from damage until final acceptance of the Work by the District.

END OF DOCUMENT

SECTION 01 66 00

PRODUCT DELIVERY, STORAGE AND HANDLING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Site Access, Conditions and Requirements;
- B. Special Conditions.

1.02 PRODUCTS

- A. Products are as defined in the General Conditions.
- B. Contractor shall not use and/or reuse materials and/or equipment removed from existing Premises, except as specifically permitted by the Contract Documents.
- C. Contractor shall provide interchangeable components of the same manufacturer, for similar components.

1.03 TRANSPORTATION AND HANDLING

- A. Contractor shall transport and handle Products in accordance with manufacturer's instructions.
- B. Contractor shall promptly inspect shipments to confirm that Products comply with requirements, quantities are correct, and products are undamaged.
- C. Contractor shall provide equipment and personnel to handle Products by methods to prevent soiling, disfigurement, or damage.

1.04 STORAGE AND PROTECTION

- A. Contractor shall store and protect Products in accordance with manufacturer's instructions, with seals and labels intact and legible. Contractor shall store sensitive products in weather-tight, climate controlled enclosures.
- B. For exterior storage of fabricated Products, Contractor shall place on sloped supports, above ground.
- C. Contractor shall provide off-site storage and protection when Site does not permit on-site storage or protection.

- D. Contractor shall cover products subject to deterioration with impervious sheet covering and provide ventilation to avoid condensation.
- E. Contractor shall store loose granular materials on solid flat surfaces in a well-drained area and prevent mixing with foreign matter.
- F. Contractor shall provide equipment and personnel to store Products by methods to prevent soiling, disfigurement, or damage.
- G. Contractor shall arrange storage of Products to permit access for inspection and periodically inspect to assure Products are undamaged and are maintained under specified conditions.

PART 2 – PRODUCTS Not Used.

PART 3 - EXECUTION Not Used.

END OF DOCUMENT

FIELD ENGINEERING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Site Investigation, and Soils Investigation Report;
- B. Special Conditions;
- C. Site-Visit Certification.

1.02 REQUIREMENTS INCLUDED:

- A. Contractor shall provide and pay for field engineering services by a California-registered engineer, required for the project, including, without limitations:
 - (1) Survey work required in execution of the Project.
 - (2) Civil or other professional engineering services specified, or required to execute Contractor's construction methods.

1.03 QUALIFICATIONS OF SURVEYOR OR ENGINEERS:

Contractor shall only use a qualified licensed engineer or registered land surveyor, to whom District makes no objection.

1.04 SURVEY REFERENCE POINTS:

- A. Existing basic horizontal and vertical control points for the Project are those designated on the Drawings.
- B. Contractor shall locate and protect control points prior to starting Site Work and preserve all permanent reference points during construction. In addition Contractor shall:
 - (1) Make no changes or relocation without prior written notice to District and Architect.
 - (2) Report to District and Architect when any reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
 - (3) Require surveyor to replace Project control points based on original survey control that may be lost or destroyed.

1.05 RECORDS:

Contractor shall maintain a complete, accurate log of all control and survey work as it progresses.

1.06 SUBMITTALS:

- A. Contractor shall submit name and address of Surveyor and Professional Engineer to District and Architect prior to its/their work on the Project.
- B. On request of District and Architect, Contractor shall submit documentation to verify accuracy of field engineering work, at no additional cost to the District.
- C. Contractor shall submit a certificate signed by registered engineer or surveyor certifying that elevations and locations of improvements are in conformance or nonconformance with Contract Documents.

PART 2 – PRODUCTS Not Used.

PART 3 - EXECUTION

3.01 COMPLIANCE WITH LAWS:

Contractor is responsible for meeting all applicable codes, OSHA, safety and shoring requirements.

3.02 NONCONFORMING WORK:

Contractor is responsible for any re-surveying required by correction of nonconforming work.

END OF DOCUMENT

CUTTING AND PATCHING

1. PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Inspector, Inspections, and Tests, Integration of Work, Nonconforming Work, and Correction of Work, and Uncovering Work;
- B. Special Conditions;
- C. Hazardous Materials Procedures and Requirements;
- D. Hazardous Materials Certification;
- E. Lead-Based Paint Certification;
- F. Imported Materials Certification.

1.02 CUTTING AND PATCHING:

- A. Contractor shall be responsible for all cutting, fitting, and patching, including associated excavation and backfill, required to complete the Work or to:
 - (1) Make several parts fit together properly.
 - (2) Uncover portions of Work to provide for installation of ill-timed Work.
 - (3) Remove and replace defective Work.
 - (4) Remove and replace Work not conforming to requirements of Contract Documents.
 - (5) Remove Samples of installed Work as specified for testing.
 - (6) Provide routine penetrations of non-structural surfaces for installation of piping and electrical conduit.
 - (7) Attaching new materials to existing remodeling areas – including painting (or other finishes) to match existing conditions.
- B. In addition to Contract requirements, upon written instructions from the District, Contractor shall uncover Work to provide for observations of covered Work in accordance with the Contract Documents; remove samples of

installed materials for testing as directed by District; and remove Work to provide for alteration of existing Work.

- C. Contractor shall not cut or alter Work, or any part of it, in such a way that endangers or compromises the integrity of the Work, the Project, or work of others.

1.03 SUBMITTALS:

- A. Prior to any cutting or alterations that may affect the structural safety of Project, or work of others, and well in advance of executing such cutting or alterations, Contractor shall submit written notice to District pursuant to the applicable notice provisions of the Contract Documents, requesting consent to proceed with the cutting or alteration, including the following:
 - (1) The work of the District or other trades.
 - (2) Structural value or integrity of any element of Project.
 - (3) Integrity or effectiveness of weather-exposed or weather-resistant elements or systems.
 - (4) Efficiency, operational life, maintenance or safety of operational elements.
 - (5) Visual qualities of sight-exposed elements.
- B. Contractor's Request shall also include:
 - (1) Identification of Project.
 - (2) Description of affected Work.
 - (3) Necessity for cutting, alteration, or excavations.
 - (4) Affects of Work on District, other trades, or structural or weatherproof integrity of Project.
 - (5) Description of proposed Work:
 - (a) Scope of cutting, patching, alteration, or excavation.
 - (b) Trades that will execute Work.
 - (c) Products proposed to be used.
 - (d) Extent of refinishing to be done.
 - (6) Alternates to cutting and patching.
 - (7) Cost proposal, when applicable.

- (8) The scheduled date the Contractor intends to perform the Work and the duration of time to complete the Work.
- (9) Written permission of other trades whose Work will be affected.

1.04 QUALITY ASSURANCE:

- A. Contractor shall ensure that cutting, fitting, and patching shall achieve security, strength, weather protection, appearance for aesthetic match, efficiency, operational life, maintenance, safety of operational elements, and the continuity of existing fire ratings.
- B. Contractor shall ensure that cutting, fitting, and patching shall successfully duplicate undisturbed adjacent profiles, materials, textures, finishes, colors, and that materials shall match existing construction. Where there is dispute as to whether duplication is successful or has been achieved to a reasonable degree, the District's decision shall be final.

1.05 PAYMENT FOR COSTS:

- A. Cost caused by ill-timed or defective Work or Work not conforming to Contract Documents, including costs for additional services of the District, its consultants, including but not limited to the Construction Manager, the Architect, the Project Inspector(s), Engineers, and Agents, will be paid by Contractor and/or deducted from the Contract by the District.
- B. District shall only pay for cost of Work if it is part of the original Contract Price or if a change has been made to the contract in compliance with the provisions of the General Conditions. Cost of Work performed upon instructions from the District, other than defective or nonconforming Work, will be paid by District on approval of written Change Order. Contractor shall provide written cost proposals prior to proceeding with cutting and patching.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Contractor shall provide for replacement and restoration of Work removed. Contractor shall comply with the Contract Documents and with the Industry Standard(s), for the type of Work, and the Specification requirements for each specific product involved. If not specified, Contractor shall first recommend a product of a manufacturer or appropriate trade association for approval by the District.
- B. Materials to be cut and patched include those damaged by the performance of the Work.

PART 3 – EXECUTION

3.01 INSPECTION:

- A. Contractor shall inspect existing conditions of the Site and the Work, including elements subject to movement or damage during cutting and patching, excavating and backfilling. After uncovering Work, Contractor shall inspect conditions affecting installation of new products.
- B. Contractor shall report unsatisfactory or questionable conditions in writing to District as indicated in the General Conditions and shall proceed with Work as indicated in the General Conditions by District.

3.02 PREPARATION:

- A. Contractor shall provide shoring, bracing and supports as required to maintain structural integrity for all portions of the Project, including all requirements of the Project.
- B. Contractor shall provide devices and methods to protect other portions of Project from damage.
- C. Contractor shall, provide all necessary protection from weather and extremes of temperature and humidity for the Project, including without limitation, any work that may be exposed by cutting and patching Work. Contractor shall keep excavations free from water.

3.03 ERECTION, INSTALLATION AND APPLICATION:

- A. With respect to performance, Contractor shall:
 - (1) Execute fitting and adjustment of products to provide finished installation to comply with and match specified tolerances and finishes.
 - (2) Execute cutting and demolition by methods that will prevent damage to other Work, and provide proper surfaces to receive installation of repairs and new Work.
 - (3) Execute cutting, demolition excavating, and backfilling by methods that will prevent damage to other Work and damage from settlement.
- B. Contractor shall employ original installer or fabricator to perform cutting and patching for:
 - (1) Weather-exposed surfaces and moisture-resistant elements such as roofing, sheet metal, sealants, waterproofing, and other trades.
 - (2) Sight-exposed finished surfaces.
- C. Contractor shall execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances, and finishes as shown or specified in the Contract Documents including, without limitation, the Drawings and Specifications.

- D. Contractor shall fit Work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces. Contractor shall conform to all Code requirements for penetrations or the Drawings and Specifications, whichever calls for a higher quality or more thorough requirement. Contractor shall maintain integrity of both rated and non-rated fire walls, ceilings, floors, etc.
- E. Contractor shall restore Work which has been cut or removed. Contractor shall install new products to provide completed Work in accordance with requirements of the Contract Documents and as required to match surrounding areas and surfaces.
- F. Contractor shall refinish all continuous surfaces to nearest intersection as necessary to match the existing finish to any new finish.

END OF DOCUMENT

ALTERATION PROJECT PROCEDURES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Integration of Work, Purchase of Materials and Equipment, Uncovering of Work and Non-conforming Work and Correction of Work and Trenches;
- B. Special Conditions.

PART 2 - PRODUCTS

2.01 PRODUCTS FOR PATCHING AND EXTENDING WORK:

- A. New Materials: As specified in the Contract Documents including, without limitation, in the Specifications, Contractor shall match existing products, conditions, and work for patching and extending work.
- B. Type and Quality of Existing Products: Contractor shall determine by inspection, by testing products where necessary, by referring to existing conditions and to the Work as a standard.

PART 3 - EXECUTION

3.01 EXAMINATION:

- A. Contractor shall verify that demolition is complete and that areas are ready for installation of new Work.
- B. By beginning restoration Work, Contractor acknowledges and accepts the existing conditions.

3.02 PREPARATION:

- A. Contractor shall cut, move, or remove items as necessary for access to alterations and renovation Work. Contractor shall replace and restore these at completion.
- B. Contractor shall remove unsuitable material not as salvage unless otherwise indicated in the Contract Documents. Unsuitable material may include, without limitation, rotted wood, corroded metals, and deteriorated masonry and concrete. Contractor shall replace materials as specified for finished Work.

- C. Contractor shall remove debris and abandoned items from all areas of the Site and from concealed spaces.
- D. Contractor shall prepare surface and remove surface finishes to provide for proper installation of new Work and finishes.
- E. Contractor shall close openings in exterior surfaces to protect existing work from weather and extremes of temperature and humidity. Contractor shall insulate ductwork and piping to prevent condensation in exposed areas. Contractor shall insulate building cavities for thermal and/or acoustical protection, as detailed.

3.03 INSTALLATION:

- A. Contractor shall coordinate Work of all alternations and renovations to expedite completion and to accommodate District occupancy.
- B. Designated Areas and Finishes: Contractor shall complete all installations in all respects, including operational, mechanical work and electrical work.
- C. Contractor shall remove, cut, and patch Work in a manner to minimize damage and to provide a means of restoring Products and finishes to original or specified condition.
- D. Contractor shall refinish visible existing surfaces to remain in renovated rooms and spaces, to specified condition for each material, with a neat transition to adjacent finishes.
- E. Contractor shall install products as specified in the Contract Documents, including without limitation, the Specifications.

3.04 TRANSITIONS:

- A. Where new Work abuts or aligns with existing, Contractor shall perform a smooth and even transition. Patched Work must match existing adjacent work in texture and appearance.
- B. When finished surfaces are cut so that a smooth transition with new Work is not possible, Contractor shall terminate existing surface along a straight line at a natural line of division and make a recommendation for resolution to the District and the Architect for review and approval.

3.05 ADJUSTMENTS:

- A. Where removal of partitions or walls results in adjacent spaces becoming one, Contractor shall rework floors, walls, and ceilings to a smooth plane without breaks, steps, or bulkheads.

- B. Where a change of plane of 1/4 inch or more occurs, Contractor shall submit a recommendation for providing a smooth transition to the District and the Architect for review and approval.
- C. Contractor shall trim existing doors as necessary to clear new floor finish and refinish trim as required.
- D. Contractor shall fit Work at penetrations of surfaces.

3.06 REPAIR OF DAMAGED SURFACES:

- A. Contractor shall patch or replace portions of existing surfaces which are damaged, lifted, discolored, or showing other imperfections.
- B. Contractor shall repair substrate prior to patching finish.

3.07 CULTIVATED AREAS AND OTHER SURFACE IMPROVEMENTS:

- A. Cultivated or planted areas and other surface improvements which are damaged by actions of the Contractor shall be restored by Contractor to their original condition or better, where indicated.
- B. Contractor shall protect and replace, if damaged, all existing guard posts, barricades, and fences.
- C. Contractor shall give special attention to avoid damaging or killing trees, bushes and/or shrubs on the Premises and/or identified the Contract Documents, including without limitation, the Drawings.

3.08 FINISHES:

- A. Contractor shall finish surfaces as specified in the Contract Documents, including without limitations, the provisions of all Divisions of the Specifications.
- B. Contractor shall finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, Contractor shall refinish entire surface to nearest intersections.

3.09 CLEANING:

- A. Contractor shall continually clean the Site and the Premises as indicated in the Contract Documents, including without limitation, the provisions in the General Conditions and the Specifications regarding cleaning.

END OF DOCUMENT

CONTRACT CLOSEOUT AND FINAL CLEANING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Completion of Work;
- B. Special Conditions;
- C. Temporary Facilities and Controls.

1.02 CLOSEOUT PROCEDURES

Contractor shall comply with all closeout provisions as indicated in the General Conditions.

1.03 FINAL CLEANING

- A. Contractor shall execute final cleaning prior to final inspection.
- B. Contractor shall clean interior and exterior glass and surfaces exposed to view; remove temporary labels, tape, stains, and foreign substances, polish transparent and glossy surfaces, wax and polish new vinyl floor surfaces, vacuum carpeted and soft surfaces.
- C. Contractor shall clean equipment and fixtures to a sanitary condition.
- D. Contractor shall replace filters of operating equipment.
- E. Contractor shall clean debris from roofs, gutters, down spouts, and drainage systems.
- F. Contractor shall clean Site, sweep paved areas, and rake clean landscaped surfaces.
- G. Contractor shall remove waste and surplus materials, rubbish, and construction facilities from the Site.

1.04 ADJUSTING

Contractor shall adjust operating products and equipment to ensure smooth and unhindered operation.

1.05 RECORD DOCUMENTS AND SHOP DRAWINGS

- A. Contractor shall legibly mark each item to record actual construction, including:
- (1) Measured depths of foundation in relation to finish floor datum.
 - (2) Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permit surface improvements.
 - (3) Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 - (4) Field changes of dimension and detail.
 - (5) Details not on original Contract Drawings
 - (6) Changes made by modification(s).
 - (7) References to related Shop Drawings and modifications.
- B. Contractor will provide one hard copy set of Record Drawings to District and one electronic native version and one electronic pdf version.
- C. Contractor shall submit all required documents to District and/or Architect prior to or with its final Application for Payment.

1.06 INSTRUCTION OF DISTRICT PERSONNEL

- A. Before final inspection, at agreed upon times, Contractor shall instruct District's designated personnel in operation, adjustment, and maintenance of products, equipment, and systems.
- B. For equipment requiring seasonal operation, Contractor shall perform instructions for other seasons within six months.
- C. Contractor shall use operation and maintenance manuals as basis for instruction. Contractor shall review contents of manual with personnel in detail to explain all aspects of operation and maintenance.
- D. Contractor shall prepare and insert additional data in Operation and Maintenance Manual when need for such data becomes apparent during instruction.
- E. Contractor shall use operation and maintenance manuals as basis for instruction. Contractor shall review contents of manual with personnel in detail to explain all aspects of operation and maintenance.

1.07 SPARE PARTS AND MAINTENANCE MATERIALS

A. Contractor shall provide products, spare parts, maintenance, and extra materials in quantities specified in the Specifications and in Manufacturer's recommendations.

B. Contractor shall provide District two (2) binders of all required Operation and Maintenance Data.

C. Contractor shall provide District one (1) binder of Warranties.

PART 2 – PRODUCTS Not used.

PART 3 – EXECUTION Not used.

END OF DOCUMENT

OPERATION AND MAINTENANCE DATA

PART 1 – GENERAL (REVIEW ALL)

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Completion of the Work;
- B. Special Conditions.

1.02 QUALITY ASSURANCE:

Contractor shall prepare instructions and data by personnel experienced in maintenance and operation of described products.

1.03 FORMAT:

- A. Contractor shall prepare data in the form of an instructional manual entitled "OPERATIONS AND MAINTENANCE MANUAL & INSTRUCTIONS" ("Manual").
- B. Binders: Contractor shall use commercial quality, 8-1/2 by 11 inch, three-side rings, with durable plastic covers; two inch maximum ring size. When multiple binders are used, Contractor shall correlate data into related consistent groupings.
- C. Cover: Contractor shall identify each binder with typed or printed title "OPERATION AND MAINTENANCE MANUAL & INSTRUCTIONS"; and shall list title of Project and identify subject matter of contents.
- D. Contractor shall arrange content by systems process flow under section numbers and sequence of Table of Contents of the Contract Documents.
- E. Contractor shall provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- F. Text: The content shall include Manufacturer's printed data, or typewritten data on 24 pound paper.
- G. Drawings: Contractor shall provide with reinforced punched binder tab and shall bind in with text; folding larger drawings to size of text pages.

1.04 CONTENTS, EACH VOLUME:

- A. Table of Contents: Contractor shall provide title of Project; names, addresses, and telephone numbers of the Architect, any engineers, subconsultants,

Subcontractor(s), and Contractor with name of responsible parties; and schedule of products and systems, indexed to content of the volume.

- B. For Each Product or System: Contractor shall list names, addresses, and telephone numbers of Subcontractor(s) and suppliers, including local source of supplies and replacement parts.
- C. Product Data: Contractor shall mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
- D. Drawings: Contractor shall supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Contractor shall not use Project Record Documents as maintenance drawings.
- E. Text: The Contractor shall include any and all information as required to supplement product data. Contractor shall provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.
- F. Warranties and Bonds: Contractor shall bind in one copy of each.

1.05 MANUAL FOR MATERIALS AND FINISHES:

- A. Building Products, Applied Materials, and Finishes: Contractor shall include product data, with catalog number, size, composition, and color and texture designations. Contractor shall provide information for re-ordering custom manufactured products.
- B. Instructions for Care and Maintenance: Contractor shall include Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- C. Moisture Protection and Weather Exposed Products: Contractor shall include product data listing applicable reference standards, chemical composition, and details of installation. Contractor shall provide recommendations for inspections, maintenance, and repair.
- D. Additional Requirements: Contractor shall include all additional requirements as specified in the Specifications.
- E. Contractor shall provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

1.06 MANUAL FOR EQUIPMENT AND SYSTEMS:

- A. Each Item of Equipment and Each System: Contractor shall include description of unit or system, and component parts and identify function, normal operating characteristics, and limiting conditions. Contractor shall

include performance curves, with engineering data and tests, and complete nomenclature, and commercial number of replaceable parts.

- B. Panelboard Circuit Directories: Contractor shall provide electrical service characteristics, controls, and communications.
- C. Contractor shall include color coded wiring diagrams as installed.
- D. Operating Procedures: Contractor shall include start-up, break-in, and routine normal operating instructions and sequences. Contractor shall include regulation, control, stopping, shut-down, and emergency instructions. Contractor shall include summer, winter, and any special operating instructions.
- E. Maintenance Requirements: Contractor shall include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- F. Contractor shall provide servicing and lubrication schedule, and list of lubricants required.
- G. Contractor shall include manufacturer's printed operation and maintenance instructions.
- H. Contractor shall include sequence of operation by controls manufacturer.
- I. Contractor shall provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- J. Contractor shall provide control diagrams by controls manufacturer as installed.
- K. Contractor shall provide Contractor's coordination drawings, with color coded piping diagrams as installed.
- L. Contractor shall provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- M. Contractor shall provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- N. Additional Requirements: Contractor shall include all additional requirements as specified in Specification(s).
- O. Contractor shall provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

1.08 SUBMITTAL:

- A. Contractor shall submit to the District for review two (2) copies of preliminary draft or proposed formats and outlines of the contents of the Manual within thirty (30) days of Contractor's start of Work.
- B. For equipment, or component parts of equipment put into service during construction and to be operated by District, Contractor shall submit draft content for that portion of the Manual within ten (10) days after acceptance of that equipment or component.
- C. Contractor shall submit two (2) copies of a complete Manual in final form prior to final Application for Payment. Copy will be returned with Architect/Engineer comments. Contractor must revise the content of the Manual as required by District prior to District's approval of Contractor's final Application for Payment.
- D. Contractor must submit two (2) copies of revised Manual in final form within ten (10) days after final inspection.

PART 2 – PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

WARRANTIES

PART 1 – GENERAL REVIEW PER RECENT WARRANTY PROCEDURE

1.01 RELATED DOCUMENTS AND PROVISIONS

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Warranty/Guarantee Information;
- B. Special Conditions.

1.02 FORMAT

- A. Binders: Contractor shall use commercial quality, 8-1/2 by 11 inch, three-side rings, with durable plastic covers; two inch maximum ring size.
- B. Cover: Contractor shall identify each binder with typed or printed title "WARRANTIES" and shall list title of Project.
- C. Table of Contents: Contractor shall provide title of Project; name, address, and telephone number of Contractor and equipment supplier, and name of responsible principal. Contractor shall identify each item with the number and title of the specific Specification, document, provision, or section in which the name of the product or work item is specified.
- D. Contractor shall separate each warranty with index tab sheets keyed to the Table of Contents listing, providing full information and using separate typed sheets as necessary. Contractor shall list each applicable and/or responsible Subcontractor(s), supplier(s), and/or manufacturer(s), with name, address, and telephone number of each responsible principal(s).

1.03 PREPARATION:

- A. Contractor shall obtain warranties, executed in duplicate by each applicable and/or responsible subcontractor(s), supplier(s), and manufacturer(s), within ten (10) days after completion of the applicable item or work. Except for items put into use with District's permission, Contractor shall leave date of beginning of time of warranty until the date of completion is determined.
- B. Contractor shall verify that documents are in proper form, contain full information, and are notarized, when required.
- C. Contractor shall co-execute submittals when required.
- D. Contractor shall retain warranties until time specified for submittal.

1.04 TIME OF SUBMITTALS:

- A. For equipment or component parts of equipment put into service during construction with District's permission, Contractor shall submit a draft warranty for that equipment or component within ten (10) days after acceptance of that equipment or component.
- B. Contractor shall submit for District approval all warranties and related documents within ten (10) days after date of completion. Contractor must revise the warranties as required by the District prior to District's approval of Contractor's final Application for Payment.
- C. For items of work delayed beyond date of completion, provide updated submittal within ten days after acceptance, listing the date of acceptance as start of warranty period.

PART 2 - PRODUCTS Not Used.

PART 3 – EXECUTION Not Used.

END OF DOCUMENT

RECORD DOCUMENTS

PART 1 – GENERAL REVIEW PER RECENT CLOSE OUT PROCEDURES

1.01 RELATED DOCUMENTS AND PROVISIONS:

All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:

- A. General Conditions, including, without limitation, Documents on Work;
- B. Special Conditions.

PART 2 - RECORD DRAWINGS

2.01 GENERAL:

- A. As indicated in the Contract Documents, the District will provide Contractor with one set of reproducible (mylars) plans of the original Contract Drawings.
- B. Contractor shall maintain at each Project Site one set of marked-up plans and shall transfer all changes and information to those marked-up plans, as often as required in the Contract Documents, but in no case less than once each week. Contractor shall submit to the Project Inspector one set of reproducible vellums of the Project Record Drawings ("As-Builts") showing all changes incorporated into the Work since the preceding monthly submittal. The As-Builts shall be available at the Project Site. The Contractor shall submit reproducible vellums at the conclusion of the Project following review of the blue-line prints.
- C. Label and date each Record Drawing "RECORD DOCUMENT" in legibly printed letters.
- D. All deviations in construction, including but not limited to pipe and conduit locations and deviations caused by without limitation Change Orders, Construction Claim Directives, RFI's, and Addenda, shall be accurately and legibly recorded by Contractor.
- E. Locations and changes shall be done by Contractor in a neat and legible manner and, where applicable, indicated by drawing a "cloud" around the changed or additional information.

2.02 RECORD DRAWING INFORMATION:

- A. Contractor shall record the following information:
 - (1) Locations of Work buried under or outside each building, including, without limitation, all utilities, plumbing and electrical lines, and conduits.

- (2) Actual numbering of each electrical circuit.
- (3) Locations of significant Work concealed inside each building whose general locations are changed from those shown on the Contract Drawings.
- (4) Locations of all items, not necessarily concealed, which vary from the Contract Documents.
- (5) Installed location of all cathodic protection anodes.
- (6) Deviations from the sizes, locations, and other features of installations shown in the Contract Documents.
- (7) Locations of underground work, points of connection with existing utilities, changes in direction, valves, manholes, catch basins, capped stubouts, invert elevations, etc.
- (8) Sufficient information to locate Work concealed in each building with reasonable ease and accuracy.

In some instances, this information may be recorded by dimension. In other instances, it may be recorded in relation to the spaces in the building near which it was installed.

- B. Contractor shall provide additional drawings as necessary for clarification.
- C. Contractor shall provide reproducible record drawings, made from final Shop Drawings marked "No Exceptions Taken" or "Approved as Noted."

PART 3 - RECORD SPECIFICATIONS

3.01 GENERAL:

Contractor shall mark each section legibly to record manufacturer, trade name, catalog number, and supplier of each Product and item of equipment actually installed.

PART 4 - MAINTENANCE OF RECORD DOCUMENTS

4.01 GENERAL

- A. Contractor shall store Record Documents apart from documents used for construction as follows:
 - (1) Provide files and racks for storage of Record Documents.
 - (2) Maintain Record Documents in a clean, dry, legible condition and in good order.

B. Do not use Record Documents for construction purposes.

PART 5 – PRODUCTS Not Used.

END OF DOCUMENT



State of California • Natural Resources Agency

Department of Conservation

California Geological Survey

801 K Street • MS 12-31

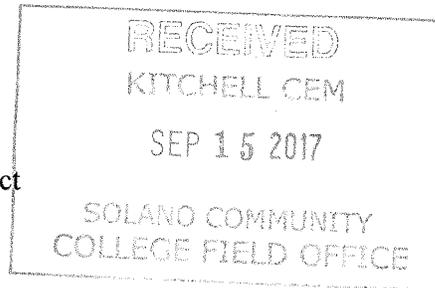
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Edmund G. Brown Jr., Governor

John G. Parrish, Ph.D., State Geologist

Mr. Lucky Lofton
Executive Bonds Manager
Solano Community College District
4000 Suisun Valley Road
Fairfield, CA 94534



September 8, 2017

**Subject: Engineering Geology and Seismology Review for
Vacaville Center – Classroom Building Rehabilitation and Addition
2000 North Village Parkway, Vacaville, CA 95688
CGS Application No. 02-CGS2962**

Dear Mr. Lofton:

In accordance with your request and transmittal of documents on June 29, 2017, the California Geological Survey has reviewed the engineering geology and seismology aspects of the consulting reports prepared for Vacaville Center in Vacaville. Based on the project application and Site Data Report referenced below, is our understanding that the current project is to rehabilitate the existing, non-conforming Vacaville Center annex building for compliance with current codes and ASCE 41-13 to obtain DSA certification. Based on discussions with the project structural engineer, Dan Manheim, CGS understands the ultimate goal is to certify the building so that an addition can be constructed, and geologic/geotechnical evaluation of this proposed addition was the scope of the reports prepared by Wallace-Kuhl & Associates. This review was performed in accordance with Title 24, California Code of Regulations, 2016 California Building Code (CBC) and followed CGS Note 48 guidelines. We reviewed the following reports:

Geologic Hazards and Geotechnical Engineering Report Update, Solano County Office of Education Joint-Use Building, Vaca Valley and North Village Parkways, Vacaville, California: Wallace-Kuhl & Associates; 3050 Industrial Boulevard, Sacramento, CA 95691, company Project No. 9927.01P, report dated June 6, 2017, 2 pages.

Geologic Hazards and Geotechnical Engineering Report, Solano County Office of Education Joint Use Building Addition, Vacaville, California: Wallace-Kuhl & Associates; 3050 Industrial Boulevard, Sacramento, CA 95691, company Project No. 9927.01P, report dated December 18, 2013, 20 pages, 12 figures, 4 appendices.

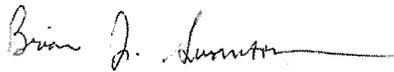
SCCD Vacaville Annex Rehabilitation Project – Site Data Report: CA Architects; 475 Gate Five Road, Suite 107, Sausalito, CA 94965, report dated June 26, 2017, 1 page.

September 8, 2017

Based on our review, the consultant generally provides a thorough assessment of the engineering geology and seismology issues *with respect to the proposed addition*. The principal concern identified by the consultant is the potential for liquefaction **and 3.5 inches of associated total seismic settlement**. The consultant also reports the site soils are corrosive to buried metals. The consultant recommends design spectral acceleration parameters of $S_{DS} = 1.070g$ and $S_{D1} = 0.551g$, derived from a map-based analysis, which are considered reasonable for the site. *CGS understands that many, or all, of the consultant's findings for the proposed addition may also be applicable to the existing building; however, the consultant does not specifically evaluate the engineering geology and seismology conditions with respect to rehabilitation of the existing building.*

In conclusion, *the engineering geology and seismology issues at this site are not adequately assessed in the referenced reports with respect to rehabilitation of the existing building*. It is recommended that additional information be provided as requested in the attached Note 48 Checklist Review Comments portion of this letter. The consultant is reminded that one copy of all supplemental documents should be submitted directly to CGS and should include the CGS application number. If you have any further questions about this review letter, please contact the reviewer at (213) 239-0885.

Respectfully submitted,



Brian J. Swanson
Engineering Geologist
PG 6494, CEG 2055



Concur:



Jennifer Thornburg
Senior Engineering Geologist
PG 5476, CEG 2240



Enclosures:

Note 48 Checklist Review Comments

Keyed to: *Note 48 - Checklist for the Review of Engineering Geology and Seismology Reports
for California Public Schools, Hospitals, and Essential Services Buildings*

Copies to:

David R. Gius, *Certified Engineering Geologist*, and Mathew S. Moynour, *Registered Geotechnical Engineer*
Wallace-Kuhl & Associates, 3050 Industrial Boulevard, Sacramento, CA 95691

Joshua Cohn, *Architect*
CA Architects, 475 Gate Five Road, Suite 107, Sausalito, CA 94965

Erik Edgmon, *Senior Architect*
Division of State Architect, 1102 Q Street, Suite 5200, Sacramento, CA 95814

Note 48 Checklist Review Comments

In the numbered paragraphs below, this review is keyed to the paragraph numbers of California Geological Survey Note 48 (October, 2013 edition), *Checklist for the Review of Engineering Geology and Seismology Reports for California Public Schools, Hospitals, and Essential Services Buildings*.

Project Location

1. Site Location Map, Street Address, County Name: Adequately addressed.
2. Plot Plan with Exploration Data with Building Footprint: Adequately addressed.
3. Site Coordinates: Adequately addressed. Latitude and Longitude provided in report: 38.3938°N, 121.9435°W

Engineering Geology/Site Characterization

4. Regional Geology and Regional Fault Maps: Adequately addressed.
5. Geologic Map of Site: Not provided and therefore not reviewed.
6. Subsurface Geology: **Additional information is requested.** The consultant reports the site is underlain by Pleistocene deposits of the lower member of the Modesto Formation based on published mapping and 3 borings drilled to a maximum depth of 51.5 ft at the location of the proposed addition. Groundwater reportedly was measured at depths of 11.5 to 19 ft following the completion of drilling of the borings. The consultant has adequately characterized the engineering geologic conditions at the site of the **proposed addition**. *The consultant should evaluate and substantiate that the same conditions apply for the existing building site, or provide additional data and updated descriptions as needed.*
7. Geologic Cross Sections: Adequately addressed. One provided.
8. Active Faulting & Coseismic Deformation Across Site: Adequately addressed. The consultant reports the site is not within an Alquist-Priolo Earthquake Fault Zone and is not located across the trace of any mapped faults.
9. Geologic Hazard Zones (Liquefaction & Landslides): Adequately addressed. The consultant reports the site is not currently mapped in a seismic hazard zone by CGS.
10. Geotechnical Testing of Representative Samples: Adequately addressed.
11. Geological Consideration of Grading Plans and Foundation Plans: **Additional information is requested.** The consultant provides recommendations for the design of conventional shallow footings and for preparation of the subgrade materials for the **proposed addition**. *The consultant should address the existing building site with respect to the site conditions and provide updated recommendations as needed.*

Seismology & Calculation of Earthquake Ground Motion

12. Evaluation of Historic Seismicity: Adequately addressed. The consultant reports the site has experienced a shaking intensity of X on the Modified Mercalli Scale as a result of the April 19, 1892 Vacaville earthquake, the epicenter of which was about 3 miles from the site.

13. Classify the Geologic Subgrade (Site Class): Adequately addressed. The consultant classifies the site soil profile as **Site Class D**, Stiff Soil, which appears reasonable based on the data provided.
14. General Procedure Seismic Parameters: **Additional information is requested.** The consultant reports the following parameters reportedly obtained using the USGS Design Maps website, which appear reasonable for the proposed addition:
 $S_s = 1.605g$ and $S_1 = 0.551g$
 $S_{Ds} = 1.070g$ and $S_{D1} = 0.551g$

CGS understands that rehabilitation of the existing building is to follow ASCE 41-13 and DSA-SS/CC amendments. *Therefore, the consultants should also provide appropriate seismic parameters for this code and parameters in accordance with Table 317.5 of the California Existing Building Code.* The consultants are encouraged to discuss these parameters with CGS.

15. Seismic Design Category: Adequately addressed. $S_1 < 0.75$. Category D.
16. Site-Specific Ground Motion Analysis: Not applicable.
17. Deaggregated Seismic Source Parameters: Adequately addressed. The consultant selects a modal magnitude of 6.6 for use in their liquefaction analyses, which appears reasonable based on the USGS Unified Hazard Tool website.
18. Time-Histories of Earthquake Ground Motion: Not applicable.

Liquefaction/Seismic Settlement Analysis

19. Geologic Setting for Occurrence of Seismically Induced Liquefaction: Adequately addressed. The consultant reports the site is underlain primarily by medium dense to dense silty sands and stiff to hard lean clays to the depths explored. The consultant selects a design groundwater depth of 10 ft for purposes of analyses based on data from a nearby water well, which appears reasonable.
20. Seismic Settlement Calculations: **Additional information is requested.** The consultant provides the results of liquefaction analyses conducted based on data from boring D2 and a PGA of 0.59g. The consultant's analyses indicate the potential for **3.5 inches of seismic settlement due to liquefaction** between depths of about 20 to 30 ft, **which appears reasonable for the proposed addition** based on the data and analyses provided. The consultant recommends the design of the addition consider a potential differential settlement of 1 inch over a horizontal distance of 50 ft, or the shortest dimension of the structure, which is less. *The consultant should evaluate the potential for liquefaction and seismic settlements with respect to the existing building and provide updated analyses and recommendations as needed.*
21. Other Liquefaction Effects: **Additional information is requested.** The consultant reports the site is relatively flat and that conventional shallow foundations should be adequate for the **proposed addition** based on the depth of liquefiable soils. *The consultant should provide an assessment of potential surface manifestations and loss of bearing capacity with respect to the existing building.*
22. Mitigation Options for Liquefaction: **Additional information is requested.** The consultant provides recommendations for minimum reinforcement of the footings for the **proposed**

addition. The consultant should assess the footings supporting the existing building and provide design recommendations as needed.

Slope Stability Analysis

23. Geologic Setting for Occurrence of Landslides: Adequately addressed. The consultant reports the site is relatively flat and therefore concludes the potential for landslides at the site is nonexistent.
24. Determination of Static and Dynamic Strength Parameters: Not applicable.
25. Determination of Pseudo-Static Coefficient (K_{eq}): Not applicable.
26. Identify Critical Slip Surfaces for Static and Dynamic Analyses: Not applicable.
27. Dynamic Site Conditions: Not applicable.
28. Mitigation Options/Other Slope Failure: Not applicable.

Other Geologic Hazards or Adverse Site Conditions

29. Expansive Soils: Adequately addressed. The consultant reports the shallow site soils have a “medium” expansion potential based on one expansion index test ($EI = 51$). The consultant concludes that special reinforcement is not necessary to mitigate expansive soils conditions.
30. Corrosive/Reactive Geochemistry of the Geologic Subgrade: Adequately addressed. The consultant reports the site soils are not corrosive with respect to sulfate content, chloride content or pH. However, the consultant reports the soils may be corrosive to buried metals based on resistivity testing and refers mitigation to a corrosion engineer.
31. Conditional Geologic Assessment: Selected geologic hazards addressed by the consultant are listed below:
 - C. Flooding: Adequately addressed. The consultant reports the site is in Zone X, areas outside of the 0.2% annual chance floodplain, per FEMA. The consultant also reports the site is not within a mapped dam inundation zone.

Report Documentation

32. Geology, Seismology, and Geotechnical References: Adequately addressed.
33. Certified Engineering Geologist: Adequately addressed.
David R. Gius, Jr., Certified Engineering Geologist #1681
34. Registered Geotechnical Engineer: Adequately addressed.
Mathew S. Moyneur, Registered Geotechnical Engineer #2920

Geologic Hazards and Geotechnical Engineering Report

SOLANO COUNTY OFFICE OF EDUCATION

JOINT USE BUILDING

WKA No. 9927.01P

December 18, 2013

Prepared For:

Solano County Office of Education
2460 Clay Bank Road
Fairfield, California 94533

Geologic Hazards and Geotechnical Engineering Report
SOLANO COUNTY OFFICE OF EDUCATION JOINT-USE BUILDING ADDITION

Vacaville, California

WKA No. 9927.01P

TABLE OF CONTENTS

INTRODUCTION	1
Work Scope	1
Figures and Attachments	2
Proposed Development	2
Site Description	3
Regional Geology	3
Site Geology	3
Subsurface Soil Conditions	4
Groundwater	4
Faulting	4
Coseismic Ground Deformation	6
Historic Seismicity	6
CONCLUSIONS	6
Seismic Hazards	6
Seismic Site Class	7
2013 CBC/ASCE 7-10 Seismic Design Criteria	7
Liquefaction Potential	8
Liquefaction Analysis and Results	8
Dry Settlement	9
Volcanic Hazards	9
Landslides	10
Naturally Occurring Asbestos (NOA) and Radon Gas	10
Flood Hazards	10
Dam Inundation	10
Tsunamis and Seiches	10
Subsidence and Hydrocollapse	10
Soil Expansion Potential	11
Bearing Capacity	11
Excavation Conditions	11
Groundwater	11
Preliminary Soil Corrosion Potential	12
RECOMMENDATIONS	12
Site Preparation	13
Engineered Fill Construction	14
Subgrade Preparation	14
Utility Trench Backfill	15
Foundations	15
Interior Floor Slab Support	16
Floor Slab Moisture Penetration Resistance	18
Exterior Concrete Flatwork	18
Site Drainage	19
Construction Testing and Observation	19
LIMITATIONS	19



Geologic Hazards and Geotechnical Engineering Report
SOLANO COUNTY OFFICE OF EDUCATION JOINT-USE BUILDING ADDITION
Vacaville, California
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TABLE OF CONTENTS (continued)

FIGURES

Vicinity Map.....	Figure 1
Site Plan.....	Figure 2
USGS Topographic Map	Figure 3
Site Geologic Map.....	Figure 4
Site Geologic Cross Section	Figure 5
Fault Map	Figure 6
Epicenter Map.....	Figure 7
FEMA Flood Map	Figure 8
Logs of Borings	Figure 9 through 11
Unified Soil Classification System	Figure 12

APPENDIX A – Field and Laboratory Test

Expansion Index Test Results	Figure A1
Corrosion Test Results.....	Figure A2

APPENDIX B – References

APPENDIX C – Liquefaction Results

APPENDIX D - Guide Earthwork Specifications



Geologic Hazards and Geotechnical Engineering Report

SOLANO COUNTY OFFICE OF EDUCATION JOINT-USE BUILDING

Vaca Valley and N. Village Parkways

Vacaville, California

WKA No. 9927.01P

December 18, 2013

INTRODUCTION

Wallace-Kuhl & Associates (WKA) has performed a geologic hazards and geotechnical engineering investigation for the planned improvements for the Solano County Office of Education (SCOE) Joint-Use Building project in Vacaville, California. The purposes of this investigation have been to explore the existing site, soil, geologic and groundwater conditions in the area of the proposed improvements, and to provide geologic hazards and geotechnical engineering conclusions and recommendations for use by the other members of the design team during the design and construction of the proposed improvements. This report presents the results of our work.

Work Scope

Our scope of work included the following:

1. site reconnaissance;
2. review of historic aerial photographs, topographic maps and groundwater information of the area;
3. review of previous geotechnical engineering investigations performed in the vicinity of the site;
4. review of geologic maps and fault maps;
5. review of historic seismicity within 100 kilometers of the site;
6. subsurface exploration, including the drilling and sampling of three test borings to maximum depths of approximately 20 to 50 feet below the existing ground surface;
7. laboratory testing of selected soil samples;
8. engineering analyses; and,
9. preparation of this report.

Figures and Attachments

The following figures are included with this report:

Table 1: Figures

Figure	Title	Figure	Title
1	Vicinity Map	6	Fault Map
2	Site Plan	7	Epicenter Map
3	USGS Topographic Map	8	FEMA Flood Map
4	Regional Geologic Map	9-11	Logs of Borings
5	Site Geologic Cross Section	12	Unified Soil Classification System

Appended to this report are:

- **Appendix A** - General information regarding project concepts; exploratory methods used during our field investigation; and, laboratory test results not included on the boring logs.
- **Appendix B** - A list of references cited.
- **Appendix C** – Liquefaction Analysis Results
- **Appendix D** - *Guide Earthwork Specifications* that may be used in the preparation of contract documents.

Proposed Development

We understand the project will consist of the design and construction of a single-story building addition to an existing concrete tilt-up structure. The building addition will extend north of the existing building. At the time this report was prepared, the exact layout of the building addition was not known. However, our review of schematic design drawings dated October 4 and 10, 2013 prepared by Meta Architecture Design Initiative indicates the building addition may vary in size from 4100 square feet to 1150 square feet and may or may not be structurally connected to the existing building.



FINDINGS

Site Description

The project site is located in a vacant area just north of an existing single-story, concrete tilt-up building located northwesterly of the corner of Vaca Valley Parkway and N. Village Parkway in Vacaville, California. At the time of our field investigation on October 29, 2013, the site was vacant and bound to the north by plowed farm fields and to the east and west by vacant land, beyond which was asphalt concrete parking for the existing building. The surface of the majority of the proposed building appeared to be a graded and compacted gravel access road to access to the north end of the existing building.

Based upon our review of the topographic map of the *Allendale Quadrangle*, published by the United States Geologic Survey (dated 1980), the elevation of the site is approximately +96 feet relative to mean sea level (msl). A USGS topographic map of the site is presented as Figure 3. The site is located at approximately 38.3938° north latitude and 121.9435° west longitude.

Regional Geology

The project site is located at the south end of the Sacramento Valley within the Great Valley geomorphic province of California. The geology in the Great Valley is characterized by thick sequences of alluvial and flood plain deposits consisting of sedimentary material derived from the Coast Ranges to the west and the Sierra Nevada mountain range to the east.

The Great Valley of California is generally considered to be an elongated sedimentary trough, approximately 450 miles long and 50 miles wide, which has been filled by a thick sequence of Jurassic to Holocene continental and marine sediments. The sediments have been folded into an asymmetric syncline, the axis of which lies immediately east of the interior Coast Ranges (Bailey, 1966). Surface elevations within the Great Valley generally range from several feet below msl to more than 1000 feet msl.

Site Geology

The site has been mapped as being underlain by the Pleistocene-aged lower member of the Modesto Formation (Q_{ml} – Helley and Harwood, 1985) overlying late Tertiary-aged sandstones and siltstones associated with the Tehama Formation. The lower member of the Modesto Formation is characterized by unconsolidated slightly weathered gravels, sands, silts and clays. The soil conditions encountered during our recent subsurface investigation are consistent with



the mapped geology. A geologic map is presented as Figure 4 and a geologic cross section illustrating the geologic surface conditions is presented on Figure 5.

Subsurface Soil Conditions

On October 29 2013, a total of three test borings were advanced within areas of the proposed building addition footprint. The borings extended to maximum depths of approximately 20 to 50 feet below existing grades. Approximate subsurface exploration locations are shown on Figure 2.

In general, the borings indicate the subsurface soils consist of interbedded, clay, silt and sand layers extending to the explored 20 to 50 foot depths of the borings. For soil conditions at a specific location, please refer to the boring logs contained on Figures 9 through 11.

Groundwater

Groundwater was encountered about 18 to 25 feet below the existing ground surface on October 29, 2013. Immediately following the drilling operations, groundwater was encountered about 11½ to 19 feet below the existing ground surface at the boring locations.

Review of historical groundwater data compiled by the Department of Water Resources (DWR) for well 07N01W35R001M located about one mile north of the site indicates groundwater elevations have fluctuated from a maximum of approximately +60.1 feet msl in March of 1959, or about 31.9 feet below the ground surface at the well location, to about +84.2 feet msl in March of 1993, or about 7.8 feet below the ground surface at the well location.

The most recent groundwater reading at the well (March of 1994) indicates a groundwater elevation of +79.6 feet msl, or about 12.4 feet below the ground surface at the well location.

Faulting

Based on our review of available geologic and seismic references, the existing building and the planned building expansion are not located across a mapped trace of any fault. The site is *not* located within an Alquist-Priolo (AP) Earthquake Fault Zone (Hart and Bryant, 2007).

Using the *Revised 2002 California Probabilistic Seismic Maps* (Cao, et al, 2003), we have prepared Table 2 containing faults and fault systems within about 100 kilometers of the site that



are considered capable of producing earthquakes with moment magnitude (M_w) of 6.5 or greater. A fault location map is presented on Figure 6.

Table 2: Faults Influential to the site

Fault Name	Distance		Maximum Magnitude (M_w)
	Miles	Kilometers	
GREAT VALLEY 4	0.0	0.0	6.6
GREAT VALLEY 5	6.7	10.8	6.5
CONCORD/GREEN VALLEY (GV) (CON+GVS+GVN)	12.6	20.3	6.7
HUNTING CREEK – BERRYESSA	14.4	23.1	7.1
GREAT VALLEY 3	18.8	30.2	6.9
WEST NAPA	21.3	34.3	6.5
MOUNT DIABLO (MTD)	30.9	49.7	6.7
HAYWARD (HS+HN+RC)	33.6	54.1	7.3
GREENVILLE (GN)	35.7	57.5	6.7
CALAVERAS (CS+CC+CN)	40.0	64.4	6.9
HAYWARD (HS)	41.8	67.2	6.7
MAACAMA – GERBERVILLE	42.5	68.4	7.5
COLLAYOMI	48.0	77.3	6.5
BARTLETT SPRINGS FAULT SYSTEM	48.1	77.4	7.6
FOOTHILLS FAULT SYSTEM 1	49.0	78.9	6.5
GREAT VALLEY 7	50.9	81.9	6.7
GREENVILLE (GS+GN)	51.2	82.4	6.9
GREAT VALLEY 2	51.6	83.1	6.4
SAN ANDREAS (SAS+SAP+SAN+SAO)	51.7	83.2	7.9
POINT REYES	54.0	86.9	7.0
SAN GREGORIO (SGS+SGN)	56.5	91.0	7.4
FOOTHILLS FAULT SYSTEM 2	60.5	97.4	6.5

Segment 4 of the Great Valley Fault Zone has been interpolated as being less than 0.1 km from the site based upon the segments end point locations as published in Cao, et al 2003. The Great Valley Fault Zone is not mapped as having surface rupture in Holocene time, and is therefore not placed within an Alquist-Priolo Fault Study Zone. This fault system is used to model potential earthquake ground shaking and is recognized in the modeling and calculation of the seismic design parameters presented later in this report for structural engineering design as well in determination of the peak ground acceleration used to determine the potential for liquefaction and seismically induced settlement. The risk of ground rupture from movement on Segment 4 of the Great Valley Fault is very low.



Coseismic Ground Deformation

The California State Legislature passed the Seismic Hazards Mapping Act (SHMA) in 1990 (Public Resources Code Division 2, Chapter 7.8) as a result of earthquake damage caused by the 1987 Whittier Narrows and 1989 Loma Prieta earthquakes. The purpose of the SHMA is to protect public safety from the effects of strong ground shaking, liquefaction, landslides, or other ground failure, and other hazards caused by earthquakes (CGS SP117). The planned Joint-Use Building site is not mapped within a seismic hazard zone based on review of currently published maps available on the CGS website.

Historic Seismicity

Data pertinent to the greatest historical earthquakes affecting the site are contained within the database of the EQSEARCH computer program (Blake, 2000; database updated to July, 2010). The EQSEARCH database was developed by extracting records of events greater than magnitude 4.0 from the DMG *Comprehensive Computerized Earthquake Catalog*, and supplemented by records from the USGS; University of California, Berkeley; the California Institute of Technology; and, the University of Nevada at Reno. A historic earthquake epicenter map is presented as Figure 7.

An examination of the tabulated data suggests that the site has experienced ground shaking equivalent to Modified Mercalli Intensity X^1 . According to this data, the most intense earthquake ground shaking in the vicinity of the site resulted from the Vacaville-Winters earthquake of April 19, 1892, with an epicenter located approximately 3.1 miles (5 km) southwest of the site, which is also the closest earthquake to the site.

CONCLUSIONS

Seismic Hazards

No active or potentially active faults are shown to pass through the project site as indicated by the published geologic maps or aerial photographs that we reviewed. The project site is located within an area of moderate to high seismic activity; however, design of the structures in conformance with the 2013 edition of the California Building Code (CBC) (Title 24 of the California Code of Regulations), should be sufficient to prevent significant damage from ground

¹ Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.



shaking during seismic events resulting from movement on any of the faults or fault systems discussed in this report.

Seismic Site Class

The site is underlain by Pleistocene-aged lower member of the Modesto Formation (Q_{ml}), which has been identified as a material meeting Site Classification CD (Wills, et al., 2001). It is our opinion, based on the geology of the site and the soil conditions encountered at the borings, that the soils at this site should be designated as Site Class D in determining seismic design forces for this project in accordance with Section 1613A.3.2 of the 2013 edition of the CBC.

2013 CBC/ASCE 7-10 Seismic Design Criteria

Section 1613 of the 2013 edition of the CBC references ASCE Standard 7-10 for seismic design. The following seismic parameters were determined based on the site latitude and longitude using the public domain computer program developed by the USGS. The following parameters summarized in the table below may be used for seismic design of the proposed improvements.

Table 3: 2013 CBC/ASCE 7-10 Seismic Design Parameters

Latitude: 38.3938° N Longitude: 121.9435° W	ASCE 7-10 Table/Figure	2013 CBC Table/Figure	Factor/ Coefficient	Value
Short-Period MCE at 0.2s	Figure 22-1	Figure 1613.3.1(1)	S_s	1.605 g
1.0s Period MCE	Figure 22-2	Figure 1613.3.1(2)	S_1	0.551 g
Soil Class	Table 20.3-1	Section 1613.3.2	Site Class	D
Site Coefficient	Table 11.4-1	Table 1613.3.3(1)	F_a	1.000
Site Coefficient	Table 11.4-2	Table 1613.3.3(2)	F_v	1.500
Adjusted MCE Spectral Response Parameters	Equation 11.4-1	Equation 16-37	S_{MS}	1.605 g
	Equation 11.4-2	Equation 16-38	S_{M1}	0.827 g
Design Spectral Acceleration Parameters	Equation 11.4-3	Equation 16-39	S_{DS}	1.070 g
	Equation 11.4-4	Equation 16-40	S_{D1}	0.551 g
Seismic Design Category	Table 11.6-1	Section 1613.3.5(1)	Occupancy I to IV	D
	Table 11.6-2	Section 1613.3.5(2)	Occupancy I to IV	D



Liquefaction Potential

Liquefaction is a soil strength loss phenomenon that typically occurs in loose, saturated cohesionless sands as a result of strong ground shaking during earthquakes. The potential for liquefaction at a site is usually determined based on the results of a subsurface soil investigation and the groundwater conditions beneath the site. Hazards to buildings associated with liquefaction include shallow and deep foundation bearing capacity failure, lateral spreading of soil, and differential settlement of soils below foundations, all of which can contribute to structural damage or collapse.

The results of our subsurface soil exploration at the site indicate the underlying soils generally consist of dense and stiff cohesive soils to the maximum explored depth of 50 feet below the existing ground surface. Based upon the presence of relatively dense and cohesive soils, it is our opinion that the potential for liquefaction of the soils beneath the site is low. However, the presence of relatively young alluvial soils and groundwater within 50 feet of the ground surface are site conditions that require that an evaluation of the liquefaction potential be performed per CGS Note 48 and Special Publication 117.

Liquefaction Analysis and Results

We performed a liquefaction analysis of data obtained from the blow counts measured in the hollow-stem auger Boring D2 using LiqIT (version 4.7) and the NCEER methodology. The blow counts obtained during the field exploration were converted to Standard Penetration Test (SPT) resistances based on a correction factor of 0.65. A design static groundwater level of approximately 10 feet below existing ground surface was used in our analysis based on our review of historic groundwater levels in the area. A peak ground acceleration (PGA) of 0.585 g was used in the liquefaction analysis based on Section 11.8.3 of the ASCE -10. A mode magnitude earthquake of 6.6 was used for this analysis using the 2008 USGS National Seismic Hazard Mapping Project (NSHMP) Probabilistic Seismic Hazard Analysis (PSHA) Interactive Deaggregation web site.

The results of the liquefaction analyses indicate factors of safety against liquefaction below 1.3 for a portion of the soils located beneath the groundwater table and those soils are considered susceptible to liquefaction. Copies of the liquefaction analysis performed for this investigation are presented in Appendix C.



Seismically Induced Settlement

Post-liquefaction settlement calculations within LiqIT are performed using the methodology of Ishihara and Yoshimine (1992).

Given the results of our analysis performed for this investigation, the worst-case estimate of total post-liquefaction settlement is calculated to be about 3.5 inches total seismic induced settlement. Based on the soil conditions encountered at the borings, we anticipate about one inches of differential settlement across 50 feet, or the shortest dimension of the structure, whichever is less. These estimates of post-liquefaction seismic settlements represent free-field ground settlement, not settlement of the structures.

Dry Settlement

Using the methodology of Pradel (1998) we estimated the potential for dry sand settlement of the portion of the soil column above the water table to be negligible since the soils above the historical groundwater level of 10 feet are clayey in nature.

Provided the site is prepared in accordance with the recommendations presented in our report, static settlements of the structures should be less than one-inch total and one-half inch differential across the width of any of the planned new structures or structural additions. Static settlements are expected to be elastic and should occur during the construction of the proposed improvements.

Volcanic Hazards

According to the USGS publication "Potential Hazards from Future Volcanic Eruptions in California," (Miller, 1989), the proposed building addition is located about 60 miles southeast of the Clear Lake volcanic area; at least 150 miles south and southwest of the Mount Shasta, Medicine Lake, Highland, and Lassen Peak volcanic areas; about 165 miles west of the Mono Lake-Long Valley volcanic area; and, more than 240 miles northwest from the Owens River, Ubehebe Crater, Coso, Amboy Crater, and Lavic Lake volcanic areas. The site is not located within an identified Volcanic Hazard Area.



Landslides

The topography across the planned building addition is relatively flat. In our opinion the potential for landslides affecting the planned improvements does not exist provided that the recommendations for site preparation and fill construction are followed.

Naturally Occurring Asbestos (NOA) and Radon Gas

Due to the absence of geologic materials typically associated with naturally occurring asbestos (CGS SP 124, 2008; Churchill and Hill, 2000), it is unlikely that naturally occurring asbestos exists at the subject site.

Geologic conditions that are more likely to be associated to indoor radon gas hazards (Churchill, 1991) are not known to exist at the site.

Flood Hazards

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map for Solano County, California (Community-Map Number 06095C0164E; effective date May 4, 2009), the building addition area is located within OTHER AREAS - ZONE X defined as "Areas determined to be outside the 0.2% annual chance floodplain". A FEMA Flood Map is presented as Figure 8.

Dam Inundation

The addition site is not located within a mapped dam inundation zone.

Tsunamis and Seiches

There are no significant bodies of standing water near the site; therefore, the potential for seiches or tsunamis influencing the site does not exist.

Subsidence and Hydrocollapse

Subsidence occurs when a large land area settles due to extensive withdrawal of groundwater, oil, natural gas or oxidation of peat. The soil at the project site is underlain by interbedded clay, silt, and sand layers. No documents, including the *Solano County General Plan* dated November 2008, indicate the site is subject to ground subsidence as a result of groundwater pumping or withdrawal of gas or oil.



Soil Expansion Potential

The Expansion Index tests performed on a soil sample collected during our subsurface exploration indicate the near-surface soils have a medium expansion potential when subjected to conventional testing procedures. In our opinion, special reinforcement of foundations to resist or control soil expansion pressures is not considered necessary on this project. Expansion test results performed for this evaluation are attached as Figure A1.

Bearing Capacity

Based upon our field and laboratory testing, it is our opinion the undisturbed native soils and new engineered fills composed of native soils or approved imported soils are capable of supporting the planned improvements associated with the proposed building addition.

Excavation Conditions

Based on the information obtained during the field exploration, we anticipate the soils at the site will be readily excavatable with conventional earthmoving and trenching equipment. Relatively dense or partially cemented soils may be encountered at the site and can prove slower to excavate with smaller equipment; however, it is our opinion that larger equipment can remove these materials with light to moderate effort.

In general, we anticipate the on-site soils will likely remain stable at near-vertical inclinations without significant caving for relatively short periods (i.e., less than one day) during foundation construction. Excavations deeper than five feet should be sloped or braced in accordance with current OSHA regulations.

The contractor must provide a safely sloped excavation or an adequately constructed and braced shoring system in accordance with federal, state and local safety regulations for individuals working in an excavation that may expose them to the danger of moving ground. If material is stored or heavy equipment is operated near an excavation, stronger shoring must be used to resist the extra pressure due to the superimposed loads.

Groundwater

Based on the groundwater information in the area and our subsurface investigation, a permanent groundwater table should not be a significant factor in development for excavations extending less than about 10 feet below the existing ground surface. However, saturation of



surface soils should be expected from rainfall, surface run-off, or irrigation. In general, standard sump pit and pumping procedures should be adequate to control localized seepage into required excavations.

Preliminary Soil Corrosion Potential

A sample of near-surface soil was submitted to Sunland Analytical for testing to determine pH, chloride and sulfate concentrations, and resistivity to help evaluate the potential for corrosive attack upon buried structures. Results of the corrosivity testing are provided in the table below and presented on Figure A2.

Table 4: Corrosion Test Results

Sample Location	Depth (feet)	Soil Type	pH	Chloride Content (ppm)	Sulfate Content (ppm)	Resistivity (ohm-cm)
D2	1 to 4	CL	6.65	10.6	34.7	1580

The California Department of Transportation Corrosion Technology Section, Office of Materials and Foundations, Corrosion Guidelines Version 1.0, September 2003, considers a site to be corrosive to foundation elements if one or more of the following conditions exists for the representative soil and/or water samples taken: has a chloride concentration greater than or equal to 500 ppm, sulfate concentration greater than or equal to 2000 ppm, or the pH is 5.5 or less. Based on this criterion, the on-site soils are not considered corrosive to foundation elements for the samples tested. Table 4.2.1 *Exposure Categories and Classes* of the American Concrete Institute (ACI) Manual of Concrete Practice Part 3 - 2010, indicate the severity of sulfate exposure for the samples tested is Not Applicable, with the exception of the D12 sample that is indicated to be Moderate. However, the relatively low resistivity value (less than 1000 ohm-cm) for one of the samples indicates the soils could also be corrosive to unprotected buried metal.

Wallace-Kuhl & Associates are not corrosion engineers. Therefore, if it is desired to further define the soil corrosion potential at the site, a corrosion engineer should be consulted.

RECOMMENDATIONS

The recommendations presented below are appropriate for typical construction in the late spring through fall months. The on-site soils likely will be saturated by rainfall in the winter and



early spring months, and will not be compactable without drying by aeration or the addition of lime (or a similar product). In the event that the construction schedule requires work during wet conditions, additional recommendations can be provided, as conditions dictate.

Site preparation should be accomplished in accordance with the provisions of this report and the appended guide specifications. A representative of the Geotechnical Engineer should be present during site grading to evaluate compliance with the above recommendations and the guide specifications. The Geotechnical Engineer of Record referenced herein should be considered the Geotechnical Engineer that is retained to provide geotechnical engineering observation and testing services during construction.

Site Preparation

The proposed improvement areas should be cleared of existing structures, pavements, flatwork, below-grade structures, debris, and other deleterious materials to expose undisturbed soils. Where practical, the clearing should extend a minimum of five feet beyond the limits of the proposed structural areas of the site.

Existing underground utilities within the proposed building pad should be completely removed and/or rerouted as necessary. Utilities located outside the building area should be properly abandoned (i.e., fully grouted provided the abandoned utility is situated at least 2½ feet below the final subgrade level to reduce the potential for localized “hard spots”). Depressions resulting from removal of underground structures (e.g., foundations, utilities, etc.) should be cleaned of loose soil and properly backfilled in accordance with the recommendations of this report.

Necessary excavations adjacent to existing structures should not remove soil from the zone extending at a one horizontal to one vertical (1:1) plane extending down and out from existing foundations.

Following site clearing and demolition activities, areas to receive structural improvements and/or slab-on-grade concrete should be scarified to a depth of 12 inches. The soil should be moisture conditioned to at least two percent above the optimum moisture content and compacted to at least 90 percent of the ASTM International (ASTM) D1557 maximum dry unit weight.



Engineered Fill Construction

Any fill placed within the construction area should be an approved material, free of significant quantities of organics or other deleterious materials. The fill should be spread in level layers not exceeding six inches in compacted thickness and compacted to a minimum of 90 percent of the maximum dry density. Maximum dry densities shall be determined in accordance with ASTM D1557. Engineered fill composed of native soil should be moisture conditioned to at least two percent above the optimum moisture content and maintained in that condition. The on-site soils encountered at the boring locations are considered suitable for use as engineered fill provided they are free of rubble and organic concentrations.

Compaction operations should be performed in the presence of the Geotechnical Engineer's representative who will evaluate the performance of the subgrade under compactive load and identify loose or unstable soils that could require additional subgrade preparation.

Imported fill should be an approved compactable, well-graded, granular material, have an Expansion Index of 20 or less and be free of particles larger than three inches in maximum dimension. The Geotechnical Engineer must approve import material *before* being transported to the project site. In addition, we recommend that the contractor supply a certification for any imported fill materials that designates the fill materials to be free of known contaminants and have corrosion characteristics within acceptable limits.

Permanent excavation and fill slopes should be constructed no steeper than two horizontal to one vertical (2:1), and should be vegetated as soon as practical following grading to minimize erosion. Slopes should be over-built and cutback to design grades and inclinations.

Site preparation should be accomplished in accordance with the recommendations of this section and the appended specifications. We recommend the Geotechnical Engineer's representative be present during site preparation and all grading operations to observe and test the fill to verify compliance with the recommendations of this report and the job specifications.

Subgrade Preparation

Subgrade soils supporting interior and exterior slab-on-grade concrete should be compacted to at least 90 percent relative compaction at no less than two percent above the optimum moisture content regardless of whether the grade is achieved by filling, excavation or remains near existing grade. Relative compaction should be based on the maximum dry density as determined in accordance with the ASTM D1557 Test Method.



Subgrade soils must be protected from drying and disturbance until covered by aggregate base, capillary break gravel, slabs and/or pavements.

Utility Trench Backfill

Bedding and initial backfill for utility construction should conform to the pipe manufacturer's recommendations and applicable sections of the governing agency standards. General trench backfill should consist of engineered fill backfilled in maximum nine-inch thick loose lifts with each compacted to at least 90 percent of the maximum dry density as determined by ASTM D1557 within five feet of the final subgrade and to a minimum of 95 percent of the maximum dry density for any fills placed below five feet of the final subgrade. Utility trench backfill within the upper six inches of the final subgrade within pavement areas should be compacted to at least 95 percent of the maximum dry density.

We recommend that all underground utility trenches aligned nearly parallel with existing or new foundations be located at least five feet horizontally from the foundations, wherever possible. If this is not practical, the trenches should not encroach on a zone extending at a one horizontal to one vertical (1:1) inclination below the bottom of the foundations.

Foundations

As noted previously, seismically induced settlements of about 3.5 inches of total settlement were calculated based on the soil and groundwater conditions at the site. However, the calculated settlements are based on settlements within discrete soil layers and do not take into consideration the interbedded nature of the soil layers or how those settlements will be manifested at the surface. At this site, the majority of the seismically induced settlement will theoretically occur at depths of 25 to 30 feet below the existing ground surface below interbedded layers of cohesive soils and relatively dense soils that are not anticipated to liquefy during the design seismic event. Therefore, we anticipate the potential for liquefaction adversely affecting the performance of the proposed structures is low and the proposed building addition and associated structures may be supported upon a continuous perimeter foundation with continuous or isolated interior spread foundations.

Foundations should be embedded at least 18 inches below lowest adjacent soil grade. For this project, the pad soil grade is the surface on which capillary break materials are placed. Continuous foundations should maintain a minimum width of 12 inches and isolated spread foundations should be at least 24 inches in plan dimension. Foundations so established may be sized for maximum net allowable soil bearing pressures of 3000 pounds per square foot



(psf) for dead plus live loads, with a 1/3 increase for total loads including the short-term effects of wind or seismic forces. The weight of the foundation concrete extending below lowest adjacent soil grade may be disregarded in sizing computations.

Significant additional settlement of the existing building foundations from loads imposed by new foundations constructed immediately adjacent to existing foundations is generally not anticipated.

Continuous foundations should be reinforced with at least four No. 4 reinforcement bars, placed two each near the top and bottom of the foundation. This is considered a guide minimum only; the project structural engineer should determine the final dimensions and structural reinforcement of the building foundations.

Resistance to lateral foundation displacement for conventional foundations may be computed using an allowable friction factor of 0.25, which may be multiplied by the effective vertical load on each foundation. Additional lateral resistance may be computed using an allowable passive earth pressure of 250 psf per foot of depth. These two modes of resistance should not be added unless the frictional value is reduced by 50 percent since full mobilization of these resistances typically occurs at different degrees of horizontal movement.

We recommend that all foundation excavations be observed by the Geotechnical Engineer's representative prior to placement of reinforcement and concrete to verify firm bearing materials are exposed.

We estimate total settlement for shallow footing foundations using the recommended maximum net allowable bearing pressure presented above, should be one inch or less. Differential settlements are estimated to be about one-half the total settlement over a horizontal distance of 50 feet or the least dimension of the structure, whichever is less. These settlement estimates are based on the available boring information, our experience with similar structures and soil conditions, and construction of the building pads as recommended in this report.

Interior Floor Slab Support

Interior concrete slab-on-grade floors can be supported upon the compacted soil subgrade prepared in accordance with the recommendations in this report and maintained in that condition (optimum moisture) and protected from disturbance.



Interior concrete slab-on-grade floors should be at least five inches thick and, as a minimum, should contain No. 3 reinforcing bars on 18-inch center-to-center spacing or No. 4 reinforcing bars on 24-inch centers, located at mid-slab depth. This slab reinforcement is suggested as a guide "minimum" only; final reinforcement and joint spacing should be determined by the structural engineer. Temporary loads exerted during construction from vehicle traffic, cranes, forklifts, and storage of palletized construction materials should be considered in the design of the slab.

Slabs that will receive moisture sensitive floor covering should be underlain by a layer of free-draining gravel serving as a deterrent to migration of capillary moisture. The gravel layer should be at least four inches thick and should be graded such that 100 percent passes a one-inch sieve and no appreciable amount passes a No. 4 sieve. If heavier floor loads are anticipated, the crushed rock section (if used) beneath interior slab-on-grade floor should be replaced with Class 2 aggregate base compacted to at least 95 percent of the maximum dry density as determined by ASTM D1557.

Additional moisture protection may be provided by placing a sheet plastic membrane (at least 10-mils thick) directly over the crushed rock or under the aggregate base. The plastic membrane should meet or exceed the minimum specifications for plastic water vapor retarders as outlined in ASTM E1745 and be installed in strict conformance with the manufacturer's recommendations.

Floor slab construction over the past 25 years or more has included placement of a thin layer of sand over the vapor retarder membrane where capillary break gravel is used. The intent of the sand is to aid in the proper curing of the slab concrete. However, recent debate over excessive moisture vapor emissions from floor slabs includes concern for water trapped within the sand. Typically, the sand shifts during concrete placement resulting in an irregular slab thickness and sand pockets in the slab concrete. The slab designer should consider these factors when detailing the slab support layers.

The recommendations presented above are intended to mitigate any significant soils-related cracking of the slab-on-grade floors. More important to the performance and appearance of a Portland cement concrete slab is the quality of the concrete, the workmanship of the concrete contractor, the curing techniques utilized and the spacing of control joints.



Floor Slab Moisture Penetration Resistance

It is considered likely that floor slab subgrade soils will become wet to near saturated at some time during the life of the structures. This is a certainty when slabs are constructed during the wet seasons, or when constantly wet ground or poor drainage conditions exist adjacent to the structure. For this reason, it should be assumed that all slabs intended for moisture-sensitive floor coverings or materials, require protection against moisture or moisture vapor penetration. Standard practice includes the gravel and plastic membrane as suggested above. However, the gravel and plastic membrane offer only a limited, first line of defense against soil-related moisture; they do not moisture-proof the slab. Recommendations contained in this report concerning foundation and floor slab design are presented as *minimum* requirements, only from the geotechnical engineering standpoint.

It is emphasized that the use of sub-slab gravel and sheet plastic membrane will not “moisture proof” the slab, nor does it assure that slab moisture transmission levels will be low enough to prevent damage to floor coverings or other building components. If increased protection against moisture vapor penetration of slabs is desired, a concrete moisture protection specialist should be consulted. The design team should consider all available measures for slab moisture protection. It is commonly accepted that maintaining the lowest practical water-cement ratio in the slab concrete is one of the most effective ways to reduce future moisture vapor penetration of the completed slabs.

Exterior Concrete Flatwork

Areas to receive exterior flatwork should be prepared as recommended in the Subgrade Preparation and Engineered Fill Construction sections of this report.

Exterior flatwork should be supported on no less than six inches of Class 2 aggregate base compacted to at least 95 percent relative compaction, be at least four inches thick, and reinforced for crack control. Reinforcement should include, as a minimum, chaired No. 3 rebar located on maximum 18-inch centers or No. 4 rebar located on maximum 24-inch centers, both ways, throughout slabs. Accurate and consistent location of the reinforcement at mid-slab is essential to its performance and the risk of uncontrolled drying shrinkage slab cracking is increased if the reinforcement is not properly located within the slab.

The architect or civil engineer should determine the final thickness, strength, reinforcement, and joint spacing of exterior slab-on-grade concrete. Exterior flatwork next to landscaped areas should be thickened to twice the slab thickness for a width of at least 12 inches to help support lawn mowing equipment and other maintenance equipment.



Exterior flatwork should be constructed independent of the building foundations. Isolated column foundations should be structurally separated from adjacent flatwork by the placement of a layer of felt, or other appropriate material, between the flatwork and foundations. Practices recommended by the Portland Cement Association (PCA) for proper placement and curing of concrete should be followed during exterior concrete flatwork construction.

Site Drainage

Site drainage should be accomplished to provide positive drainage of surface water away from the buildings and prevent ponding of water adjacent to foundations. The subgrade adjacent to the buildings should be sloped away from foundations at a minimum two percent gradient for at least 10 feet, where possible. We recommend consideration be given to connecting all roof drains to solid PVC pipes which are connected to available drainage features to convey water away from the structures, or discharging the drains onto paved, or hard surfaces that slope away from the foundations. Ponding of surface water should not be allowed adjacent to buildings or pavements.

Construction Testing and Observation

Site preparation should be accomplished in accordance with the recommendations of this report and the approved plans and specifications. Representatives of the Geotechnical Engineer should be present during all earthwork and foundation excavation construction to verify compliance with our recommendations and the job specifications. These services are beyond the scope of work authorized for this investigation.

In the event that WKA is not retained to provide geotechnical engineering observation and testing services during construction, the Geotechnical Engineer retained to provide these services, in conformance with Section 1705A of the 2013 edition of the CBC, should indicate in writing that they agree with the recommendations of this report, or prepare supplemental recommendations as necessary.

LIMITATIONS

Our recommendations are based upon the information provided regarding the proposed project, combined with our analysis of site conditions revealed by the field exploration and laboratory testing programs. We have used our best engineering judgment based upon the information provided and the data generated from our investigation. If the proposed construction is



modified or re-sited; or, if it is found during construction that subsurface conditions differ from those we encountered at our boring locations, we should be afforded the opportunity to review the new information or changed conditions to determine if our conclusions and recommendations must be modified.

We recommend that WKA review the final plans and specifications to determine if the intent of our recommendations has been implemented in those documents.

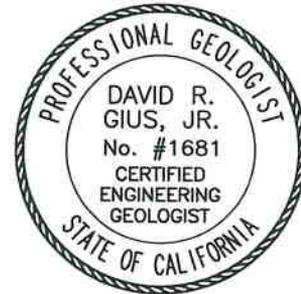
We emphasize that this report is applicable only to the proposed construction and the investigated site and should not be utilized for construction on any other site. The conclusions and recommendations are considered valid for a period of two years after the date of the report. If design and construction begins after two years, the report should be reviewed and updated as necessary by a Geotechnical Engineer.

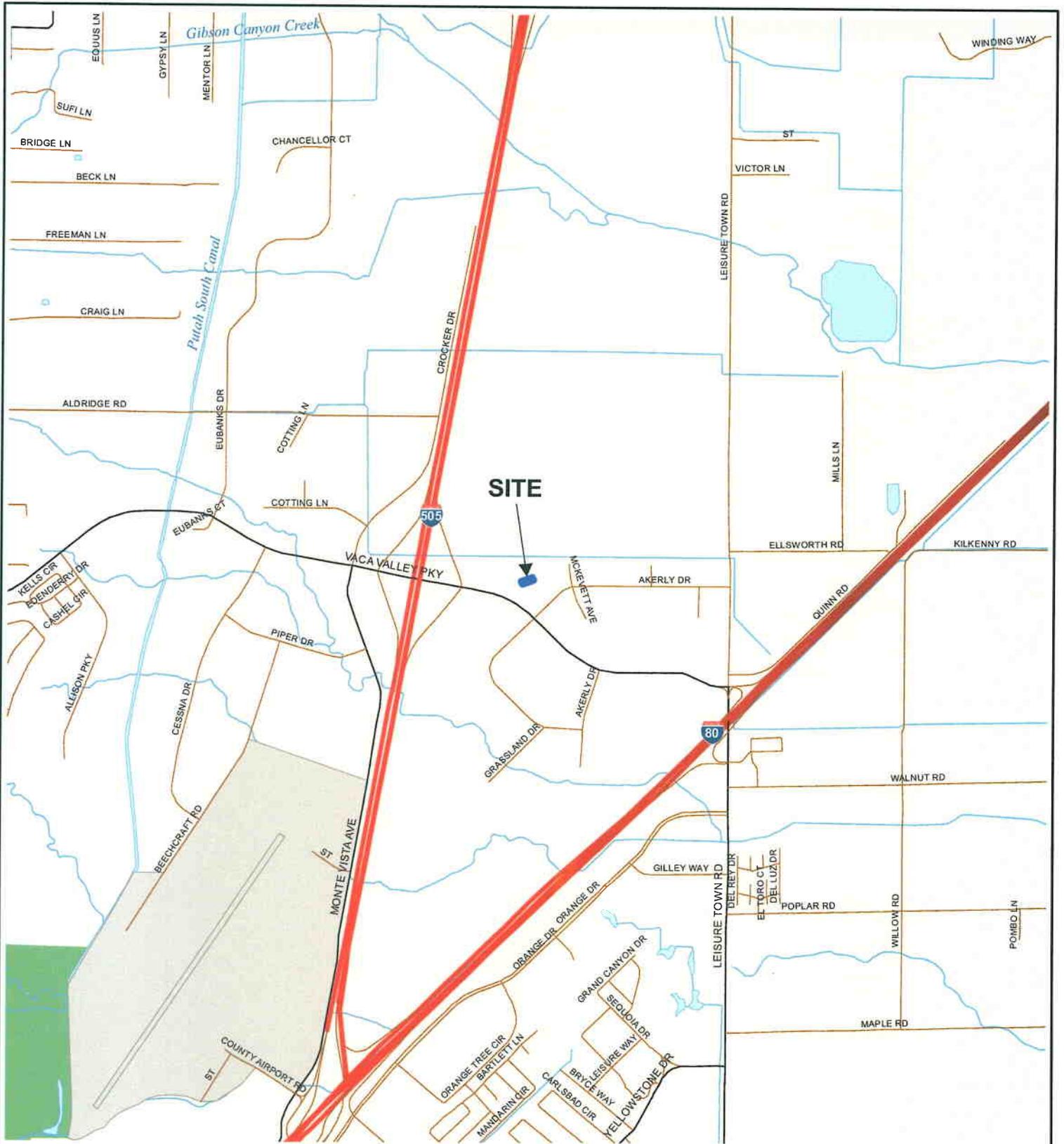
Wallace - Kuhl & Associates

Matthew S. Moyneur
Senior Engineer

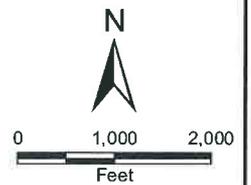


David R. Gius, Jr.
Senior Engineer





Street data courtesy of ESRI, 2010.
 Hydrography courtesy of the U.S. Geological Survey
 acquired from the GIS Data Depot, December, 2007.
 Projection: NAD 83, California State Plane, Zone II



VICINITY MAP

SOLANO COUNTY OFFICE OF EDUCATION JOINT-USE BUILDING

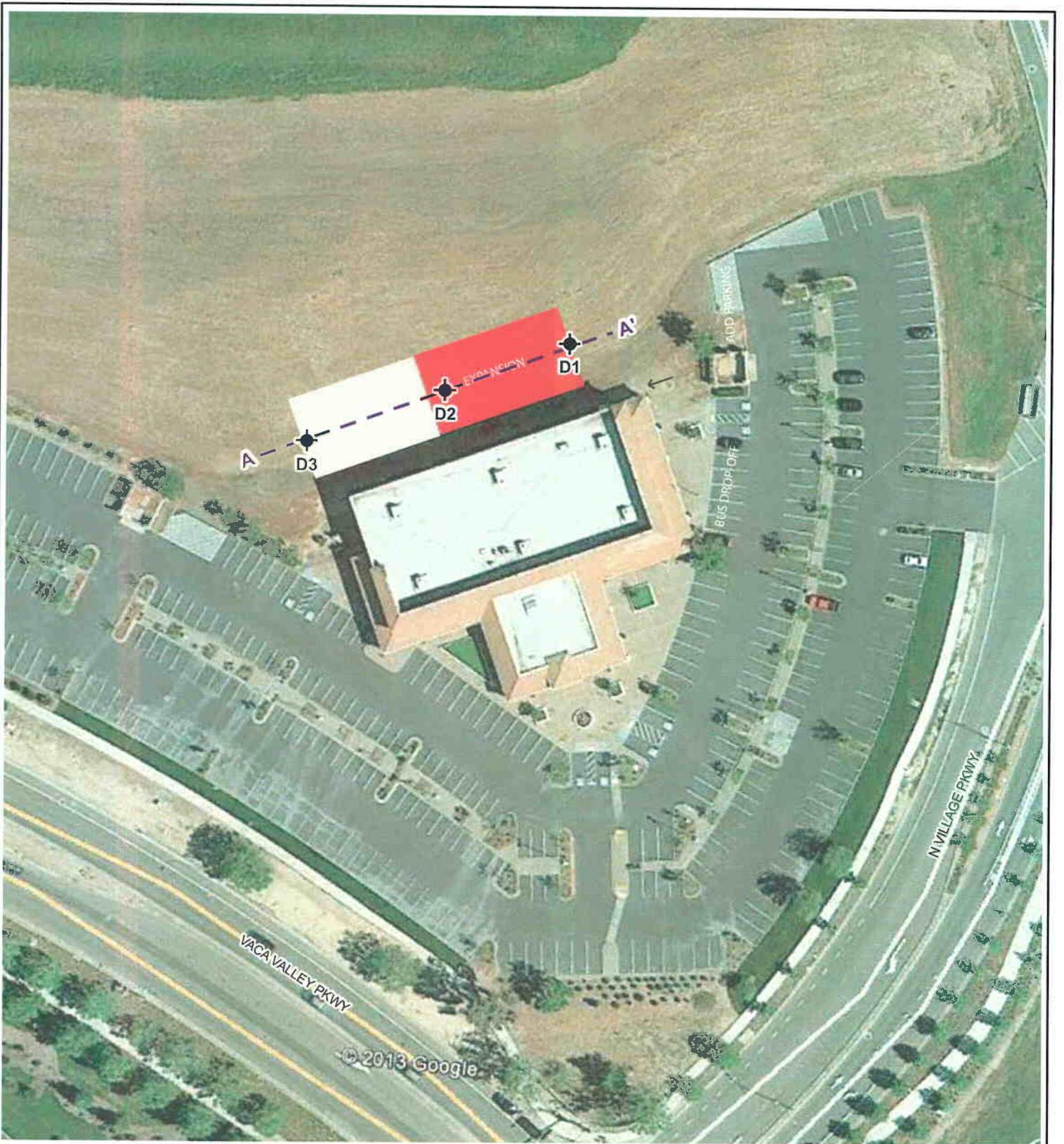
Vacaville, California

FIGURE 1

DRAWN BY	TJC
CHECKED BY	MSM
PROJECT MGR	MSM
DATE	11/13

WKA NO. 9927.01P

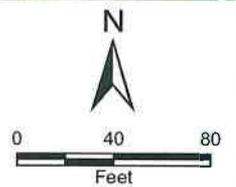




Adapted from a drawing prepared by Meta Architecture Design Initiative (MADI), dated October 10, 2013.
 Projection: NAD 83, California State Plane, Zone II

Legend

- ◆ Approximate soil boring location
- - - Geologic cross section



SITE PLAN

SOLANO COUNTY OFFICE OF EDUCATION JOINT-USE BUILDING

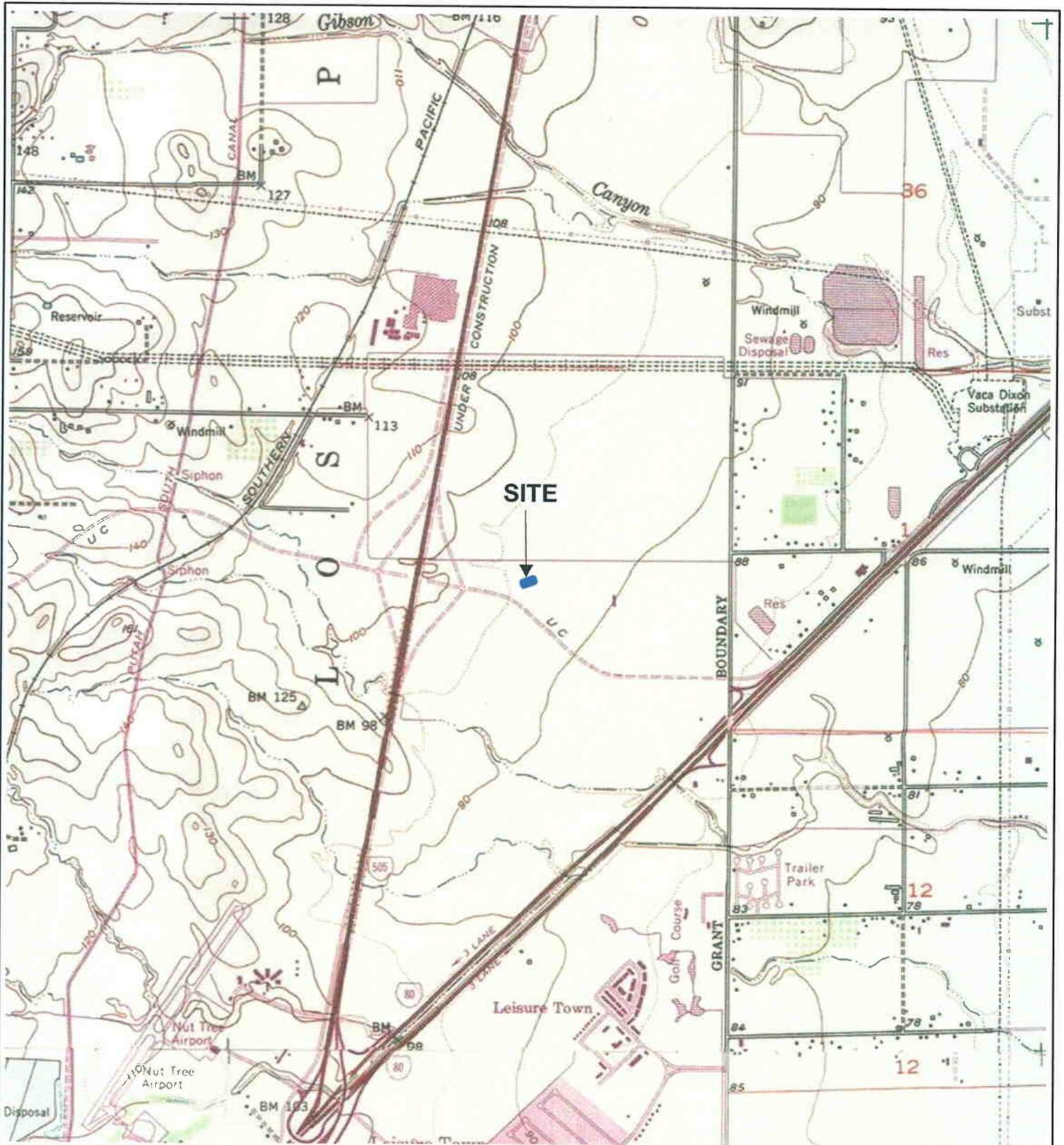
Vacaville, California

FIGURE 2

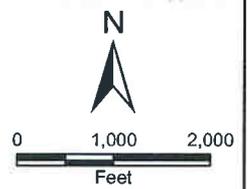
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CHECKED BY	MSM
PROJECT MGR	MSM
DATE	11/13

WKA NO. 9927.01P



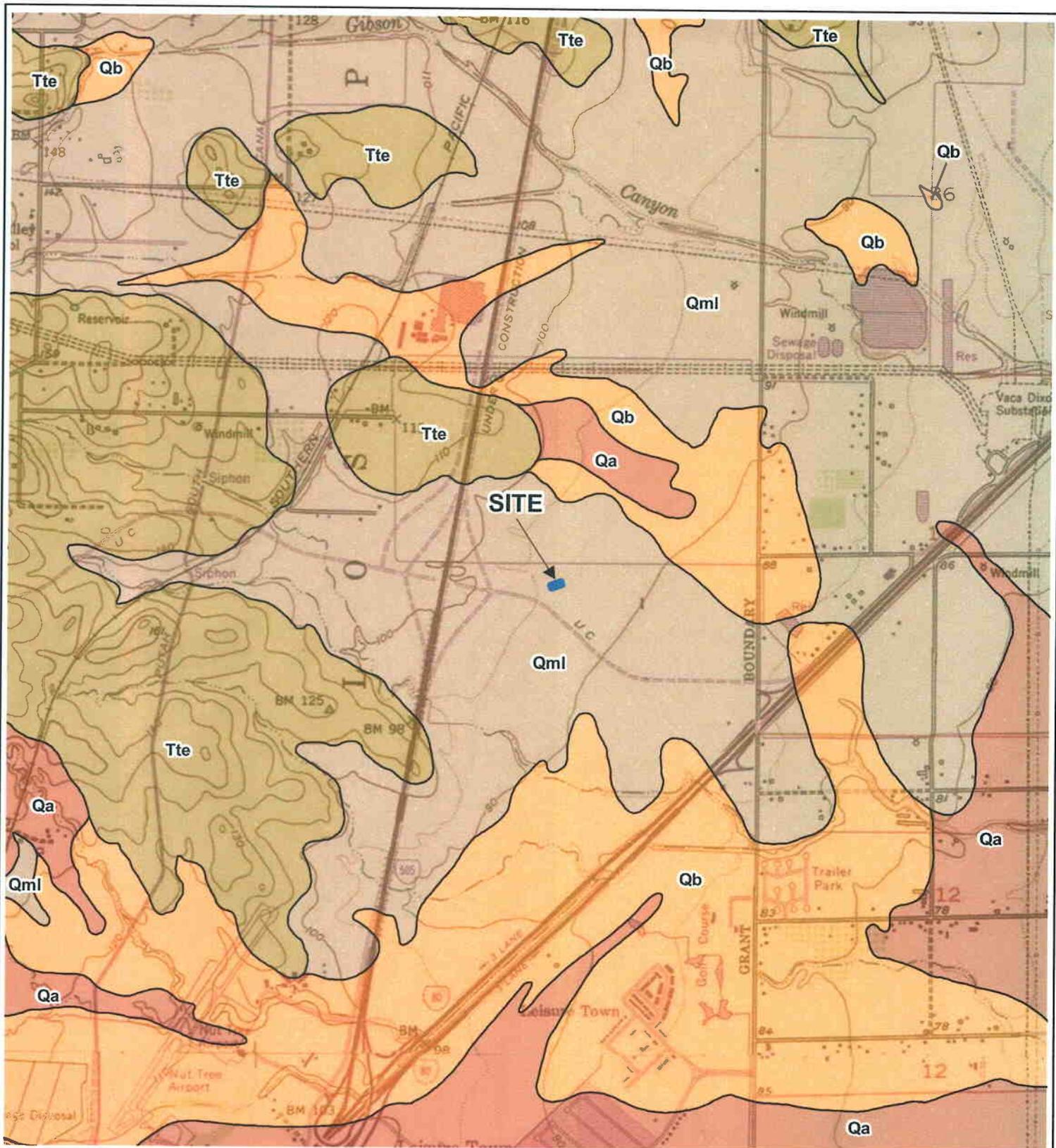


Adapted from U.S. Geological Survey 7.5 minute topographic maps of the Allendale quadrangle, California, 1975 and the Elmira quadrangle, California, 1981.
 Projection: NAD 83, California State Plane, Zone II



USGS TOPOGRAPHIC MAP
SOLANO COUNTY OFFICE OF EDUCATION JOINT-USE BUILDING
 Vacaville, California

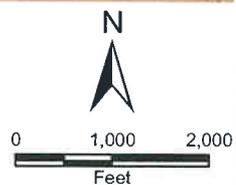
FIGURE 3	
DRAWN BY	TJC
CHECKED BY	MSM
PROJECT MGR	MSM
DATE	11/13
WKA NO. 9927.01P	



Sacramento Valley Geology from Cal-Atlas Geospatial Clearinghouse, dated June 12, 2009 modified from Helley & Harwood (1985).
 Projection: NAD 83, California State Plane, Zone II

Legend

-  Qa - Holocene Alluvium
-  Qb - Holocene Basin Deposits
-  Qml - Lower Modesto Formation
-  Tte - Tehama Formation



REGIONAL GEOLOGIC MAP

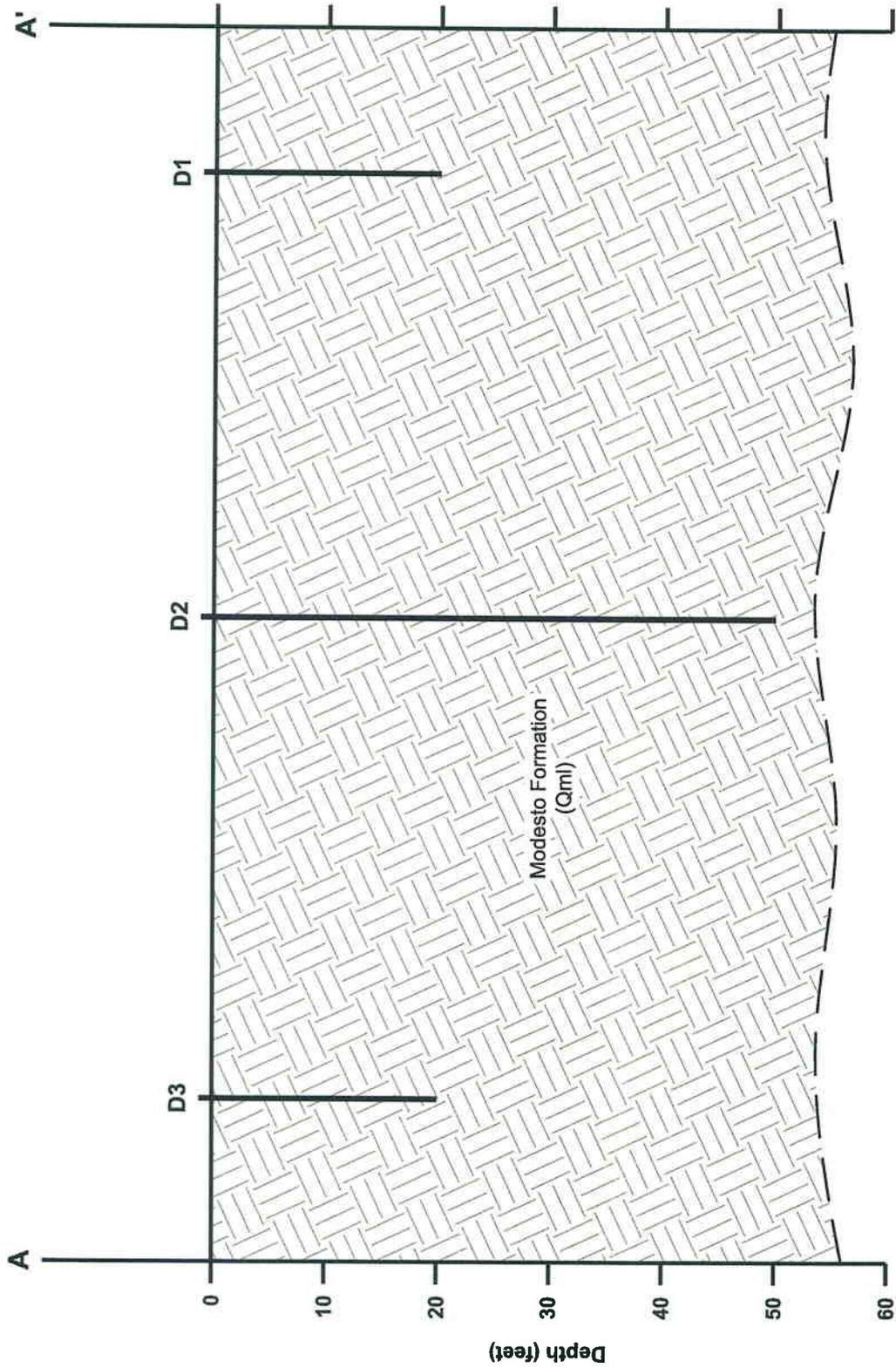
SOLANO COUNTY OFFICE OF EDUCATION JOINT-USE BUILDING

Vacaville, California

FIGURE 4

DRAWN BY	TJC
CHECKED BY	MSM
PROJECT MGR	MSM
DATE	11/13

WKA NO. 9927.01P

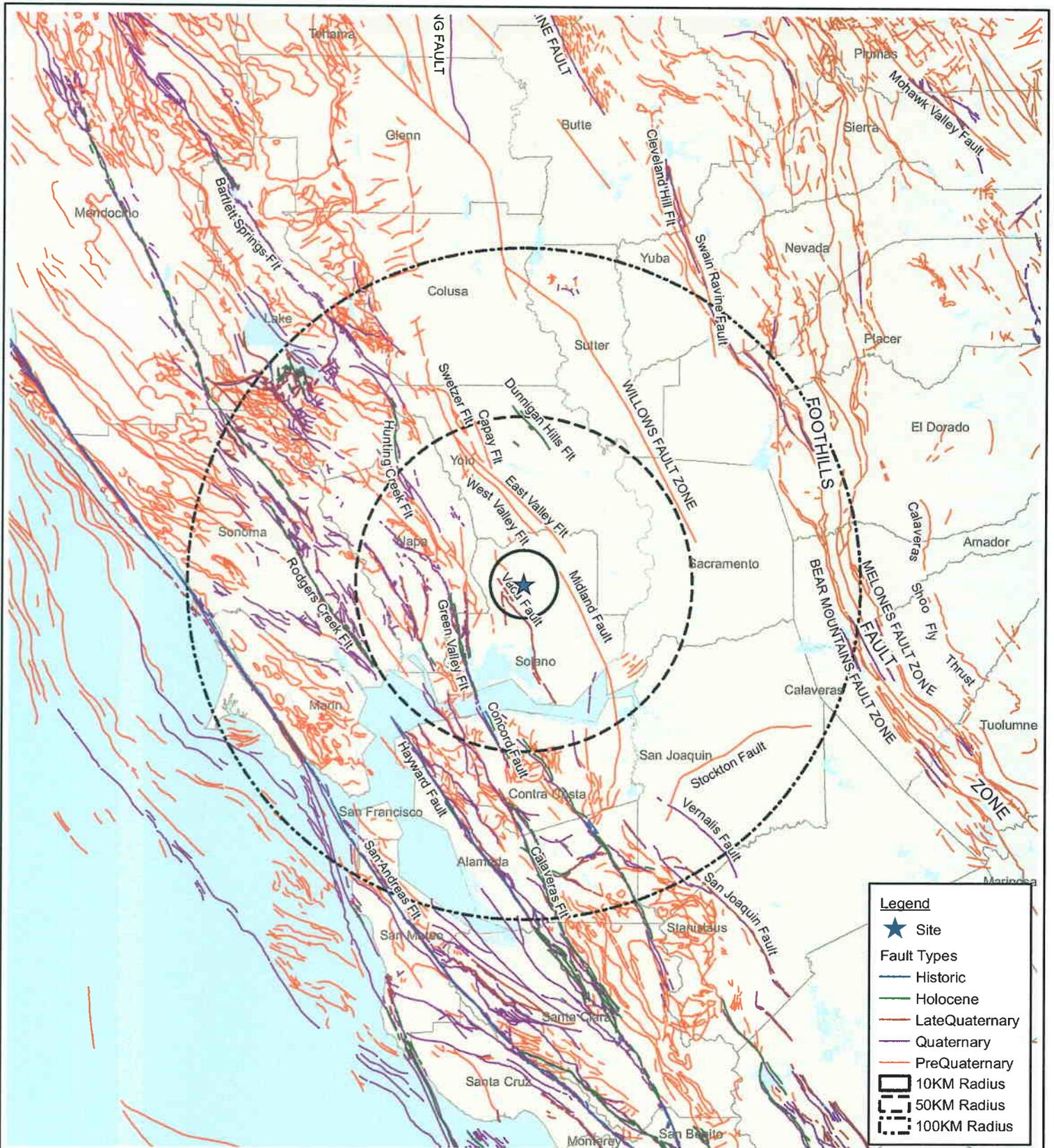


Scale
 Horizontal: 1" = 30'
 Vertical: 1" = 15'



SITE GEOLOGIC CROSS SECTION
 SOLANO COUNTY OFFICE OF EDUCATION JOINT-USE BUILDING
 Vacaville, California

FIGURE		5
DRAWN BY	TJC	
CHECKED BY	MSM	
PROJECT MGR	MSM	
DATE	11/13	
WKA NO. 9927.01P		



Legend

- ★ Site
- Fault Types**
- Historic
- Holocene
- Late Quaternary
- Quaternary
- Pre Quaternary
- 10KM Radius
- 50KM Radius
- 100KM Radius



Modified from, Division of Mines and Geology, CD-ROM 2000-08 (2000), Digital database of faults from the Fault Activity Map of California and Adjacent Areas and from the USGS Quaternary Fault and Fold Database of the United States, dated November 3, 2010.
 Projection: NAD 83, California State Plane, Zone II

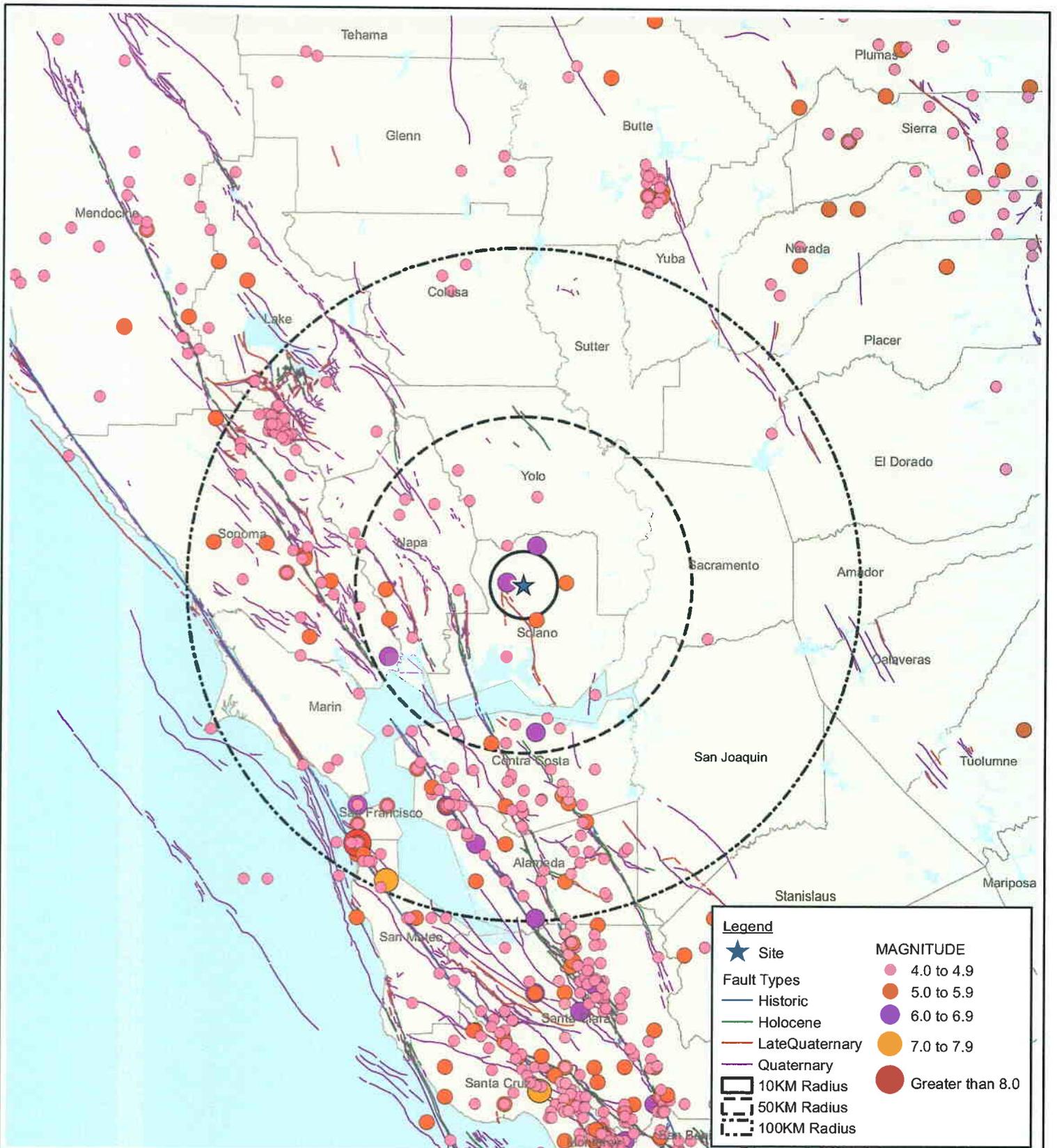


FAULT MAP

SOLANO COUNTY OFFICE OF EDUCATION JOINT-USE BUILDING

Vacaville, California

FIGURE 6	
DRAWN BY	TJC
CHECKED BY	MSM
PROJECT MGR	MSM
DATE	11/13
WKA NO. 9927.01P	

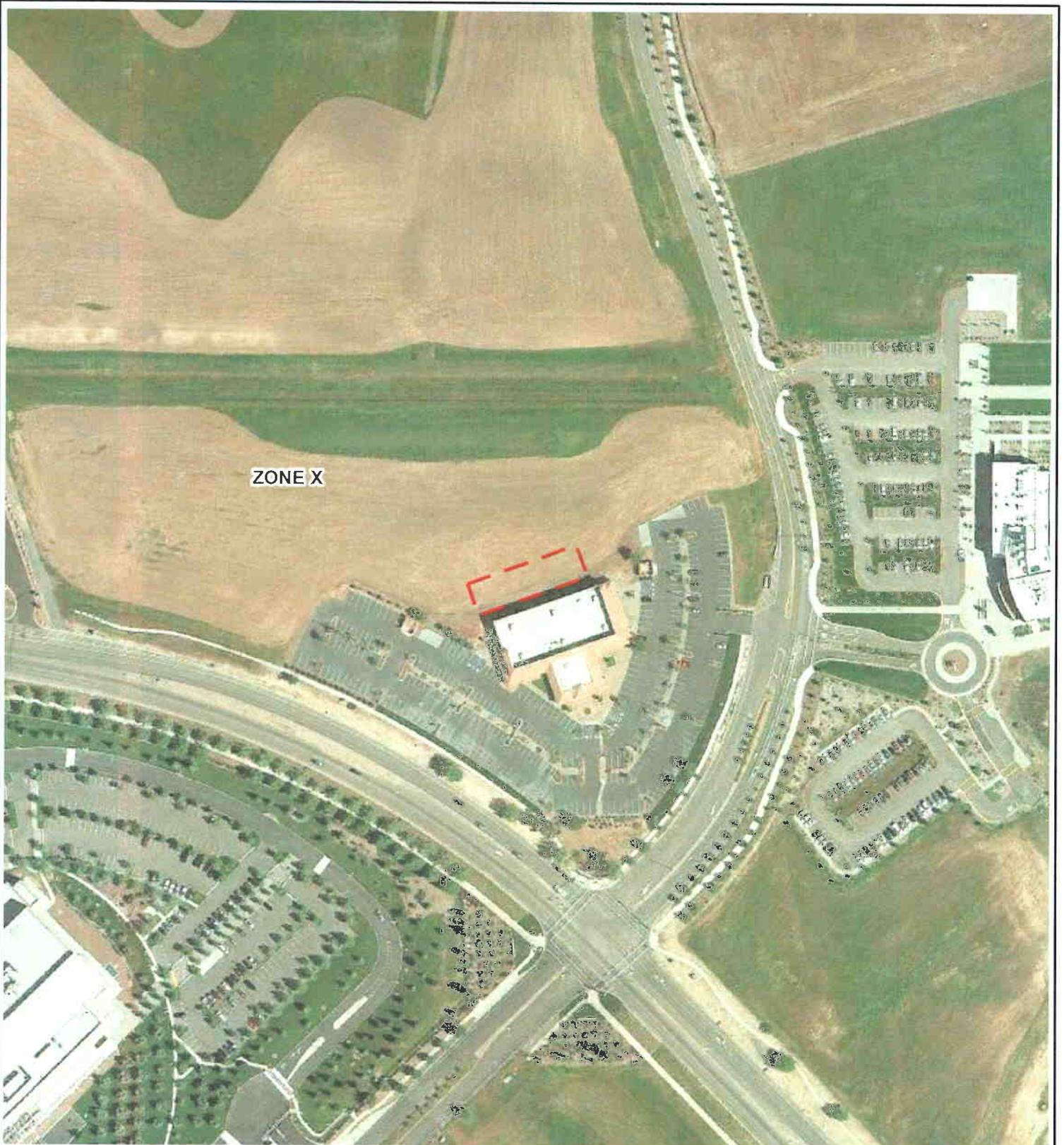


Epicenters from EQ Search 12/2010.
 Projection: NAD 83, California State Plane, Zone II



EPICENTER MAP
 SOLANO COUNTY OFFICE OF EDUCATION JOINT-USE BUILDING
 Vacaville, California

FIGURE 7	
DRAWN BY	TJC
CHECKED BY	MSM
PROJECT MGR	MSM
DATE	11/13
WKA NO. 9927.01P	

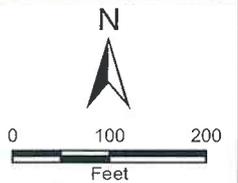


ZONE X

Adapted from a Google Earth aerial photograph, dated April 17, 2013. Flood Zone data adapted from the Solano County, California Flood Insurance Rate Map, dated May 4, 2009. Projection: NAD 83, California State Plane, Zone II

Legend

-  Site boundary
- Zone X - Areas determined to be outside the 0.2% annual chance floodplain



FEMA FLOOD MAP
SOLANO COUNTY OFFICE OF EDUCATION JOINT-USE BUILDING
 Vacaville, California

FIGURE 8	
DRAWN BY	TJC
CHECKED BY	MSM
PROJECT MGR	MSM
DATE	11/13
WKA NO. 9927.01P	

Project: Joint Use Building Addition
 Project Location: Fairfield, California
 WKA Number: 9927.01P

LOG OF SOIL BORING D1

Sheet 1 of 1

Date(s) Drilled	10/29/13	Logged By	GJF	Checked By	MSM
Drilling Method	Solid Flight Auger	Drilling Contractor	V&W Drilling, Inc.	Total Depth of Drill Hole	20.0 feet
Drill Rig Type	CME-55	Diameter(s) of Hole, inches	6"	Approx. Surface Elevation, ft MSL	
Groundwater Depth [Elevation], feet	11.5	Sampling Method(s)	California Modified	Drill Hole Backfill	Cement Grout
Remarks				Driving Method and Drop	140-lb automatic hammer; 30-inch drop

ELEVATION, feet	DEPTH, feet	GRAPHIC LOG	ENGINEERING CLASSIFICATION AND DESCRIPTION	SAMPLE DATA			TEST DATA		
				SAMPLE	SAMPLE NUMBER	NUMBER OF BLOWS	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf	ADDITIONAL TESTS
			Gray brown, moist, silty sandy gravel (GM)						
			Brown, moist, hard, silty sandy clay (CL)		D1-11	10	11.6	105	UCC = 5.0 TSF
	5		Brown, moist, loose, sandy silt (ML)		D1-21	10	13.7	107	
	10		Light brown, moist to wet, medium dense to very dense, silty fine sand with clay (SM)		D1-31	24			
	15				D1-41	50/5"			
	20		Brown, wet, variably cemented, hard, clayey silt (ML)		D1-51	61			
Boring terminated at 20 feet below existing site grade. Groundwater was encountered about 18 feet below the ground surface during drilling and about 11.5 feet below the ground surface immediately after drilling.									

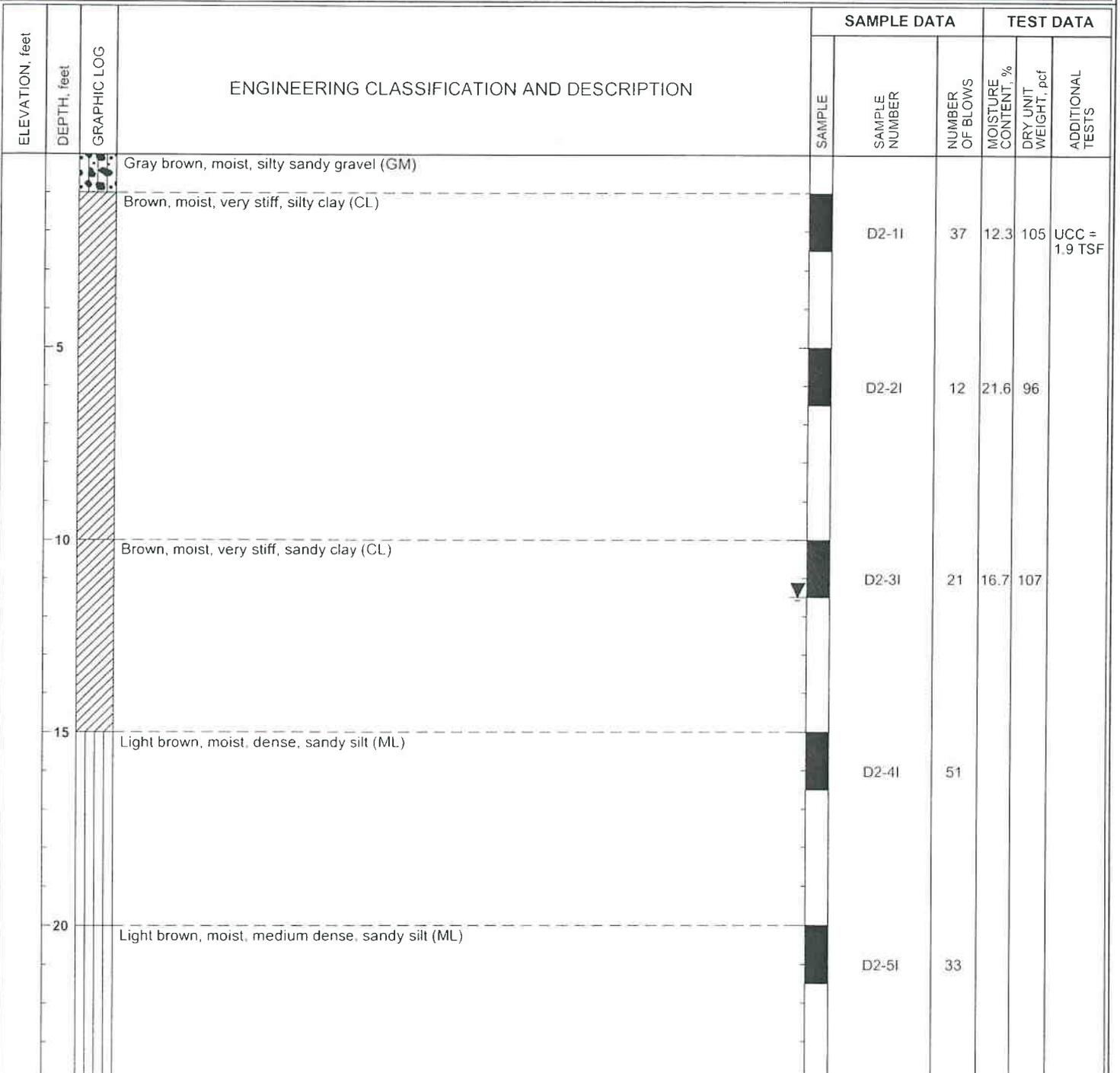
BORING LOG: 9927.01P - JOINT USE BUILDING ADDITION.GPJ_WKA.GDT 12/18/13 9:15 AM

Project: Joint Use Building Addition
 Project Location: Fairfield, California
 WKA Number: 9927.01P

LOG OF SOIL BORING D2

Sheet 1 of 2

Date(s) Drilled	10/29/13	Logged By	GJF	Checked By	MSM
Drilling Method	Solid Flight Auger	Drilling Contractor	V&W Drilling, Inc.	Total Depth of Drill Hole	51.5 feet
Drill Rig Type	CME-55	Diameter(s) of Hole, inches	6"	Approx. Surface Elevation, ft MSL	
Groundwater Depth [Elevation], feet	11.5	Sampling Method(s)	California Modified	Drill Hole Backfill	Cement Grout
Remarks				Driving Method and Drop	140-lb automatic hammer; 30-inch drop



BORING LOG 9927.01P - JOINT USE BUILDING ADDITION.GPJ_WKA.GDT 12/18/13 9:15 AM

Project: Joint Use Building Addition
 Project Location: Fairfield, California
 WKA Number: 9927.01P

LOG OF SOIL BORING D2

Sheet 2 of 2

ELEVATION, feet	DEPTH, feet	GRAPHIC LOG	ENGINEERING CLASSIFICATION AND DESCRIPTION	SAMPLE DATA			TEST DATA	
				SAMPLE	SAMPLE NUMBER	NUMBER OF BLOWS	MOISTURE CONTENT, %	DRY UNIT WEIGHT, pcf
25			Light brown, moist, medium dense, sandy silt (ML)		D2-6I	23		
30					D2-7I	25		
35			Brown, wet, dense, silty sand with gravel (SM)		D2-8I	47		
40			Brown, wet, very dense, sandy silt (ML)		D2-9I	50/6"		
45			Brown, wet, very stiff, silty clay (CL)		D2-10I	24		
50			Brown, wet, dense, sandy silt (ML)		D2-11I	58		
Boring terminated at 51.5 feet below existing site grade. Groundwater was encountered about 35 feet below the ground surface during drilling and about 11.5 feet below the ground surface immediately after drilling.								

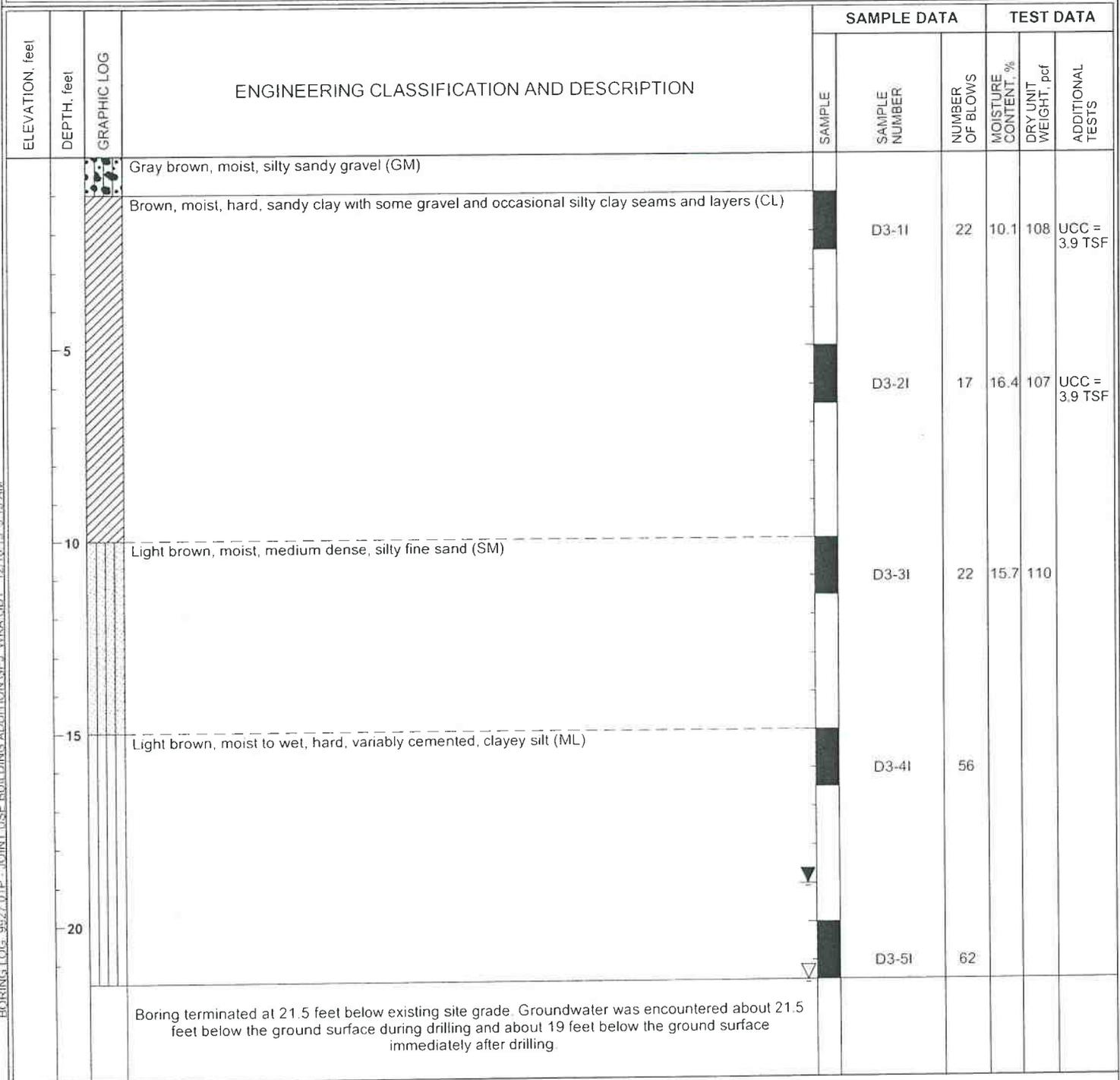
BORING LOG 9927.01P - JOINT USE BUILDING ADDITION.GPJ WKA.GDT 12/18/13 9:15 AM

Project: Joint Use Building Addition
 Project Location: Fairfield, California
 WKA Number: 9927.01P

LOG OF SOIL BORING D3

Sheet 1 of 1

Date(s) Drilled	10/29/13	Logged By	GJF	Checked By	MSM
Drilling Method	Solid Flight Auger	Drilling Contractor	V&W Drilling, Inc.	Total Depth of Drill Hole	21.5 feet
Drill Rig Type	CME-55	Diameter(s) of Hole, inches	6"	Approx. Surface Elevation, ft MSL	
Groundwater Depth [Elevation], feet	19.0	Sampling Method(s)	California Modified	Drill Hole Backfill	Cement Grout
Remarks				Driving Method and Drop	140-lb automatic hammer; 30-inch drop



BORING LOG: 9927.01P - JOINT USE BUILDING ADDITION.GPJ WKA.GDT 12/18/13 9:15 AM

FIGURE 11

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS	SYMBOL	CODE	TYPICAL NAMES	
COARSE GRAINED SOILS (More than 50% of soil > no. 200 sieve size)	<u>GRAVELS</u>			
	GW		Well graded gravels or gravel - sand mixtures, little or no fines	
	GP		Poorly graded gravels or gravel - sand mixtures, little or no fines	
	GM		Silty gravels, gravel - sand - silt mixtures	
	GC		Clayey gravels, gravel - sand - clay mixtures	
	<u>SANDS</u>			
	SW		Well graded sands or gravelly sands, little or no fines	
	SP		Poorly graded sands or gravelly sands, little or no fines	
FINE GRAINED SOILS (50% or more of soil < no. 200 sieve size)	<u>SILTS & CLAYS</u>			
	<u>LL < 50</u>			
	ML		Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity	
	CL		Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays	
	OL		Organic silts and organic silty clays of low plasticity	
	<u>SILTS & CLAYS</u>			
	<u>LL ≥ 50</u>			
	MH		Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts	
CH		Inorganic clays of high plasticity, fat clays		
OH		Organic clays of medium to high plasticity, organic silty clays, organic silts		
HIGHLY ORGANIC SOILS		Pt		Peat and other highly organic soils
ROCK		RX		Rocks, weathered to fresh
FILL		FILL		Artificially placed fill material

OTHER SYMBOLS

	= Drive Sample: 2-1/2" O.D. Modified California sampler
	= Drive Sampler: no recovery
	= SPT Sampler
	= Initial Water Level
	= Final Water Level
	= Estimated or gradational material change line
	= Observed material change line
<u>Laboratory Tests</u>	
PI = Plasticity Index	
EI = Expansion Index	
UCC = Unconfined Compression Test	
TR = Triaxial Compression Test	
GR = Gradational Analysis (Sieve)	
K = Permeability Test	

GRAIN SIZE CLASSIFICATION

CLASSIFICATION	RANGE OF GRAIN SIZES	
	U.S. Standard Sieve Size	Grain Size in Millimeters
BOULDERS	Above 12"	Above 305
COBBLES	12" to 3"	305 to 76.2
GRAVEL coarse (c) fine (f)	3" to No. 4	76.2 to 4.76
	3" to 3/4"	76.2 to 19.1
	3/4" to No. 4	19.1 to 4.76
SAND coarse (c) medium (m) fine (f)	No. 4 to No. 200	4.76 to 0.074
	No. 4 to No. 10	4.76 to 2.00
	No. 10 to No. 40	2.00 to 0.420
	No. 40 to No. 200	0.420 to 0.074
SILT & CLAY	Below No. 200	Below 0.074

APPENDICES



APPENDIX A
Field and Laboratory Test



APPENDIX A

A. GENERAL INFORMATION

The performance of a geotechnical engineering investigation for the proposed Solano County Office of Education Joint Use Building at Vaca Valley and N. Village Parkways on the Solano Community College Campus in Vacaville, California, was authorized by Mr. Alton Gay with Solano County Office of Education. Authorization was for an investigation as described in our proposal letter dated October 15, 2013, sent to Mr. Gay, whose mailing address is 5100 Business Center Drive, Fairfield, California 94534; telephone (707) 399-4860.

The project architect is Meta Architecture Design Initiative whose telephone is (800) 725-0571.

To assist in the preparation of this report, we reviewed schematic design drawings dated October 4 and 10, 2013 prepared by Meta Architecture Design Initiative.

B. FIELD EXPLORATION

At the approximate locations indicated on Figure 2, three exploratory borings were drilled on October 29, 2013 utilizing a truck-mounted CME-55 truck-mounted drill rig. Relatively undisturbed samples were recovered from the borings at various depths using an 18-inch long, 2½-inch outside diameter (O.D.), 2-inch inside diameter (I.D.) modified California sampler. The samples were driven by a 140-pound hammer freely falling 30 inches. The number of blows of the hammer required to drive the 18-inch long sampler each 6-inch interval was recorded, with the sum of the blows required to drive the sampler the lower 12-inch interval, or portion thereof, being designated the penetration resistance or "blow count" for that particular drive.

All samples obtained were retained in 2-inch diameter by 6-inch long, thin walled brass tubes contained within the samplers. Immediately after recovery, the field engineer visually classified the soil in the tubes and the ends of the tubes were sealed to preserve the natural moisture contents. The soil samples were taken to our laboratory for additional classification and selection of samples for testing.

The Logs of Test Borings, Figures 9 through 11, contain descriptions of the soils encountered in each boring. A Boring Legend explaining the Unified Soil Classification System and the symbols used on the logs is contained on Figure 12.



C. LABORATORY TESTING

Selected undisturbed samples of the soil were tested to determine dry unit weight (ASTM D2937), natural moisture content (ASTM D2216), and unconfined compressive strength (ASTM D2166). The results of the moisture/density tests and unconfined compressive strength testing are included on the boring logs at the depth each sample was obtained.

Expansion Index testing (ASTM D4829) was performed on a bulk sample of the near-surface soils; the results are presented on Figure A1.

A representative bulk sample of near-surface soil was tested by Sunland Analytical to determine the preliminary corrosion characteristics of the soil (CT 417, 422, 643). The results of the tests are presented on Figure A2.



EXPANSION INDEX TEST RESULTS

ASTM D4829

MATERIAL DESCRIPTION: Brown, fine sandy clay

LOCATION: D2

Sample Depth	Pre-Test Moisture (%)	Post-Test Moisture (%)	Dry Density (pcf)	Expansion Index
1'-4'	11.0	18.8	110.6	51

CLASSIFICATION OF EXPANSIVE SOIL *

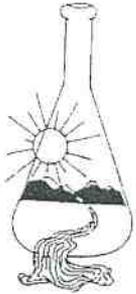
EXPANSION INDEX	POTENTIAL EXPANSION
0 - 20	Very Low
21 - 50	Low
51 - 90	Medium
91 - 130	High
Above 130	Very High

* From ASTM D4829, Table 1



EXPANSION INDEX TEST RESULTS
 SOLANO COUNTY OFFICE OF EDUCATION JOINT-USE BUILDING
 Vacaville, California

FIGURE		A1
DRAWN BY	TJC	
CHECKED BY	MSM	
PROJECT MGR	MSM	
DATE	11/13	
WKA NO. 9927.01P		



Sunland Analytical

11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

Date Reported 11/13/2013
Date Submitted 11/07/2013

To: Matt Moyneur
Wallace-Kuhl & Assoc.
3050 Industrial Blvd.
West Sacramento, CA 95691

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 9927.01P-JOINT-USE Site ID : D2 @ 1-4 FT.
Thank you for your business.

* For future reference to this analysis please use SUN # 65885-136441.

EVALUATION FOR SOIL CORROSION

Soil pH	6.65		
Minimum Resistivity	1.58 ohm-cm (x1000)		
Chloride	10.6 ppm	00.00106	%
Sulfate	34.7 ppm	00.00347	%

METHODS

pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

	CORROSION TEST RESULTS		FIGURE A2	
	SOLANO COUNTY OFFICE OF EDUCATION JOINT-USE BUILDING Vacaville, California		DRAWN BY	TJC
			CHECKED BY	MSM
			PROJECT MGR	MSM
			DATE	11/13
			WKA NO. 9927.01P	

APPENDIX B
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APPENDIX C
Liquefaction Results



LIQUEFACTION ANALYSIS REPORT

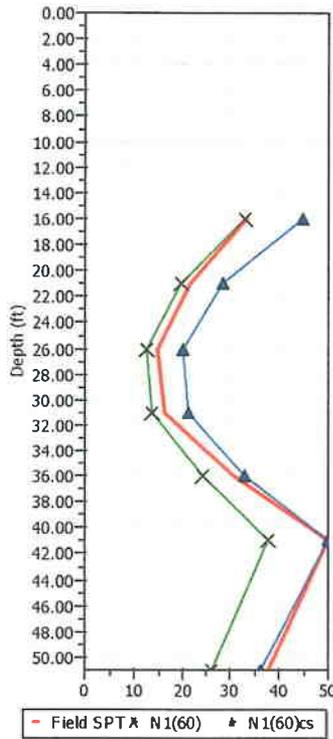
Project title : 9927.01p - SCOE Joint Use Building Addition

Project subtitle : Boring D22

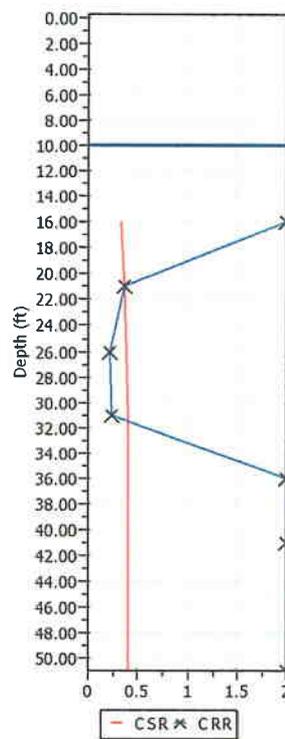
Input parameters and analysis data

In-situ data type:	Standard Penetration Test	Depth to water table:	10.00 ft
Analysis type:	Deterministic	Earthquake magnitude M_w :	6.60
Analysis method:	NCEER 1998	Peak ground acceleration:	0.59 g
Fines correction method:	Idriss & Seed	User defined F.S.:	1.00

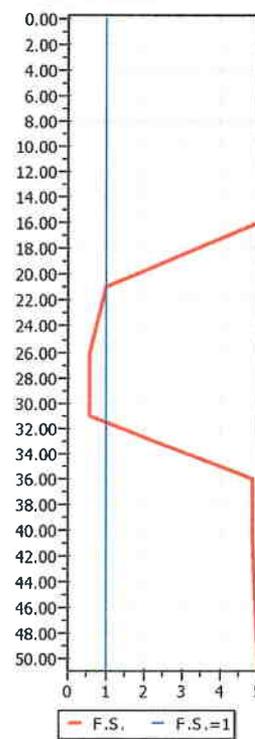
SPT data graph



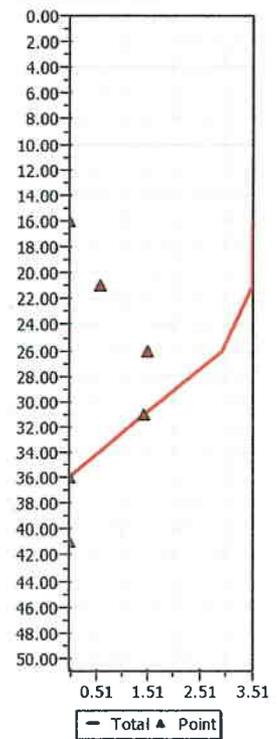
Shear stress ratio



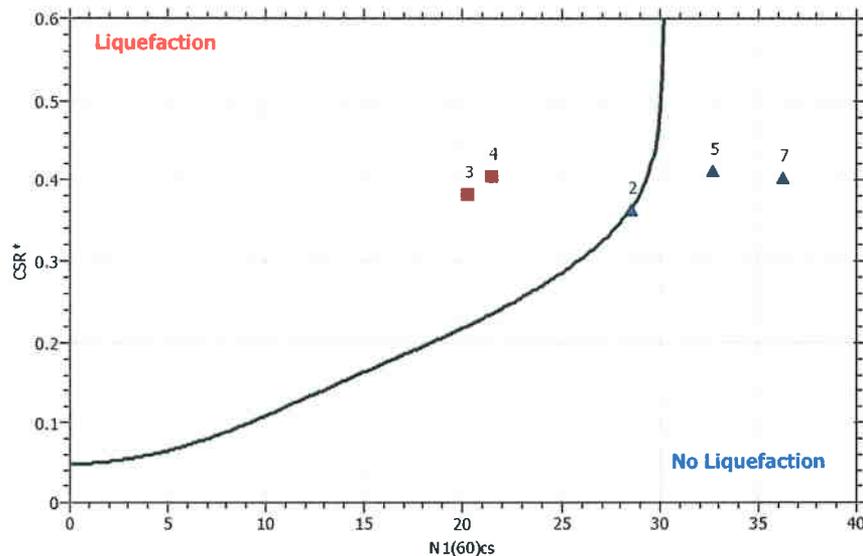
Factor of safety



Settlements (in)



$M_w=7^{1/2}$, $\sigma'_v=1$ atm base curve



:: Field input data ::

Point ID	Depth (ft)	Field N_{SPT} (blows/feet)	Unit weight (pcf)	Fines content (%)
1	16.00	33.20	120.00	60.00
2	21.00	21.50	120.00	70.00
3	26.00	15.00	120.00	80.00
4	31.00	16.30	120.00	80.00
5	36.00	30.60	120.00	30.00
6	41.00	50.00	120.00	60.00
7	51.00	37.70	120.00	60.00

Depth : Depth from free surface, at which SPT was performed (ft)
 Field SPT : SPT blows measured at field (blows/feet)
 Unit weight : Bulk unit weight of soil at test depth (pcf)
 Fines content : Percentage of fines in soil (%)

:: Cyclic Stress Ratio calculation (CSR fully adjusted and normalized) ::

Point ID	Depth (ft)	Sigma (tsf)	u (tsf)	Sigma' (tsf)	r_d	CSR	MSF	$CSR_{eq,M=7.5}$	K_{sigma}	CSR*
1	16.00	0.96	0.19	0.77	0.96	0.46	1.39	0.33	1.00	0.33
2	21.00	1.26	0.34	0.92	0.95	0.50	1.39	0.36	1.00	0.36
3	26.00	1.56	0.50	1.06	0.94	0.53	1.39	0.38	1.00	0.38
4	31.00	1.86	0.66	1.20	0.92	0.55	1.39	0.39	0.97	0.41
5	36.00	2.16	0.81	1.35	0.88	0.54	1.39	0.39	0.95	0.41
6	41.00	2.46	0.97	1.49	0.84	0.53	1.39	0.38	0.93	0.41
7	51.00	3.06	1.28	1.78	0.76	0.50	1.39	0.36	0.90	0.40

Depth : Depth from free surface, at which SPT was performed (ft)
 Sigma : Total overburden pressure at test point, during earthquake (tsf)
 u : Water pressure at test point, during earthquake (tsf)
 Sigma' : Effective overburden pressure, during earthquake (tsf)
 r_d : Nonlinear shear mass factor
 CSR : Cyclic Stress Ratio
 MSF : Magnitude Scaling Factor
 $CSR_{eq,M=7.5}$: CSR adjusted for M=7.5
 K_{sigma} : Effective overburden stress factor
 CSR* : CSR fully adjusted

:: Cyclic Resistance Ratio calculation $CRR_{7.5}$::

Point ID	Field SPT	C_n	C_e	C_b	C_r	C_s	$N_{1(60)}$	DeltaN	$N_{1(60)cs}$	$CRR_{7.5}$
1	33.20	1.16	0.90	1.00	0.95	1.00	33.00	11.60	44.60	2.00
2	21.50	1.07	0.90	1.00	0.95	1.00	19.62	8.92	28.54	0.37
3	15.00	0.99	0.90	1.00	0.95	1.00	12.73	7.55	20.27	0.22
4	16.30	0.93	0.90	1.00	1.00	1.00	13.66	7.73	21.39	0.23
5	30.60	0.88	0.90	1.00	1.00	1.00	24.24	8.45	32.68	2.00
6	50.00	0.84	0.90	1.00	1.00	1.00	37.64	12.53	50.17	2.00
7	37.70	0.77	0.90	1.00	1.00	1.00	25.99	10.20	36.19	2.00

C_n : Overburden correction factor
 C_e : Energy correction factor
 C_b : Borehole diameter correction factor
 C_r : Rod length correction factor
 C_s : Liner correction factor
 $N_{1(60)}$: Corrected N_{SPT}
 DeltaN : Addition to corrected N_{SPT} value due to the presence of fines
 $N_{1(60)cs}$: Corrected $N_{1(60)}$ value for fines
 $CRR_{7.5}$: Cyclic resistance ratio for M=7.5

:: Settlements calculation for saturated sands ::

Point ID	$N_{1(60)}$	N_1	FS_L	e_v (%)	Settle. (in)
1	44.60	37.17	5.00	0.00	0.00
2	28.54	23.79	1.01	0.97	0.58

:: Settlements calculation for saturated sands ::

Point ID	$N_{1(60)}$	N_1	FS_L	e_v (%)	Settle. (in)
3	20.27	16.89	0.58	2.49	1.49
4	21.39	17.83	0.58	2.39	1.43
5	32.68	27.24	4.86	0.00	0.00
6	50.17	41.81	4.85	0.00	0.00
7	36.19	30.15	4.98	0.00	0.00

Total settlement : 3.51

$N_{1(60)}$: Stress normalized and corrected SPT blow count
 N_1 : Japanese equivalent corrected value
 FS_L : Calculated factor of safety
 e_v : Post-liquefaction volumetric strain (%)
 Settle.: Calculated settlement (in)

:: Liquefaction potential according to Iwasaki ::

Point ID	F	w_z	I_L
1	0.00	7.56	0.00
2	0.00	6.80	0.00
3	0.42	6.04	3.90
4	0.42	5.28	3.40
5	0.00	4.51	0.00
6	0.00	3.75	0.00
7	0.00	2.23	0.00

Overall potential I_L : 7.30

$I_L = 0.00$ - No liquefaction
 I_L between 0.00 and 5 - Liquefaction not probable
 I_L between 5 and 15 - Liquefaction probable
 $I_L > 15$ - Liquefaction certain

APPENDIX D
Guide Earthwork Specifications



APPENDIX D
GUIDE EARTHWORK SPECIFICATIONS
SOLANO COUNTY OFFICE OF EDUCATION JOINT-USE BUILDING
Vacaville, California
WKA No. 9927.01P

PART 1: GENERAL

1.1 SCOPE

a. General Description

This item shall include all clearing of existing structures, foundations, utilities, organics, and associated items; preparation of surfaces to be filled, filling, spreading, compaction, observation and testing of the fill; and all subsidiary work necessary to complete the grading of the site to conform with the lines, grades and slopes as shown on the accepted Drawings.

b. Related Work Specified Elsewhere

(1) Trenching and backfilling for sanitary sewer system: Section ____.

(2) Trenching and backfilling for storm drain system: Section ____.

(3) Trenching and backfilling for underground water, natural gas, and electric supplies: Section ____.

c. Geotechnical Engineer

Where specific reference is made to "Geotechnical Engineer" this designation shall be understood to include either them or their representative.

1.2 PROTECTION

a. Adequate protection measures shall be provided to protect workers and passers-by the site. Streets and adjacent property shall be fully protected throughout the operations.

b. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.

c. Any construction review of the Contractor's performance conducted by the Geotechnical Engineer is not intended to include review of the adequacy of the Contractor's safety measures, in, on or near the construction site.

d. Adjacent pavements and sidewalks shall be kept free of mud, dirt, or similar nuisances resulting from earthwork operations.

e. Measures shall be taken to protect storm drains in adjacent depressed areas such that minimum siltation occurs in the drainage system.

f. Surface drainage provisions shall be made during the period of construction in a manner to avoid creating a nuisance to adjacent areas.



- g. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance.

1.3 GEOTECHNICAL REPORT

- a. A Geologic Hazards and Geotechnical Engineering Report (WKA No. 9927.01P; dated December 18, 2013) has been prepared for this site by Wallace - Kuhl & Associates, Geotechnical Engineers of West Sacramento, California [(916) 372-1434]. A copy is available for review at the office of Wallace - Kuhl & Associates.
- b. The information contained in this report was obtained for design purposes only. The Contractor is responsible for any conclusions the Contractor may draw from this report; should the Contractor prefer not to assume such risk, the Contractor should employ experts to analyze available information and/or to make additional borings upon which to base conclusions drawn by the Contractor, all at no cost to the Owner.

1.4 EXISTING SITE CONDITIONS

The Contractor shall become acquainted with all site conditions. If unshown active utilities are encountered during the work, the Architect shall be promptly notified for instructions. Failure to notify will make the Contractor liable for damage to these utilities arising from the Contractor's operations subsequent to the discovery of such unshown utilities.

1.5 SEASONAL LIMITS

Fill material shall not be placed, spread or rolled during unfavorable weather conditions. When the work is interrupted by heavy rains, fill operations shall not be resumed until field tests indicate that the moisture contents of the subgrade and fill materials are satisfactory.

PART 2: PRODUCTS

2.1 MATERIALS

- a. All fill shall be of approved local materials from required excavations, supplemented by imported fill, if necessary. Approved local materials are defined as local soils free from significant quantities of rubble, rubbish and vegetation, and having been tested and approved by the Geotechnical Engineer prior to use.
- b. Imported fill materials shall be approved by the Geotechnical Engineer; they shall meet the above requirements; shall have an expansion index not exceeding twenty (20); and, shall be of three-inch (3") maximum particle size. Import materials also shall be free of known contaminants and within acceptable corrosion limits, with appropriate documentation provided by the contractor.
- c. Capillary barrier material under floor slabs shall be provided to the thickness shown on the Drawings. This material shall be clean gravel or crushed rock of



one-inch (1") maximum size, with no appreciable material passing a Number Four (#4) sieve.

PART 3: EXECUTION

3.1 LAYOUT AND PREPARATION

Lay out all work, establish grades, locate existing underground utilities, set markers and stakes, set up and maintain barricades and protection of utilities prior to beginning actual earthwork operations.

3.2 CLEARING, STRIPPING, AND PREPARING BUILDING PAD AND PAVEMENT AREAS

- a. All existing structures (including utilities) and associated backfill, vegetation, brush, debris, and other items encountered during site work and deemed unacceptable by the Geotechnical Engineer, shall be removed and disposed of so as to leave the disturbed areas with a neat and finished appearance, free from unsightly debris. Excavations and depressions resulting from the removal of such items, as determined by the Geotechnical Engineer, shall be cleaned out to firm, undisturbed soils and backfilled with suitable materials in accordance with these specifications.
- b. The area beneath all building areas of the site, including the area contained within five feet (5') horizontally of the building foundations, shall be scarified to a depth of at least twelve inches (12"), moisture conditioned to at least two percent above the optimum moisture content and compacted to at least ninety percent (90%) of the ASTM D1557 maximum dry density.
- c. The building areas shall be restored to finished soil subgrade by placing fill in lifts not exceeding six inches (6") in compacted thickness.
- d. All fill shall be constructed in accordance with Section 3.3 of these specifications and the surfaces receiving fill shall be prepared in accordance with the following paragraphs in this section.
- e. When the moisture content of the subgrade is below the optimum moisture content, water shall be added until the proper moisture content is achieved.
- f. When the moisture content of the subgrade is too high to permit the specified compaction to be achieved, the subgrade shall be aerated by blading or other methods until the moisture content is satisfactory for compaction.
- g. After the foundations for fill have been cleared, plowed, or scarified, they shall be disced or bladed until uniform and free from large clods, brought to the proper moisture content and compacted to not less than ninety percent (90%) of the maximum dry density as determined by ASTM D1557.

3.3 PLACING, SPREADING AND COMPACTING FILL MATERIAL

- a. The selected soil fill material shall be placed in layers which when compacted shall not exceed six inches (6") in compacted thickness. Each layer shall be spread evenly and shall be thoroughly mixed during the spreading to promote uniformity of material in each layer.



- b. When the moisture content of the fill material is below the optimum moisture content, water shall be added until the proper moisture content is achieved.
- c. When the moisture content of the fill material is too high to permit the specified degree of compaction to be achieved, the fill material shall be aerated by blading or other methods until the moisture content is satisfactory.
- d. After each layer has been placed, mixed and spread evenly, it shall be thoroughly compacted to at least ninety percent (90%) as determined by the ASTM D1557 Test Method. Compaction shall be undertaken with equipment capable of achieving the specified density and shall be accomplished while the fill material is at the required moisture content. Each layer shall be compacted over its entire area until the desired density has been obtained.
- e. The filling operations shall be continued until the fills have been brought to the finished slopes and grades as shown on the accepted Drawings.

3.4 FINAL SUBGRADE PREPARATION

- a. The upper twelve inches (12") of building pad subgrades and subgrades supporting exterior flatwork shall be brought to a uniform moisture content not less than two percent above the optimum moisture content and shall be uniformly compacted to not less than ninety percent (90%) of the ASTM D1557 Test Method.

3.5 TESTING AND OBSERVATION

- a. Grading operations shall be observed by the Geotechnical Engineer, serving as the representative of the Owner.
- b. Field density tests shall be made by the Geotechnical Engineer after compaction of each layer of fill. Additional layers of fill shall not be spread until the field density tests indicate that the minimum specified density has been obtained.
- c. Earthwork shall not be performed without the notification or approval of the Geotechnical Engineer. The Contractor shall notify the Geotechnical Engineer at least two (2) working days prior to commencement of any aspect of the site earthwork.
- d. If the Contractor should fail to meet the technical or design requirements embodied in this document and on the applicable plans, the necessary readjustments shall be made by the Contractor until all work is deemed satisfactory, as determined by the Geotechnical Engineer and the Architect/Engineer. No deviation from the specifications shall be made except upon written approval of the Geotechnical Engineer or Architect/Engineer.

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SLDBE BID INFORMATION

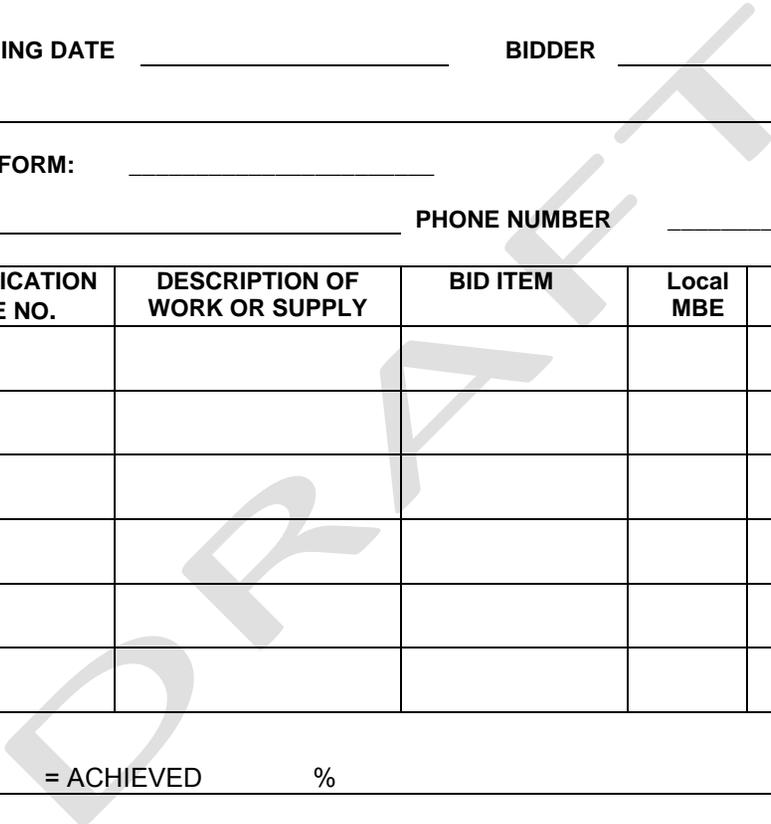
PROJECT NO. _____ BID OPENING DATE _____ BIDDER _____

PROJECT NAME _____

BIDDER REPRESENTATIVE COMPLETING THIS FORM: _____

NAME _____ EMAIL _____ PHONE NUMBER _____

NAME OF SLD BE	CERTIFIED BY	CERTIFICATION FILE NO.	DESCRIPTION OF WORK OR SUPPLY	BID ITEM	Local MBE	Local DVBE	Local DBE	Local WBE	Small Local	DOLLAR VALUE OF CONTRACT



LOCAL WBE BID AMOUNT \$ _____ = ACHIEVED _____ %

LOCAL MBE BID AMOUNT \$ _____ = ACHIEVED _____ %

LOCAL DBE BID AMOUNT \$ _____ = ACHIEVED _____ %

LOCAL DVBE BID AMOUNT \$ _____ = ACHIEVED _____ %

LOCALSBE BID AMOUNT \$ _____ = ACHIEVED _____ %



SOLANO COMMUNITY COLLEGE DISTRICT

**SMALL, LOCAL AND DIVERSE BUSINESS PROGRAM
APPENDIX C**

GOOD FAITH EFFORT (GFE) CHECKLIST SHEET (2 pages)

To be completed by all Bidders who do not achieve SLDBE participation goals

Name of Bidder (please print legibly)

PLEASE INITIAL TO INDICATE EACH ACTION TAKEN.

_____ Bidder attended pre-solicitation or pre-bid meeting scheduled by Solano Community College District

_____ Bidder identified and selected specific items of project for which the contract will be awarded to be performed by SLDBE.

_____ Bidder advertised, not less than 10 calendar days before the bid opening date in one or more daily or weekly newspapers, trade association publications, minority or trade oriented publications, trade journals, or other media, as specified by Solano Community College, for SLDBEs interested in participating in the project.

Name of publication in which advertisement was placed

Date advertisement appeared

_____ Bidder provided written notice of his/her interest in bidding on the contract to SLDBEs at least 10 calendar days prior to the opening of bids.

_____ Bidder followed up initial solicitations of interest by contacting SLDBEs to determine, with certainty, whether enterprises were interested in performing specific items of the project.

_____ Bidder provided interested SLDBEs with information about the plans, specifications, and requirements for the selected subcontracting of material supply work.

_____ Bidder requested assistance from community organizations; SLDBE contractor groups; veterans groups; local, state or federal disadvantaged business assistance officers; and/or other organizations that provide assistance in the recruitment and placement of SLDBEs as they are available.

_____ Bidder negotiated in good faith with SLDBEs and did not unjustifiably reject as unsatisfactory bids prepared by any SLDBEs.

Bidder certifies that all actions marked on the checklist were performed by the Bidder prior to the bid opening date. Failure to complete the above checklist may result in finding the proposal to be non-responsive, subject to the Solano Community College's determination. This checklist is provided as a courtesy to the bidder and is not intended to be a waiver of or modification to any of the Specifications included in the Contract Specifications or in other Contract documents, including but not limited to the SLDBE Program. Each bidder must comply with all Specifications and Contract documents. The undersigned states that the representations made herein are made under penalty of perjury.

Name of Authorized Firm Representative (Please Print)

Title

Signature of Authorized Firm Representative

Date

SECTION 024113 SELECTIVE SITE DEMOLITION

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Excavate trenches for utilities on site. Any and all work falling within the city right-of-way meet city standards.
- B. Compacted bedding and compacted fill over utilities to subgrade elevations.
- C. Compaction requirements.

1.2 REFERENCES

- A. ANSI/ASTM D. 2972–Standard test method for density of soil and soil aggregate, in place by nuclear methods–shallow depth.
- B. ANSI/ASTM D 3017 - Standard test method for moisture content of soil and soil aggregate, in place by nuclear methods–shallow depth.
- C. ANSI/ASTM D. 1557–Moisture density relations of soil and soil aggregate mixture using 10 pound Rammer and 18 inch Drop.
- D. Geotechnical report.

1.3 TESTS

- A. Tests and analysis of fill material will be performed in accordance with ANSI/ASTM D1557–78.

1.4 PROTECTION

- A. Protect excavations by shoring, bracing and sheet piling, underpinning, or other methods required to prevent cave in or loose soil from falling into trenches.
- B. Notify architect of unexpected subsurface conditions and discontinue work in affected area.
- C. Grade excavation top perimeter to prevent surface water runoff into excavation.

PART 2 - PRODUCTS

2.1 SELECT BEDDING AND FILL MATERIALS

- A. Bedding material: Bedding and backfill shall conform to the details on the Civil Plans.

2.2 COMMON FILL MATERIALS

- A. Subsoil: Reuse native material or import; free of gravel larger than 4 inch size and debris.

PART 3 – EXECUTION

3.1 INSPECTION

- A. Verified stockpiles still to be reused is approved.
- B. Verify areas to be backfilled are free of debris, snow, ice, or water, and surfaces are not frozen.

3.2 PREPARATION

- A. Trenching shall conform to the Civil Plans, the geotechnical report recommendations, and applicable requirements of other reference standards.

3.3 EXCAVATION

- A. Excavate subsoil as required for storm drain, and other piping utilities.
- B. Cut trenches sufficiently wide to enable installation of utilities and allow inspection.
- C. Remove lumped subsoil, boulders and rocks up to 6 inches, measured by the largest dimension.
- D. Correct unauthorized excavation at no cost to the owner.
- E. Fill over excavated areas under pipe bearing surfaces in accordance with direction by the engineer.
- F. Stockpile excavated material in area designated on the site by the architect and owner. Remove all excess sub soil not reused from the site.

3.4 BACKFILLING

- A. Support pipe and conduit during placement and compaction of bedding fill. Place bedding to a minimum depth of 6 inches under pipe and 12 inches minimum over pipe as shown on the Civil Plans.
- B. Place and compact fill material in continuous layers not exceeding 8 inches loose depth in accordance with the geotechnical report compaction requirements.
- C. Maintain moisture content of backfill materials as recommended by the geotechnical report to attain required compaction density.
- D. Remove surplus backfill materials from the site.

3.5 TOLERANCES

- A. Top surface of backfilling: plus or minus one inch.

3.6 FIELD QUALITY CONTROL

- A. Compaction testing will be performed in accordance with ANSI/ASTM D 2972, D 3017 and under provisions of section 01455.

END OF SECTION _____

SECTION 024119 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Demolition and removal of selected portions of building or structure.
- 2. Demolition and removal of selected site elements.
- 3. Salvage of existing items to be reused or recycled.

- B. Related Requirements:

- 1. Section 011000 "Summary" for restrictions on use of the premises, Owner-occupancy requirements, and phasing requirements.
- 2. Section 017300 "Execution" for cutting and patching procedures.
- 3. Section 013516 "Alteration Project Procedures" for general protection and work procedures for alteration projects.
- 4. Section 311000 "Site Clearing" for site clearing and removal of above- and below-grade improvements not part of selective demolition.

1.3 DEFINITIONS

- A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged or reinstalled.
- B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse.
- C. Remove and Reinstall: Detach items from existing construction, in a manner to prevent damage, prepare for reuse, and reinstall where indicated.
- D. Existing to Remain: Leave existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.
- E. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

1.4 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.

1.5 INFORMATIONAL SUBMITTALS

- A. Schedule of Selective Demolition Activities: Indicate the following:
 - 1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity.
 - 2. Interruption of utility services. Indicate how long utility services will be interrupted.
 - 3. Coordination for shutoff, capping, and continuation of utility services.
- B. Predemolition Photographs or Video: Show existing conditions of adjoining construction, including finish surfaces, that might be misconstrued as damage caused by demolition operations. Comply with Section 013233 "Photographic Documentation." Submit before Work begins.

1.6 FIELD CONDITIONS

- A. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
 - 1. Before selective demolition, confirm with Owner items Owner may want to move.
- B. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- C. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
 - 1. Hazardous materials will be removed by Owner before start of the Work.
 - 2. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.
- D. Storage or sale of removed items or materials on-site is not permitted.
- E. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
 - 1. Maintain fire-protection facilities in service during selective demolition operations.

1.7 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials and using approved contractors so as not to void existing warranties. Notify warrantor before proceeding.

- B. Notify warrantor on completion of selective demolition, and obtain documentation verifying that existing system has been inspected and warranty remains in effect. Submit documentation at Project closeout.

1.8 COORDINATION

- A. Arrange selective demolition schedule so as not to interfere with Owner's operations.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.
 - 1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
 - 2. Arrange to shut off utilities with utility companies.
 - 3. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.

4. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated on Drawings to be removed.
 - a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
 - b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material and leave in place.
 - c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
 - d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
 - e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
 - f. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
 - g. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material and leave in place.

3.3 PROTECTION

- A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent walkways, parking and facilities to remain.
 1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
 2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
 3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
 4. Cover and protect furniture, furnishings, and equipment that have not been removed.
- B. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
- C. Remove temporary barricades and protections where hazards no longer exist.

3.4 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
 2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
 3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 4. Dispose of demolished items and materials promptly.
- B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
- C. Removed and Salvaged Items:
1. Clean salvaged items.
 2. Store items in a secure area until delivery to Owner.
 3. Transport items to Owner's storage area designated by Owner
 4. Protect items from damage during transport and storage.
- D. Removed and Reinstalled Items:
1. Clean and repair items to functional condition adequate for intended reuse.
 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
 3. Protect items from damage during transport and storage.
 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and reinstalled in their original locations after selective demolition operations are complete.

3.5 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

- A. Concrete: Demolish in small sections. Using power-driven saw, cut concrete to a depth of at least 3/4 inch at junctures with construction to remain. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete. Neatly trim openings to dimensions indicated.
- B. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, and then remove concrete between saw cuts.
- C. Resilient Floor Coverings/Carpet: Remove floor coverings and adhesive according to recommendations in RFCI's "Recommended Work Practices for the Removal of

Resilient Floor Coverings. Do not use methods requiring solvent-based adhesive strippers.

- D. Roofing: Remove no more existing roofing than what can be covered in one day by new roofing and so that building interior remains watertight and weathertight. See Roofing requirements under various roofing specification for additional requirements. Provide adequate protection around and below areas of demolition to maintain safe working areas at all times.
 - 1. Remove existing roof membrane, flashings, copings, and roof accessories.
 - 2. Remove existing roofing system down to substrate.

3.6 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove demolition waste materials from Project site [and dispose of them in a manner acceptable to authorities having jurisdiction. Recycle or dispose of them according to Section 017419 "Construction Waste Management and Disposal."
 - 1. Do not allow demolished materials to accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 - 3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
- B. Burning: Do not burn demolished materials.

3.7 CLEANING

- A. Clean adjacent structures, walkways, parking and site improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

3.8 SELECTIVE DEMOLITION SCHEDULE

- A. Remove: Existing Roof areas as indicated in documents, existing suspended ceiling and tiles.
- B. Remove and Salvage: Items as indicated by Owner
- C. Remove and Reinstall: Existing lay-in Batt insulation, ceiling tiles and as indicated in documents.
- D. Existing to Remain: As required for scope of work in documents.
- E. Dismantle: As required for scope of work in documents.

END OF SECTION 024119

SECTION 032000

CONCRETE REINFORCEMENT

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Reinforcing steel bars, welded steel wire fabric fabricated steel bar or rod mats for cast-in-place concrete.
- B. Support chairs, bolsters, bar supports, and spacers, for supporting reinforcement.
- C. Tie-ins to existing concrete.

1.2 REFERENCES

- A. CCR - California Code of Regulations, Title 24, Part 2, Chapter 19A (ACI 318).
- B. ACI 301 - Specifications for Structural Concrete for Buildings.
- C. ACI 315 (SP-66) - Details and Detailing of Concrete Reinforcement.
- D. ACI 318 - Building Code Requirements for Reinforced Concrete.
- E. ASTM A82 - Cold Drawn Steel Wire for Concrete Reinforcement.
- F. ASTM A185 - Welded Steel Wire Fabric for Concrete Reinforcement.
- G. ASTM A615 - Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
- H. ASTM A706 - Standard Specification for Low Alloy Steel Deformed Bars for Concrete Reinforcement.
- I. ASTM C1116 - Specification for Fiber-Reinforced Concrete and Shotcrete.
- J. AWS D1.4 - Structural Welding Code Reinforcing Steel.
- K. CRSI - Manual of Practice.
- L. CRSI - Placing Reinforcing Bars.

1.3 QUALITY ASSURANCE

- A. Perform concrete reinforcement work in accordance with CRSI Manual of Standard Practice.

- B. Conform to ACI 301 and ACI 315 (SP-66).
- C. Conform to IBC and California Code of Regulations, Title 24, Part 2.

1.4 CERTIFICATES

- A. Submit mill test certificates of supplied concrete reinforcing, indicating physical and chemical analysis.

PART 2 PRODUCTS

1.5 MATERIALS

- A. Reinforcing Steel: ASTM A706, Grade 60. Billet-steel deformed bars, uncoated finish.
- B. Welded Reinforcement: ASTM A706, Grade 60, deformed bars, unfinished.
- C. Welded Steel Wire Fabric: ASTM A185 plain type; coiled rolls; uncoated finish.
- D. Steel Wire: ASTM A82, plain, cold drawn steel.

1.6 ACCESSORY MATERIALS

- A. Tie Wire: Minimum 16 gage annealed type.
- B. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for strength and support of reinforcement during installation and placement of concrete including load bearing pad on bottom to prevent vapor barrier puncture.
- C. [Chairs, Bolsters, Bar Supports, Spacers Adjacent to Architectural Concrete Surfaces: Plastic coated sized and shaped as required.]

1.7 FABRICATION

- A. Fabricate in accordance with ACI 315 (SP-66), providing concrete cover specified in Section 03300.
- B. Locate reinforcing splices not indicated on Drawings at points of minimum stress. Indicate location of splices on shop drawings.
- C. Weld reinforcing bars in accordance with AWS D1.4.

PART 3 EXECUTION

1.8 INSTALLATION

- A. Before placing concrete, clean reinforcement of foreign particles or coatings.

- B. Place, support, and secure reinforcement against displacement. Do not deviate from alignment or measurement.
- C. Dowel into existing concrete as detailed.
- D. Do not displace or damage vapor barrier required by Section 033000.

1.9 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed under provisions of Section 01410 [and as required by the Division of the State Architect and District Inspector].

END OF SECTION

SECTION 032500

EXPANSION ANCHORS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This Section describes the requirements for providing all material, labor, equipment and services necessary for the installation of all expansion anchors. The work shall include but not necessarily be limited to the following:
 - 1. Drill holes in existing concrete elements for new expansion anchors.
 - 2. Install expansion anchors in drilled holes.
 - 3. Tighten the anchors to the required torque.
- B. Related Sections:
 - 1. Concrete Reinforcement: Section 032000
 - 2. Cast-In-Place Concrete: Section 033000
 - 3. Structural Steel: Section 051200

1.2 SUBMITTALS

- A. Submit the following according to Conditions of the Contract and Specification Sections 01300.
- B. Shop Drawings: Submit shop drawings for the Architect's review. Indicate placing and assembly diagrams, dimensions and details, accessories, and cover for anchors.
 - 1. Review of Drawings will cover only the general scheme and character of the details, but not the checking of dimensions, nor will such review relieve the Contractor from responsibility for executing the work in accordance with the Contract Documents.
- C. Manufacturer's Catalog Data
 - 1. Expansion Anchors and Components.
- D. Certificates of Compliance and ICC Evaluation Service Reports.
 - 1. Expansion Anchors and Components.
- E. Test and Inspection Reports
 - 1. Anchor placement inspection.
 - 2. Anchor testing in place.

1.3 QUALITY ASSURANCE

- A. Standards: Comply with the following applicable standards unless otherwise specified herein:
 - 1. California Code of Building Regulations, Title 24, 2010 edition, also known as California Building Code (CBC), with amendment.

2. ESR/ICC – “Evaluation Report” of ICC Evaluation Service, Inc./UBC.
3. ASTM - American Society for Testing and Materials.
4. ASTM E488-15 – “Strength of Anchors in Concrete and Masonry Elements”
5. FF-S-325 (Interim Amendment 3) - Federal Specification “Shield, Expansion; Nail, Expansion; and Nail, Drive Screw (Devices, Anchoring, Masonry)”

B. Tests and Inspections: Tests and inspections shall be done by the Owner’s Testing Lab.

1. Sampling and Testing:
 - a. Anchors shall be sampled and identified in accordance with ASTM A 108 for carbon steel anchors and ASTM A276 for stainless steel anchors.
2. Inspection:
 - a. Special Inspection as required by the California Building Code.
 - (i) Drilling and placing of anchors shall be continuously inspected by the Owner’s Testing Lab.
3. Testing:
 - a. Test each size and type of anchor to tension loads specified in Schedules and Details in the Contract Documents
 - (i) Refer to Drawings for test load requirements for total number of anchors installed each day.
 - (ii) Testing shall be in accordance with ASTM E488-15, “Strength of Anchors in Concrete and Masonry Elements.”
 - (iii) Tension Test Loads: Refer to schedules on Drawings for test loads.
 - (iv) Test loads shall be a minimum of two (2) minutes each with a maximum slip of 1/8”.
 - (v) If any one anchor installed in any one day fails this test, all dowels and anchors installed that day shall be tested. Cost of the additional testing shall be borne by the Contractor.
 - (vi) Do not apply test loads for a minimum of two days after grouting.

1.4 STORAGE

- A. Provide job site storage in weatherproof and dry enclosure. Protect from contaminants such as grease, oil and dirt.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Expansion Anchors:
1. Expansion Anchors in concrete shall be steel “Wedge Anchors,” stud type with wedge clips.
 2. The following wedge anchors have the minimum ICC requirements for the shear and tension values for use in lightweight aggregate concrete and/or stone aggregate concrete at the tabulated values for anchor diameter, minimum embedment, and concrete strength:
 - a. Hilti Kwik Bolt TZ as manufactured by Hilti Corporation.
 - b. Simpson StrongBolt as manufactured by Simpson Strong- Tie.
 3. Headed and tie-wire hold anchors having the minimum ICC/ CBC requirements for shear and tension values for use in concrete at the tabulated values for anchor size and minimum embedment:
 - a. Rawl-Drive anchors headed and tie-wire hole, ASTM B633 steel without surface finish, as manufactured by the Rawlplug Company, Inc.

- b. Simpson Tie-wire anchor, carbon steel, as manufactured by Simpson Strong-Tie.
 4. Carbon steel anchors shall consist of the following, or equivalent materials:
 - a. Studs - ASTM A108, AISI Grade Designation 1010.
 - b. Wedge Clips - ASTM A108, AISI Grade Designation 1010.
 - c. Nuts - ASTM A563, Grade A.
 - d. Washers - ASTM A108, AISI Grade Designation 1010.
 - e. Zinc Coating on all items - ASTM A153 or ASTM B695.
 5. Stainless steel anchors shall consist of the following, or equivalent material:
 - a. Studs, Wedge Clips, Nuts and Washers - ASTM A276, Type 304 or 316.
- B. Concrete Screws
1. Concrete screws in concrete shall be carbon steel with zinc plating in accordance with ASTM B633, Class SC1, Type 1.
 2. The following concrete screws have the minimum ICC requirements for shear and tension values for use in lightweight aggregate concrete and/or stone aggregate concrete at the tabulated values for anchor diameter, minimum embedment and concrete strength.
 - a. Simpson Titen HD screw, as manufactured by Simpson Strong-Tie.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Inspect areas to be drilled to verify conditions of access, interferences and existing materials.
1. Verify location of all existing mild steel reinforcement in existing concrete prior to drilling. Pacometer tests, radiograph tests, or other appropriate tests shall be required to locate all steel.
 2. All alternate locations of holes shall be provided by Contractor and approved by the Architect.
 3. Where drilling causes existing concrete to spall or crack, remove unsound materials and replace as directed by the Architect.
 4. Proceed with drilling following removal or replacement of unsound or damaged concrete.

3.2 ANCHOR HOLES

- A. Holes for anchors shall be drilled in new and/or existing concrete using a rotary hammer drill with a tungsten carbide bit. Holes shall be the same diameter as bolts to the depths indicated.
- B. Anchor size and embedment shall be as indicated in schedules and details on the Drawings. In no case shall embedment of anchor be less than that shown in the valid ESR/ICC Evaluation Report for that particular anchor.
- C. Dust and other contaminants shall be completely removed from holes by blowing with compressed air or any other effective means.

3.3 ANCHOR PLACEMENT

- A. Anchors shall be placed and driven in holes to a depth that will provide the minimum embedment.

3.4 ANCHOR TIGHTENING

- A. Anchors shall be tightened to the minimum torque values specified in Schedules and Details on the Drawings, using torque wrenches or other approved methods for tightening the anchors.
- B. Installation of anchors shall be in strict accordance with manufacturer's written recommendations and as directed by the manufacturer's service representative.
- C. Anchors shall set for a minimum of 2 (two) days before any load test can be performed on the anchors.

3.5 PROTECTION

- A. Protect anchors from displacement or disturbance during curing period.
- B. Protect existing exposed surfaces and surrounding area during drilling operations. Clean and or repair marred or damaged surfaces as directed by the Architect.

3.6 EXISTING CONCRETE ENCASEMENT AND SLABS

- A. Contractor shall be responsible to repair any spalling or cracking due to drilling for dowels and/or anchors. Repairs shall be neatly done using damp-pack grout and bonding agent as specified in Section 03300, and shall be scheduled so as not to cause delays or impede the smooth flow or work.
- B. Proceed with drilling following removal or replacement of unsound or damaged concrete.

3.7 CLEAN-UP

- A. Remove from the site all debris resulting from the work of this Section.

END OF SECTION

SECTION 032520

DRILLED DOWELS AND ANCHORS IN RESIN

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Section Includes: Provide all material, labor, equipment and services necessary for the installation of all drilled dowels in existing concrete.
- B. Related Sections:
 - 1. Concrete Reinforcement: Section 032000
 - 2. Cast-In-Place Concrete: Section 033000
 - 3. Structural Steel: Section 051200

1.2 SUBMITTALS

- A. Drawings: Submit Drawings for Architect's review. Indicate placing diagrams for the dowels and anchors.
 - 1. Review of drawings will cover only the general scheme and character of the anchor layout, but not the checking of dimensions, nor will such review relieve the Contractor from responsibility for executing the work in accordance with the Drawings and Specifications.
- B. Manufacturer's literature describing products.
- C. ICC/ESR Evaluation Reports: Submit current report for each system furnished.
- D. Test and Inspection Reports:
 - 1. Anchor placement.
 - 2. Anchor inspection testing (in-place).

1.3 QUALITY ASSURANCE

- A. Standards: Comply with the following applicable standards unless otherwise specified herein:
 - 1. California Code of Regulations. Title 24, 2016 edition, also known as California Building Code (CBC), with amendments.
 - 2. ACI 315 – American Concrete Institute, “Details and Detailing of Concrete Reinforcement.”
 - 3. ASTM A36 – Structural Steel.
 - 4. ASTM A615 – American Society for Testing and Materials, “Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.”
 - 5. ICC/ESR – “Evaluation Report” of ICC Evaluation Service, Inc..
 - 7. ASTM E488-88 – Strength of Anchors in Concrete and Masonry Elements.

- B. Installer's Qualifications:
 - 1. Experienced in installing dowels in concrete using adhesive materials.
 - 2. To employ field personnel with minimum one year experience in construction with the adhesive material.

- C. Testing and Inspection: Tests and inspections shall be done by the Owner's Testing Lab.
 - 1. Sampling and Testing:
 - a. Reinforcing bar dowels shall be sampled and tested in accordance with ASTM A615 as specified in Section 03200, "Concrete Reinforcement."
 - 2. Inspection:
 - a. Special Inspection as required by Chapter 17A, CBC.
 - b. Continuously inspect drilling of holes in existing concrete and masonry, cleaning of holes, injection of adhesives into holes, and placement of dowels in holes.
 - 3. Testing:
 - a. Load test 100 percent of each size and type of anchors to the tensions loads specified in schedules on the Drawings.
 - i. Testing shall be in accordance with ASTM E488-88, "Strength of Anchors in Concrete and Masonry Elements."
 - ii. Tension Test Loads: Refer to schedules on Drawings for test loads.
 - iii. Test loads shall be held a minimum of 10 minutes each without slip of more than 1/8".
 - iv. If any one dowel or anchor installed in any one day fails this test, all dowels and anchors installed that day shall be tested. Cost of additional testing shall be borne by the Contractor.
 - v. Do not apply test loads for a minimum of 3 days following installation.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver, store, protect, and handle under provisions of Division 1.
- B. Ensure storage facilities are weather-tight and dry.

1.5 JOB CONDITIONS

- A. Existing Exterior or Interior Surfaces: Preserve and protect from drilling, chipping or other mechanical disturbances, and from adhesive residue.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. HIT Doweling Anchor System for Concrete (HIT-RE 500-SD, or Simpson Strong-Tie SET-XP)
 - 1. Hilti Fastening Systems HIT-RE 500-SD anchor system with continuously threaded rod or Simpson Strong-Tie SET-XP epoxy with continuously threaded rod.
 - 2. Type to suit application condition; i.e., vertical, overhead, etc.

B. Reinforcing Bar Dowels: ASTM A706, Grade 60.

C. Threaded Rod Anchors: ASTM A36

2.2 EQUIPMENT

A. Use rotary hammer drill for all drilling in concrete except where finishes are to be protected. All holes for anchors in brick shall be drilled with rotary drills or coring equipment-rotary hammer or impact devices shall not be used for drilling brick masonry.

PART 3 – EXECUTION

3.1 PREPARATION

A. Ensure availability of sufficient labor, equipment and materials to install dowels correctly in accordance with requirements above.

B. Inspect areas to be drilled to verify conditions of access, interferences and existing materials.

C. Verify location of all existing steel reinforcement in new and/or existing concrete prior to drilling. Pacometer tests or other appropriate tests shall be required to locate steel. Locate holes to avoid all steel reinforcement where practicable unless authorized by the Architect in writing. All alternate locations of holes shall be provided by Contractor and approved by the Architect.

D. Protect existing exposed surfaces from resin grouting operations.

E. Dowels shall be free of grease, paint or mill scale prior to use. Using solvents to clean dowels is not allowed.

F. Use rotary hammer drill with tungsten carbide bit for all drilling in concrete. Use coring machine with diamond bit for drilling through reinforcing steel.

3.2 DRILLED DOWELS IN CONCRETE ADHESIVE ANCHOR SYSTEM

A. Drill holes to the minimum depth indicated on the Drawings and to the diameter required by the manufacturer's for each size of dowel.

B. Clean hole with nylon brush and compressed air, and in accordance with Manufacturer's instructions.

C. Mix contents of two cartridges and inject adhesive into back of bottom of hole and fill hole approximately half full.

D. Insert dowel and/or anchor into hole containing adhesive until it is completely embedded.

- E. Drilling and installation of dowels and/or anchors shall be strictly in accordance with approved manufacturer's recommendations.
- F. Allow adhesive to cure in accordance with manufacturer's recommendations.

3.3 EXISTING CONCRETE ENCASUREMENT AND SLABS

- A. Where drilling causes existing concrete to spall or crack, remove unsound material. Contractor shall be responsible to repair any spalling or cracking due to drilling for dowels. Repairs shall be neatly done using epoxy injection or damp-pack grout and bonding agent as specified in Section 03300, and shall be scheduled so as not to cause delays or impede the smooth flow of work.

3.4 PROTECTION

- A. Protect dowels after setting from accidental disturbance during curing time specified by manufacturer, or for 24 hours minimum, whichever is greater.

3.5 FIELD QUALITY CONTROL

- A. The Owner's Testing Agency will load-test 100% of each size of HIT dowels in concrete to tension specified in Schedule on the Drawings.
 - 1. Test loads shall be maintained for a minimum of 10 minutes without a slip or movement of more than 1/8" of the dowel and/or anchor.
 - 2. If any one dowel installed in any one day fails this test, all dowels installed that day shall be tested, and all cost of such tests and inspection shall be paid for by the Contractor.
 - 3. Do not apply test loads for a minimum of 3 days after installation.

3.6 CLEAN-UP

- A. Remove from the site all debris resulting from the work of this Section.

END OF SECTION

SECTION 033000

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Section Includes: Provision of cast-in-place concrete unless specifically noted otherwise.

1.2 REFERENCES

- A. Requirements of GENERAL CONDITIONS and DIVISION NO. 1 apply to all Work in this Section.
- B. Published specifications, standards, tests, or recommended methods of trade, industry, or governmental organizations apply to Work of this Section where cited by abbreviations noted below (latest editions apply).
1. California Code of Regulations. Title 24, 2016 edition, also known as California Building Code (CBC), with 2008 amendments.
 2. American Society for Testing and Materials (ASTM).
 3. American Concrete Institute's:
 - a. "Specification for Structural Concrete for Buildings" (ACI 301).
 - b. "Recommended Practice for Cold Weather Concreting"(ACI 306).
 - c. "Recommended Practice for Hot Weather Concreting"(ACI 305).
 - d. "Recommended Practice for Measuring, Mixing and Placing Concrete" (ACI 304).
 - e. "Building Code Requirements for Reinforced Concrete" (ACI 318).
 4. State of California, Business and Transportation Agency Division of Highways' "Materials Manual," (CMM).
 5. California Department of General Services, Division of the State Architect, Interpretation of Regulations Document IR 19-3.

1.3 QUALITY ASSURANCE

- A. The Contractor's Testing Laboratory Qualifications: The Contractor's Testing Laboratory shall be under direction of a Civil Engineer registered in the State of California, shall have operated successfully for four years prior to this work, and shall conform to requirements of ASTM E329.
- B. Requirements of ACI 301 shall govern work, materials and equipment related to this Section; specifications herein set minimum results required, and references to procedures are intended to establish minimal guides.
- C. The Contractor shall be responsible for quality of concrete in place and shall bear burden of proof that concrete meets minimum requirements.

- D. Placing of concrete by means of pumping will be an acceptable method of placement providing that the Contractor can demonstrate that:
 1. Specified concrete strengths will be met.
 2. Equipment has a record of satisfactory performance under similar conditions and using a similar mix.
 3. Trial batches have been made.

1.4 SUBMITTALS

- A. The Contractor's Testing Laboratory's certificate of compliance.
- B. The Contractor shall submit:
 1. Certified copies of mix designs for each concrete class specified including compressive strength test reports. The mix designs will be approved by the Owner's Testing Agency and reviewed by the Architect.
 2. Certification that materials meet requirements specified.
 3. Samples only as requested by the Architect.
 4. Certification from vendor that samples originate from and are representative of each lot proposed for use.
- C. The Owner's Testing Agency will submit reports on tests and inspections performed to the Owner, the Architect, the Contractor, and the Division of the State Architect.
- D. Shop Drawings: Show construction joint locations and details.
- E. Schedule of placing for the Architect's review before starting Work.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Ensure storage facilities are weather tight and dry.
- B. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use.
- C. Store bulk cement in bins capable of preventing exposure to moisture.
- D. Use sacked cement in chronological order of delivery. Store each shipment so that it may be readily distinguishable from other shipments.

PART 2 - PRODUCTS

2.1 CONCRETE CLASSES

CLASS	STRENGT H	AGGREGATE	WEIGHT	SLUMP	W/C (By Weight)
A. Foundations	4000	1	145	4	0.40
B.Slab on grade	4000	1	145	4	0.40

CLASS	STRENGT H	AGGREGATE	WEIGHT	SLUMP	W/C (By Weight)

- A. Class: see table
- B. Strength: Compressive strength in psi after 28-days when tested in accordance with ASTM C39. All concrete shall develop compression strength specified in 28-days. To meet above requirements, mix shall be designed such that average compressive strength will exceed specified 28-day strength by an amount as specified by ACI 318.
- C. Aggregate: Maximum size in inches.
- D. Weight: Pounds per cubic foot, air dry.
- E. Slump: In inches when tested in accordance with ASTM C143.
- F. W/C: Water-cement ratio.

2.2 MATERIALS

- A. General Requirements:
 - 1. Cement and aggregates shall have proven history of successful use with one another. Sources of cement and aggregate shall remain unchanged through-out work unless the Architect approves request for change made at least 10-days prior to anticipated date of casting.
 - 2. Ready-mixed concrete shall meet requirements of ASTM C94.
 - 3. Deviations in properties of materials tested by the Owner's Testing Agency shall be cause for their rejection pending additional test results and redesign of mix by the Contractor's Testing Laboratory.
 - 4. No frozen aggregates will be permitted.
- B. Cements:
 - 1. For Class A and B Concrete: ASTM C150, Type II. Use one brand of cement throughout project unless otherwise acceptable to Architect.
- C. Fly Ash: ASTM C618-05, Class N or F (Class C is not permitted). More than 15 percent of fly ash by weight is permitted to be substituted for ASTM C150 Portland cement if the mix design is proportioned per CBC Section 1905.A.3 and in accordance with ACI, Section 5.3. Per ASTM C618, sampling and testing of fly ash shall be in accordance with ASTM C311.
 - 1. Fly ash shall be added to all concrete at the rate of 25% replacement by weight of the scheduled amount of cement.
 - 2. Use of fly ash in concrete with super-plasticizer admixtures is mandatory.
 - 3. Fly ash generated from municipal solid waste incinerators or coal plants fired with hazardous waste, medical waste or tire-derived fuel is prohibited.

- D. Aggregates:
1. Coarse: ASTM C33. Coarse aggregate shall consist of a clean, hard, fine grained, sound crushed rock, or washed gravel or a combination of both. It shall be free from oil, organic matter or other deleterious substances and shall not contain more than two percent by weight of shale or cherty material. "Cleanness value shall not be less than 75 when tested per MM Test Method, 227 and conforming to CBC Section 1903A.3.2.
 2. Fines: ASTM C33. Sand equivalent shall be not less than 75 when tested as per ASTM D2419.
 3. For Class B Concrete: ASTM C330; expanded shale type uniformly graded from 3/4-inch to No. 200 Mesh. Cleanliness value and sand equivalent not less than 75. Same as Aggregate Division of Basalt Rock Co., Inc's "Basalite"; Port Costa Clay Products Co.'s "PC-7"; or equal product substituted per Section 01630.
 4. Provide aggregates from a single source for exposed concrete.
- E. Water: Clean and potable, free from impurities detrimental to concrete.
- F. Water-Reducing Admixture: ASTM C494, Type A, non-lignini sulfonate. Same as Grace Construction Materials' "WRDA with Hycol"; Master Builders "Pozzolith 322N"; Sika Corp.'s "Plastocrete 161"; or equal product substituted per Section 01630.
1. Air Entraining Admixture: ASTM C260, certified by manufacturer to be compatible with other products. Same as W.R. Grace's "Daravair", Master Builders' "Micro-Air", Sika Corp.'s "Sika Aer", or equal product substituted per Section 01630.
 2. High-Range Water-Reducing Admixture (Super Plasticizer): ASTM C494, Type F or Type G. Same as W.R. Grace's "WRDA 19", Master Builders' "Rheobuild", Sika Corp.'s "Sikament", or equal product substituted per Section 01630.
 3. Water Reducing, Accelerator Admixture: ASTM C494, Type E. Same as W.R. Grace's "Daraset", Master Builder's "Pozzutec 20", Euclid's "Accelgurad 80", or equal product substituted per Section 01630.
 4. Water Reducing, Retarding Admixture: ASTM C494, Type D. Same as W.R. Grace's "Daratard-17", Master Builders' "Pozzolith R", Sika's "Plastiment", or equal product substituted per Section 01630.
 5. Fibrous Reinforcement: Engineered polypropylene fibers designed for secondary reinforcement of concrete slabs. Same as W.R. Grace's "Grace Fibers", Euclid's "Fiberstrand 100", Fibermesh's "Fibermesh", or equal product substituted per Section 01630.
- G. Other Admixtures: Only as approved by the Architect.
- H. Moisture Barrier: Polyethylene minimum 6 mils thick, fungus-resistant in 12' wide sheets, lapped 6 inches and taped.
- I. Sand Protection Course: Non-abrasive sand as approved by the Architect in 2 inch layers above and below the moisture barrier.
- J. Wax Sealer: Heavy penetrating type as manufactured by approved manufacturer of clear hardener.
- K. Abrasive Grains: Aluminum oxide type. Same as Sonneborn-Contech's "Frictex NS";

General Abrasive Co., Inc.'s "Fut-Sure"; The Exolon Co.'s "Exolon Anti-Slip"; or equal product substituted per Section 01630.

- L. Non-Shrink Grout: Premixed high strength grout requiring only addition of water at the site. Same as Master Builder's "Masterflow 928 Grout"; Burke's "Non-Ferrous, Non-Shrink Grout", or equal product substituted per Section 01630.
- M. Curing Materials:
 - 1. Waterproof Paper: ASTM C171, Type 1, regular. Same as Sisalkraft Division of St. Regis Paper Co.'s "Orange Label"; or equal product substituted per Section 01630.
 - 2. Sheet Plastic: Polyethylene, four mils thick, fungus-resistant.
 - 3. Curing Compound: ASTM C309. Same as Grace Construction Materials' "Horn Clear Seal"; Grimes Co.'s "Sealcrete"; Master Builders' "Masterseal W", or equal product substituted per Section 01630.
- N. Concrete Sealer: Clear water repellent treatment, blend of six resins containing no silicones or stearates, no darkening or change of color. Same as Sonneborn-Contech's "White Rox M-6-50-8"; Tamms Industries' "Chemstop" or equal product substituted per Section 01630.
- O. Hardener, Clear Liquid Type: Grace construction Materials' "Hornstone Crystal Chemical Hardener"; Master Builder's "Mastercron"; Sonneborn-Contech's "Lapidolith"; Upco Co.'s "Vitrox 4701"; or equal product substituted per Section 01630.
- P. Epoxy Adhesive: Two component material suitable for anchoring rebar into dry or damp concrete. Same as Simpson Strong Tie SET-XP or HILTI HIT RE-500-SD. Do not use without written consent from Engineer and DSA.

2.3 MIXES

- A. General Requirements:
 - 1. The Contractor shall perform tests or assemble the necessary data indicating conformance with specifications.
 - 2. For each mix submit data showing that proposed mix will attain the required strength in accordance with requirements of CBC Section 1905A.3, Method "B".
 - 3. The Contractor shall instruct Laboratory to base mix design on use of materials tested and approved by the Owner's Testing Agency.
 - 4. Mix design shall include compression strength test reports per CBC Section 1905A.3.1.
 - 5. Mix shall be designed, tested, and adjusted if necessary in ample time before first concrete is scheduled to be placed. Laboratory data and strength test results for revised mix design shall be submitted to Architect prior to using in project.
 - 6. Insure mix designs will produce concrete to strengths specified and of uniform density without segregation.
 - 7. If mix yield exceeds 1-cubic yard, modify mix design to no more than one cubic yard without changing cement content.
 - 8. The Contractor's mix designs shall be subject to review by the Architect and by

the Owner's Testing Agency.

9. Introduction of calcium chloride will not be permitted.
10. Unspecified admixtures will not be permitted unless the Architect reviews, the Contractor modifies mix designs as necessary, and modifications are accepted by the Owner's Testing Agency.

B. Slab-on-Grade Mix requirements

1. Maximum water/cement ratio of 0.45.
2. Minimum fly ash content of 25% (as percentage replacement of cement).
3. Do not use air entrainment additives.
4. Use of Water-Reducing admixture is required. High Range Water-Reducing admixture (super plasticizer) shall be used when required to maintain workability and pumpability.

C. Patching Mortar: Mix in proportions by volume of one part cement to two parts fine sand.

D. Concrete Fill at Stairs: Mix in proportions by volume of one part cement, two parts fine aggregate, one part coarse aggregate (3/8- inch); with as little water as necessary to make stiff workable plastic mix.

E. Non-Shrink Grout: Follow approved manufacturer's printed instructions and recommendations.

2.4 MIXING

A. Batching Plant Conditions:

1. Ensure equipment and plant will afford accurate weighing, minimize segregation and will efficiently handle all materials to satisfaction of the Architect and the Owner's Testing Agency.
2. Replace at no additional expense equipment the Architect and the Owner's Testing Agency deem inadequate or unsuitable.
3. Use approved moisture meter capable of determining moisture content of sand.

B. General Requirements:

1. Thoroughly clean concrete equipment before use for architectural concrete mixes to avoid contamination.
2. Mix cement, fine and coarse aggregates, admixtures and water to exact proportions of mix designs. Method of mixing shall comply with CBC Section 1905A.8.
3. Measure fine and coarse aggregates separately according to approved method which provides accurate control and easy checking.
4. Adjust grading to improve workability; do not add water unless otherwise directed.
5. Maintain proportions, values, or factors of approved mixes throughout work.
6. Mix concrete in transit mixers five minutes immediately prior to discharge in addition to mixing as called for by ACI 304 and ASTM C94.

C. Admixtures: Use automatic metering dispenser to introduce admixture into mix.

Dispenser shall be recommended and calibrated by admixture manufacturer.

2.5 SOURCE QUALITY CONTROL

A. The Owner's Testing Agency will:

1. Review mix designs, certificates of compliance, and samples of materials the Contractor proposes to use.
2. Test and inspect materials, as necessary, in accordance with ACI 318 and CBC Sections 1903A, 1905A and 1929A for compliance with requirements.
3. Take samples as required from the Contractor's designated sources.
4. Take one grab sample for each 100 tons of Portland cement except that, when used in bulk loading ready-mix plants where separate bins for pretested cement are not available, take grab samples for each shipment of cement placed in bin with not less than one sample being taken for each day's pour and subsequently test such samples if required by the Architect who may be so advised by Division of the State Architect.
5. Test both coarse and fine aggregate by use of solution of sodium or magnesium sulfate, or both whenever in the judgment of the Architect such tests are necessary to determine quality of material. Perform such tests in accordance with ASTM C88. Loss shall not exceed 6-percent of either fine or coarse aggregate. Aggregate failing to comply with this requirement may be used in the Work provided it contains less than 2- percent of shale and other deleterious particles and shows a loss in soundness test of not more than 10-percent when tested in the sodium sulphate solution. Test aggregates as required by CBC Section 1903A.3.
6. Test for sand equivalent of fine aggregate in accordance with California Test 217.
7. Test for cleanness value of coarse aggregate in accordance with California Test 227.
8. Inspect plant prior to any work to verify following:
 - a. Plant is equipped with approved metering devices for determining moisture content of fine aggregate.
 - b. Other plant quality controls are adequate.
9. Continuously inspect quality and quantity of materials used in transit mixed concrete, in batched aggregates and ready-mixed concrete at mixing plant or other location per CBC Section 1929A.4 where other materials are measured.
10. Fly Ash: Contractor shall supply the Owner's Testing Lab adequate samples for testing, if required and certified mill analysis and test reports for Owner's Testing Lab review.
 - a. Comply with IR19-3.
 - b. Submit certification by manufacturer that fly ash has been manufactured and tested in accordance with ASTM C618 and CCR Title 24, Section 2628(a). Where certification is not available, one grab sample shall be taken and tested for each day's pour in accordance with CCR Title 24, Section 2628(a). Sampling and testing shall be in accordance with requirements of ASTM C311.
 - c. Comply with CCR Title 24 Section 1903A.5.
 - d. If origin of fly ash is unknown, the fly ash shall be subject to Waste Extraction Test per California Hazardous Waste Code Title 22, Chapter 11, Appendix II. Mercury concentrations must be less than 11 part per billion.

11. Fly-ash Pre-construction Meeting: A pre-construction meeting concerning the use of fly ash is required. Representatives of the Owner, the Owner's testing agency, the architect, the engineer, the contractor and concrete sub-contractor shall attend.
- B. Waiver of Batch Plant Inspection:
1. Continuous batch plant inspection may be waived in accordance with CBC Section 1929A.5 if the plant complies with ASTM C94 and has been certified by an agency acceptable to DSA to comply with the requirements of the National Ready Mix Concrete Association.
 2. When batch plant inspection is waived, the following requirements shall apply:
 - a. Testing Agency shall check the first batching at the start of work and furnish mix proportions to the licensed Weighmaster.
 - b. Licensed Weighmaster shall identify material quantities and certify each load by a ticket.
 - c. Project Inspector shall collect truck mix tickets with load identification and maintain a daily record of placement. Trucks without a load ticket identifying the mix shall be rejected. Copies of daily placement record shall be submitted to DSA.
 - d. At the end of the project, the Weighmaster shall submit an affidavit to DSA certifying that all concrete supplied conforms to proportions established by mix designs.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine units of work to be cast and verify that:
1. Construction of formwork is complete.
 2. Moisture barrier is placed and properly protected.
 3. Required reinforcement, inserts, and embedded items are in place.
 4. Form ties at construction joints are tight.
 5. Concrete-receiving places are free of debris.
 6. Dampen subgrade or sand course for slabs-on-grade. Do not saturate.
 7. Depths of depressed slab conditions are correct for delayed finish noted and for its proper bonding to concrete.
 8. Conveying equipment is clean and properly operating.
 9. The Architect has reviewed formwork and reinforcing steel and that preparations have been checked with the Project Inspector.
- B. Do not begin casting before unsatisfactory conditions have been corrected.
- C. At locations where new concrete is dowelled to existing work, drill holes in existing concrete, insert steel dowels, and pack solid with non-shrink grout.
- D. Install vapor barrier in compliance with ASTM E1643 under interior slabs. Turn vapor barrier up at exterior walls and seal. Lap horizontal joints 6 inches and seal with pressure-sensitive tape. Seal penetrations of vapor barrier. Place 2 inch sand fill under and over vapor barrier.

3.2 PREPARATION

- A. Ensure availability of sufficient labor, equipment and materials to place concrete correctly in accordance with scheduled casting.
- B. Protect finished surfaces adjacent to concrete-receiving places.
- C. Clean transportation and handling equipment at frequent intervals and flush thoroughly with water before each day's run. Do not discharge wash water into concrete form.
- D. Construction Joints: Clean and roughen all construction joint contact surfaces by removing all surface laitance and exposing sound mortar. Sandblasting and bush-hammering are acceptable methods.

3.3 PLACING

- A. The Inspector of Record, Architect, Structural Engineer, Testing Laboratory and DSA shall be notified at least 48 hours before placing concrete.
- B. Place concrete in accordance with CBC Section 1905A.
- C. Place concrete in cycles as a continuous operation to permit proper and thorough integration and to complete scheduled placement. Place no concrete where sun, wind, heat, or facilities prevent proper finishing and curing.
- D. Convey concrete as rapidly and directly as practicable to preserve quality and to prevent separation from rehandling and flowing; do not deposit concrete initially set. Cast concrete within ninety (90) minutes after adding water unless otherwise noted. Retempering of concrete which has partially set will not be permitted.
- E. Take precautions to avoid damage to under-slab moisture barrier and displacement of reinforcement and formwork.
- F. Deposit concrete vertically in its final position. Avoid free falls in excess of six feet where reinforcement will cause segregation and in typical conditions unless the Architect approves otherwise.
- G. Keep forms and reinforcement clean above pour line by removing clinging concrete with wire brush before casting next lift. Also remove leakage through forms.
- H. Interruption in casting longer than 60-minutes shall be cause for discontinuing casting for remainder of day. In this event, cut back concrete and provide construction joints as the Architect directs; clean forms and reinforcement as necessary to receive concrete at a later time.
- I. Hot Weather Concreting: Conform to ACI 305 and following requirements when mean daily temperature rises above 75 degrees Fahrenheit.
 - 1. An upper temperature limit of concrete mixes shall be established by the

Contractor for each class of concrete. Concrete temperature during placing shall not be so high as to cause difficulty from loss of slump, flash set, or cold joints, and shall not exceed 90°F. Other project climatic conditions detrimental to concrete quality such as relative humidity, wind velocity, and solar radiation shall also be considered.

2. Trial batches of concrete for each mix design shall be made at the limiting mix temperature selected. In lieu of trial batches, compression strength test reports (20 minimum) at the limiting temperature for each proposed mix shall be submitted to the Owner's testing laboratory for review.
3. Practices to maintain concrete below maximum limiting temperature shall be in accordance with ACI 305. Concrete ingredients may be cooled before mixing, or flake ice or well-crushed ice of a size that will melt completely during mixing may be substituted for part of the mixing water.
4. Practices to avoid the potential problems of hot weather concreting shall be employed by the Contractor in accordance with ACI 305.
5. When the temperature of the reinforcing steel or steel deck forms is greater than 120°F, reinforcing and forms shall be sprayed with water just prior to placing the concrete.

J. Cold Weather Concreting:

1. No placement of concrete will be allowed at temperatures below 20 degrees Fahrenheit or if mean daily temperature for curing period is anticipated to be below 20 degrees Fahrenheit.
2. No concrete placement will be allowed on frozen subgrade.
3. Conform to ACI 306 and following requirements when mean daily temperature falls below 40 degrees Fahrenheit.
 - a. Reinforcement, forms or ground to receive concrete shall be completely free from frost.
 - b. Concrete at time of placement for footings shall have temperature no lower than 50 degrees Fahrenheit, for all other concrete this minimum temperature at time of placement shall be 60 degrees Fahrenheit. Maximum temperature shall be 90 degrees Fahrenheit.
 - c. Concrete shall be maintained at temperature no lower than 50 degrees Fahrenheit for minimum 7-day period after placement by means of blanket insulation, heaters, or other methods as approved by the Architect.
 - d. Use of calcium chloride or admixtures containing calcium chloride as accelerators will not be permitted.
 - e. The Contractor shall keep a record of concrete surface temperature for first 7-days after each pour. This record shall be open to inspection by the Architect.

- K. Consolidating:
1. Use vibrators for thorough consolidation of concrete.
 2. Provide vibrators for each location during simultaneous placing to ensure timely consolidation around reinforcement, embedded items and into corners of forms; ensure availability of spare vibrators in case of failures. Vibrate through full depth of freshly placed concrete.
 3. Do not place vibrators against reinforcement, attach to forms, or use to spread concrete.
 4. Exposed Concrete: Vibrate with rubber type heads and, in addition, spade along forms with flat strap or plate.
- L. Construction Joints:
1. Verify location and conformance with typical details; provide only where designated or approved by the Architect. Comply with CBC Section 1906A.4.
 2. All horizontal and vertical construction joints to be thoroughly sandblasted to clean and roughen entire surface to minimum 1/4-inch relief exposing clean coarse aggregate solidly embedded in mortar matrix.
 3. Just prior to depositing concrete, the surface of the construction joint shall be thoroughly wetted.
- M. Contraction (Control) Joints in Slabs-on-Grade:
1. Construct contraction joints in slabs-on-ground to form panels of patterns indicated on Shop Drawings. Use saw cuts 1/8" x 1/4 slab depth, unless otherwise indicated.
 2. Time saw cutting to allow sufficient curing of concrete to prevent ravelled or broken edges.
 3. Contraction joints in unexposed floor slabs may be formed by saw cuts as soon as possible after slab finishing as may be safely done without dislodging aggregate.
 4. If joint pattern not shown, provide joints not exceeding 15' in either direction and located to conform to bay spacing wherever possible (at column centerlines, half bays, third-bays).
- N. Walls and Other Formed Elements:
1. Space points of deposit to eliminate need for lateral flow. Placing procedures of concrete in forms permitting escape of mortar, or flow of concrete itself, will not be permitted.
 2. Level top surface upon stopping work.
 3. Take special care to fill each part of the forms by depositing concrete directly as near final position as possible, and to force concrete under and around reinforcement, embedded items, without displacement.
 4. After concrete has taken its initial set, care shall be exercised to avoid jarring forms or placing any strain on ends of projecting reinforcement.
 5. Where backfill is placed against a wall, it shall be adequately shored until it has attained design strength.
- O. Concrete Fill at Stairs:
1. Preparation:
 - a. Remove latence, mortar, oil, grease, paint, etc.
 - b. Mechanically chip insufficiently rough surfaces.

- c. Remove sand, etc., with compressed air.
2. Finish stairs to profiles shown with cove at base of risers and radius at top: tool grooves at edge of treads as detailed.

3.4 CURING

A. General Requirements:

1. Take curing measures immediately after casting and for measures other than application of curing compound, extend for seven days. The Architect may recommend longer periods based upon prevailing temperature, wind and relative humidity. Comply with CBC Section 1905A.11.
2. Avoid alternate wetting and drying and fluctuations of concrete temperature.
3. Protect fresh concrete from direct rays of sun, rain, freezing, drying winds, soiling, and damage.
4. Do not permit curing method to affect adversely finishes or treatments applied to finish concrete.

B. Curing Method, Typical: Obtain the Architect's approval of alternate measures.

1. Keep forms and concrete surfaces moist during period forms are required to remain in place.
2. Apply curing compound per manufacturers' recommendations, except at slabs-on-grade apply curing compound at 150% of manufacturer's recommended application coverage rate.

3.5 CLEANING, PATCHING AND DEFECTIVE WORK

A. Where concrete is under strength, out of line, level or plumb, or shows objectionable cracks, honeycombing, rock pockets, voids, spalling, exposed reinforcement, signs of freezing or is otherwise defective, and, in the Architect's judgement, these defects impair proper strength or appearance of the work, the Architect will require its removal and replacement at the Contractor's expense.

B. Immediately after stripping and before concrete is thoroughly dry, patch minor defects, form-tie holes, honeycombed areas, etc., with patching mortar. Patch shall match finish of adjacent surface unless otherwise noted. Remove ledges and bulges.

C. Compact mortar into place and neatly file defective surfaces to produce level, true planes. After initial set, dress surfaces of patches mechanically or manually to obtain same texture as surrounding surfaces.

D. Rock Pockets:

1. Cut out to full solid surface and form key.
2. Thoroughly wet before casting mortar.
3. Where the Architect deems rock pocket too large for satisfactory mortar patching as described, cut out defective section to solid surface, key and pack solid with concrete to produce firm bond and match adjacent surface.

E. Cleaning

1. Insure removal of bituminous materials, form release agents, bond breakers, curing compounds if permitted and other materials employed in work of

concreting which would otherwise prevent proper application of sealants, liquid waterproofing, and other delayed finishes and treatments.

2. Where cleaning is required, take care not to damage surrounding surfaces or leave residue from cleaning agents.

3.6 PROTECTION

- A. Protect concrete from injurious action of the elements and defacement of any nature during construction operations.
- B. Protect exposed corners of concrete from traffic or use which will damage them in any way.
- C. Make provisions to keep all exposed concrete free from laitance caused by spillage or leaking forms or other contaminants. Do not allow laitances to penetrate, stain, or harden on surfaces which have been textured.

3.7 FIELD QUALITY CONTROL

- A. The Owner's Testing Agency will:
 1. Perform testing in accordance with ACI 318 and CBC Section 1903A and 1905A.
 2. Review concrete mix designs.
 3. Inspect concrete and grout placement continuously.
 4. Test concrete to control slumps according to ASTM C143.
 5. Continuously monitor concrete temperature as it arrives on the site.
 6. Test concrete for required compressive strength in accordance with CBC Section 1905A.6:
 - a. Make and cure three specimen cylinders according to ASTM C31 for each 150 cubic yards, or fraction thereof, of each class poured at site each day.
 - b. Retain one cylinder for 7-day test and two for the 28-day test.
 - c. Number each cylinder 1A, 1B, 1C, 2A, 2B, 2C, etc; date each set; and keep accurate record of pour each set represents.
 - d. Transport specimen cylinders from job to laboratory after cylinders have cured for 24-hours on site. Cylinders shall be covered and kept at air temperatures between 60 and 80 degrees Fahrenheit.
 - e. Test specimen cylinders at age 7-days and age 28-days for specified strength according to ASTM C39.
 - f. Base strength value on average of two cylinders taken for 28-day test.
 7. Test and inspect materials, as necessary, in accordance with ACI 318, MM Test Method 227 (Coarse Aggregates) and MM Test Method 217 (Fine Aggregates), for compliance with requirements specified in this section.
- B. The Contractor shall:
 1. Submit ticket for each batch of concrete delivered to job site. Ticket shall bear the following information:
 - a. Design mix number.
 - b. Signature or initials of ready mix representative.
 - c. Time of batching.
 - d. Weight of cement, aggregates, water and admixtures in each batch with

- maximum aggregate size.
 - e. Total volume of concrete in each batch.
 - f. Notation to indicate equipment was checked for contaminants prior to batching.
2. Pay the Owner's Testing Agency for taking core specimens of hardened structure and testing specimen according to ASTM C88 and C42 when laboratory tests of specimen cylinders show compressive strengths below specified minimum.

3.8 FINISH OF FORMED SURFACES

- A. Rough Form Finish: For formed concrete surfaces not exposed-to-view in the finish Work or by other construction. Concrete surface shall have texture imparted by form facing material used, with tie holes and defective areas repaired and patched and fins and other projections exceeding 1/4 inch in height rubbed down or chipped off.
- B. Smooth Form Finish: For formed concrete surfaces exposed-to-view, or to be covered with a coating material applied directly to concrete, or a covering material applied directly to concrete, such as waterproofing, dampproofing, painting or other similar system. This is as-cast concrete surface obtained with selected form facing material, arranged orderly and symmetrically with a minimum of seams. Repair and patch defective areas with fins or other projections completely removed and smoothed.
- C. Architectural Concrete Finish: Integrally colored concrete, using specified color additive; smooth light sandblast surface.
- D. Related Unformed Surfaces: At tops of walls, horizontal offsets and similar unformed surfaces occurring adjacent to formed surfaces, strike-off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.
- E. Salt Finish: Covered under Section 02751.

3.9 SLAB FINISHES

- A. Scratch Finish: Apply scratch finish to monolithic slab surfaces that are to receive concrete floor topping or mortar setting beds for tile, portland cement terrazzo, and other bonded applied cementitious finish flooring material, and as otherwise indicated.
 - 1. After placing slabs, plane surface to tolerances for floor flatness (F_F) of 15. Slope surfaces uniformly to drains where required. After leveling, roughen surface before final set, with stiff brushes, brooms or rakes.
- B. Float Finish: Apply float finish to monolithic slab surfaces to receive trowel finish and other finishes as hereinafter specified, and slab surfaces which are to be covered with membrane or elastic waterproofing, membrane or elastic roofing, or sand-bed terrazzo, and as otherwise indicated.
 - 1. After screeding, consolidating, and leveling concrete slabs, do not work surface until ready for floating. Begin floating when surface water has disappeared or when concrete has stiffened sufficiently to permit operation of power-driven floats, or both. Consolidate surface with power-driven floats, or by hand-floating if area is small or inaccessible to power units. Check and level surface plane to

tolerances of F_F18. Cut down high spots and fill low spots. Uniformly slope surfaces to drains. Immediately after leveling, refloat surface to a uniform, smooth, granular texture.

- C. Trowel Finish: Apply trowel finish to monolithic slab surfaces to be exposed-to-view, and slab surfaces to be covered with resilient flooring, carpet, ceramic or quarry tile, paint, or other thin film finish coating system.
 - 1. After floating, begin first trowel finish operation using a power-driven trowel. Begin final troweling when surface produces a ringing sound as trowel is moved over surface. Consolidate concrete surface by final hand-troweling operation, free of trowel marks, uniform in texture and appearance, and with surface leveled to tolerances of F_F20. Grind smooth surface defects which would telegraph through applied floor covering system.
 - 2. Floors to receive traffic topping shall have steel trowel finish.
- D. Trowel and Fine Broom Finish: Where ceramic or quarry tile is to be installed with thin-set mortar, apply trowel finish as specified, then immediately follow with slightly scarifying surface by fine brooming.
- E. Non-Slip Broom Finish: Apply non-slip broom finish to exterior concrete platforms, steps and ramps, and elsewhere as indicated.
 - 1. Immediately after float finishing, slightly roughen concrete surface by brooming with fiber bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.
- F. Dry Shake Hardener, Wear-Resistant Finish: Provide hardened wear-resistant finish at Loading Dock floor slabs.
 - 1. Apply dry shake materials for wear-resistant finish at rate of not less than 60 lbs. per 100 sq. ft., unless greater amount is recommended by material manufacturer.
 - 2. Immediately following first floating operation, uniformly distribute approximately 2/3 of required weight of dry shake material over concrete surface, and embed by means of power floating. Follow floating operation with second shake application, uniformly distributing remainder of dry shake material at right angles to first application, and embed by power floating.
 - 3. After completion of broadcasting and floating, apply trowel finish as herein specified. Cure slab surface with curing compound recommended by dry shake hardener manufacturer. Apply curing compound immediately after final finishing.

3.10 CLEAN UP

- A. Perform Work under this Section to keep affected portions of building site neat, clean, and orderly. Remove, immediately upon completion of Work under this Section, surplus materials, rubbish, and equipment associated with or used in performance. Be aware that failure to perform clean-up operations within 24 hours of notice by Architect will be considered adequate grounds for having work done by others at no added expense to the Owner.

END OF SECTION

SECTION 033500 CONCRETE FINISHES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. This section describes general requirements, products and methods of execution relating to concrete finishes approved for use on this project.

1.2 DESCRIPTION

- A. Work included in this section: Furnish all labor, tools, equipment, materials and transportation and perform all operations necessary including incidental work to properly execute and complete the work of this section and in accordance with the drawings and specifications.
- B. Work specified under other sections: Consult all other sections, determine the extent and character of related work, and properly coordinate work specified herein with that specified elsewhere to produce a finished, high quality installation.
- C. Provide concrete work as indicated on the drawings and specifications. The work includes but is not limited to:
 - 1. Final sub grade and subbase preparation and compaction.
 - 2. Reinforcement, form work, testing and inspection.
 - 3. Concrete sidewalks, walkways and larger paving areas.
 - 4. Concrete headers
 - 5. Concrete gutters and curbs
 - 6. Concrete steps and related cheek walls

1.3 INTENT

- A. The intent of this section is to provide the contractor with supplemental information for the color and finishes for installation of concrete as indicated on the drawings. The contractor shall comply with related sections and requirements.

1.4 QUALITY ASSURANCE

- A. The contractor should refer to the current version of the project's geotechnical report for additional information pertaining to concrete products and installation standards. Bring to the attention of the owner's representative any discrepancies between the drawings and specifications.
- B. Materials and methods of construction shall comply with the latest edition of the following standards:

1. California Building Code, (CBC)
 2. American Society of Testing and Materials, (ASTM)
 3. American Concrete Institute, (ACI)
 4. California Department of Transportation (CDT), Standard Plans (CSP) and Standard Specifications (CSS).
- C. Do not change source or brands of cement in the aggregate materials during the course of the work.
- D. Comply with related concrete work requirements in Division 32.

1.5 FIELD SAMPLES

- A. Sample panel: Prior to installing concrete, provide two sample panels per specified concrete color and finish type, a minimum of 4' x 4' in 3 1/2 inches thick, using specified materials. Show color, texture, pattern, edging, joint treatments. Correct and rebuild sample panel until acceptance of the work by the owner's representatives. Retain accepted sample panels during construction as a standard for completing concrete work.
- B. Discard all unacceptable sample panels in an acceptable manner off-site.
- C. The approved sample panel may be a portion of the work and remain in place. Location as directed by the owner's representative.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Comply with related concrete sections in project.

2.2 ACCESSORIES

- A. Comply with related division ____ and division ____ concrete requirements.
- B. Forms: Wood or metal of sufficient strength to resist concrete placement pressure and to maintain horizontal and vertical alignment during concrete placement. Provide forms straight, free of defects and distortion, and height equal to the full depth of the specified concrete work.
 1. Paving forms:
 - a. Provide 2 inch nominal thickness, surface planked wood forms for straight sections. Use flexible metal, one-inch lumber or plywood forms to form radius bends.

2. Vertical forms:
 - a. Provide plywood forms free of imperfections for all above grade landscape vertical concrete work. Use plywood to achieve this move is concrete possible. Use only cone ties in forming.
- C. Joint Filler: Conform to requirements of ASTM D1751, pre-molded non-extruded asphalt impregnated fiberboard. Thickness is indicated on the drawings.
- D. Joint sealant: Self-leveling, designed for foot and vehicular traffic. Sonneborne SL-2 or equal.
- E. Former release agent: Non-staining chemical form release agent free of oils, waxes and other materials harmful to concrete.
- F. Coloring agents shall use only commercially pure mineral pigments to produce the desired color and in no case shall exceed 10% of the cement content by weight. Coloring agent shall be CHROMIX admixtures as manufactured by:
 1. No coloring agents shall be used for landscape concrete work.
- G. Metal dowels: Shall conform to the requirements of ASTM a 615 with Speed Dowel sleeves as manufactured by Speed Dowel™.

PART 3 – EXECUTION

3.1 STANDARDS

- A. Comply with related division ___ in division ___ concrete requirements.

3.2 CONCRETE JOINTS

- A. Joints: Install expansion joints, contraction control joints and construction joints properly aligned with face perpendicular to concrete surface.
- B. Expansion Joints:
 1. Expansion joints shall be formed and provided at the locations and intervals as indicated on the drawings at all locations where concrete abuts fixed structures.
 2. Expansion joints shall be installed no further apart than 24'-0".
 3. Review the final locations of the expansion joints in the field with the owner's representative prior to installation.
 4. Approved joint materials shall be placed with top edge 1/2 inch below the concrete surface and shall be securely held in place to prevent movement.
 5. Joints and other edges shall be formed in the fresh concrete using an edging tool to provide a smooth uniform impression.

6. All it shall be struck before and after finishing.
 7. After the curing, expansion joint shall be carefully cleaned and filled with joint sealant to 1/8 inch below concrete surface with self-leveling grade suitable for pedestrian and vehicular traffic conditions, in such a manner as to avoid spilling on concrete surface from overflow from joint compound.
 8. When expansion joints are not indicated, provide joints at maximum 24 feet on center or per the geotechnical investigative report, whichever is less dimensionally. Align expansion joints and abutting curbs and sidewalks.
 9. Install joint fillers the full width and depth of the joint. Recessed top edge below finish surface were joint sealants are indicated.
 10. Provide joint fillers in single links for the full slab with, whenever possible. Fasten joint filler sections together when multiple links are required.
 11. Protect top edge of the joint filler during concrete placement.
 12. Install smoothed out dowels at all expansion joints using Speed Dowel sleeves as manufactured by Speed Dowel™.
- B. Contraction/control joints: Should be installed as shown on the drawings. Bring to the attention the owner's representative immediately if conflicts in the drawings are exceeding 8 feet maximum spacing.
1. Tooled:
 - a. Provide tool contraction/control joints, sectioning concrete into areas indicated. Tool joints to debt equal to not less than 1/5 of the concrete thickness. Hand tool control joints in pattern and at spacing indicated, provide spacing not greater than 8 feet on center or as per the geotechnical report, which ever is the lesser dimension.
 - b. Contraction/control joints shall be formed in the fresh concrete using a jointer to cut the groove so that a smooth uniform impression is obtained. All joints shall be struck before and after brooming to match accepted sample.
 - c. Finish slab edges, including those formed joints, with an edge or having a radius of 1/8 inch.
- C. Construction Joints:
1. Provide standard metal keyed construction joints were necessary between pours.
 2. Horizontal construction joints shall conform to CBC section 1906B .4.

3. Provide standard keyed section construction joints as specified under section 03 11 00 Concrete Forming.

D. Joint Sealant:

1. Install joint sealant were indicated in accordance with manufacturer's installation instructions. Clean and prime joints. Remove dirt and loose coatings.
2. Apply sealant in continuous beads, without open joints, voids, or air pockets.
3. Confine materials to joint areas with masking tape or other precautions.
4. Remove excess compound promptly as work progresses and clean adjoining surfaces.
5. In rough surfaces or joints or on even widths, install joint sealant while back into joints.

3.3 CONCRETE FINISHING

- A. Perform concrete finishing using mechanical or hand methods as required.
- B. Upon completion of floating, and after bleeding water has disappeared and concrete can sustain foot pressure with nominal indentation, cut concrete away from forms. Work edges within edging tool. Rounded edges on flatwork to ½ inch radius.
- C. Install contraction/control joints at indicated locations during edging operations.
- D. Broom finish concrete paving:
 1. Provide sidewalk and pavement surfaces textured light broom finish as indicated on the drawings. Edge outside edges and all joints with a radius edging tool to match excepted sample and mockup.
 2. Provide ramps with nonslip textured medium broom finish perpendicular to the direction of travel to match accepted sample.

END OF SECTION 033500

SECTION 036000

CONCRETE TESTS AND INSPECTIONS

PART 1 - GENERAL

- A. Section Includes: Tests and inspections for work provided under following sections:
 - 1. Section 03200 - Reinforcement.
 - 2. Section 03300 - Cast-In-Place Concrete.

1.1 REFERENCES

- A. Requirements of GENERAL CONDITIONS and DIVISION NO. 1 apply to all Work in this Section.
- B. Published specifications, standards, tests, or recommended methods of trade, industry, or governmental organizations apply to Work of this Section where cited by abbreviations noted below (latest editions apply).
 - 1. California Code of Regulations. Title 24, 2016 edition, also known as California Building Code (CBC), with amendments.
 - 2. American Society for Testing and Materials (ASTM).
 - 3. American Concrete Institute's "Building Code Requirements for Reinforced Concrete" (ACI 318).
 - 4. American Welding Society's "Recommended Practices for Welding Reinforcing Steel, Metal Inserts, and Connections in Reinforced Concrete Construction" (AWS D1.4).
 - 5. State of California, Business and Transportation Agency, Division of Highways "Materials Manual" (MM).

1.2 SUBMITTALS

- A. The Contractor shall submit:
 - 1. Certified copies of mix designs for concrete classes A including compressive strength test reports.
 - 2. Certification that materials meet requirements specified.
 - 3. Samples only as requested by the Architect.
 - 4. Certification from vendor that samples originate from and are representative of each lot proposed for use.
- B. The Owner's Testing Agency will submit reports on tests and inspections performed to the Owner, the Architect, and the Contractor.

1.3 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. The Contractor shall supply labor, transport and on-site storage facilities required by the Owner's Testing Agency for taking and preparing samples for testing.

1.4 JOB CONDITIONS

A. The Contractor shall:

1. Provide the Owner's Testing Agency with free access to places whether on or off the job site where materials are stored, proportioned, mixed or fabricated, to places where equipment is stored or serviced, and to job site during times of preparation, installation, erection, placement, curing and patching.
2. Sequencing, Scheduling: Notify the Architect in sufficient time prior to fabrication, field welding, mixing, or placement to permit testing and inspecting without delaying Work.

PART 2 - PRODUCTS

2.1 REINFORCEMENT

A. The Owner's Testing Agency will:

1. Collect mill test reports for reinforcement.
2. Take samples from bundles at fabricators.
 - a. When bundles are identified by heat number and accompanied by mill analysis, two specimens shall be taken from each 10 tons, or fraction thereof, of each size and grade.
 - b. When reinforcement is not positively identified by heat numbers or when random sampling is intended, two specimens shall be taken from each 2-1/2 tons, or fraction thereof, of each size and grade in accordance with CBC 1910 A.2.
3. Test for tensile and bending strength.
4. Provide inspection of welding, including prior fit-up, welding equipment, weld quality and welder certification in accordance with AWS D1.4 and CBC 1705.A.3.1. Chemical analysis sufficient to determine carbon equivalent shall be performed when reinforcement does not conform to low-alloy steel requirements of AWS D1.4.

2.2 CAST-IN-PLACE CONCRETE

A. The Owner's Testing Agency will:

1. Review mix designs, certificates of compliance, and samples of materials the Contractor proposes to use.
2. Test and inspect materials, as necessary, in accordance with ACI 318, CMM Test 217 (Coarse Aggregates) and CMM Test 227 (Fine Aggregates), for compliance with requirements specified in Section 03300, Cast-In-Place Concrete.
3. Take samples as required from the Contractor's designated sources.
4. Take one sample for each 100 tons of Portland cement except that, when used in bulk loading ready-mix plants where separate bins for pretested cement are not available, take grab samples for each shipment of cement placed in bin with not less than one sample being taken for each day's pour and subsequently test such samples if required by the Architect.
5. Test both coarse and fine aggregate by use of solution of sodium or magnesium sulfate, or both whenever in the judgment of the Architect such tests are necessary to determine quality of material. Perform such tests in accordance with ASTM C88. Loss shall not exceed 6-percent of either fine or coarse aggregate. Aggregate failing to comply with this requirement may be used in the Work provided it contains less than

2-percent of shale and other deleterious particles and shows a loss in soundness test of not more than 10-percent when tested in the sodium sulphate solution.

6. Inspect plant prior to any work to verify following:
 - a. Plant is equipped with approved metering devices for determining moisture content of fine aggregate.
 - b. Other plant quality controls are adequate. Continuously inspect quality and quantity of materials used in transit mixed concrete, in batched aggregates and ready-mixed concrete at mixing plant or other location where materials are measured.

PART 3 - EXECUTION

3.1 REINFORCEMENT

- A. The Owner's Testing Agency will:
 1. Test and inspect field welds as deemed necessary.
 2. Inspect placement of reinforcement for conformance with Contract Documents.

3.2 CONCRETE, CAST-IN-PLACE

- A. The Owner's Testing Agency will:
 1. Perform testing in accordance with ACI 318.
 2. Inspect concrete placement.
 3. Test concrete to control slumps according to ASTM C143.
 4. Continuously monitor concrete temperature as it arrives on the site.
 5. Test concrete for required compressive strength as follows:
 - a. Make and cure three specimen cylinders according to ASTM C31 for each 150 cubic yards, or fraction thereof, of each class poured at site each day.
 - b. Retain one cylinder for 7-day test and two for 28-day test.
 - c. Number each cylinder 1A, 1B, 1C, 2A, 2B, 2C, etc.; date each set; and keep accurate record of pour each set represents.
 - d. Transport specimen cylinders from job to laboratory. After cylinders have cured for 24 hours on site, cover cylinders and keep them at air temperatures between 60 and 80 degrees Fahrenheit.
 - e. Test specimen cylinders at age seven days and age 28 days for specified strength according to ASTM C39.
 - f. Base strength value on average of two cylinders taken for 28-day test.
- B. The Contractor shall:
 1. Submit ticket for each batch of concrete delivered to job site. Ticket shall bear following information:
 - a. Design mix number of the Contractor Testing Agency.
 - b. Signature or initials of ready mix representative.
 - c. Time of batching.
 - d. Weight of cement, aggregates, water and admixtures in each batch with maximum aggregate size.
 - e. Total volume of concrete in each batch.
 - f. Indication that all ingredients are as previously certified or approved for use in

- architectural concrete.
- g. Notation to indicate equipment was checked for contaminants prior to batching.
2. Pay the Owner's Testing Agency for taking core specimens of hardened structure and testing specimen according to ASTM C42 when laboratory tests of specimen cylinders show compressive strengths below specified minimum.

END OF SECTION

SECTION 051200

STRUCTURAL STEEL

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Section Includes: Provision of structural steel as indicated on the Contract Drawings. Work includes but is not necessarily limited to the following:
1. Structural steel framing, including all structural steel shown on the structural drawings and all standard structural shapes, plates and rods shown on the Architectural, Mechanical and Electrical drawings that connect to the building structure.
 2. Anchors bolts and plates.
 3. Shop painting.

1.2 REFERENCES

- A. Requirements of GENERAL CONDITIONS and DIVISION NO. 1 apply to all Work in this Section.
- B. Published specifications, standards, tests, or recommended methods of trade, industry, or governmental organizations apply to Work of this Section where cited by abbreviations noted below (latest editions apply).
1. California Code of Regulations. Title 24, 2016 edition, also known as California Building Code (CBC), with amendments.
 2. American Society for Testing and Materials (ASTM).
 3. Federal Specifications (FS).
 4. American Institute of Steel Construction's "Manual of Steel Construction":
 - a. "Specification for Structural Steel Buildings" (AISC1).
 - b. "Code of Standard Practice for Steel Buildings and Bridges" (AISC2).

CHPS. CHPS Best Practices Manual 2006 Criteria.

 - 1) No provision of AISC2 shall be effective to change the duties and responsibilities of the Owner, Contractor or Engineer from those set forth in these Contract Drawings.
 - 2) Where discrepancies exist between the requirements of the Contract Documents and AISC2, the requirements of the Contract Documents shall govern.
 5. American Welding Society's:
 - a. "Structural Welding Code" (AWS D1.1).
 - b. "Welding Symbols" (AWS A2.0).
 6. American National Standards Institute's:
 - a. "Plain Washers" (ANSI B18.22.1).
 - b. "Beveled Washers" (ANSI B18.22.1).
 7. Steel Structures Painting Council's "Painting Manual":
 - a. Solvent Cleaning (SSPC-SP 1).
 - b. Hand Tool Cleaning (SSPC-SP 2).
 - c. Brush-Of Blast Cleaning (SSPC-SP-7).

8. Research Council on Structural Connections (RCSC) Specifications for Structural Joints using ASTM A325 or A490 Bolts.

1.3 QUALITY ASSURANCE

- A. Steel Fabricator's Qualifications: Fabricator shall have had not less than 5 years' experience in fabrication of structural steel and be able to furnish evidence of his ability, facilities, proficiency of his personnel and completed projects.
- B. Steel Erector's Qualifications: Erector shall have had not less than 5 years' experience in erection of structural steel and be able to furnish evidence of his ability, facilities, proficiency of his personnel and completed projects.
- C. Welding Qualifications: Welding procedures, welders, welding operations, and tackers shall be qualified in accordance with AWS D1.1 and CBC Section 2231A.5.
 1. Welders performing complete penetration beam flange-to-column welds shall be job-qualified per AWS D1.1 procedures.
 2. Welders who have not performed welding for period of three or more months shall be requalified.
 3. Welders whose work fails to pass inspection shall be requalified before performing further welding.
 4. The Contractor shall pay costs of certifying qualifications.
- D. Welding Inspector Qualifications: All welding inspectors shall be AWS certified welding inspectors (CWI) as defined in AWS Standard and Guide for Qualification and Certification of Welding Inspectors, latest edition. Welding inspector's qualifications shall be submitted to the Structural Engineer and DSA for approval. Inspectors shall be trained and thoroughly experienced in inspecting welding operations. Comply with AWS section 6.1.3.
- E. Allowable Tolerances:
 1. Straightness of Structural Members:
 - a. Members: Meet requirements of AISC1 Section M2.7.
 2. Erection Tolerances: Individual pieces shall be erected so that deviation from plumb, level, and alignment shall not exceed 1 to 500.
 - a. Displacement of centerline of columns adjacent to elevator shafts, from established column line, shall not be more than one inch at any point.
 - b. Displacement of centerline of exterior columns, from established column line, shall be not more than 1-inch inward, nor 2-inches away from, building line at any point.
- F. All steel shall conform to the requirements of CBC section 2203A.

1.4 SUBMITTALS

- A. Manufacturer's literature describing products.
- B. Shop Drawings: Show details including cuts, copes, connections, holes, threaded fasteners, and welds in accordance with AWS A2.0.
- C. Welding

1. Certification of Welder's Qualifications: Welders that will make welds in restricted access, such as, but not limited to, the bottom flange-to-column welds through a cope hole or access hole in the beam web, shall be qualified by the Contractor using the same welding procedure as will be used for production and a mock-up assembly that simulates the construction configuration.
 2. Welding Procedure Specification: All Welding Procedure Specification (WPS) shall be submitted to the Owner's Testing Agency and the Structural Engineer for review prior to the start of the work. The WPS's shall contain the actual values to be used for the welding parameters and variables so that instruction is provided to welders. For WPS's which require qualification, Procedure Qualification Records (PQR's) shall also be submitted for review. WPS's for Flux Core Arc Welding (FCAW) shall be qualified by testing in accordance with AWS D1.1, Section 5. Production welding heat input shall be limited based on the PQR. See attached forms.
 3. Weld Shrinkage and Distortion Control Plan: For highly restrained joints or where shrinkage is likely to cause problems, submit a mitigation plan to Owner's Testing Agency and the Structural Engineer for review to determine compliance with the design intent.
 4. Quality Control Plan: Submit plan to Owner's Testing Agency and Structural Engineer that addresses all inspection issues, including in-process and final inspection, addressed in AWS D1.1, including sections 6.1 through 6.6, including the qualifications of the Contractor/Fabricator/Erector's Inspectors and NDE personnel.
 5. Welding electrode data sheets for shop and field welding.
- D. Proofs of Compliance for Materials:
1. Certification that materials meet requirements specified.
 2. All steel which cannot be identified per CBC Section 2203A.2 shall have:
 - a. Certified reports of ladle analysis for all steel.
 - b. Certified reports of tensile, elongation, and bend tests.
- E. Samples: Provide continuously as requested by the Owner's Testing Agency.
- F. The Owner's Testing Agency will submit reports on test and inspections performed to the Owner, Architect, DSA and Contractor.
- G. CHPS calculations for Recycled Content Value (RCV): Calculate the Recycled content Value of each product. Structural steel must meet their minimum total recycled content level entirely with post-consumer (collected from end-users) content. Follow CHPS requirements. Structural steel must be either Basic Oxygen Furnace (BOF) Produced Steel with 16% minimum recycled content and or Electric Arc Furnace (EAF) Produced Steel with 67% minimum recycled content.
- 1.5 PRODUCT DELIVERY, STORAGE AND HANDLING
- A. Deliver, store, and handle packaged materials in original containers with seals unbroken and labels intact until time of use.
 - B. Discharge materials carefully; do not dump onto ground.
 - C. Store structural steel members, whether on or off site, above ground on platforms, skids, or other support; store other materials in weather-tight, dry place until time of use.

1.6 JOB CONDITIONS

- A. Provide the Owner's Testing Agency with free access to places whether on or off job site where materials are stored or fabricated, to places where equipment is stored or serviced, and to job site during time of laying out, erection or job-site fabrication.
- B. Sequencing, Scheduling:
 - 1. Notify the Architect in sufficient time prior to shop or field fabrication or erection to permit testing and inspection without delaying Work.
 - 2. Insure timely delivery of items to be embedded in work of other sections such as cast-in-place concrete; furnish setting drawings or templates and directions for installation.

PART 2- PRODUCTS

2.1 MATERIALS

- A. Steel Shapes, Bars, and Plates:
 - 1. WF and WT Shapes: ASTM A992.
 - 2. Channels, angles, and bars: ASTM A36.
 - 3. Plate: ASTM A36.
- B. Steel Tubing: ASTM A500, Grade B.
- C. Steel Pipe: ASTM A53, Grade B.
- D. Standard Threaded Fasteners:
 - 1. Machine Bolts and Nuts: ASTM A307, Grade A.
 - 2. Plain Washers: ANSI B18.22.1.
 - 3. Beveled Washers: ANSI B18.23.1.
- E. High Strength Bolts: ASTM A325SC.
- F. Direct Tension Indicators: Load Indicator Washers, ASTM F959 or Hex Head "Tru Tension" Bolts by Nucor.
- G. Shear Connectors: Size as shown, conform to requirements of AWS D1.1, same as The Nelson Stud Welding Co.'s "Nelson Stud"; or equal product substituted per Section 01630.
- H. Anchor Bolts: ASTM A307 and ASTM A449 as noted on Drawings.
- I. Threaded Rods: ASTM A36.
- J. Welding Electrodes: E70. The weld metal used shall be rated for Charpy V-Notch (CVN) values of 20 Ft-Lbs at a -20°F. This may be determined based on the electrode classification system, or by performing CVN tests in accordance with the AWS A5.x filler metal specifications. SMAW electrodes shall be E7018.
- K. Primer: Tnemec Co., Inc's "99 Red Metal Primer"; Rust-Oleum Co.'s "769 Damp-Proof Red

Primer"; or equal product substituted per Section 01630.

- L. Structural Steel - Structural steel must be either Basic Oxygen Furnace (BOF) Produced Steel with 16% minimum recycled content and or Electric Arc Furnace (EAF) Produced Steel with 67% minimum recycled content per CHPS requirements.

2.2 FABRICATION

A. General Requirements:

1. Fabricate structural steel in accordance with AISC Manual of Steel Construction; AWS D1.1 Structural Steel Welding Code, section 8, Statically Loaded Structures, except as noted otherwise herein; and requirements of regulatory agencies.
2. Fabricate and preassemble work in shop to greatest extent possible.
3. Do shearing, flame cutting, and chipping carefully and accurately.
4. Do not drift to match misaligned holes. Where enlarging is required, ream and use larger bolt. Misaligned holes will subject members to rejection.
5. Coordinate as required for attachment of other work to structural steel.
6. Drill or punch holes for passage of reinforcing steel shapes, sections, plates, or bars as indicated on Contract Drawings. Notify architect of conditions not shown or noted.

B. Connections:

1. Shop Connections: Bolted or welded as noted.
2. Field Connections:
 - a. Locate field splices only where noted or approved by Architect.
 - b. Where connection is not shown, design in accordance with standard practices unless otherwise directed by the Architect.
 - c. Mark completely tightened bolts with identifying symbol.

C. Bolted Connections:

1. Punch or drill holes 1/16-inch larger than bolt size.
2. Ream unfair holes, but only up to next larger bolts size. Where unfairness exceeds maximum, weld hole in base material solid and drill hole of proper size.
3. As erection progresses, provide sufficient bolts to adequately resist dead load, lateral forces, and erection stresses.

D. Assembly with Standard Threaded Fasteners:

1. Beveled Washers: Provide under bolt heads or nuts resting surfaces exceeding five percent slope with respect to head or nut.
2. Draw up tight, check threads with chisel or provide approved lock washers or self-tightening nuts.

E. Assembly of High-Strength Structural Bolted Connections:

1. Meet requirements of RCSC and Fabrication article of this specification.
2. Connections shall be friction-type as defined in RCSC.
3. Provide hardened washers under head or nut of high strength bolts. Washer shall be provided under the element turned in the tightening procedure.
4. Provide direct tension indicator washers under the head of slip-critical high strength bolts.

F. Welded Construction: (shop and field)

1. Weld in accordance with AISC and AWS D1.1, and CBC Section 2205A.10 Beam flange-to-column welds shall be made with the Shielded Metal Arc Welding (SMAW) or Flux Cored Arc Welding (FCAW) gas shielded or self shielding processes.
2. Welds that will be exposed to view on the completed Work shall be inspected and burrs, flux, welding oxide air spots, and discolorations removed. Grind, polish, or finish as specified or shown. Exterior welds shall also be watertight.
3. Butt-welds and/or Groove Welds:
 - a. Provide complete penetration welds.
 - b. If welded from one side, use back-up plates.
 - c. If welded from both sides, back-scarf and clean root weld before depositing weld metal from second side.
 - d. Preheat for minimum three inches on each side of welds; maintain interpass temperatures in accordance with ASWS D1.1.
 - e. Weld "dams" or "end dams" shall not be used.
 - f. Weld tabs (also known as weld "extension" tabs or "run off" tabs) shall be used. After the weld has been completed, the weld tabs shall be removed, the weld ground to a smooth contour, and magnetic particle tested for defects.
 - g. If groove weld backing (also known as "backup or backer bars") are used under the bottom beam flange-to-column complete penetration groove weld, the weld backing shall be removed, the removal area ground to sound, bright metal, and the area subjected to magnetic particle examination for defects. A reinforcing fillet weld, sized at least 1/4 of the bottom flange thickness, shall be placed in this location, but need not be greater than 3/8 inch.
 - h. If groove weld backing is used under the top beam flange-to-column-flange complete penetration groove weld, and is not removed, the backing shall not exceed 1/4 inch thickness and shall be attached to the column by either a fillet weld along the complete bar length on the underside of the bar, or by a partial joint penetration groove weld from the underside of the backing for the full length of the backing. Other methods of welding the backing to the column may be used subject to the Engineer's approval.
4. Grind exposed welds smooth.
5. Column Bases: Prepare in accordance with the provision of AWS and AISC Specification M2.8.

G. Camber: Provide camber as indicated on contract drawings by mill rolling techniques or in accordance with AISC Specification M2.1.

H. Shear Connectors:

1. Weld to beam or girders in composite construction where noted.
2. Headed Stud Type: Automatically end weld in accordance with AWS D1.1-81 and manufacturer's recommendations in such a manner as to provide complete fusion between the stud and the steel member. There shall be no porosity or evidence of lack of fusion between the end of the stud and the steel member. The stud shall decrease in length during welding approximately 3/16-inch for the 3/4-inch diameter studs.

2.3 FINISHES

A. Preparation of Surfaces:

1. Thoroughly clean mill scale, rust, dirt, grease, and other foreign matter from steel prior to

- painting.
- 2. Where hand-cleaning methods are not adequate, clean in accordance with SSPC-SP1, SSPC-SP 2, or SSPC-SP 7, as required.
- B. Galvanizing: Structural steel members to be exposed to weather are to receive hot-dip galvanizing per Section 05500.
- C. Prime Painting:
 - 1. Apply one (1) coat of primer to structural steel surfaces permanently exposed to weather.
 - 2. Apply primer in accordance with manufacturer's specifications to provide minimum dry film thickness of 1.0 mils per coat.
 - 3. Permit thorough drying before shipment.
 - 4. Do not prime in temperatures lower than 45 degrees Fahrenheit.
- D. Do not prime paint following surfaces:
 - 1. Surfaces to be encased in concrete except initial 2-inches.
 - 2. Surface to be field welded.
 - 3. Surface to receive sprayed-on fireproofing.
 - 4. Contact surfaces joined by high-strength bolts.
 - 5. Galvanized surfaces designated to remain unpainted.

2.4 SOURCE QUALITY CONTROL

- A. The Owner's Testing Agency will:
 - 1. Review ladle analysis and certificates of compliance. Where certification is questionable, test material to verify compliance per CBC Section 2231A.1.
 - 2. Inspect shop fabrication per CBC Section 2231A.4.
 - 3. Inspect bolted connection made in the shop. Test high-strength bolts, nuts, and washers per CBC Section 2231A.2.
 - 4. Review Welding Procedure Specifications for conformance with AWS D1.1 and the electrode manufacturer's recommendations.
 - 5. Inspect shop welding, including welding equipment, weld quality, welder certification and conformity with drawings per CBC Section 2231A.5.
 - 6. Ultrasonic test all complete penetration welds per CBC Section 2231A.5.
 - 7. Forward copies of all product and procedure certificates, data sheets, and test reports to the Architect.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Examine units of Work to be placed and verify that:
 - 1. All anchor bolts have been installed properly.
 - 2. Do not begin erection before unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Supervise setting of anchor bolts and other embedded items required for erection of structural

steel. Ensure correct bearing of steel and correct location of anchor bolts.

3.3 ERECTION

A. General Requirements:

1. Erect structural steel in accordance with AISC Manual of Steel Construction and AWS D1.1 Structural Steel Welding Code, section 8, Statically Loaded Structures.
2. Requirements for bolted and welded connections specified in Section 2 apply to shop and field connections.
3. Ensure steel is plumb, level and aligned as specified before making final connections.
4. Leveling of base plates shall be achieved through the use of leveling nuts and anchor bolts.
5. Where erection requires performing work of fabrication on site, conform to applicable standards for fabrication.
6. Field corrections of major members will not be permitted without the Architect's prior written approval.

B. Field Assembly:

1. Clean bearing surfaces and surfaces to be in permanent contact before assembling members.
2. Accurately assemble frames to lines and elevation indicated, within erection tolerances noted.
3. Ensure assembly is plumb, level, and aligned before final connecting.
4. Do not fasten splices of compression members, before abutting surfaces have been brought completely into contact.
5. Installation of high-strength bolts shall conform to ASTM A325 for slip critical type connection in accordance with RCSC. Provide washer under head or nut of high strength bolts. Washer shall be provided under the element being turned during tightening. Bolts in welded connections shall be tensioned after completion of welding.
6. Mill scale shall be removed from the column in the area where the beam flanges will be welded to the column.
7. Flat reinforcing plates aligned parallel to the top and bottom beam flange, if used, shall be installed in accordance with these requirements: The reinforcing plate for the bottom flange shall be welded to the column in the fabricating shop using a complete joint penetration double bevel groove joint, e.g., AWS D1.1 configuration TC-U5. This weld shall be inspected by ultrasonic examination. The balance of the welding is to be done in the field. The reinforcing plate for the top flange shall be shipped loose. After the top flange has been welded to the column, and ultrasonically examined and accepted, the top flange weld surface shall be prepared, the reinforcing plate fitted for welding, the reinforcing plate welded to the column flange with a CJP single groove weld, e.g., AWS D1.1 configuration TC-U4. The reinforcing plate shall be restrained from rotation during welding to the column. After completion of the reinforcing plate to the column weld, the reinforcing plate shall be welded to the top flange.

C. Gas Cutting: Use of flame cutting torch will be permitted only after the Architect's prior written approval and only where metal cut will not carry stress during cutting, stresses will not be transmitted through flame-cut surface and cut surfaces will not be visible.

1. Make cuts smooth and regular in contour.
2. To determine effective width of members so cut, deduct 1/8-inch from least width at cut

edge.

3. Make radius or re-entrance of cut fillet as large as practical, but in no case less than 1-inch.
4. Do not use flame cutting torch to align bolt holes.

D. Field Touch-Up Painting: After erection, touch-up paint field connections and abrasions resulting from the Work of this Section with same paint used for shop prime painting.

3.4 CLEANING

A. After erection, thoroughly clean surfaces of foreign or deleterious matter such as dirt, mud, oil, or grease that would impair bonding of fireproofing concrete.

3.5 FIELD QUALITY CONTROL

A. The Owner's Testing Agency shall:

1. Re-qualify welders who will be performing complete penetration beam flange-to-column welds.
2. Inspect all field welding, including welding equipment, electrodes, weld quality, welder certification, and conformity with drawings per CBC Section 2231A.5.
3. Review Welding Procedure Specifications for conformance with AWS D1.1 and the electrode manufacturer's recommendations.
4. Ultrasonic test all complete penetration and partial penetration welds.
5. Provide magnetic particle inspection of weld backing removal area and fillet welds on continuity plates.
6. Inspect and test high strength bolted connections in accordance with CBC Sections 2231A.2 and 2231A.6.
7. Bolt assemblies, which include direct tension indicators, shall be sampled and tested on a daily basis to verify proper indication of deformation with required bolt tension for each size and lot. The inspector shall have a torque wrench, calibrated daily, to verify correlation with proper tension as the installation proceeds. Test at least 10 percent of the bolts with a minimum of 2 per connection from the start of bolting and until waived by the DSA Field Engineer upon demonstration of continued good workmanship.
8. Inspect erected structural steel as required to establish conformity of Work with reviewed shop drawings and Contract Drawings.
9. Perform testing and inspection of shear connectors in accordance with requirements of AWS D1.1 and CBC 2231A.3, except that the test studs shall be subjected to a 90 bend test by striking them with a heavy hammer. After the bend test, the weld section shall not exhibit any tearing or cracking.

END OF SECTION

SECTION 054000
COLD FORMED METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

- A. General: Provide cold formed metal framing in accordance with requirements of the Contract Documents.

1.2 REFERENCES

- A. General: Comply with the applicable provisions of the referenced standards except as modified by governing codes and the Contract Documents. Where a recommendation or suggestion occurs in the referenced standards, such recommendation or suggestion shall be considered mandatory. In the event of conflict between referenced standards, this specification or within themselves, the more stringent standard or requirement shall govern
1. American Institute of Steel Construction (AISC)
 - a. AISC "Specification for the Design of Cold-Formed Steel Structural Members".
 - b. AISC "Specification for the Design, Fabrication and Erection of Structural Steel for Buildings".
 - c. AISC "Standard for Cold-Formed Steel Framing - General Provisions."
 - d. AWS D1.3 "Structural Welding Code - Sheet Steel".
 2. Industrial Fasteners Institute (IFI)
 - a. "Fastener Standards".

1.3 DEFINITIONS

- A. Minimum Uncoated Steel Thickness: Minimum uncoated thickness of cold-formed framing delivered to the Project site shall be not less than 95 % of the thickness used in the cold-formed framing design. Lesser thicknesses shall be permitted at bends due to cold forming.
- B. Manufacturer or Producer: Entity that produces steel sheet coil fabricated into cold-formed members

1.4 SYSTEM DESCRIPTION

- A. Performance Requirements:
1. Deflection Limits: Design framing systems to withstand design loads without deflections greater than the following:
 - a. Interior Load-Bearing Wall Framing: Horizontal deflection of 1/240 of the wall height.
 - b. Design framing system to maintain clearances at openings, to allow

for construction tolerances.

2. Design Modifications: Make design modifications of work shown only as may be necessary to meet performance requirements and coordinate the work. Variations in details and materials which do not adversely affect appearance, durability or strength shall be submitted to the Architect for review. Maintain the general design concept without altering profiles and alignments shown

1.5 SUBMITTALS

- A. Product Data: Submit for Architect's action. Submit manufacturer's literature, specifications and installation instructions describing the general properties of each material and accessory to be used in the Work.
- B. Shop Drawings: Submit for Architect's action. Provide shop drawings prepared for cold formed metal framing components. Shop drawings shall be submitted in complete packages so that individual parts and the assembled unit may be reviewed together. This Section and the applicable drawings used in the development of the shop drawings shall be referenced on each shop drawing to facilitate checking.
- C. Quality Control Submittals: Submit for Architect's information. Submit the following:
 1. Certificates
 - a. Mill certificates signed by steel sheet producer or test reports from a qualified independent testing agency] indicating steel sheet complies with requirements.

1.6 QUALITY ASSURANCE

- A. Qualified Installer: The cold-formed metal framing work shall be performed by a firm having 5 years experience in the installation of specified materials on comparable projects. The firm shall have the approval of the cold-formed metal framing materials manufacturer. The installer shall provide evidence of successful completion of work of similar scope to that shown and specified for this Project using similar cold-formed metal framing systems.

1.7 DELIVERY STORAGE AND HANDLING

- A. General: Provide in accordance with manufacturer and fabricator's recommendations and by methods or sequence as required to prevent damage or delay.
- B. Storage: Store materials off the ground, in a dry location, protected against damage, corrosion and deterioration and in a manner to permit easy access for inspection and identification. Provide for proper drainage. Do not store materials on structure in a manner that might cause distortion or damage to members or supporting structures. Store packaged materials in unopened containers.
- C. Handling: Handle materials in a manner so as to protect surfaces and to prevent distortion of, or damage to components.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products of one of the following:
1. Alabama Metal Industries Corp.
 2. Dale Industries, Inc.
 3. Dietrich Industries, Inc.
 4. Marino Industries, Inc.
 5. Superior Steel Components, Inc.
 6. Wheeling Corrugating Co.

2.2 METAL FRAMING

- A. System Components: Manufacturers' standard steel studs of type, size, shape, and gage as indicated. With each type of metal framing required, provide manufacturer's standard, steel runners (tracks), blocking, lintels, clip angles, shoes, reinforcements, fasteners, and accessories for applications indicated, as needed to provide a complete metal framing system.
- B. Steel Studs, Runners, Furring, Bracing and/or Bridging: ASTM C955; hot dipped galvanized steel sheet complying with ASTM A1003 Structural Grade 33 Type H for 20 ga. and below (33,000 psi yield point) , Structural Grade 37 Type H for 18 ga. to 20 ga. (37,000 psi yield point) and Structural Grade 50 Type H for 16 ga. and greater (50,000 psi yield point), Coating Designation G90.
- C. Clip Angles, Flat Straps, Web Stiffeners, Hole Reinforcement Plates, and Clips: ASTM C955; hot dipped galvanized steel sheet complying with ASTM A1003 Structural Grade 33 Type H for 20 ga. and below (33,000 psi yield point) , Structural Grade 37 Type H for 18 ga. to 20 ga. (37,000 psi yield point) and Structural Grade 50 Type H for 16 ga. and greater (50,000 psi yield point), Coating Designation G90.
- D. Fasteners: Provide self-drilling, self-tapping screws; Steel, complying with ASTM C1002; Galvanized coating, plated or oil-phosphate coated complying with ASTM B633 as needed for required corrosion resistance.

2.3 FABRICATION

- A. General: Framing components may be prefabricated into assemblies before erection. Fabricate panels plumb, square, true to line, and braced against racking with joints welded. Perform lifting of prefabricated units to prevent damage or distortion. Fabricate units in jig templates to hold members in proper alignment and position and to assure consistent component placement. Cut framing members by sawing or shearing; do not torch cut
- B. Fastenings: Attach components by, bolting, or screw fasteners, as standard with manufacturer. Wire tying of framing components is not permitted.
- C. Fabrication Tolerances: Fabricate units to a maximum allowable tolerance variation from plumb, level, and true to line of 1/8 in.[3mm] in 10 ft. [3m] and as follows:

1. Spacing: Space individual framing members no more than plus or minus 1/8 in. [3mm] from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.
2. Squareness: Fabricate each cold-formed metal framing assembly to a maximum out-of-square tolerance of 1/8 in [3mm].

2.4 SOURCE QUALITY CONTROL

- A. Contractor's Quality Control Responsibilities: Contractor is solely responsible for quality control of the Work.
- B. Shop Inspection of Connections: Perform 100% visual inspection at bolted connections in the Work. Examine the size, quality and placement of each connection to verify installation in accordance with Contract Documents and actioned shop drawings.

PART 3 - EXECUTION

3.1 GENERAL

- A. Manufacturer's Instructions: Prepare substrates and erect the work of this Section, including components, and accessories in accordance with the manufacturer's instructions, except where more stringent requirements are shown or specified, and where project conditions require extra precautions or provisions to ensure satisfactory performance of the Work

3.2 EXAMINATION

- A. Verification of Conditions: Examine the areas to receive the Work and the conditions under which the Work would be performed. Contractor shall remedy conditions detrimental to the proper and timely completion of the Work. Do not proceed with installation until unsatisfactory conditions have been corrected

3.3 COORDINATION

- A. Consult and cooperate with Contractors for other trades whose work affects or is affected by cold-formed metal framing Work under this Section in order that phases of the work are properly coordinated to avoid delays, errors, omissions, or damage to any part of the work.

3.4 PREPARATION

- A. Substrate Acceptability: Commencement of installation shall constitute acceptance of substrate conditions by the Installer.

3.5 INSTALLATION

- A. General: Install metal framing systems in accordance ASTM C1007 and with manufacturer's printed or written instructions and recommendations. Set framing accurately in location, alignment and elevation, plumb, level and true, within

tolerances indicated by accepted shop drawings, as measured from established building lines and from other Work already in place.

- B. Erection Tolerances: Install shop- or field-fabricated, cold-formed framing and securely anchor to supporting structure. Bolt wall panels at horizontal and vertical junctures to produce flush, even, true-to-line joints with maximum variation in plane and true position between fabricated panels not exceeding 1/16 in.
- C. Install cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened, according to manufacturer's written recommendations and requirements in this Section. Cut framing members by sawing or shearing; do not torch cut. Fasten cold-formed metal framing members by screw fastening, as standard with fabricator. Wire tying of framing members is not permitted.
- D. Runner Tracks: Install continuous tracks sized to match studs. Align tracks accurately to layout at base and tops of studs. Butt all track joints. Securely anchor abutting pieces of track to a common structural element, or splice them together. Secure tracks as recommended by stud manufacturer for type of construction involved, except do not exceed 24 in. o.c. spacing for power-driven fasteners or 16 in. o.c. for other types of attachment. Provide fasteners at corners and ends of tracks. Provide a sill sealer or integrity gasket barrier between concrete and steel connections.

3.6 FIELD QUALITY CONTROL

- A. Contractor's Quality Control Responsibilities: Contractor is solely responsible for quality control of the Work.
- B. Field Inspection of Connections: Perform 100% visual inspection at bolted connections in the Work. Examine the size, quality and placement of each connection to verify installation in accordance with Contract Documents and actioned shop drawings.

END OF SECTION 05 40 00

SECTION 061000 – ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes: Provision of all lumber framing, rough hardware and blocking as indicated in the contract drawings.
- B. LEED General: Refer to LEED “Checklist” indicating points Design Team has anticipated relating to specific LEED credits and LEED requirements.

1.3 REFERENCES

- A. Published Specifications, standards, tests, or recommended methods of trade, industry, or governmental organizations apply to Work in this Section where cited by abbreviations noted below (latest editions apply).
 1. 2016 California Building Code (CBC)
 2. (APA) - American Plywood Association, "Guide to Plywood Grades".
 3. (PS) - United States Product Standard, PS-1 "Construction and Industrial Plywood".
 4. (UL) - Underwriters' Laboratories, Inc., "Fire Hazard Classification, FR-S".
 5. (WCLIB) - West Coast Lumber Inspection Bureau, "Standard Grading Rules No. 16".
 6. (WWPA) - Western Wood Products Association, "Grading Rules for Lumber".
 7. (AWPA) - American Wood Preservers Association Standards.
 8. (ASTM) - American Society of Testing and Materials.

1.4 SUBMITTALS

- A. Shop Drawings of all specially fabricated rough hardware..
- B. Certificates of compliance with standards specified.
- C. Product Data: Submit wood treatment certifications and instructions for proper use of each type of treated material.
- D. Wood Product Certification: Furnish certification indicating wood products are from “well-managed” forests.
- E. LEED Certification Points: Submit information necessary to achieve maximum points for LEED certification; coordinate and cooperate with Owner and Architect in providing information necessary for LEED Certification.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Provide proper facilities for handling and storage of materials to prevent damage to edges, ends, and surfaces.

- B. Keep materials dry. Where necessary, stack materials off ground on level flat forms, fully protected from weather.

1.6 JOB CONDITIONS

- A. Environmental Requirements: Maintain uniform moisture content of lumber at not more than 19-percent before, during, and after installation.
- B. Sequencing, Scheduling: Coordinate details with other Work supporting, adjoining or fastening to rough carpentry Work.

PART 2 - PRODUCTS

2.1 MATERIAL

A. Rough Carpentry:

1. Sills on Concrete: Foundation or Pressure treated Douglas Fir.
2. Lumber (Wood Framing): Meet requirements of following minimum grades.

<u>Item</u>	
Studs	D.F. No. 1
Plates	D.F. No. 2
Beams	D.F. No. 1
Joists	D.F. No. 1
Posts	D.F. No. 1
Blocking	D.F. No. 2

3. Plywood: Provide thickness, grade, and panel identification index shown on drawings.

B. Rough Hardware: All exterior hardware and hardware at sills shall be hot-dipped galvanized.

1. Nails: Common wire, typical.
2. Powder Driven Fasteners: Tempered steel pins with special corrosion-resistant finish. Provide guide washers to accurately control penetration, maximum 3/4-inch. Accomplish fastening by low-velocity piston-driven powder-actuated tool. Pins and tool: Hilti Fastening Systems; Impex Tool Corporation; or equal product substituted per Section 01630.
3. Expansion Bolts: Reverse cone, self-wedging, expansion type, Tightening of nut or increased tension on bolt shank shall act to force wedges outward to create positive increased resistance to withdrawal, Ramset/Read Head "Tru-Bolt", Hilti Kwik - Bolt II or equal product substituted per Section 01630.
4. Metal Timber Framing Connectors: Fabricate from hot-dipped galvanized steel. Connectors shall be at least 16-gauge material, 1/8-inch plate materials where welded, unless otherwise shown or specified, punched for nailing. Nails and nailing shall conform to the manufacturer's instructions, with a nail provided for each punched hole. Manufactured by Simpson Company or equal product substituted per Section 01630.
5. Miscellaneous Hardware: Provide all common screws, bolts, fastenings, washers and nuts required to complete rough carpentry Work.

C. LEED Recycled Content: Where available provide materials with post-consumer and pre-consumer recycled content to achieve maximum LEED credits.

D. LEED Regionally Manufactured, Extracted, Harvested, or Recovered Materials: Where possible obtain materials that qualify for LEED credits for regional materials obtained within 500 miles of project.

- E. LEED Total Volatile Organic Compound (VOC) Emissions and Toxic Substances: Provide materials with minimal volatile organic compound (VOC) emissions and free of toxic substances. Where applicable, product must meet the requirements of LEED EQ credit 4.1 (low-emitting adhesives and sealants), 4.2 (low emitting paints and coatings), 4.3 (Carpet systems), and 4.4 (Composite wood and agri-fiber products).

2.2 TREATMENTS

- A. Wood Preservation: Treat lumber and plywood exposed to weather to comply with applicable requirements of American Wood Preservers Association.
 - 1. Decay Resistance Treatment: Pressure treat following items with water-borne preservatives for above ground use with AWWA C-2 for lumber and AWWA C-9 for plywood.
 - a. Treat wood members in connection with roofing, flashing, vapor barriers and waterproofing.
 - b. Treat wood members in contact with concrete and below grade.
 - c. Kiln-dry wood to maximum moisture content of 19% after treatment with water—borne preservation.
 - 2. Fire Retardant Treatment: Comply with AWWA standards for pressure impregnation with fire-retardant chemicals to achieve flame-spread rating of not more than 25 in accordance with ASTM E84 or UL Test 723.
 - a. Treat interior wood and plywood complying with AWWA C20 and C27, Interior Type A, and identify with FRTW.
 - b. Exterior Type: Where indicated for exterior applications, provide fire treated wood passing ASTM D2898 rain test.
 - 3. Complete fabrication of treated items prior to treatment, wherever possible; if cut after treatment, coat cut surfaces with heavy brush coat of same chemical used for treatment.

2.3 FABRICATION

- A. Preparation (Finish Carpentry):
 - 1. Verify measurements at job site.
 - 2. Verify details and dimensions of equipment and fixtures integral with finish carpentry for proper fit and accurate alignment.
 - 3. Coordinate details with other work supporting, adjoining, or fastening to casework.
- B. Lumber:
 - 1. Air or kiln-dry to maximum 19-percent moisture content prior to shipment and prior to installation.
 - 2. Furnish surfaced four sides, S4S, unless otherwise noted.
 - 3. Size to conform to rules of governing standard. Sizes shown are nominal unless otherwise noted.

2.4 QUALITY CONTROL

- A. Lumber Grades: Provide visible grade stamp of an agency certified by FPS.
- B. Lumber Standard: Comply with US Product Standard PS20 for each indicated use, including moisture content and actual sizes related to indicated nominal sizes.
- C. Plywood Standard: Comply with PS1 (ANSI A 199.1)
- D. Plywood shall bear APA grade-trademark.

- E. Air-dry all framing lumber to a maximum of 15 percent moisture content prior to installing.
- F. Inspect each piece after drying and discard damaged and defective pieces.
- F. Certified Wood Products: Wood products to be from forests certified "well-managed" by an agency accredited by Forest Stewardship Council (FSC) including SmartWood Program and Forest Conservation Program.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive rough carpentry Work and verify following:
 - 1. Completion of installation of building components to receive rough carpentry Work.
 - 2. That surfaces are satisfactory to receive Work.
 - 3. That spacing, direction, and details of supports are correct to accommodate installation of blocking, backing, stripping, furring and nailers.
 - 4. That all anchor bolts and holdown bolts are properly installed.

3.2 INSTALLATION

- A. Cutting: Perform all cutting, boring, and similar Work required.
- B. Studs, Joists, Beams, and Posts: Install all members true to line. No wood shingle shims are permitted. Place joists with crown up; maximum 1/4-inch crown permitted.
- C. Nail joints in accordance with applicable requirements of the CBC Table 23A-II-B-I unless otherwise shown or specified. Predrill where nails tend to split wood.
- D. Bolt holes to be 1/16-inch oversize. Threads shall not bear on wood. Use standard malleable iron washers against wood. Carriage bolts require washers under the nut only.
- E. Provide blocking, grounds, nailers, stripping, and backing as shown and as required to secure other Work.
- F. Maintain 1/8-inch gap between all plywood panel edges.
- G. Do not utilize plywood sheets having a width smaller than 2-feet 0-inches.
- H. Plywood flooring shall be field glued with adhesives meeting APA specification AFG-01 applied in accordance with the manufacturer's recommendations. Apply continuous line of glue on joists and in groove of tongue and groove panels.
- I. Where wood is cut, sawed, planed, bored or marred after preservative or fire-retardant treatment, apply two heavy brush coats of same material used in treatment.
- J. Nail heads shall be driven flush with plywood surface. Overdriven nails (nails which fracture the outer ply layer) shall be replaced one for one.
- K. Screws (Wood or Lag): Screws shall be screwed and not driven into place. Screw holes shall be predrilled to the same diameter and depth of shank. Holes for threaded portion shall be predrilled less than or equal to the diameter of the root of the thread. Provide standard cut washers under head of lag screws.

- L. Sills under bearing, exterior and shear walls shall be bedded on 1/2 inch minimum drypack or grout to obtain continuous bearing.

3.3 CLEANING AND ADJUSTING (Finish Carpentry)

- A. Remove damaged or otherwise disfigured portions and replace with new prior to the Owner's acceptance.
- B. Wash finished Work in strict accordance with product manufacturer's directions and ensure that washed surfaces do not differ from clean unwashed surfaces. Any difference will be considered unsatisfactory work.

3.4 FIELD QUALITY CONTROL

- A. The Owner's Testing Agency shall:
 - 1. Inspect erected timber framing as required to establish conformity of work with Drawings.
 - 2. Inspect all bolted connections.
 - 3. Inspect all timber connectors per CBC Section 2337.2.
 - 4. Inspect roof diaphragm nailing for nail size, spacing and penetration at plywood panel edges, and special nailing at collector and drag members.
 - 5. Inspect shear wall nailing for nail size, spacing and penetration at plywood panel edges, and nailing at holdown posts.

END OF SECTION 061000

SECTION 070150.19 - PREPARATION FOR REROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Partial removal as indicated on Drawings.
- 2. Removal of flashings and counterflashings as indicated on Drawings.

- B. Related Requirements:

- 1. Section 011000 "Summary" for use of premises and for phasing requirements.
- 2. Section 015000 "Temporary Facilities and Controls" for temporary construction and environmental-protection measures for reroofing preparation.

1.3 ALLOWANCES

- A. Allowance for removal of existing deteriorated wood roof deck, and replacement with new wood deck, is specified under Section 012100 "Allowances."
- B. Allowance for removal of existing deteriorated wood nailers and curbs, and replacement with new wood, is specified under Section 012100 "Allowances."

1.4 UNIT PRICES

- A. Work of this Section is affected by roof sheathing removal and replacement unit price and replacement unit price.

1.5 DEFINITIONS

- A. Partial Roof Tear-off: Removal of existing roofing system as indicated down to existing roof deck including but not limited to existing rigid insulation, nailers and blocking.
- B. Roofing Terminology: Definitions in ASTM D 1079 and glossary of NRCA's "The NRCA Roofing Manual: Membrane Roof Systems" apply to work of this Section.

1.6 PREINSTALLATION MEETINGS

- A. Preliminary Roofing Conference: Before starting removal Work, conduct conference at Project site.
 - 1. Meet with Construction Manager, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
 - 2. Review methods and procedures related to roofing tear-off, including, but not limited to, the following:
 - a. Reroofing preparation, including roofing system manufacturer's written instructions.
 - b. Temporary protection requirements for existing roofing system components that are to remain.
 - c. Existing roof drains and roof drainage during each stage of reroofing, and roof-drain plugging and plug removal unless otherwise indicated (see MP documents).
 - d. Construction schedule and availability of materials, Installer's personnel, equipment, and facilities needed to avoid delays.
 - e. Existing roof deck removal procedures and Owner notifications.
 - f. Condition and acceptance of existing roof deck and base flashing substrate for reuse.
 - g. Structural loading limitations of roof deck during reroofing.
 - h. Base flashings, special roofing details, drainage, penetrations, equipment curbs, and condition of other construction that affect reroofing.
 - i. HVAC shutdown and sealing of air intakes.
 - j. Governing regulations and requirements for insurance and certificates if applicable.
 - k. Existing conditions that may require Architect notification before proceeding.

1.7 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Temporary Roofing Submittal: Product data and description of temporary roofing system.
 - 1. If portions of the existing roof remains in place, include surface preparation requirements needed to receive permanent roof, and submit a letter from roofing manufacturer stating acceptance of the existing roof and that its inclusion does not adversely affect the new roofing system's resistance to fire and wind or specified special warranty or its FM Approvals rating.

1.8 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

1. Include certificate that Installer is approved by warrantor of existing roofing system.
2. Include certificate that Installer is licensed to perform asbestos abatement.

B. Field Test Reports:

1. Fastener pull-out test report.

C. Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including exterior and interior finish surfaces, that might be misconstrued as having been damaged by reroofing operations.

1. Submit before Work begins.

D. Landfill Records: Indicate receipt and acceptance of demolished roofing materials and hazardous wastes, such as asbestos-containing materials, by a landfill facility licensed to accept them.

1.9 CLOSEOUT SUBMITTALS

A. Certified statement from installer stating that existing roof warranty has not been affected by Work performed under this Section.

1.10 QUALITY ASSURANCE

A. Installer Qualifications: Approved by warrantor of existing roofing system to work on existing roofing Regulatory Requirements:

1. Comply with governing EPA notification regulations before beginning roofing removal.
2. Comply with hauling and disposal regulations of authorities having jurisdiction.

1.11 FIELD CONDITIONS

A. Existing Roofing System: Partial Built-up asphalt, partial concrete tile and parapet asphaltic shingles.

B. Owner will not occupy portions of building immediately below reroofing area during construction.

1. Conduct reroofing so Owner's operations are not disrupted.
2. Coordinate work activities daily with Owner so Owner has adequate advance notice to place protective dust and water-leakage covers over sensitive

equipment and furnishings, shut down HVAC and fire-alarm or -detection equipment if needed, and evacuate occupants from below work area.

- C. Protect building to be reroofed, adjacent buildings, walkways, site improvements, exterior plantings, and landscaping from damage or soiling from reroofing operations.
- D. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.
- E. Coordinate proposed loads with structural documents for compliance.
- F. Weather Limitations: Proceed with reroofing preparation only when existing and forecasted weather conditions permit Work to proceed without water entering existing roofing system or building.
 - 1. Remove only as much roofing in one day as can be made watertight in the same day unless otherwise approved by Architect in advance.
- G. Hazardous Materials: It is not expected that hazardous materials, such as asbestos-containing materials, will be encountered in the Work.
 - 1. Hazardous materials will be removed by Owner before start of the Work.
 - 2. Existing roof will be left no less watertight than before removal.
 - 3. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner.

1.12 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces as indicated on the documents by methods and with materials so as not to void existing roofing system warranty as defined by the District.
 - 1. Notify warrantor before proceeding with the Work.
 - 2. Notify warrantor of existing roofing system on completion of reroofing, and obtain documentation verifying that existing roofing system has been inspected and warranty remains in effect.

PART 2 - PRODUCTS

2.1 TEMPORARY PROTECTION MATERIALS

- A. Plywood: DOC PS 1, Grade CD, Exposure 1 or as

2.2 TEMPORARY ROOFING MATERIALS

- A. Design and selection of materials for temporary roofing are Contractor's responsibilities.

2.3 INFILL AND REPLACEMENT MATERIALS

- A. Use infill materials matching existing roofing system materials unless otherwise indicated.
 - 1. Infill materials are specified in Section 075113 Built-up Asphalt Roofing"unless otherwise indicated.
- B. Wood blocking, curbs, and nailers to match existing.
- C. Plywood roof sheathing to match existing and shall be exterior grade, see structural drawings for additional requirements.
- D. Parapet Sheathing:
 - 1. Exterior grade, fire-retardant-treated plywood wall sheathing, to match existing thickness and compliance with substrate requirements for roofing to be applied.
- E. Fasteners: Factory-coated steel fasteners with metal or plastic plates listed in FM Approvals' RoofNav, and acceptable to new roofing system manufacturer.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protection of In-Place Conditions:
 - 1. Protect existing roofing system that is not to be reroofed.
 - 2. Limit traffic and material storage to areas of existing roofing that have been protected.
 - 3. Maintain temporary protection and leave in place until replacement roofing has been completed. Remove temporary protection on completion of reroofing.
 - 4. Comply with requirements of existing roof system manufacturer's warranty requirements.
- B. Seal or isolate windows and access panels that may be exposed to airborne substances created in removal of existing materials.
- C. Shut off rooftop utilities and service piping before beginning the Work.
- D. Test existing roof drains to verify that they are not blocked or restricted.
 - 1. Immediately notify Architect of any blockages or restrictions.
- E. Coordinate with Owner to shut down air-intake equipment in the vicinity of the Work.
 - 1. Cover air-intake louvers before proceeding with reroofing work that could affect indoor air quality or activate smoke detectors in the ductwork.

- F. During removal operations, have sufficient and suitable materials on-site to facilitate rapid installation of temporary protection in the event of unexpected rain.
- G. Maintain roof drains in functioning condition to ensure roof drainage at end of each workday.
 - 1. Prevent debris from entering or blocking roof drains and conductors.
 - a. Use roof-drain plugs specifically designed for this purpose.
 - b. Remove roof-drain plugs at end of each workday, when no work is taking place, or when rain is forecast.
 - 2. If roof drains are temporarily blocked or unserviceable due to roofing system removal or partial installation of new roofing system, provide alternative drainage method to remove water and eliminate ponding.
 - a. Do not permit water to enter into or under existing roofing system components that are to remain.

3.2 ROOF TEAR-OFF

- A. Lower removed roofing materials to ground and onto lower roof levels, using dust-tight chutes or other acceptable means of removing materials from roof areas.
- B. Remove loose aggregate from aggregate-surfaced, built-up bituminous roofing using a power broom.
- C. Remove accessories from roofing.
 - 1. Store and protect any accessories for reuse in manner not to exceed structural loading limitations of roof deck.
- D. Remove ballast, protection mat, and EPS insulation from protected roofing membrane.
- E. Full Roof Tear-off: Where indicated on Drawings, remove existing roofing and other roofing system components down to the existing roof deck.
 - 1. Remove base flashings and counter flashings.
 - 2. Remove perimeter edge flashing and gravel stops.
 - 3. Remove copings.
 - 4. Remove expansion-joint covers as req'd.
 - 5. Remove flashings at pipes, curbs, mechanical equipment, and other penetrations.
 - 6. Remove roof drains indicated on Drawings to be removed.
 - 7. Remove wood blocking, curbs, and nailers as req'd
 - 8. Remove fasteners from deck.

3.3 DECK PREPARATION

- A. Inspect deck after tear-off of roofing system.
- B. If broken or loose fasteners that secure deck panels to one another or to structure are observed, or if deck appears or feels inadequately attached, immediately notify Architect.
 - 1. Do not proceed with installation until directed by Architect.
- C. If deck surface is unsuitable for receiving new roofing or if structural integrity of deck is suspect, immediately notify Architect.
 - 1. Do not proceed with installation until directed by Architect.
- D. Provide additional deck securement as indicated on Drawings.
- E. Replace plywood roof sheathing as indicated on Drawings.

3.4 INFILL MATERIALS INSTALLATION

- A. Immediately after roof tear-off, and inspection and repair, if needed, of deck, fill in tear-off areas to match existing roofing system construction.
 - 1. Section 075113 "Built-up Asphalt Roofing", asphaltic shingles and standing metal seam roofing.
 - 2. Section 074113.16 Standing Metal Seam Roof Panels
 - 3. Section 073113 Asphalt Shingles
- B. Install new roofing patch over roof infill area.
 - 1. If new roofing is installed the same day tear-off is made, roofing patch is not required.

3.5 ROOF RE-COVER PREPARATION

- A. Remove blisters, ridges, buckles, roofing fastener buttons projecting above roofing, and other substrate irregularities from existing roofing that inhibit new recover boards from conforming to substrate.
 - 1. Remove loose aggregate from aggregate-surfaced, built-up bituminous roofing with a power broom.
 - 2. Broom clean existing substrate.
 - 3. Coordinate with Owner's inspector to schedule times for tests and inspections.
 - 4. Verify that existing substrate is dry.

- a. Spot check substrates with an electrical capacitance moisture-detection meter.
5. Remove materials that are wet or damp.
 - a. Removal will be paid for by adjusting the Contract Sum according to unit prices included in the Contract Documents.
6. Provide additional uplift securement for existing roofing system with new screws and plates applied to each roof zone as required for adequate adherence.

3.6 BASE FLASHING REMOVAL

- A. Remove existing base flashings to allow for the new areas of roofing to be adequately installed per manufacturer's recommendations.
 1. Clean substrates of contaminants, such as asphalt, sheet materials, dirt, and debris.
- B. Do not damage metal counterflashings that do not need to be removed for new roof installation.
 1. Replace metal counterflashings damaged during removal with counterflashings of same metal, weight or thickness, and finish as existing.
- C. Inspect parapet sheathing, wood blocking, curbs, and nailers for deterioration and damage.
 1. If parapet sheathing, wood blocking, curbs, or nailers have deteriorated, immediately notify Architect.

3.7 FASTENER PULL-OUT TESTING

- A. **[Perform] [Retain independent testing and inspecting agency to conduct] fastener pull-out tests according to SPRI FX-1, and submit test report to [Architect] [and] [roofing manufacturer] before installing new roofing system.**

3.8 DISPOSAL

- A. Collect demolished materials and place in containers.
 1. Promptly dispose of demolished materials.
 2. Do not allow demolished materials to accumulate on-site.
 3. Storage or sale of demolished items or materials on-site is not permitted.
- B. Transport and legally dispose of demolished materials off Owner's property.

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Vacaville (Annex) Renovation Project
Fairfield, California

END OF SECTION 070150.19

SECTION 072100 - THERMAL INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Glass-fiber blanket tiles for replacement of damaged tiles only over existing 2'x4' suspended ceiling. To the extent possible, new tiles shall match existing for min R-value and weight.
 - 2. Glass-fiber blanket for replacement of areas of wall insulation that have removed to accommodate structural work. To the extent possible, new wall insulation shall match existing for min R-value and type (including vapor barrier where applicable).

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: For each product, for tests performed by a qualified testing agency.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

PART 2 - PRODUCTS

2.1 GLASS-FIBER BLANKET

- A. Glass-Fiber Blanket, Unfaced ASTM C 665, Type I; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics. Shall match existing 2'x4' tiles in ceiling (or shall be cut to match) and match existing wall insulation where applicable.
 - 1. Owens-Corning
 - 2. Johns Mansfield
 - 3. Certain Teed

2.2 PREPARATION

- A. Ensure neat fit with existing tiles to minimize gaps or openings below to ceiling grid below. Review documents to provide conformance with structural weight limits. Install over clean ceiling tiles/grid, including removing projections capable of puncturing insulation, or that interfere with insulation attachment.

2.3 INSTALLATION, GENERAL

- A. Comply with insulation manufacturer's written instructions applicable to products and applications.
- B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.
- C. Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- D. Provide sizes to fit applications and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units unless multiple layers are otherwise shown or required to make up total thickness or to achieve R-value.

2.4 INSTALLATION OF INSULATION IN FRAMED CONSTRUCTION

- A. Blanket Insulation: Install in cavities formed by framing members according to the following requirements:
 - 1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.

2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
 3. Maintain 3-inch clearance of insulation around recessed non-IC rated lighting fixtures, i.e. not rated for or protected from contact with insulation.
- B. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:
1. Glass-Fiber Insulation: Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft.

2.5 PROTECTION

- A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION 072100

SECTION 075113 - BUILT-UP ASPHALT ROOFING (BUR)

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Built-up asphalt roofing system.
- B. Base sheet.
- C. Sheathing paper.

1.2 Related Sections

- A. Division 06 Section "Miscellaneous Rough Carpentry" for wood nailers, cants, curbs, and blocking [and for wood-based, structural-use roof deck panels].
- B. Division 07 Section "Sheet Metal Flashing and Trim" for metal roof penetration flashings, flashings, and counter flashings.
- C. Division 22 Section "Storm Drainage Piping Specialties" for roof drains.

1.3 REFERENCES

- A. Roofing Terminology: Refer to the following publications for definitions of roofing work related terms used in this Section:
 - 1. ASTM D 1079 "Standard Terminology Relating to Roofing and Waterproofing."
 - 2. Glossary of NRCA's "The NRCA Roofing Manual."
- B. Sheet Metal Terminology and Techniques: SMACNA "Architectural Sheet Metal Manual."

1.4 DESIGN CRITERIA

- A. General: Installed roofing membrane systems shall remain watertight; and resist specified wind uplift pressures, thermally induced movement, and exposure to weather without failure.
- B. Material Compatibility: Roofing materials shall be compatible with one another under conditions of service and application required, as demonstrated by roofing system manufacturer based on testing and field experience.
- C. Wind Uplift Performance: Roofing system shall be identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist wind uplift pressure calculated in accordance with ASCE 7.

1.5 SUBMITTALS

- A. Product Data: Manufacturer's data sheets for each product to be provided.
- B. Detail Drawings: Provide roofing system plans, elevations, sections, details, and details of attachment to other Work, including:
 - 1. Base flashings, cants, and membrane terminations.
 - 2. Tapered insulation, including slopes.
 - 3. Crickets, saddles, and tapered edge strips, including slopes.
 - 4. Insulation fastening patterns.
- C. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install roofing system.
- D. Maintenance Data: Refer to Johns Manville's latest published documents on www.JM.com or an approved equal.
- E. Guarantees: Provide manufacturer's current guarantee specimen.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and is eligible to receive the specified manufacturer's guarantee.
- B. Manufacturer Qualifications: Qualified manufacturer that has UL listing for roofing system identical to that used for this Project.
- C. Test Reports:
 - 1. Roof drain and leader test or submit plumber's verification.
 - 2. Roof deck fastener pullout test.
- D. Moisture Survey:
 - 1. Submit prior to installation, results of a non-destructive moisture test of roof system completed by approved third party.
- E. Source Limitations: Obtain all components from the single source roofing system manufacturer guaranteeing the roofing system. All products used in the system must be labeled by the single source roofing system manufacturer issuing the guarantee.
- F. Fire-Test-Response Characteristics: Roofing materials shall comply with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.
 - 1. Exterior Fire-Test Exposure: Class B; ASTM E 108, for application and roof slopes indicated.

2. Fire-Resistance Ratings: ASTM E 119, for fire-resistance-rated roof assemblies of which roofing system is a part.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roofing materials in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storage.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer.
- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
- D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

1.8 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when current and forecasted weather conditions permit roofing system to be installed in accordance with manufacturer's written instructions and guarantee requirements.

1.9 Guarantees

- A. Provide manufacturer's system guarantee equal to Johns Manville's Peak Advantage No Dollar Limit Roofing System Guarantee.
 1. Single-Source special guarantee includes roofing plies, base flashings, roofing membrane accessories, liquid applied flashings, and other single-source components of roofing system marketed by the manufacturer.
 2. Guarantee Period: **20** years from date of Substantial Completion.
- B. Installer's Guarantee: Submit roofing Installer's guarantee signed by Installer, covering Work of this Section, including all components of roofing system for the following guarantee period:
 1. Guarantee Period: Five Years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 ROOFING MEMBRANE Felts

- A. Basis of Design: [Ventsulation Felt](#) or approved equal.

- B. Glass-Fiber Felts: ASTM D 2178, Type **IV**, asphalt-impregnated, glass-fiber felt. Basis of Design: [GlasPly IV](#) or approved equal.

2.2 Roofing Membrane capSheet

- A. Cap Sheet: ASTM D 3909, asphalt-impregnated and -coated, glass-fiber cap sheet, with white **reflective** coarse mineral-granule top surfacing and fine mineral surfacing on bottom surface. ASTM D4601, Type II, asphalt coated, fiberglass base felt. Basis of Design: GlasKap. Shall meet prescriptive requirements for Title 24, non-residential new roofing and re-roofing.

2.3 BASE SHEET MATERIALS

- A. Glass-Fiber Base Sheet: [ASTM D4897, Type II, asphalt coated, fiberglass venting base sheet] [ASTM D4601, Type II, asphalt coated, fiberglass base felt]. Basis of Design: [Ventsulation Felt](#) [PermaPly 28](#)
- B. Glass-Fiber Base Sheet: ASTM D 2178, Type **[IV] [VI]**, asphalt-impregnated, glass-fiber felt. Basis of Design: [GlasPly IV](#) [GlasPly Premier](#)
- C. Composite Base Sheet: Roofing system manufacturer's asphalt-impregnated and -coated composite sheet; smooth surfaced and reinforced with a composite polyester and glass-fiber core. Basis of Design: [GlasTite Flexible](#)

2.4 FLASHING MATERIALS

- A. Backer Sheet: ASTM D 2178, Type **IV**, asphalt-impregnated, glass-fiber felt. Basis of Design: [GlasPly IV](#) [GlasPly Premier](#)
- B. Backer Sheet: ASTM D 4601, Type II, asphalt-impregnated and -coated, glass-fiber sheet, dusted with fine mineral surfacing on both sides. Basis of Design: [PermaPly 28](#) [GlasBase Plus](#)
- C. Backer Sheet: [ASTM D 6164, Grade S, Type I, polyester-reinforced] [ASTM D 6163, Grade S, Type I, glass-fiber-reinforced] [ASTM D 6162, Grade S, Type II, composite polyester- and glass-fiber-reinforced], SBS-modified asphalt sheet; smooth surfaced; suitable for application method specified. Basis of Design: [DynaLastic 180 S](#) [DynaBase](#) [DynaPly T1](#)
- D. Flashing Sheet: [ASTM D 6164, Grade G, Type II, polyester-reinforced] [ASTM D 6163, Grade G, Type I, glass-fiber-reinforced] [ASTM D 6221, Grade G, Type I, composite polyester- and glass-fiber-reinforced] [ASTM D 6298, embossed aluminum foil surfaced, glass-fiber-reinforce], SBS-modified asphalt sheet; granular surfaced; suitable for application method specified. Basis of Design: [DynaLastic 250 FR](#) [DynaLastic 250 FR CR](#) [DynaFlex](#) [DynaFlex CR](#) [DynaClad](#) [DynaKap](#) [GlasTite Flexible](#)

- E. Liquid Applied Flashing: A liquid and fabric reinforced flashing system created with a stitchbonded polyester scrim and a two-component, moisture cured, elastomeric, liquid applied flashing material, consisting of an asphalt extended urethane base material and an activator. Basis of Design: [PermaFlash System](#)

2.5 VAPOR RETARDER

- A. Glass-Fiber Felts: ASTM D 2178, Type IV, asphalt-impregnated, glass-fiber felt. Basis of Design: GAFGlass

2.6 AUXILIARY ROOFING MEMBRANE Materials

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with built-up roofing.
- B. Roofing Asphalt: ASTM D 312, Type III.
- C. Asphalt Primer: ASTM D 41. Basis of Design: JM Asphalt Primer
- D. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required by roofing system manufacturer for application. Basis of Design: [Bestile Industrial Roof Cement](#)
- E. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required by roofing system manufacturer for application. Basis of Design: [MBR Utility Cement](#)
- F. Cold-Applied Flashing Cement: Roofing system manufacturer's asphalt-based, two-component, asbestos-free, trowel-grade, cold-applied adhesive specially formulated for compatibility and use with flashing applications. Basis of Design: [MBR Flashing Cement](#)
- G. Mastic Sealant: As required by Johns Manville.
- H. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening roofing membrane components to wood substrate, tested by manufacturer for required pullout strength, and provided by the roofing system manufacturer. Basis of Design: : [High Load Fasteners and Plates](#)
- I. Roofing Granules: Ceramic-coated roofing granules matching specified cap sheet, provided by roofing system manufacturer (see Title 24 requirements).
- J. Coating: Acrylic elastomeric coating with unique bleed-blocking properties particularly well suited for coating over asphalt surfaces. Basis of Design: JM CR Seam Coating
- K. Miscellaneous Accessories: Provide miscellaneous accessories recommended by roofing system manufacturer.

2.7 Sheathing Paper

- A. Sheathing Paper: Red-rosin type, minimum 3 lb/100 sq. ft. (0.16 kg/sq. m).

2.8 ROOFING accessories

- A. Expansion Joints: Provide factory fabricated weatherproof, exterior covers for expansion joint openings consisting of flexible rubber membrane, supported by a closed cell foam to form flexible bellows, with two metal flanges, adhesively and mechanically combined to the bellows by a bifurcation process. Provide product manufactured and marketed by single-source membrane supplier that is included in the No Dollar Limit guarantee. Basis of Design: [\[Expand-O-Flash\]](#) [\[Expand-O-Gard\]](#)
- B. Metal Flashing Sheet: Metal flashing sheet is specified in Division 07 Section "Sheet Metal Flashing and Trim."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions for compliance with the requirements affecting performance of roofing system.
 - 1. General:
 - a. Verify that roof openings and penetrations are in place and set and braced and that roof drains are securely clamped in place.
 - b. Verify that wood cants, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
 - 1. Wood Decks:
 - a. Verify that wood-based substrate is visibly dry and free of moisture according to manufacturer's approved method.
 - b. Verify that wood-based substrate has ability to provide minimum base sheet, insulation and membrane (if applicable) fastener pull-out resistance.
 - 1) Provide documentation of pull out resistance values using manufacturer's approved procedures.
 - 2. Ensure general rigidity and proper slope for drainage.
 - 3. Verify that deck is secured with no projecting fasteners and with no adjacent units in excess of 1/16 inch (1.6 mm) out of plane relative to adjoining deck.
- B. Unacceptable panels should be brought to the attention of the General Contractor and Project Owner's Representative and must be corrected prior to installation of roofing system.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean and remove from substrate sharp projections, dust, debris, moisture, and other substances detrimental to roofing system installation in accordance with roofing system manufacturer's written instructions.
- B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction.
- C. Prime surface of deck as applicable, with asphalt primer at a rate recommended by roofing manufacturer and allow primer to dry.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 Re-roof Preparation

- A. Remove all roofing membrane, surfacing, cover boards, insulation, fasteners, asphalt, pitch, adhesives, etc.
 - 1. Remove an area no larger than can be re-roofed in one day.
- B. Tear out all base flashings, counter lashings, pitch pans, pipe flashings, vents and like components necessary for application of new membrane.
- C. Remove abandoned equipment curbs, skylights, smoke hatches, and penetrations.
 - 1. Install decking to match existing as directed by Owner's Representative.
- D. Raise (disconnect by licensed craftsmen, if necessary) all HVAC units, equipment, piping and other equipment in areas to be reroofed and modify sleepers, curbs and equipment per documents to allow for new work to be preformed.
- E. Immediately remove all debris from roof surface. Demolished roof system may not be stored on the roof surface.
- F. Proceed with installation only after unsatisfactory conditions have been corrected.

3.4 Sheathing Paper INSTALLATION

- A. Loosely lay sheathing paper in a single layer over all wood deck areas, side and end lapping each sheet a minimum of **2 inches** and **6 inches**, respectively.
 - 1. Seal side and end laps with **[tape] [adhesive]**.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.5 Base-sheet installation

- A. Install one lapped base sheet course and mechanically fasten to substrate according to roofing system manufacturer's written instructions.
 - 1. Install to resist uplift pressures at corners, perimeter, and field of roof.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.6 VAPOR-RETARDER INSTALLATION

- A. Install polyethylene-sheet vapor retarder as a loosely laid single layer over area to receive vapor retarder, side and end lapping each sheet a minimum of **2 inches (50 mm)** and **6 inches (150 mm)**, respectively.
 - 1. Seal side and end laps.
- B. Install 2 glass-fiber felt plies lapping each sheet **19 inches (483 mm)** over preceding sheet. Embed each sheet in a solid mopping of hot roofing asphalt per manufacturer's written instructions.
- C. Install modified bituminous vapor retarder sheet according to roofing manufacturer's written instructions, starting at low point of roofing system. Extend roofing membrane sheets over and terminate beyond cants, installing as follows:
 - 1. Torch-apply vapor retarder to substrate according to roofing system manufacturer's instruction.
 - 2. Adhere vapor retarder in a full mopping of hot asphalt to substrate according to roofing system manufacturer's instruction.
 - 3. Self-adhere vapor retarder to substrate according to roofing system manufacturer's instruction.
 - 4. Unroll roofing membrane sheets and allow them to relax for minimum time period required by manufacturer.
- D. Laps: Accurately align roofing membrane sheets, without stretching, and maintain uniform side and end laps. Stagger end laps. Completely bond and seal laps, leaving no voids.
 - 1. Repair tears and voids in laps and lapped seams not completely sealed.
- E. Completely seal vapor retarder at terminations, obstructions, and penetrations to prevent air movement into membrane roofing system.
- F. Proceed with installation only after unsatisfactory conditions have been corrected.

3.7 ROOFING MEMBRANE INSTALLATION, GENERAL

- A. Install roofing membrane in accordance with roofing system manufacturer's written instructions, applicable recommendations of the roofing manufacturer and requirements in this Section.

- B. Start installation of roofing membrane in presence of roofing system manufacturer's technical personnel.
- C. Where roof slope exceeds 1/2 inch per 12 inches (1:24), contact the membrane manufacturer for installation instructions regarding installation direction and back nailing
- D. Cooperate with testing and inspecting agencies engaged or required to perform services for installing roofing system.
- E. Asphalt Heating: Heat roofing asphalt and apply within plus or minus 25 deg F (14 deg C) of equiviscous temperature unless otherwise required by roofing system manufacturer. Do not raise roofing asphalt temperature above equiviscous temperature range more than one hour before time of application. Do not exceed roofing asphalt manufacturer's recommended temperature limits during roofing asphalt heating. Do not heat roofing asphalt within 25 deg F (14 deg C) of flash point. Discard roofing asphalt maintained at a temperature exceeding finished blowing temperature for more than 4 hours.
- F. Proceed with installation only after unsatisfactory conditions have been corrected.

3.8 ROOFING MEMBRANE INSTALLATION

- A. Install **four** ply sheets starting at low point of roofing system. Align ply sheets without stretching. Shingle side laps of ply sheets uniformly to achieve required number of plies throughout thickness of roofing membrane. Shingle in direction to shed water. Extend ply sheets over and terminate beyond cants.
 - 1. Install each ply sheet in a solid mopping of hot roofing asphalt applied at rate required by roofing system manufacturer, to form a uniform membrane without ply sheets touching.
- B. Cap Sheet: Install lapped granulated cap sheet starting at low point of roofing system. Offset laps from laps of preceding ply sheets and align cap sheet without stretching. Lap in direction to shed water. Extend cap sheet over and terminate beyond cants.
 - 1. Install cap sheet in a solid mopping of hot roofing asphalt applied at rate required by roofing system manufacturer.
 - 2. Install cap sheet in a cold fluid-applied adhesive according to roofing system manufacturer's instruction.
 - 3. Torch-apply cap sheet according to roofing system manufacturer's instruction.
- C. Aggregate Surfacing: Promptly after installing and testing roofing membrane, base flashing, and stripping, flood-coat roof surface with **60 lb/100 sq. ft. (3 kg/sq. m)** of hot roofing asphalt. While flood coat is hot and fluid, cast the following average weight of aggregate in a uniform course:
 - 1. Aggregate Weight: **400 lb/100 sq. ft. (20 kg/sq. m)**.

2. If aggregate surfacing is delayed, promptly apply glaze coat of hot roofing asphalt at a rate of 10 lb/100 sq. ft. (0.5 kg/sq. m).

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.9 FLASHING AND STRIPPING INSTALLATION

A. Install base flashing over cant strips and other sloping and vertical surfaces, at roof edges, and at penetrations through roof, and secure to substrates according to roofing system manufacturer's written instructions and as follows:

1. Prime substrates with asphalt primer if required by roofing system manufacturer.
2. Backer Sheet Application: Mechanically fasten backer sheet to walls or parapets where required. Adhere backer sheet over roofing membrane at cants in a solid mopping of hot roofing asphalt.
3. Backer Sheet Application: Install backer sheet and adhere to substrate in a solid mopping of hot roofing asphalt.
4. Backer Sheet Application: Install backer sheet and self-adhere to substrate as required by roofing system manufacturer.
5. Flashing Sheet Application: Adhere flashing sheet to substrate in a solid mopping of hot roofing asphalt. Apply hot roofing asphalt to back of flashing sheet if recommended by roofing system manufacturer.
6. Flashing Sheet Application: Adhere flashing sheet to substrate in approved adhesive applied at rate required by roofing system manufacturer.
7. Flashing Sheet Application: Adhere flashing sheet to substrate in approved asphalt roofing cement; apply cement at rate required by roofing system manufacturer.

B. Extend base flashing up walls or parapets a minimum of 8 inches (200 mm) above roofing membrane and 4 inches (100 mm) onto field of roofing membrane.

C. Mechanically fasten top of base flashing securely at terminations and perimeter of roofing at a rate given by roofing system manufacturer.

1. Seal top termination of base flashing with a strip of glass-fiber fabric set in cold applied flashing adhesive.

D. Roof Drains: Cover metal flashing with roofing membrane cap-sheet stripping and extend a minimum of 4 inches (100 mm) beyond edge of metal flashing onto field of roofing membrane. Clamp roofing membrane, metal flashing, and stripping into roof-drain clamping ring.

E. Roof Drains: Flash drain using liquid applied flashing system. Clamp roofing membrane, flashing, and stripping into roof-drain clamping ring.

1. Install stripping according to roofing system manufacturer's written instructions.

F. Flash all penetrations using liquid applied flashing system.

- G. Proceed with installation only after unsatisfactory conditions have been corrected.

3.10 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform roof tests and inspections and to prepare test reports.
- B. Final Roof Inspection: Arrange for roofing system manufacturer's Registered Roof Observer (RRO) to inspect roofing installation on completion and submit report to Architect.
- C. Repair or remove and replace components of roofing system where test results or inspections indicate that they do not comply with specified requirements.
- D. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.11 ROOFING INSTALLER'S WARRANTY

- A. WHEREAS _____ of _____, herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:

1. Owner: **<Insert name of Owner>**.
2. Address: **<Insert address>**.
3. Building Name/Type: **<Insert information>**.
4. Address: **<Insert address>**.
5. Area of Work: **<Insert information>**.
6. Acceptance Date: _____.
7. Warranty Period: **<Insert time>**.
8. Expiration Date: _____.

- B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,
- C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period Roofing Installer will, at Roofing Installer's own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.
- D. This Warranty is made subject to the following terms and conditions:
1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:
 - a. lightning;
 - b. fire;

- c. failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
 - d. faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;
 - e. vapor condensation on bottom of roofing; and
 - f. activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.
2. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.
 3. Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of work.
 4. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.
 5. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray-cooled surface, flooded basin, or other use or service more severe than originally specified, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.
 6. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.
 7. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

E. IN WITNESS THEREOF, this instrument has been duly executed this _____ day of _____, _____.

1. Authorized Signature: _____.
2. Name: _____.
3. Title: _____.

CA Architects
July 20, 2017
100% CD

Solano Community College District
Vacaville (Annex) Renovation Project
Fairfield, California

END OF SECTION 075113

SECTION 076200 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. Manufactured through-wall flashing with snaplock receiver or with counterflashing.
2. Manufactured reglets with counterflashing.
3. Formed roof-drainage sheet metal fabrications.
4. Formed low-slope roof sheet metal fabrications.
5. Formed steep-slope roof sheet metal fabrications.
6. Formed wall sheet metal fabrications.
7. Formed equipment support flashing.

- B. Related Requirements:

1. Section 077200 "Roof Accessories" for set-on-type curbs, equipment supports, roof hatches, vents, and other manufactured roof accessory units.

1.3 COORDINATION

- A. Coordinate sheet metal flashing and trim layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.
- B. Coordinate sheet metal flashing and trim installation with adjoining roofing and wall materials, joints, and seams to provide leakproof, secure, and noncorrosive installation.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1. Review special roof details, roof drainage, roof-penetration flashing, equipment curbs, and condition of other construction that affect sheet metal flashing and trim.
2. Review sheet metal flashing observation and repair procedures after flashing installation.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.
- B. Shop Drawings: For sheet metal flashing and trim.
 - 1. Include plans, elevations, sections, and attachment details.
 - 2. Detail fabrication and installation layouts, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work.
 - 3. Include identification of material, thickness, weight, and finish for each item and location in Project.
 - 4. Include details for forming, including profiles, shapes, seams, and dimensions.
 - 5. Include details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
 - 6. Include details of termination points and assemblies.
 - 7. Include details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction from fixed points.
 - 8. Include details of roof-penetration flashing.
 - 9. Include details of edge conditions, including eaves, ridges, valleys, rakes, crickets, and counterflashings as applicable.
 - 10. Include details of special conditions.
 - 11. Include details of connections to adjoining work.

1.6 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: For each product, for tests performed by a qualified testing agency.
- B. Sample Warranty: For special warranty.

1.7 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For sheet metal flashing and trim, and its accessories, to include in maintenance manuals.

1.8 QUALITY ASSURANCE

- A. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.
 - 1. For copings and roof edge flashings that are and FM Approvals approved, shop shall be listed as able to fabricate required details as tested and approved.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.
- B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.

1.10 WARRANTY

- A. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General: Sheet metal flashing and trim assemblies shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.
- B. Sheet Metal Standard for Flashing and Trim: Comply with NRCA's "The NRCA Roofing Manual" and SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.
- C. Sheet Metal Standard for Copper: Comply with CDA's "Copper in Architecture Handbook." Conform to dimensions and profiles shown unless more stringent requirements are indicated.
- D. FM Approvals Listing: Manufacture and install [copings] [roof edge flashings] that are listed in FM Approvals' "RoofNav" and approved for windstorm classification, Class 1-105 Identify materials with name of fabricator and design approved by FM Approvals.
- E. SPRI Wind Design Standard: Manufacture and install copings and roof edge flashings tested according to SPRI ES-1 and capable of resisting the following design pressure:
 - 1. Design Pressure: As indicated in Documents.
 - 2. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental

effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

2.2 SHEET METALS

- A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.
- B. Metallic-Coated Steel Sheet: Provide galvanized steel sheet according to ASTM A 653/A 653M, **G90 (Z275)** coating designation prepainted by coil-coating process to comply with ASTM A 755/A 755M.
 - 1. Surface: Smooth, flat
 - 2. Exposed Coil-Coated Finish:
 - a. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - 3. Color: To match Standing Metal Seam panel.

2.3 UNDERLAYMENT MATERIALS

- A. Felt: ASTM D 226/D 226M, Type II (No. 30), asphalt-saturated organic felt; nonperforated.
- B. Synthetic Underlayment: Laminated or reinforced, woven polyethylene or polypropylene, synthetic roofing underlayment; bitumen free; slip resistant; suitable for high temperatures over **220 deg F (111 deg C)**; and complying with physical requirements of ASTM D 226/D 226M for Type I and Type II felts.
- C. Self-Adhering, High-Temperature Sheet: Minimum **30 mils (0.76 mm)** thick, consisting of a slip-resistant polyethylene- or polypropylene-film top surface laminated to a layer of butyl- or SBS-modified asphalt adhesive, with release-paper backing; specifically designed to withstand high metal temperatures beneath metal roofing. Provide primer according to written recommendations of underlayment manufacturer.
 - 1. Thermal Stability: ASTM D 1970; stable after testing at **240 deg F (116 deg C)** or higher.
 - 2. Low-Temperature Flexibility: ASTM D 1970; passes after testing at minus **20 deg F (29 deg C)** or lower.
- D. Slip Sheet: Rosin-sized building paper, **3 lb/100 sq. ft. (0.16 kg/sq. m)** minimum.

2.4 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim

installation and as recommended by manufacturer of primary sheet metal unless otherwise indicated.

- B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal.
 - 1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
 - a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.
 - b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
 - c. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.
- C. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape **1/2 inch (13 mm)** wide and **1/8 inch (3 mm)** thick.
- D. Elastomeric Sealant: ASTM C 920, elastomeric sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- E. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.
- F. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.
- G. Bituminous Coating: Cold-applied asphalt emulsion according to ASTM D 1187.
- H. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

2.5 MANUFACTURED SHEET METAL FLASHING AND TRIM

- A. Through-Wall, Ribbed, Sheet Metal Flashing: Manufacture through-wall sheet metal flashing for embedment in masonry, with ribs at **3-inch (75-mm)** intervals along length of flashing to provide integral mortar bond. Manufacture through-wall flashing [with snaplock receiver on exterior face to receive counterflashing] [with interlocking counterflashing on exterior face, of same metal as flashing].
- B. Reglets: Units of type, material, and profile required, formed to provide secure interlocking of separate reglet and counterflashing pieces, and compatible with flashing

indicated with factory-mitered or welded corners and junctions and with interlocking counterflashing on exterior face, of same metal as reglet.

1. Material: Galvanized steel, 0.022 inch (0.56 mm) thick.
2. Surface-Mounted Type: Provide with slotted holes for fastening to substrate, with neoprene or other suitable weatherproofing washers, and with channel for sealant at top edge.
3. Stucco Type: Provide with upturned fastening flange and extension leg of length to match thickness of applied finish materials.
4. Concrete Type: Provide temporary closure tape to keep reglet free of concrete materials, special fasteners for attaching reglet to concrete forms, and guides to ensure alignment of reglet section ends.
5. Accessories:
 - a. Flexible-Flashing Retainer: Provide resilient plastic or rubber accessory to secure flexible flashing in reglet where clearance does not permit use of standard metal counterflashing or where Drawings show reglet without metal counterflashing.
 - b. Counterflashing Wind-Restraint Clips: Provide clips to be installed before counterflashing to prevent wind uplift of counterflashing's lower edge.
6. Finish: With manufacturer's standard color coating to match standing metal seam roof panels.

2.6 FABRICATION, GENERAL

- A. General: Custom fabricate sheet metal flashing and trim to comply with details shown and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required. Fabricate sheet metal flashing and trim in shop to greatest extent possible.
 1. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
 2. Obtain field measurements for accurate fit before shop fabrication.
 3. Form sheet metal flashing and trim to fit substrates without excessive oil canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
 4. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.
- B. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines indicated on Drawings and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.
- C. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."
- D. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.

1. Form expansion joints of intermeshing hooked flanges, not less than **1 inch (25 mm)** deep, filled with butyl sealant concealed within joints.
 2. Use lapped expansion joints only where indicated on Drawings.
- E. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal to provide for proper installation of elastomeric sealant according to cited sheet metal standard.
- F. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
- G. Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard for application, but not less than thickness of metal being secured.
- H. Seams: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.
- I. Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use.

2.7 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

- A. Roof Edge Flashing and Fascia Cap: Fabricate in minimum **96-inch- (2400-mm-)** long, but not exceeding **12-foot- (3.6-m-)** long sections. Furnish with **6-inch- (150-mm-)** wide, joint cover plates.
1. Joint Style: Overlapped, **4 inches (100 mm)** wide, concealed backup plate.
 2. Fabricate with scuppers spaced [**10 feet (3 m)**] <Insert dimension> apart, to dimensions required with **4-inch- (100-mm-)** wide flanges and base extending **4 inches (100 mm)** beyond cant or tapered strip into field of roof. Fasten gravel guard angles to base of scupper.
 3. Fabricate from the Following Materials:
 - a. Galvanized Steel: [**0.028 inch (0.71 mm)**] <Insert dimension> thick.
- B. Copings: Fabricate in minimum **96-inch- (2400-mm-)** long, but not exceeding **12-foot- (3.6-m-)** long, sections. Fabricate joint plates of same thickness as copings. Furnish with continuous cleats to support edge of external leg and interior leg. Miter corners, fasten and seal watertight.
1. Coping Profile: Shall match existing UON, formed according to SMACNA's "Architectural Sheet Metal Manual."
 2. Joint Style: Butted with expansion space and **6-inch- (150-mm-)** wide, concealed backup plate.
 3. Fabricate from the Following Materials:
 - a. Galvanized Steel: **0.040 inch (1.02 mm)** thick.
- C. Base Flashing: Fabricate from the following materials:
1. Galvanized Steel: **0.028 inch (0.71 mm)** thick.

- D. Counterflashing: Fabricate from the following materials:
1. Galvanized Steel: 0.022 inch (0.56 mm) thick.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, substrate, and other conditions affecting performance of the Work.
1. Verify compliance with requirements for installation tolerances of substrates.
 2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
 3. Verify that air- or water-resistant barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 UNDERLAYMENT INSTALLATION

- A. Felt Underlayment: Install felt underlayment, wrinkle free, using adhesive to minimize use of mechanical fasteners under sheet metal flashing and trim. Apply in shingle fashion to shed water, with lapped joints of not less than 2 inches (50 mm).
- B. Synthetic Underlayment: Install synthetic underlayment, wrinkle free, according to manufacturers' written instructions, and using adhesive where possible to minimize use of mechanical fasteners under sheet metal.
- C. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free. Prime substrate if recommended by underlayment manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation; use primer for installing underlayment at low temperatures. Apply in shingle fashion to shed water, with end laps of not less than 6 inches (150 mm) staggered 24 inches (600 mm) between courses. Overlap side edges not less than 3-1/2 inches (90 mm). Roll laps and edges with roller. Cover underlayment within 14 days.
- D. Apply slip sheet, wrinkle free, [over underlayment] [directly on substrate] <Insert requirement> before installing sheet metal flashing and trim.

3.3 INSTALLATION, GENERAL

- A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners[, solder], protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.

1. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
 2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
 3. Space cleats not more than **12 inches (300 mm)** apart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.
 4. Install exposed sheet metal flashing and trim with limited oil canning, and free of buckling and tool marks.
 5. Torch cutting of sheet metal flashing and trim is not permitted.
 6. Do not use graphite pencils to mark metal surfaces.
- B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.
1. Coat concealed side of sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.
 2. Underlayment: Where installing sheet metal flashing and trim directly on cementitious or wood substrates, install underlayment and cover with slip sheet.
- C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at maximum of **10 feet (3 m)** with no joints within **24 inches (600 mm)** of corner or intersection.
1. Form expansion joints of intermeshing hooked flanges, not less than **1 inch (25 mm)** deep, filled with sealant concealed within joints.
 2. Use lapped expansion joints only where indicated on Drawings.
- D. Fasteners: Use fastener sizes that penetrate [wood blocking or sheathing not less than **1-1/4 inches (32 mm)** for nails and not less than **3/4 inch (19 mm)** for wood screws] [substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance] <Insert size requirement>.
- E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.
- F. Seal joints as required for watertight construction.
1. Use sealant-filled joints unless otherwise indicated. Embed hooked flanges of joint members not less than **1 inch (25 mm)** into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is between **40 and 70 deg F (4 and 21 deg C)**, set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below **40 deg F (4 deg C)**.

2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."
- G. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets with solder to width of **1-1/2 inches (38 mm)**; however, reduce pre-tinning where pre-tinned surface would show in completed Work.
1. Do not use torches for soldering.
 2. Heat surfaces to receive solder, and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.

3.4 ROOF FLASHING INSTALLATION

- A. General: Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and cited sheet metal standard. Provide concealed fasteners where possible, and set units true to line, levels, and slopes. Install work with laps, joints, and seams that are permanently watertight and weather resistant.
- B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in cited sheet metal standard unless otherwise indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate at staggered **3-inch (75-mm)** centers.
- C. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in FM Global Property Loss Prevention Data Sheet 1-49 for FM Approvals' listing for required windstorm classification.
- D. Copings: Anchor to resist uplift and outward forces according to recommendations in cited sheet metal standard unless otherwise indicated.
- E. Copings: Anchor to resist uplift and outward forces according to recommendations in FM Global Property Loss Prevention Data Sheet 1-49 for specified FM Approvals' listing for required windstorm classification.
- F. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing **4 inches (100 mm)** over base flashing. Lap counterflashing joints minimum of **4 inches (100 mm)**. Secure in waterproof manner by means of [snap-in installation and sealant or lead wedges and sealant] [interlocking folded seam or blind rivets and sealant] [anchor and washer at **36-inch (910-mm)** centers] <Insert requirement> unless otherwise indicated.

3.5 WALL FLASHING INSTALLATION

- A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to cited sheet metal standard unless otherwise indicated. Coordinate

installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.

- B. Opening Flashings in Frame Construction: Install continuous head, sill,[jamb,] and similar flashings to extend [4 inches (100 mm)] <Insert dimension> beyond wall openings.

3.6 ERECTION TOLERANCES

- A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."

3.7 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder.
- C. Clean off excess sealants.
- D. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended by sheet metal flashing and trim manufacturer. Maintain sheet metal flashing and trim in clean condition during construction.
- E. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 076200

SECTION 077100 - ROOF SPECIALTIES

PART 1 - GENERAL : Pre-bid visual inspection to assist in the scope for bid. Installer shall replace any portions of the roof specialties that show signs of degradation sufficient to warrant replacement, i.e. rust, holes, un-spliced/un-welded seams, etc. Where feasible, installer may elect to leave in place and/or remove and re-install elements of existing system to allow for new roofing systems to be adequately installed per manufacturer's recommendations provided complete compliance to standards listed under this section and related sections as listed below. Scope shall include any conditioning and/or adjustments required of the existing conditions to allow for the new work to be performed.

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Copings.
2. Roof-edge specialties.
3. Roof-edge drainage systems.
4. Reglets and counterflashings.

B. Related Requirements:

1. Section 074113.13 "Formed Metal Roof Panels" for roof-edge drainage-system components provided by metal-roof-panel manufacturer.
2. Section 070150.19 "Preparation of Re-Roofing"
3. Section 074113.16 "Standing-Seam Metal Roof Panels" for roof-edge drainage-system components provided by metal-roof-panel manufacturer.
4. Section 05113 "Built-up Roofing" (BUR)
5. Section 076200 "Sheet Metal Flashing and Trim" for custom- and site-fabricated sheet metal flashing and trim.
6. Section 077200 "Roof Accessories" for set-on-type curbs, equipment supports, roof hatches, vents, and other manufactured roof accessory units.
7. Section 079200 "Joint Sealants" for field-applied sealants between roof specialties and adjacent materials.

C. Preinstallation Conference: Conduct conference at Project site

1. Examine substrate conditions for compliance with requirements, including flatness and attachment to structural members.
2. Review special roof details, roof drainage, and condition of other construction that will affect roof specialties.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: For roof specialties, after inspection of existing conditions and review of new replacement roofing systems:
 - 1. Include plans, elevations, expansion-joint locations, keyed details, and attachments to other work. Distinguish between plant- and field-assembled work.
 - 2. Include details for expansion and contraction; locations of expansion joints, including direction of expansion and contraction based on requirements for each of the systems proposed.
 - 3. Indicate profile and pattern of seams and layout of fasteners, cleats, clips, and other attachments.
 - 4. Detail termination points and assemblies, including fixed points.
 - 5. Include details of special conditions.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For manufacturer.
- B. Sample Warranty: For manufacturer's special warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For roofing specialties to include in maintenance manuals.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer offering products meeting requirements that are compatible with all of the roofing systems.
- B. Source Limitations: Obtain roof specialties approved by manufacturer providing roofing-system warranty specified in Section

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Do not store roof specialties in contact with other materials that might cause staining, denting, or other surface damage. Store roof specialties away from uncured concrete and masonry.
- B. Protect strippable protective covering on roof specialties from exposure to sunlight and high humidity, except to extent necessary for the period of roof-specialty installation.

1.8 FIELD CONDITIONS

- A. Field Measurements: Verify profiles and tolerances of roof-specialty substrates by field measurements before fabrication, and indicate measurements on Shop Drawings.
- B. Coordination: Coordinate roof specialties with flashing, trim, and construction of parapets, roof deck, roof and wall panels, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.9 WARRANTY

- A. Roofing-System Warranty: Roof specialties are included in warranty provisions in Section : 20 year warranty.
- B. Special Warranty on Painted Finishes: Manufacturer agrees to repair finish or replace roof specialties that show evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Fluoropolymer Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 - 2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General Performance: Roof specialties shall withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.
- B. SPRI Wind Design Standard: Manufacture and install copings and roof-edge specialties tested according to SPRI ES-1 and capable of resisting the following design pressures:
 - 1. Design Pressure (based on Exposure C, Importance 3 and wind speed of 110mph) :
Design Pressure Horizontal: (outward pressure) 37 psf

Design Pressure Vertical(upward pressure):60 psf

- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that resist rotation and avoid shear stress as a result of thermal movements. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 25 degrees (min ave.) to 91 (max ave.) on the material surfaces.

2.2 COPINGS

- A. Metal Copings: Manufactured coping system consisting of metal coping cap in section lengths not exceeding manufacturer's recommendation for given application (12'-0" max). concealed anchorage; with corner units, end cap units, and concealed splice plates with finish matching coping caps. Preference shall a be given to manufacturer's recommendation's when copings are a part of the roofing system.

1. Metallic-Coated Steel Sheet Coping Caps: Zinc-coated (galvanized) steel, nominal thickness as required to meet performance requirements.
 - a. Surface: Smooth, flat finish.
 - b. Finish: Two-coat fluoropolymer
 - c. Color: To match existing
2. Corners: Factory mitered and soldered or continuously welded.
3. Special Fabrications: Review all existing conditions to match configuration to adequately allow for new roofing
4. Coping-Cap Attachment Method: Snap-on or face leg hooked to continuous cleat with back leg fastener exposed (as indicated), fabricated from coping-cap material.
 - a. Snap-on Coping Anchor Plates: Concealed, galvanized-steel sheet, **12 inches** wide, with integral cleats.
 - b. Face-Leg Cleats: Concealed, continuous: galvanized-steel sheet

2.3 ROOF-EDGE SPECIALTIES

- A. Roof-Edge Fascia: Manufactured, two-piece, roof-edge fascia consisting of snap-on metal fascia cover in section lengths not exceeding **12 feet** and a continuous metal receiver with integral drip-edge cleat to engage fascia cover and secure roof membrane. Provide matching corner units.
1. Metallic-Coated Steel Sheet Fascia Covers: Zinc-coated (galvanized) steel, thickness as required to meet performance requirements.

- a. Surface: Smooth, flat finish.
 - b. Finish: Two-coat fluoropolymer
 - c. Color: To match existing.
2. Corners: Factory mitered and soldered or continuously welded
 3. Splice Plates: Exposed, of same material, finish, and shape as fascia cover.
 4. Receiver: Galvanized-steel sheet, manufacturer's standard material and thickness.
 5. Special Fabrications: Shall match wherever feasible existing conditions, preference shall a be given to manufacturer's recommendation's when specialties are a part of the roofing system

2.4 ROOF-EDGE DRAINAGE SYSTEMS

- A. Gutters: Gutter shall be manufactured in uniform section lengths not exceeding **12 feet** with matching corner units, ends, outlet tubes, and other accessories. Elevate back edge at least **1 inch (25 mm)** above front edge. Furnish flat-stock gutter straps, gutter brackets, expansion joints, and expansion-joint covers fabricated from same metal as gutters and match existing profiles.
 1. Zinc-Coated Steel: Nominal **0.028-inch** thickness.
 2. Gutter Profile: To match existing profile and shall be fabricated and installed according to SMACNA's "Architectural Sheet Metal Manual."
 3. Corners: Factory mitered and soldered.
 4. Gutter Supports: Gutter brackets and Straps to match existing supports with finish to match the gutters.
 5. Gutter Accessories: See pre-bid inspection to match existing accessories.
- B. Downspouts: Tie into existing drain leaders and downspouts where required due to replacements of gutters. Match existing to provide adequate connection. Furnish all materials with metal hangers, from same material as downspouts, and anchors.
- C. Zinc-Coated Steel Finish: Two-coat fluoropolymer.
 1. Color: To match existing.

2.5 REGLETS AND COUNTERFLASHINGS

- A. Basis of design: Fry Reglet Inc.
- B. Reglets: Manufactured units formed to provide secure interlocking of separate reglet and counterflashing pieces, from the following exposed metal:
 1. Zinc-Coated Steel: Nominal **0.022-inch** thickness.
 2. Corners: Factory mitered and soldered or continuously welded.
 3. Surface-Mounted Type: Provide reglets with slotted holes for fastening to substrate, with neoprene or other suitable weatherproofing washers, and with channel for sealant at top edge.

4. Stucco Type, Embedded: Provide reglets with upturned fastening flange and extension leg of length to match thickness of applied finish materials.
 5. Concrete Type, Embedded: Provide temporary closure tape to keep reglet free of concrete materials, special fasteners for attaching reglet to concrete forms, and guides to ensure alignment of reglet section ends.
- C. Counterflashings: Manufactured units of heights to overlap top edges of base flashings by **4 inches** and in lengths not exceeding **12 feet** designed to snap into reglets or through-wall-flashing receiver (as indicated in the documents) and compress against base flashings with joints lapped, from the following exposed metal:
1. Zinc-Coated Steel: Nominal **0.022-inch** thickness (min.).
- D. Accessories:
1. Flexible-Flashing Retainer: Provide resilient plastic or rubber accessory to secure flexible flashing in reglet where clearance does not permit use of standard metal counterflashing or where reglet is provided separate from metal counterflashing.
 2. Counterflashing Wind-Restraint Clips: Provide clips to be installed before counterflashing to prevent wind uplift of counterflashing lower edge.
- E. Zinc-Coated Steel Finish: Two-coat fluoropolymer
1. Color: To match existing.

2.6 MATERIALS

- A. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, **G90 (Z275)** coating designation.

2.7 UNDERLAYMENT MATERIALS

- A. Self-Adhering, High-Temperature Sheet: Minimum **30 to 40 mils** thick, consisting of slip-resisting polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer.
 1. Thermal Stability: ASTM D 1970/D 1970M; stable after testing at **240 deg F**.
 2. Low-Temperature Flexibility: ASTM D 1970/D 1970M; passes after testing at minus **20 deg F**.
- B. Felt: ASTM D 226/D 226M, Type II (No. 30), asphalt-saturated organic felt, nonperforated.
- C. Slip Sheet: Rosin-sized building paper, **3-lb/100 sq. ft. (0.16-kg/sq. m)** minimum.

2.8 MISCELLANEOUS MATERIALS

- A. Fasteners: Manufacturer's recommended fasteners, suitable for application and designed to meet performance requirements. Furnish the following unless otherwise indicated:
 - 1. Exposed Penetrating Fasteners: Gasketed screws with hex washer heads matching color of sheet metal.
 - 2. Fasteners for Zinc-Coated (Galvanized) Steel Sheet: Series 300 stainless steel or hot-dip zinc-coated steel according to ASTM A 153/A 153M or ASTM F 2329.
- B. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane polymer sealant of type, grade, class, and use classifications required by roofing-specialty manufacturer for each application.
- C. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type joints with limited movement.
- D. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.
- E. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

2.9 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- D. Coil-Coated Galvanized-Steel Sheet Finishes:
 - 1. High-Performance Organic Finish: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with ASTM A 755/A 755M and coating and resin manufacturers' written instructions.
 - a. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

- b. Concealed Surface Finish: Apply pretreatment and manufacturer's standard acrylic or polyester backer finish consisting of prime coat and wash coat with a minimum total dry film thickness of **0.5 mil (0.013 mm)**.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of the Work.
- B. Examine walls, roof edges, and parapets for suitable conditions for roof specialties.
- C. Verify that substrate is sound, dry, smooth, clean, sloped for drainage where applicable, and securely anchored.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 UNDERLAYMENT INSTALLATION

- A. Self-Adhering Sheet Underlayment: Apply primer if required by manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation. Apply wrinkle staggered **24 inches** between courses. Overlap side edges not less than **3-1/2 inches**. Roll laps with roller. Cover underlayment within 14 days.
 1. Apply continuously under copings, roof-edge specialties and reglets and counterflashings.
 2. Coordinate application of self-adhering sheet underlayment under roof specialties with requirements for continuity with adjacent air barrier materials.
- B. Felt Underlayment: Install with adhesive for temporary anchorage to minimize use of mechanical fasteners under roof specialties. Apply in shingle fashion to shed water, with lapped joints of not less than **2 inches**.
- C. Slip Sheet: Install with tape or adhesive for temporary anchorage to minimize use of mechanical fasteners under roof specialties. Apply in shingle fashion to shed water, with lapped joints of not less than **2 inches**.

3.3 INSTALLATION, GENERAL

- A. General: Install roof specialties according to manufacturer's written instructions. Anchor roof specialties securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, underlayments, sealants, and other miscellaneous items as required to complete roof-specialty systems.

1. Install roof specialties level, plumb, true to line and elevation; with limited oil-canning and without warping, jogs in alignment, buckling, or tool marks.
 2. Provide uniform, neat seams with minimum exposure of solder and sealant.
 3. Install roof specialties to fit substrates and to result in weathertight performance. Verify shapes and dimensions of surfaces to be covered before manufacture.
 4. Torch cutting of roof specialties is not permitted.
 5. Do not use graphite pencils to mark metal surfaces.
- B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.
1. Bed flanges in thick coat of asphalt roofing cement where required by manufacturers of roof specialties for waterproof performance.
- C. Expansion Provisions: Allow for thermal expansion of exposed roof specialties.
1. Space movement joints at a maximum of **12 feet (3.6 m)** with no joints within **18 inches (450 mm)** of corners or intersections unless otherwise indicated on Drawings.
 2. When ambient temperature at time of installation is between **40 and 70 deg F (4 and 21 deg C)**, set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures.
- D. Fastener Sizes: Use fasteners of sizes that penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.
- E. Seal concealed joints with butyl sealant as required by roofing-specialty manufacturer.
- F. Seal joints as required for weathertight construction. Place sealant to be completely concealed in joint. Do not install sealants at temperatures below **40 deg F (4 deg C)**.
- G. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets to be soldered to a width of **1-1/2 inches (38 mm)**; however, reduce pre-tinning where pre-tinned surface would show in completed Work. Tin edges of uncoated copper sheets using solder for copper. Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.
- ### 3.4 COPING INSTALLATION
- A. Install cleats, anchor plates, and other anchoring and attachment accessories and devices with concealed fasteners.
 - B. Anchor copings with manufacturer's required devices, fasteners, and fastener spacing to meet performance requirements.

1. Interlock face and back leg drip edges of snap-on coping cap into cleated anchor plates anchored to substrate at manufacturer's required spacing that meets performance requirements.
2. Interlock face-leg drip edge into continuous cleat anchored to substrate at manufacturer's required spacing that meets performance requirements. Anchor back leg of coping with screw fasteners and elastomeric washers at manufacturer's required spacing that meets performance requirements.

3.5 ROOF-EDGE SPECIALITIES INSTALLATION

- A. Install cleats, cants, and other anchoring and attachment accessories and devices with concealed fasteners.
- B. Anchor roof edgings with manufacturer's required devices, fasteners, and fastener spacing to meet performance requirements.

3.6 ROOF-EDGE DRAINAGE-SYSTEM INSTALLATION

- A. General: Assume after inspection that existing gutters can be left in place or reinstalled to allow for new roofing system to be installed.

3.7 REGLET AND COUNTERFLASHING INSTALLATION

- A. General: Coordinate installation of reglets and counterflashings with installation of base flashings.
- B. Surface-Mounted Reglets: Install reglets to receive flashings where flashing without embedded reglets is indicated on Drawings. Install at height so that inserted counterflashings overlap **4 inches (100 mm)** over top edge of base flashings.
- C. Counterflashings: Insert counterflashings into reglets or other indicated receivers; ensure that counterflashings overlap **4 inches (100 mm)** over top edge of base flashings. Lap counterflashing joints a minimum of **4 inches (100 mm)** and bed with butyl sealant. Fit counterflashings tightly to base flashings.

3.8 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder and sealants.
- C. Remove temporary protective coverings and strippable films as roof specialties are installed. On completion of installation, clean finished surfaces, including removing unused fasteners, metal filings, pop rivet stems, and pieces of flashing. Maintain roof specialties in a clean condition during construction.

- D. Replace roof specialties that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION 077100

SECTION 077200 - ROOF ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Equipment supports.
 - 2. Roof hatches.
 - 3. Gravity ventilators.
 - 4. Pipe and duct supports.
 - 5. Pipe portals.
 - 6. Prefformed flashing sleeves.
- B. Related Sections:
 - 1. Section 055000 "Metal Fabrications" for metal vertical ladders, ships' ladders, and stairs for access to roof hatches.
 - 2. Section 076200 "Sheet Metal Flashing and Trim" for shop- and field-formed metal flashing, roof-drainage systems, roof expansion-joint covers, and miscellaneous sheet metal trim and accessories.
 - 3. Section 077100 "Roof Specialties" for manufactured fasciae, copings, gravel stops, gutters and downspouts, and counterflashing.

1.3 COORDINATION

- A. Coordinate layout and installation of roof accessories with roofing membrane and base flashing and interfacing and adjoining construction to provide a leakproof, weathertight, secure, and noncorrosive installation.
- B. Coordinate dimensions with rough-in information or Shop Drawings of equipment to be supported.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of roof accessory.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: For roof accessories.

1. Include plans, elevations, keyed details, and attachments to other work. Indicate dimensions, loadings, and special conditions. Distinguish between plant- and field-assembled work.

1.5 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Roof plans, drawn to scale, and coordinating penetrations and roof-mounted items. Show the following:

1. Size and location of roof accessories specified in this Section.
2. Method of attaching roof accessories to roof or building structure.
3. Other roof-mounted items including mechanical and electrical equipment, ductwork, piping, and conduit.
4. Required clearances.

B. Sample Warranties: For manufacturer's special warranties.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For roof accessories to include in operation and maintenance manuals.

1.7 WARRANTY

A. Special Warranty on Painted Finishes: Manufacturer's standard form in which manufacturer agrees to repair finishes or replace roof accessories that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Fluoropolymer Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
2. Finish Warranty Period: [20] [10] <Insert number> years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General Performance: Roof accessories shall withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.
- B. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design [roof curbs] [and] [equipment supports] to comply with wind performance requirements, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- C. Wind-Restraint Performance: [As indicated on Drawings] <Insert requirements>.

2.2 ROOF HATCH

- A. Roof Hatches: Metal roof-hatch units with lids and insulated single walled curbs, welded or mechanically fastened and sealed corner joints, continuous lid-to-curb counterflashing and weathertight perimeter gasketing, straight sides, and integrally formed deck-mounting flange at perimeter bottom.
- B. Type and Size: Single-leaf lid, **30 by 30 inches min**
- C. Loads: Minimum **40-lbf/sq. ft.** external live load and **20-lbf/sq. ft.** internal uplift load.
- D. Hatch Material: Zinc-coated (galvanized) steel sheet.
 - 1. Thickness: [Manufacturer's standard thickness for hatch size indicated.
 - 2. Finish: Two-coat fluoropolymer
 - 3. Color: As selected by Architect from manufacturer's full range
- E. Construction:
 - 1. Insulation: Cellulosic-fiber board or Glass-fiber board
 - a. R-Value: 12.0 according to ASTM C 1363.
 - 2. Nailer: Factory-installed wood nailer continuous around hatch perimeter.
 - 3. Hatch Lid: Opaque, insulated, and double walled, with manufacturer's standard metal liner of same material and finish as outer metal lid.
 - 4. Curb Liner: Manufacturer's standard, of same material and finish as metal curb.

5. Fabricate curbs to minimum height of **12 inches** above roofing surface unless otherwise indicated.
- F. Hardware: Spring operators, hold-open arm, galvanized steel spring latch with turn handles, galvanized-steel butt- or pintle-type hinge system, and padlock hasps inside and outside.
- G. Ladder-Assist Post: Roof-hatch manufacturer's standard device for attachment to roof-access ladder.
 1. Operation: Post locks in place on full extension; release mechanism returns post to closed position.
 2. Height: **42 inches (1060 mm)** above finished roof deck.
 3. Material: Steel tube
 4. Post: **1-5/8-inch- (41-mm-)** diameter pipe.
 5. Finish: Manufacturer's standard baked enamel or powder coat.

2.3 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of the Work.
- B. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
- C. Verify dimensions of roof openings for roof accessories.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Install roof accessories according to manufacturer's written instructions.
 1. Install roof accessories level; plumb; true to line and elevation; and without warping, jogs in alignment, buckling, or tool marks.

2. Anchor roof accessories securely in place so they are capable of resisting indicated loads.
3. Use fasteners, separators, sealants, and other miscellaneous items as required to complete installation of roof accessories and fit them to substrates.
4. Install roof accessories to resist exposure to weather without failing, rattling, leaking, or loosening of fasteners and seals.

B. Roof-Hatch Installation:

1. Verify that roof hatch operates properly. Clean, lubricate, and adjust operating mechanism and hardware.
2. Attach safety railing system to roof-hatch curb.
3. Attach ladder-assist post according to manufacturer's written instructions.

END OF SECTION 077200

SECTION 083313 - COILING COUNTER DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Counter doors (Reinstall existing coiling door – see documents)

- B. Related Requirements:

- 1. Section 055000 "Metal Fabrications" for door-opening framing and corner guards.
 - 2. Section 099123 "Interior Painting" for finish painting of factory-primed doors.

1.3 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer for both installation and maintenance of units required for this Project.

PART 2 - PRODUCTS

2.1 COUNTER DOOR ASSEMBLY: Reinstall Existing Counter Door

- A. Counter Door: Coiling counter door formed with curtain of interlocking metal slats.
- B. Manual Door Operator: Reconnect to be fully operational, replace any components to allow for serviceable operation of the existing door.

2.2 LOCKING DEVICES

- A. Locking Device Assembly: Reinstall to allow for operational use and locking of existing door.

2.3 MANUAL DOOR OPERATORS

- A. General: Equip door with manual door operator by door manufacturer.
- B. Push-up Door Operation: Reinstall counterbalance mechanism so that required lift or pull for door operation does not exceed 25 lbf.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates areas and conditions, with Installer present, for compliance with requirements for substrate construction and other conditions affecting performance of the Work.
- B. Examine locations of electrical connections.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install coiling counter doors and operating equipment complete with necessary hardware, anchors, inserts, hangers, and equipment supports; according to manufacturer's written instructions and as specified.
- B. Install coiling counter doors, hoods, controls, and operators at the mounting locations indicated for each door.

3.3 ADJUSTING

- A. Adjust hardware and moving parts to function smoothly so that doors operate easily, free of warp, twist, or distortion.
- B. Lubricate bearings and sliding parts as recommended by manufacturer.
- C. Adjust seals to provide tight fit around entire perimeter.

END OF SECTION 083313

SECTION 092216 - NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. Non-load-bearing steel framing systems for interior partitions.
2. Suspension systems for interior ceilings and soffits.
3. Grid suspension systems for gypsum board ceilings.

- B. Related Requirements:

1. Section 054000 "Cold-Formed Metal Framing" for exterior and interior load-bearing and exterior non-load-bearing wall studs; floor joists; roof rafters and ceiling joists; and roof trusses.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of code-compliance certification for studs and tracks.

1.5 QUALITY ASSURANCE

- A. Code-Compliance Certification of Studs and Tracks: Provide documentation that framing members are certified according to the product-certification program of [the Certified Steel Stud Association] [the Steel Framing Industry Association] [or] [the Steel Stud Manufacturers Association].

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Horizontal Deflection: For wall assemblies, limited to 1/240 of the wall height based on horizontal loading of 10 lbf/sq. ft. (480 Pa).

2.2 FRAMING SYSTEMS

- A. Framing Members, General: Comply with ASTM C 754 for conditions indicated.
1. Steel Sheet Components: Comply with ASTM C 645 requirements for metal unless otherwise indicated.
 2. Protective Coating: ASTM A 653/A 653M, G40 (Z120) hot-dip galvanized unless otherwise indicated.
- B. Studs and Tracks: ASTM C 645.
1. Steel Studs and Tracks:
 - a. Minimum Base-Metal Thickness: As required by performance requirements for horizontal deflection.
 - b. Depth: As indicated on Drawings, shall match existing sizes when patching into existing conditions.
- C. Slip-Type Head Joints: Where indicated, provide[one of] the following:
1. Clip System: Clips designed for use in head-of-wall deflection conditions that provide a positive attachment of studs to tracks while allowing 1-1/2-inch (38-mm) minimum vertical movement.
 2. Single Long-Leg Track System: ASTM C 645 top track with 2-inch- (51-mm-) deep flanges in thickness not less than indicated for studs, installed with studs friction fit into top track and with continuous bridging located within 12 inches (305 mm) of the top of studs to provide lateral bracing.
 3. Double-Track System: ASTM C 645 top outer tracks, inside track with 2-inch- (51-mm-) deep flanges in thickness not less than indicated for studs and fastened to studs, and outer track sized to friction-fit over inner track.
 4. Deflection Track: Steel sheet top track manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.
- D. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.
1. Minimum Base-Metal Thickness: 0.0179 inch (0.455 mm) or match existing if greater.
- E. Hat-Shaped, Rigid Furring Channels: ASTM C 645.
1. Minimum Base-Metal Thickness: 0.0179 inch (0.455 mm).

2. Depth: shall match existing.
- F. Cold-Rolled Furring Channels: 0.053-inch (1.34-mm) uncoated-steel thickness, with minimum 1/2-inch- (13-mm-) wide flanges.
1. Depth: Shall match existing
 2. Furring Brackets: Adjustable, corrugated-edge-type steel sheet with minimum uncoated-steel thickness of 0.0329 inch (0.8 mm).
 3. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062-inch- (1.59-mm-) diameter wire, or double strand of 0.048-inch- (1.21-mm-) diameter wire.
- G. Z-Shaped Furring: With slotted or nonslotted web, face flange of 1-1/4 inches (32 mm), wall attachment flange of 7/8 inch (22 mm), minimum uncoated-metal thickness of 0.0179 inch (0.455 mm), and depth required to fit insulation thickness indicated.

2.3 SUSPENSION SYSTEMS

- A. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062-inch- (1.59-mm-) diameter wire, or double strand of 0.048-inch- (1.21-mm-) diameter wire.
- B. Hanger Attachments to Concrete:
1. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES [AC01] [AC193] [AC58] [or] [AC308] as appropriate for the substrate.
 - a. Uses: Securing hangers to structure.
 - b. Type: Torque-controlled, expansion anchor
 - c. Material for Interior Locations: Carbon-steel components zinc-plated to comply with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5, unless otherwise indicated.
 2. Power-Actuated Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
- C. Wire Hangers: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.16 inch (4.12 mm) in diameter.
- D. Flat Hangers: Steel sheet, 1 by 3/16 inch (25 by 5 mm), UON.
- E. Furring Channels (Furring Members):
1. Cold-Rolled Channels: 0.0538-inch (1.367-mm) uncoated-steel thickness, with minimum 1/2-inch- (13-mm-) wide flanges, 3/4 inch (19 mm) deep.
 2. Steel Studs and Tracks: ASTM C 645.
 - a. Minimum Base-Metal Thickness: 0.0179 inch (0.455 mm).
 - b. Depth: [As indicated on Drawings]
 - 3.

4. Hat-Shaped, Rigid Furring Channels: ASTM C 645, 7/8 inch (22 mm) deep.
 - a. Minimum Base-Metal Thickness: As indicated on Drawings
5. Resilient Furring Channels: 1/2-inch- (13-mm-) deep members designed to reduce sound transmission.
 - a. Configuration: hat shaped.
- F. Grid Suspension System for Gypsum Board Ceilings: ASTM C 645, direct-hung system composed of main beams and cross-furring members that interlock.

2.4 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards.
 1. Fasteners for Steel Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Suspended Assemblies: Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength.
 1. Furnish concrete inserts and other devices indicated to other trades for installation in advance of time needed for coordination and construction.

3.3 INSTALLATION, GENERAL

- A. Installation Standard: ASTM C 754.
 1. Gypsum Plaster Assemblies: Also comply with requirements in ASTM C 841 that apply to framing installation.
 2. Portland Cement Plaster Assemblies: Also comply with requirements in ASTM C 1063 that apply to framing installation.

3. Gypsum Veneer Plaster Assemblies: Also comply with requirements in ASTM C 844 that apply to framing installation.
 4. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.
- B. Install framing and accessories plumb, square, and true to line, with connections securely fastened.
 - C. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.
 - D. Install bracing at terminations in assemblies.
 - E. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

3.4 INSTALLING FRAMED ASSEMBLIES

- A. Install framing system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types shall be at 16" OC, UON
- B. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.
- C. Install studs so flanges within framing system point in same direction.
- D. Install tracks at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts that penetrate partitions above ceiling.
 1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
 2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install track section (for cripple studs) at head and secure to jamb studs.
 - a. Install two studs at each jamb unless otherwise indicated.
 - b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch (13-mm) clearance from jamb stud to allow for installation of control joint in finished assembly.
 - c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.
 3. Other Framed Openings: Frame openings other than door openings the same as required for door openings unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
- E. Direct Furring:

1. Screw to wood framing.
2. Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches (610 mm) o.c.

F. Z-Shaped Furring Members:

1. Erect insulation, specified in Section 072100 "Thermal Insulation," vertically and hold in place with Z-shaped furring members spaced 24 inches o.c.
2. Except at exterior corners, securely attach narrow flanges of furring members to wall with concrete stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches (610 mm) o.c.
3. At exterior corners, attach wide flange of furring members to wall with short flange extending beyond corner; on adjacent wall surface, screw-attach short flange of furring channel to web of attached channel. At interior corners, space second member no more than 12 inches (305 mm) from corner and cut insulation to fit.

- G. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch (3 mm) from the plane formed by faces of adjacent framing.

3.5 INSTALLING CEILING SUSPENSION SYSTEMS

- A. Install suspension system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types. See requirements on documents for adherence to the most restrictive requirements for installation.

1. Hangers: [48 inches (1219 mm) o.c.
2. Carrying Channels (Main Runners): [48 inches (1219 mm) o.c.
3. Furring Channels (Furring Members): [16 inches (406 mm)] [24 inches (610 mm) o.c.

- B. Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement.

- C. Suspend hangers from building structure as follows:

1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or suspension system.
 - a. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with locations of hangers required to support standard suspension system members, install supplemental suspension members and hangers in the form of trapezes or equivalent devices.

- a. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced installation standards.
 3. Wire Hangers: Secure by looping and wire tying, either directly to structures or to inserts, eye screws, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause hangers to deteriorate or otherwise fail.
 4. Flat Hangers: Secure to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices and fasteners that are secure and appropriate for structure and hanger, and in a manner that will not cause hangers to deteriorate or otherwise fail.
 5. Do not attach hangers to steel roof deck.
 6. Do not attach hangers to permanent metal forms. Furnish cast-in-place hanger inserts that extend through forms.
 7. Do not attach hangers to rolled-in hanger tabs of composite steel floor deck.
 8. Do not connect or suspend steel framing from ducts, pipes, or conduit.
- D. Fire-Resistance-Rated Assemblies: Wire tie furring channels to supports.
- E. Seismic Bracing: Sway-brace suspension systems with hangers used for support
- F. Grid Suspension Systems: Attach perimeter wall track or angle where grid suspension systems meet vertical surfaces. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track.
- G. Installation Tolerances: Install suspension systems that are level to within [1/8 inch in 12 feet (3 mm in 3.6 m) measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

END OF SECTION 092216

SECTION 092400 - CEMENT PLASTERING PATCHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. Exterior vertical plasterwork (stucco) to patch existing to allow for new roofing/flashing and counter flashing.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Store materials inside under cover, and keep them dry and protected against damage from weather, moisture, direct sunlight, surface contamination, corrosion, construction traffic, and other causes.

1.5 FIELD CONDITIONS

- A. Comply with ASTM C 926 requirements.
- B. Exterior Plasterwork:
 1. Apply and cure plaster to prevent plaster drying out during curing period. Use procedures required by climatic conditions, including moist curing, providing coverings, and providing barriers to deflect sunlight and wind.
 2. Apply plaster when ambient temperature is greater than 40 deg F (4.4 deg C).
 3. Protect plaster coats from freezing for not less than 48 hours after set of plaster coat has occurred.
- C. Factory-Prepared Finishes: Comply with manufacturer's written recommendations for environmental conditions for applying finishes.

PART 2 - PRODUCTS

2.1 METAL LATH

- A. Expanded-Metal Lath: ASTM C 847, cold-rolled carbon-steel sheet with ASTM A 653/A 653M, G60 (Z180), hot-dip galvanized-zinc coating to tie into existing.
- B. Wire-Fabric Lath:
 - 1. Welded-Wire Lath: ASTM C 933; self-furring, [1.4 lb/sq. yd. (0.8 kg/sq. m)] [1.95 lb/sq. yd. (1.1 kg/sq. m)].
- C. Paper Backing: FS UU-B-790a, Type I, Grade D, Style 2 vapor-permeable paper
 - 1. Provide paper-backed lath at exterior locations in locations indicated on Drawings that require patching.

2.2 ACCESSORIES

- A. General: Comply with ASTM C 1063, and coordinate depth of trim and accessories with thicknesses and number of plaster coats required.
- B. Metal Accessories (to match existing):
 - 1. Foundation Weep Screed: Fabricated from hot-dip galvanized-steel sheet, ASTM A 653/A 653M, G60 (Z180) zinc coating.
 - 2. Cornerite: Fabricated from metal lath with ASTM A 653/A 653M, G60 (Z180), hot-dip galvanized-zinc coating.
 - 3. Cornerbeads: Fabricated from zinc or zinc-coated galvanized steel to match existing.
- C. Plastic Accessories: Manufactured from high-impact PVC (to match existing).
 - 1. Cornerbeads: With perforated flanges.
 - 2. Casing Beads: With perforated flanges in depth required to suit plaster bases indicated and flange length required to suit applications indicated.

2.3 MISCELLANEOUS MATERIALS

- A. Water for Mixing and Finishing Plaster: Potable and free of substances capable of affecting plaster set or of damaging plaster, lath, or accessories.
- B. Fiber for Base Coat: Alkaline-resistant glass or polypropylene fibers, 1/2 inch (13 mm) long, free of contaminants, manufactured for use in cement plaster.
- C. Bonding Compound: ASTM C 932.
- D. Fasteners for Attaching Metal Lath to Substrates: ASTM C 1063.

2.4 PLASTER MATERIALS

- A. Portland Cement: ASTM C 150/C 150M, Type I.
- B. Colorants for Job-Mixed Finish Coats: Colorfast mineral pigments that produce finish plaster color to match existing.
- C. Lime: ASTM C 206, Type S; or ASTM C 207, Type S.
- D. Sand Aggregate: ASTM C 897.
- E. Perlite Aggregate: ASTM C 35.
- F. Ready-Mixed Finish-Coat Plaster: Mill-mixed portland cement, aggregates, coloring agents, and proprietary ingredients.
 - 1. Color: to Match existing cement plaster
- G. Acrylic-Based Finish Coatings: Factory-mixed acrylic-emulsion coating systems formulated with colorfast mineral pigments and fine aggregates; for use over cement plaster base coats. Include manufacturer's recommended primers and sealing topcoats for acrylic-based finishes.
 - 1. Color: To match existing

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PLASTER APPLICATION

- A. General: Comply with ASTM C 926.
 - 1. Do not deviate more than plus or minus 1/4 inch in 10 feet (6 mm in 3 m) from a true plane in finished plaster surfaces when measured by a 10-foot (3-m) straightedge placed on surface.
 - 2. Finish plaster flush with metal frames and other built-in metal items or accessories that act as a plaster ground unless otherwise indicated. Where casing bead does not terminate plaster at metal frame, cut base coat free from metal frame before plaster sets and groove finish coat at junctures with metal.
 - 3. Provide plaster surfaces that are ready to receive field-applied finishes indicated.

3.3 PLASTER REPAIRS

- A. Repair or replace work to eliminate cracks, dents, blisters, buckles, crazing and check cracking, dry outs, efflorescence, sweat outs, and similar defects and where bond to substrate has failed.

3.4 CLEANING AND PROTECTION

- A. Remove temporary protection and enclosure of other work after plastering is complete. Promptly remove plaster from door frames, windows, and other surfaces not indicated to be plastered. Repair floors, walls, and other surfaces stained, marred, or otherwise damaged during plastering.

END OF SECTION 092400

SECTION 092900 - GYPSUM BOARD

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. Interior gypsum board.
2. Exterior gypsum board for ceilings and soffits.
3. Tile backing panels.

- B. Related Requirements:

1. Section 092216 "Non-Structural Metal Framing" for non-structural steel framing and suspension systems that support gypsum board panels.
2. Section 093013 "Ceramic Tiling" for cementitious backer units installed as substrates for ceramic tile.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.5 FIELD CONDITIONS

- A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written instructions, whichever are more stringent.
- B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.
- C. Do not install panels that are wet, moisture damaged, and mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or blotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.

2.2 GYPSUM BOARD, GENERAL

- A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.3 INTERIOR GYPSUM BOARD

- A. Gypsum Wallboard: ASTM C 1396/C 1396M.
 1. Thickness: to match existing.
 2. Long Edges: Tapered
- B. Gypsum Board, Type X: ASTM C 1396/C 1396M.
 1. Thickness: to match existing.
 2. Long Edges: Tapered
- C. Gypsum Ceiling Board: ASTM C 1396/C 1396M.
 1. Thickness: to match existing.
 2. Long Edges: Tapered.

2.4 TILE BACKING PANELS

- A. Glass-Mat, Water-Resistant Backing Board: ASTM C 1178/C 1178M, with manufacturer's standard edges.
 1. Core: To match existing, Type X.
 2. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.
- B. Cementitious Backer Units: ANSI A118.9 and ASTM C 1288 or ASTM C 1325, with manufacturer's standard edges.
 1. Thickness: to match existing
 2. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

- C. Water-Resistant Gypsum Backing Board: ASTM C 1396/C 1396M, with manufacturer's standard edges.
 - 1. Core: to match existing, Type X.

2.5 TRIM ACCESSORIES

- A. Interior Trim: ASTM C 1047.
 - 1. Material: Galvanized steel sheet, rolled zinc, plastic, or paper-faced galvanized-steel sheet to match existing
 - 2. Shapes: Shall match existing:
 - a. Cornerbead.
 - b. Bullnose bead.
 - c. LC-Bead: J-shaped; exposed long flange receives joint compound.
 - d. L-Bead: L-shaped; exposed long flange receives joint compound.
 - e. U-Bead: J-shaped; exposed short flange does not receive joint compound.
 - f. Expansion (control) joint.
 - g. Curved-Edge Cornerbead: With notched or flexible flanges.

2.6 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C 475/C 475M.
- B. Joint Tape:
 - 1. Interior Gypsum Board: Paper.
 - 2. Tile Backing Panels: As recommended by panel manufacturer.
- C. Joint Compound for Interior Gypsum Board: For each coat, use formulation that is compatible with other compounds applied on previous or for successive coats.
 - 1. Prefilling: At open joints[, rounded or beveled panel edges,] and damaged surface areas, use setting-type taping compound.
 - 2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use [setting-type taping] [drying-type, all-purpose] compound.
 - a. Use setting-type compound for installing paper-faced metal trim accessories.
 - 3. Fill Coat: For second coat, use [setting-type, sandable topping] [drying-type, all-purpose] compound.
 - 4. Skim/Finish Coat: To match existing for final coat.
- D. Joint Compound for Tile Backing Panels:

1. Glass-Mat, Water-Resistant Backing Panel: As recommended by backing panel manufacturer.
2. Cementitious Backer Units: As recommended by backer unit manufacturer.
3. Water-Resistant Gypsum Backing Board: Use setting-type taping compound and setting-type, sandable topping compound.

2.7 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.
- B. Steel Drill Screws: ASTM C 1002 unless otherwise indicated.
 1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick.
 2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates including welded hollow-metal frames and support framing, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLYING AND FINISHING PANELS, GENERAL

- A. Comply with ASTM C 840.
- B. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch (1.5 mm) of open space between panels. Do not force into place.
- C. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
 1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. (0.7 sq. m) in area.
 2. Fit gypsum panels around ducts, pipes, and conduits.

3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch- (6.4- to 9.5-mm-) wide joints to install sealant.
- D. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments. Provide 1/4- to 1/2-inch- (6.4- to 12.7-mm-) wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- E. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.
- F. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

3.3 APPLYING INTERIOR GYPSUM BOARD

- A. Single-Layer Application:
 1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
 2. On partitions/walls, apply gypsum panels [vertically (parallel to framing)] [horizontally (perpendicular to framing)] unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
 - a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
 3. On Z-shaped furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
 4. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

3.4 APPLYING TILE BACKING PANELS

- A. Glass-Mat, Water-Resistant Backing Panels: Comply with manufacturer's written installation instructions and install at [showers, tubs, and where indicated] [locations indicated to receive tile]. Install with 1/4-inch (6.4-mm) gap where panels abut other construction or penetrations.
- B. Cementitious Backer Units: ANSI A108.11, at [showers, tubs, and where indicated] [locations indicated to receive tile].
- C. Water-Resistant Backing Board: Install where indicated with 1/4-inch (6.4-mm) gap where panels abut other construction or penetrations.
- D. Where tile backing panels abut other types of panels in same plane, shim surfaces to produce a uniform plane across panel surfaces.

3.5 INSTALLING TRIM ACCESSORIES

- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Control Joints: Install control joints [at locations indicated on Drawings] [according to ASTM C 840 and in specific locations approved by Architect for visual effect].
- C. Interior Trim: Install in the following locations:
 - 1. Cornerbead: Use at outside corners[unless otherwise indicated].
 - 2. Bullnose Bead: Use [at outside corners] [where indicated] <Insert requirements>.
 - 3. LC-Bead: Use [at exposed panel edges] <Insert requirements>.
 - 4. L-Bead: Use [where indicated] <Insert requirements>.
 - 5. U-Bead: Use [at exposed panel edges] [where indicated] <Insert requirements>.
 - 6. Curved-Edge Cornerbead: Use at curved openings.
- D. Exterior Trim: Install in the following locations:
 - 1. Cornerbead: Use at outside corners.
 - 2. LC-Bead: Use [at exposed panel edges] <Insert requirements>.
- E. Aluminum Trim: Install in locations [indicated on Drawings] <Insert requirements>.

3.6 FINISHING GYPSUM BOARD

- A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Prefill open joints[, rounded or beveled edges,] and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.
- D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840 to match existing finishes:
 - a. Primer and its application to surfaces are specified in Section 099123 "Interior Painting."
- E. Glass-Mat Gypsum Sheathing Board: Finish according to manufacturer's written instructions for use as exposed soffit board.
- F. Glass-Mat Faced Panels: Finish according to manufacturer's written instructions.
- G. Cementitious Backer Units: Finish according to manufacturer's written instructions.

3.7 PROTECTION

- A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.
- B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- C. Remove and replace panels that are wet, moisture damaged, and mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 092900

SECTION 093013 - CERAMIC TILING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Pressed floor tile to match existing.
 - 2. Glazed wall tile to match existing.
 - 3. Tile backing panels.
 - 4. Waterproof membrane **for thinset applications**.
- B. Related Requirements:
 - 1. Section 079200 "Joint Sealants" for sealing of expansion, contraction, control, and isolation joints in tile surfaces.
 - 2. Section 092400 "Cement Plastering" for scratch coat for thickset mortar setting-bed installations.
 - 3. Section 092900 "Gypsum Board" for **cementitious backer units**.

1.3 DEFINITIONS

- A. General: Definitions in the ANSI A108 series of tile installation standards and in ANSI A137.1 apply to Work of this Section unless otherwise specified.
- B. ANSI A108 Series: ANSI A108.01, ANSI A108.02, ANSI A108.1A, ANSI A108.1B, ANSI A108.1C, ANSI A108.4, ANSI A108.5, ANSI A108.6, ANSI A108.8, ANSI A108.9, ANSI A108.10, ANSI A108.11, ANSI A108.12, ANSI A108.13, ANSI A108.14, ANSI A108.15, ANSI A108.16, and ANSI A108.17, which are contained in its "Specifications for Installation of Ceramic Tile."
- C. Module Size: Actual tile size plus joint width indicated.
- D. Face Size: Actual tile size, excluding spacer lugs.

1.4 PREINSTALLATION MEETINGS

- 1. Review requirements in ANSI A108.01 for substrates and for preparation by other trades.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples for Verification:
 - 1. Full-size units of each type and composition of tile and for each color and finish required.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Certificates: For each type of product.
- C. Product Test Reports: For tile-setting and -grouting products.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match and are from same production runs as products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Tile and Trim Units: **Furnish quantity of full-size units equal to 3 percent of amount installed for each type, composition, color, pattern, and size indicated.**
 - 2. Grout: Furnish quantity of grout equal to 3 percent of amount installed for each type, composition, and color indicated.

1.8 QUALITY ASSURANCE

- A. Installer Qualifications:
 - 1. Installer's supervisor for Project holds the International Masonry Institute's Foreman Certification.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirements in ANSI A137.1 for labeling tile packages.
- B. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination can be avoided.

- D. Store liquid materials in unopened containers and protected from freezing.

1.10 FIELD CONDITIONS

- A. Environmental Limitations: Do not install tile until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated in referenced standards and manufacturer's written instructions.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations for Tile: Match all existing tiles, grout and accessories.

2.2 PRODUCTS, GENERAL

- A. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1 for types, compositions, and other characteristics indicated.
 - 1. Provide tile complying with Standard grade requirements.
- B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced in other Part 2 articles, ANSI standards referenced by TCNA installation methods specified in tile installation schedules, and other requirements specified.

2.3 TILE PRODUCTS

- A. Ceramic Tile Type: Factory-mounted **glazed** wall tile and floor tile.
 - 1. Composition: To match existing
 - 2. Module Size: To match existing Face: with cushion edges.
 - 3. Dynamic Coefficient of Friction: Not less than 0.42.
 - 4. Finish: To match existing glaze.
 - 5. Tile Color and Pattern: To match existing
 - 6. Grout Color: To match existing.
 - a. Base Cove: Cove, module size: To match existing
 - b. Base Cap for Thinset Mortar Installations: To match existing
 - c. Wainscot Cap for Thinset Mortar Installations: To match existing
 - d. Internal Corners: Cove, module size To match existing

2.4 WATERPROOF MEMBRANE

- A. General: Manufacturer's standard product, that complies with ANSI A118.10 and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.

2.5 SETTING MATERIALS – Determine best suited to match existing

- A. Standard Dry-Set Mortar (Thinset): ANSI A118.1.
 - 1. For wall applications, provide mortar that complies with requirements for nonsagging mortar in addition to the other requirements in ANSI A118.1.

2.6 GROUT MATERIALS

- A. Standard Cement Grout: ANSI A118.6.

2.7 MISCELLANEOUS MATERIALS

- A. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.
- B. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.
- C. Floor Sealer: Manufacturer's standard product for sealing grout joints and that does not change color or appearance of grout.

2.8 MIXING MORTARS AND GROUT

- A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.
- B. Add materials, water, and additives in accurate proportions.
- C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine existing substrates, areas, and conditions where tile will be installed and patched into existing conditions.
1. Verify that substrates for setting tile are firm; dry; clean; free of coatings that are incompatible with tile-setting materials, including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.
 2. Verify that concrete substrates for tile floors installed with **bonded mortar bed or thinset mortar** comply with surface finish requirements in ANSI A108.01 for installations indicated.
 - a. Verify that surfaces that received a steel trowel finish have been mechanically scarified.
 - b. Verify that protrusions, bumps, and ridges have been removed by sanding or grinding.
 3. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed.
 4. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 CERAMIC TILE INSTALLATION

- A. Comply with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for TCNA installation methods specified in tile installation schedules. Comply with parts of the ANSI A108 series "Specifications for Installation of Ceramic Tile" that are referenced in TCNA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.
1. For the following installations, follow procedures in the ANSI A108 series of tile installation standards for providing 95 percent mortar coverage:
 - a. Tile floors in wet areas.
- B. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
- C. Accurately form intersections and returns to match with existing tile. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to

electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.

- D. Provide manufacturer's standard trim shapes where necessary to eliminate exposed tile edges.
- E. Jointing Pattern: Lay tile in grid pattern unless otherwise indicated to match with existing tile.
 - 1. Where adjoining tiles on floor, base, walls, or trim are specified or indicated to be same size, align joints.
- F. Joint Widths: to match with existing tile.
- G. Lay out tile wainscots to match with existing tile.

3.3 TILE BACKING PANEL INSTALLATION

- A. Install panels and treat joints according to ANSI A108.11 and manufacturer's written instructions for type of application indicated.

3.4 ADJUSTING AND CLEANING

- A. Remove and replace tile that is damaged or that does not match adjoining tile. Provide new matching units, installed as specified and in a manner to eliminate evidence of replacement.
- B. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.
 - 1. Remove grout residue from tile as soon as possible.
 - 2. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions but no sooner than 10 days after installation. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.

3.5 PROTECTION

- A. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear. If recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors.
- B. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.

- C. Before final inspection, remove protective coverings and rinse neutral protective cleaner from tile surfaces.

END OF SECTION 093013

SECTION 095113 - ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes acoustical panels and exposed suspension systems for interior ceilings. Panels shall be furnished to match existing Panels on site and only to replace existing panels that have been damaged and cannot be reinstalled. Support frames shall be selected to accommodate existing panels. Ceiling panel systems shall accommodate the re-installation of existing insulation over top of the new panels/supporting frame. Follow profiles of existing classrooms 101, 102, 103, 104, 105 & 106 for sloped conditions and install to match.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference to determine extent of panels to be ordered.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each exposed product and for each color and texture specified, 6 inches (150 mm) in size.
- C. Samples for Verification: For each component indicated and for each exposed finish required, prepared on Samples of sizes indicated below:
 - 1. Acoustical Panels: Set of 6-inch- (150-mm-) square Samples of each type, color, pattern, and texture.
- D. Delegated-Design Submittal: For seismic restraints for ceiling systems.
 - 1. Include design calculations for seismic restraints including analysis data signed and sealed by the qualified professional engineer responsible for their preparation. See DSA requirements for installation.

1.5 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved. Ceiling layout shall accommodate the existing conditions including coordination of the existing fire sprinklers, field verify conditions prior to layout drawings:
 - 1. Ceiling suspension-system members.
 - 2. Structural members to which suspension systems will be attached.
 - 3. Method of attaching hangers to building structure, confirm adherence to DSA standards and details for installation.
 - 4. Items penetrating finished ceiling and ceiling-mounted items including the following:
 - a. Lighting fixtures.
 - b. Diffusers.
 - c. Grilles.
 - d. Speakers.
 - e. Sprinklers.
 - f. Access panels.
 - g. Perimeter moldings.
- B. Qualification Data: For testing agency.
- C. Product Test Reports: For each acoustical panel ceiling, for tests performed by manufacturer.
- D. Evaluation Reports: For each acoustical panel ceiling suspension system and anchor and fastener type, from ICC-ES.
- E. Field quality-control reports.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For finishes to include in maintenance manuals.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver acoustical panels, suspension-system components, and accessories to Project site and store them in a fully enclosed, conditioned space where they will be protected

against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.

- B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.

1.9 FIELD CONDITIONS

- A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Shall match existing panels, and provide supporting suspension system from single source from single manufacturer for matching panel.

2.2 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design seismic restraints for ceiling systems based on location and jurisdiction.
- B. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 1. Flame-Spread Index: Class B according to ASTM E 1264.
 2. Smoke-Developed Index: 450 or less.

2.3 ACOUSTICAL PANELS

- A. Acoustical Panel Standard: Shall match existing and comply with ASTM E 1264.
- B. Color: Shall match existing
- C. Edge/Joint Detail: Shall match existing
- D. Thickness: Shall match existing
- E. Modular Size: 24 by 48 inches (610 by 1220 mm)

2.4 METAL SUSPENSION SYSTEM

- A. Metal Suspension-System Standard: Provide manufacturer's standard, direct-hung, metal suspension system and accessories according to ASTM C 635/C 635M and designated by type, structural classification, and finish indicated.
- B. Wide-Face, Capped, Double-Web, Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet; prepainted, electrolytically zinc coated, or hot-dip galvanized, G30 (Z90) coating designation; with prefinished 15/16-inch- (24-mm-) wide metal caps on flanges.
 - 1. Structural Classification: Heavy-duty system.
 - 2. Face Design: Flat, flush.
 - 3. Cap Material: Cold-rolled steel
 - 4. Cap Finish: As selected by Architect from full ranges of manufacturer's colors

2.5 ACCESSORIES

- A. Attachment Devices: Size for five times the design load indicated in ASTM C 635/C 635M, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements – See structural documents and DSA for additional requirements.
 - 1. Anchors in Concrete: Anchors of type and material indicated below, with holes or loops for attaching hangers of type indicated and with capability to sustain, without failure, a load equal to five times that imposed by ceiling construction, as determined by testing according to ASTM E 488/E 488M or ASTM E 1512 as applicable, conducted by a qualified testing and inspecting agency.
 - a. Type: Postinstalled expansion anchors.
 - b. Corrosion Protection: Carbon-steel components zinc plated according to ASTM B 633, Class SC 1 (mild) service condition.
 - c. Corrosion Protection: Stainless-steel components complying with ASTM F 593 and ASTM F 594, Group 1 Alloy 304 or 316.
 - d. Corrosion Protection: Components fabricated from nickel-copper-alloy rods complying with ASTM B 164 for UNS No. N04400 alloy.
 - 2. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hangers of type indicated and with capability to sustain, without failure, a load equal to 10 times that imposed by ceiling construction, as determined by testing according to ASTM E 1190, conducted by a qualified testing and inspecting agency.
- B. Wire Hangers, Braces, and Ties: Provide wires as follows:
 - 1. Zinc-Coated, Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.

- C. Hanger Rods: Mild steel, zinc coated or protected with rust-inhibitive paint.
- D. Flat Hangers: Mild steel, zinc coated or protected with rust-inhibitive paint.
- E. Angle Hangers: Angles with legs not less than 7/8 inch (22 mm) wide; formed with 0.04-inch- (1-mm-) thick, galvanized-steel sheet complying with ASTM A 653/A 653M, G90 (Z275) coating designation; with bolted connections and 5/16-inch- (8-mm-) diameter bolts.
- F. Hold-Down Clips: Manufacturer's standard hold-down.
- G. Impact Clips: Manufacturer's standard impact-clip system designed to absorb impact forces against acoustical panels.
- H. Seismic Clips: Manufacturer's standard seismic clips designed to secure acoustical panels in place during a seismic event.
- I. Seismic Stabilizer Bars: Manufacturer's standard perimeter stabilizers designed to accommodate seismic forces.
- J. Seismic Struts: Manufacturer's standard compression struts designed to accommodate seismic forces.

2.6 METAL EDGE MOLDINGS AND TRIM

- A. Roll-Formed, Sheet-Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that comply with seismic design requirements; formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension-system runners.
 - 1. Edge moldings shall fit acoustical panel edge details and suspension systems indicated and match width and configuration of exposed runners unless otherwise indicated.
 - 2. For lay-in panels with reveal edge details, provide stepped edge molding that forms reveal of same depth and width as that formed between edge of panel and flange at exposed suspension member.
 - 3. For circular penetrations of ceiling, provide edge moldings fabricated to diameter required to fit penetration exactly.
- B. Extruded-Aluminum Edge Moldings and Trim: Where indicated, provide manufacturer's extruded-aluminum edge moldings and trim of profile indicated or referenced by manufacturer's designations, including splice plates, corner pieces, and attachment and other clips, complying with seismic design requirements.
 - 1. Baked-Enamel or Powder-Coat Finish: Minimum dry film thickness of 1.5 mils (0.04 mm). Comply with ASTM C 635/C 635M and coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.
- B. Examine acoustical panels before installation. Reject acoustical panels that are wet, moisture damaged, or mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders unless otherwise indicated, and comply with layout shown on reflected ceiling plans.
- B. Layout openings for penetrations centered on the penetrating items.

3.3 INSTALLATION

- A. Install acoustical panel ceilings according to ASTM C 636/C 636M and manufacturer's written instructions.
- B. Suspend ceiling hangers from building's structural members and as follows:
 - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
 - 2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
 - 3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
 - 4. Secure wire hangers to ceiling-suspension members and to supports above with a minimum of three tight turns. Connect hangers directly to structure or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
 - 5. Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices that are

- secure and appropriate for both the structure to which hangers are attached and the type of hanger involved. Install hangers in a manner that will not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.
6. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, postinstalled mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.
 7. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
 8. Do not attach hangers to steel deck tabs.
 9. Do not attach hangers to steel roof deck. Attach hangers to structural members.
 10. Space hangers not more than 48 inches (1200 mm) o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches (200 mm) from ends of each member.
 11. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards.
- C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or postinstalled anchors.
- D. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.
1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
 2. Screw attach moldings to substrate at intervals not more than 16 inches (400 mm) o.c. and not more than 3 inches (75 mm) from ends. Miter corners accurately and connect securely.
 3. Do not use exposed fasteners, including pop rivets, on moldings and trim.
- E. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
- F. Install acoustical panels with undamaged edges and fit accurately into suspension-system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide precise fit.
1. Arrange directionally patterned acoustical panels as follows:
 - a. As indicated on reflected ceiling plans.
 - b. Install panels with pattern running in one direction parallel to [long] [short] axis of space.
 - c. Install panels in a basket-weave pattern.
 2. For square-edged panels, install panels with edges fully hidden from view by flanges of suspension-system runners and moldings.
 3. For reveal-edged panels on suspension-system runners, install panels with bottom of reveal in firm contact with top surface of runner flanges.

4. For reveal-edged panels on suspension-system members with box-shaped flanges, install panels with reveal surfaces in firm contact with suspension-system surfaces and panel faces flush with bottom face of runners.
5. Paint cut edges of panel remaining exposed after installation; match color of exposed panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.
6. Install seismic clips in areas indicated; space according to panel manufacturer's written instructions unless otherwise indicated. Retain first subparagraph below for clean-room installations.
7. Protect lighting fixtures and air ducts according to requirements indicated for fire-resistance-rated assembly.

3.4 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections of completed installations of acoustical panel ceiling hangers and anchors and fasteners in successive stages and when installation of ceiling suspension systems on each floor has reached 20 percent completion, but no panels have been installed. Do not proceed with installations of acoustical panel ceiling hangers for the next area until test results for previously completed installations of acoustical panel ceiling hangers show compliance with requirements.
 1. Within each test area, testing agency will select one of every 10 power-actuated fasteners and postinstalled anchors used to attach hangers to concrete and will test them for 200 lbf (890 N) of tension; it will also select one of every two postinstalled anchors used to attach bracing wires to concrete and will test them for 440 lbf (1957 N) of tension.
 2. When testing discovers fasteners and anchors that do not comply with requirements, testing agency will test those anchors not previously tested until 20 pass consecutively and then will resume initial testing frequency.
- B. Acoustical panel ceiling hangers, anchors, and fasteners will be considered defective if they do not pass tests and inspections.
- C. Prepare test and inspection reports and forward to Owner/Architect.

3.5 CLEANING

- A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension-system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage.
- B. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 095113

CA Architects
June 6, 2017
100% CD

Solano Community College District
Vacaville (Annex) Renovation Project
Fairfield, California

SECTION 096813 - TILE CARPETING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes modular carpet tile.
- B. Related Requirements:
 - 1. Section 024119 "Selective Demolition" for removing existing floor coverings.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site
 - 1. Review methods and procedures related to carpet tile installation including, but not limited to, the following:
 - a. Review delivery, storage, and handling procedures.
 - b. Review ambient conditions and ventilation procedures.
 - c. Review subfloor preparation procedures and areas to be patched to match existing, adjacent carpet tiles. .
 - d. Specific areas to be patched to match existing to adequately coordinate for demolition of whole "squares" to be removed and subsequently patched.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include manufacturer's written data on physical characteristics, durability, and fade resistance.
 - 2. Include manufacturer's written installation recommendations for each type of substrate.
- B. Samples: For each of the following products and for each color and texture required. Label each Sample with manufacturer's name, material description, color, pattern, and designation indicated on Drawings and in schedules.

1. Carpet Tile: Full-size Sample.
 2. Exposed Edge, Transition, and Other Accessory Stripping: 12-inch- (300-mm-) long Samples.
- C. Samples for Verification: For each of the following products and for each color and texture required. Label each Sample with manufacturer's name, material description, color, pattern, and designation indicated on Drawings and in schedules.
1. Carpet Tile: Full-size Sample.
 2. Transition, and Other Accessory Stripping: 12-inch- (300-mm-) long Samples.
- D. Product Schedule: For carpet tile. Use same designations indicated on Drawings.
- E. Sustainable Product Certification: Provide ANSI/NSF 140 certification for carpet products.
- 1.5 INFORMATIONAL SUBMITTALS
- A. Qualification Data: For Installer.
 - B. Product Test Reports: For carpet tile, for tests performed by a qualified testing agency.
 - C. Sample Warranty: For special warranty.
- 1.6 CLOSEOUT SUBMITTALS
- A. Maintenance Data: For carpet tiles to include in maintenance manuals. Include the following:
 1. Methods for maintaining carpet tile, including cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule.
 2. Precautions for cleaning materials and methods that could be detrimental to carpet tile.
- 1.7 MAINTENANCE MATERIAL SUBMITTALS
- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
- 1.8 QUALITY ASSURANCE
- A. Installer Qualifications: An experienced installer who is certified by the International Certified Floorcovering Installers Association certification level.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Comply with CRI's "CRI Carpet Installation Standard."

1.10 FIELD CONDITIONS

- A. Comply with CRI's "CRI Carpet Installation Standard" for temperature, humidity, and ventilation limitations.
- B. Environmental Limitations: Do not deliver or install carpet tiles until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at levels planned for building occupants during the remainder of the construction period.
- C. Do not install carpet tiles over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive and concrete slabs have pH range recommended by carpet tile manufacturer.
- D. Where demountable partitions or other items are indicated for installation on top of carpet tiles, install carpet tiles before installing these items.

1.11 WARRANTY

- A. Special Warranty for Carpet Tiles: Manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period.
 - 1. Warranty does not include deterioration or failure of carpet tile due to unusual traffic, failure of substrate, vandalism, or abuse.
 - 2. Failures include, but are not limited to, the following:
 - a. More than 10 percent edge raveling, snags, and runs.
 - b. Dimensional instability.
 - c. Excess static discharge.
 - d. Loss of tuft-bind strength.
 - e. Loss of face fiber.
 - f. Delamination.
 - 3. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 CARPET TILE

- A. Color/Type: Tandus, Aftermath II, Tapestry #23512
- B. Pattern: to match existing, installed in whole "squares" only.

- C. Primary Backing/Backcoating: Manufacturer's standard composite materials.
- D. Size: 24 by 24 inches (610 by 610 mm).

2.2 INSTALLATION ACCESSORIES

- A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.
- B. Adhesives: Water-resistant, low-VOC mildew-resistant, nonstaining, pressure-sensitive type to suit products and subfloor conditions indicated, that comply with flammability requirements for installed carpet tile, and are recommended by carpet tile manufacturer for releasable installation.
- C. Metal Edge/Transition Strips: Extruded aluminum with mill finish of profile and width shown, of height required to protect exposed edge of carpet, and of maximum lengths to minimize running joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet tile performance.
- B. Examine carpet tile for type, color, pattern, and potential defects.
- C. Concrete Slabs: Verify that finishes comply with requirements specified in Section 033000 "Cast-in-Place Concrete" and that surfaces are free of cracks, ridges, depressions, scale, and foreign deposits.
 - 1. Moisture Testing: Perform tests so that each test area does not exceed [200 sq. ft. (18.6 sq. m) and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.
 - a. Perform moisture tests as recommended in writing by adhesive and carpet tile manufacturers. Proceed with installation only after substrates pass testing.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. General: Comply with CRI's "Carpet Installation Standards" and with carpet tile manufacturer's written installation instructions for preparing substrates indicated to receive carpet tile.

- B. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level cracks, holes and depressions 1/8 inch (3 mm) wide or wider, and protrusions more than 1/32 inch (0.8 mm) unless more stringent requirements are required by manufacturer's written instructions.
- C. Concrete Substrates: Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by adhesive and carpet tile manufacturers.

3.3 INSTALLATION

- A. General: Comply with CRI's "CRI Carpet Installation Standard," Section 18, "Modular Carpet" and with carpet tile manufacturer's written installation instructions.
- B. Installation Method: Per manufacturer's recommendation.
- C. Maintain pile-direction patterns: To match existing.
- D. Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet tile manufacturer.

3.4 CLEANING AND PROTECTION

- A. Perform the following operations immediately after installing carpet tile:
 - 1. Remove excess adhesive and other surface blemishes using cleaner recommended by carpet tile manufacturer.
 - 2. Remove yarns that protrude from carpet tile surface.
 - 3. Vacuum carpet tile using commercial machine with face-beater element.
- B. Protect carpet tile against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet tile manufacturer.

END OF SECTION 096813

SECTION 099113 - EXTERIOR PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes surface preparation and the application of paint systems on [exterior substrates.] [the following exterior substrates:]
 1. Wood Trim
 2. Portland cement plaster (stucco) where patching has occurred to match existing color. .

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
 1. Include printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
 2. Indicate VOC content.
- B. Samples for Initial Selection: For each type of topcoat product.
- C. Samples for Verification: For each type of paint system and each color and gloss of topcoat.
 1. Submit Samples on rigid backing, 8 inches (200 mm) square.
 2. Apply coats on Samples in steps to show each coat required for system.
 3. Label each coat of each Sample.
 4. Label each Sample for location and application area.
- D. Product List: Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.5 FIELD CONDITIONS

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).
- B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURER

2.2 Basis of Design: Sherman Williams, Low-VOC Latex

2.3 PAINT, GENERAL

- A. MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products Lists."
- B. Material Compatibility:
 1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.
- C. <Double click to insert sustainable design text for VOC content of paints.>
- D. Colors: [As selected by Architect from manufacturer's full range] [Match Architect's samples] [As indicated in a color schedule] <Insert requirements>
 1. [Ten] [Twenty] [Thirty] <Insert number> percent of surface area will be painted with deep tones.

2.4 SOURCE QUALITY CONTROL

1. Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint

surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.
- C. Proceed with coating application only after unsatisfactory conditions have been corrected.
 - 1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.
- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
- D. Wood Substrates:
 - 1. Sand surfaces that will be exposed to view, and dust off.
 - 2. Prime edges, ends, faces, undersides, and backsides of wood.

3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."
 - 1. Use applicators and techniques suited for paint and substrate indicated.

2. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.

B. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

3.4 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.5 EXTERIOR PAINTING SCHEDULE

A. Wood Substrates: Exposed Wood Trim/Framing.

1. Latex over Latex Primer System to match existing:
 - a. Prime Coat: Primer, latex for exterior wood.
 - b. Intermediate Coat: Latex, exterior, matching topcoat.
 - c. Topcoat: Latex, exterior, low-sheen.

B. Portland Cement Plaster Substrates:

1. Latex System [MPI EXT 9.1A] [MPI EXT 9.1J]:
 - a. Prime Coat: Primer, alkali resistant, water based.
 - b. Intermediate: Latex, exterior .
 - c. Topcoat: Latex, exterior, flat.

END OF SECTION 099113

SECTION 099123 - INTERIOR PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes surface preparation and the application of paint systems on [interior substrates.] [the following interior substrates:]
 1. Wood.
 2. Gypsum board.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
 1. Include Printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
 2. Indicate VOC content.
- B. Samples for Verification: For each type of paint system and in each color and gloss of topcoat.
 1. Submit Samples on rigid backing, 8 inches (200 mm) square.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).
 1. Maintain containers in clean condition, free of foreign materials and residue.
 2. Remove rags and waste from storage areas daily.

1.5 FIELD CONDITIONS

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).

- B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Sherman Williams, Latex Low-VOC as a basis of design.

2.2 PAINT, GENERAL

- A. MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products Lists."
- B. Material Compatibility:
 - 1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
- C. Colors: To match existing where painting is required on new work on visible surfaces.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.
- C. Plaster Substrates: Verify that plaster is fully cured.
- D. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.
- E. Proceed with coating application only after unsatisfactory conditions have been corrected.
 - 1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."
 - 1. Use applicators and techniques suited for paint and substrate indicated.
 - 2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
 - 3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
 - 4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
 - 5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.

3.4 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

CA Architects
July 20, 2017
100% CD

Solano Community College District
Vacaville (Annex) Renovation Project
Fairfield, California

END OF SECTION 099123

SECTION 102113.13 - METAL TOILET COMPARTMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes painted steel toilet compartments configured to match existing Floor Anchored Overhead Braced
- B. Related Requirements:
 - 1. Section 061000 "Rough Carpentry"
 - 2. Section 102800 "Toilet, Bath, and Laundry Accessories" for toilet tissue dispensers, grab bars, purse shelves, and similar accessories mounted on toilet compartments.
- C. Shop Drawings: If required for replacement for toilet compartments.
 - 1. Include plans, elevations, sections, and attachment details.
 - 2. Show locations of cutouts for compartment-mounted toilet accessories.
 - 3. Show locations of reinforcements for compartment-mounted grab bars and locations of blocking for surface-mounted toilet accessories.
 - 4. Show locations of centerlines of toilet fixtures.
 - 5. Show locations of floor drains.
 - 6. Show[ceiling grid, ceiling-mounted items, and] overhead support or bracing locations.
- D. Product Schedule: For toilet compartments, prepared by or under the supervision of supplier, detailing location and selected colors for toilet compartment material.

1.3 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of toilet compartment.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For toilet compartments to include in maintenance manuals.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Door Hinges: Shall match existing hinges and associated fasteners.
 - 2. Latch and Keeper: One latch and keeper with associated fasteners.
 - 3. Door Bumper: One door bumper with associated fasteners.
 - 4. Door Pull: One door pull each side with associated fasteners.
 - 5. Fasteners: Sufficient for application for each size and type.

1.6 PROJECT CONDITIONS

- A. Field Measurements: Inspect existing conditions to determine extent of new work to comply with documents for reverse swing and re-attachment of doors and other modifications as shown in documents. Verify actual locations of toilet fixtures, walls, columns, ceilings, and other construction contiguous with toilet compartments by field measurements before fabrication/modification/reinstallation.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with applicable provisions in the U.S. Architectural and Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities, and ICC A117.1 for toilet compartments designated as accessible.

2.2 PAINTED STEEL TOILET COMPARTMENTS

- A. Partition Enclosure Style: Overhead braced & Floor anchored and shall match existing colors, sizes, thickness and finishes. Inspect existing site conditions for compliance prior to bidding, note any discrepancies in bids from existing if applicable.
- B. Where new panels or components are required based on visual inspection they shall comply with Panel, and Pilaster Construction: Seamless, metal facing sheets pressure laminated to core material; with continuous, interlocking molding strip or lapped-and-formed edge closures; corners secured by welding or clips and exposed welds ground smooth. Exposed surfaces shall be free of pitting, seam marks, roller marks, stains, discolorations, telegraphing of core material, or other imperfections.
 - 1. Core Material: Manufacturer's standard sound-deadening honeycomb of resin-impregnated kraft paper in thickness required to provide finished thickness of 1 inch for doors and panels and 1-1/4 inches for pilasters.
 - 2. Grab-Bar Reinforcement: Provide concealed internal reinforcement for grab bars mounted on units of size and material adequate for panel to withstand applied

- downward load on grab bar of at least 250 lbf, when tested according to ASTM F 446, without deformation of panel.
3. Tapping Reinforcement: Provide concealed reinforcement for tapping (threading) at locations where machine screws are used for attaching items to units.
- C. Urinal-Screen Construction – to match existing color/finish:
1. Flat-Panel Urinal Screen: Matching panel construction.
 2. Integral-Flange, Wall-Hung Urinal Screen: Similar to panel construction, with integral full-height flanges for wall attachment, and maximum 1-1/4 inches thick.
 3. Wedge-Shaped, Wall-Hung Urinal Screen: Similar to panels, V-shaped, fabricated for concealed wall attachment, and maximum 6 inches wide at wall and minimum 1 inch wide at protruding end.
- D. Facing Sheets and Closures – to match existing color/finish: [Electrolytically coated steel] [or] [hot-dip galvanized-steel] sheet with nominal base-metal (uncoated) thicknesses as follows:
1. Pilasters, Braced at Both Ends: Manufacturer's standard thickness, but not less than 0.036 inch (0.91 mm).
 2. Pilasters, Unbraced at One End: Manufacturer's standard thickness, but not less than 0.048 inch (1.21 mm).
 3. Panels: Manufacturer's standard thickness, but not less than 0.030 inch (0.76 mm).
 4. Doors: Manufacturer's standard thickness, but not less than 0.030 inch (0.76 mm).
 5. Flat-Panel Urinal Screens: Thickness matching the panels.
 6. Integral-Flange, Wall-Hung Urinal Screens: Manufacturer's standard thickness, but not less than 0.030 inch (0.76 mm).
 7. Wedge-Shaped, Wall-Hung Urinal Screens: Manufacturer's standard thickness, but not less than 0.036 inch (0.91 mm).
- E. Pilaster Shoes and Sleeves & Caps: Stainless-steel sheet, not less than 0.031-inch (0.79-mm) nominal thickness and 3 inches (76 mm) high, finished to match hardware.
- F. Brackets (Fittings):
1. Stirrup Type: Ear or U-brackets; [chrome-plated zamac] [clear-anodized aluminum] [stainless steel] [chrome-plated brass].
- G. Steel Sheet Finish: Immediately after cleaning and pretreating, apply manufacturer's standard baked-on finish, including thermosetting, electrostatically applied, and powder coatings. Comply with coating manufacturer's written instructions for applying and baking.
1. Color: – to match existing color/finish

2.3 HARDWARE AND ACCESSORIES

- A. Hardware and Accessories: Manufacturer's standard operating hardware and accessories.
1. Material: [Chrome-plated zamac] [Clear-anodized aluminum] [Stainless steel] [Chrome-plated brass].
 2. Hinges: Manufacturer's standard [paired, self-closing type that can be adjusted to hold doors open at any angle up to 90 degrees] [continuous, cam type that swings to a closed or partially open position] [continuous, spring-loaded type] <Insert requirement>, allowing emergency access by lifting door.
 3. Latch and Keeper: Manufacturer's standard [recessed] [surface-mounted] latch unit designed for emergency access and with combination rubber-faced door strike and keeper. Provide units that comply with regulatory requirements for accessibility at compartments designated as accessible.
 4. Coat Hook: Manufacturer's standard combination hook and rubber-tipped bumper, sized to prevent in-swinging door from hitting compartment-mounted accessories.
 5. Door Bumper: Manufacturer's standard rubber-tipped bumper at out-swinging doors[and entrance-screen doors].
 6. Door Pull: Manufacturer's standard unit at out-swinging doors that complies with regulatory requirements for accessibility. Provide units on both sides of doors at compartments designated as accessible.
- B. Hardware and Accessories: Manufacturer's heavy-duty operating hardware and accessories.
1. Hinges: Manufacturer's minimum 0.062-inch- (1.59-mm-) thick, stainless-steel continuous, cam type that swings to a closed or partially open position allowing emergency access by lifting door. Mount with through-bolts.
 2. Latch and Keeper: Manufacturer's heavy-duty, surface-mounted, cast stainless-steel latch unit designed to resist damage due to slamming, with combination rubber-faced door strike and keeper and with provision for emergency access. Provide units that comply with regulatory requirements for accessibility at compartments designated as accessible. Mount with through-bolts.
 3. Coat Hook: Manufacturer's heavy-duty, combination cast stainless-steel hook and rubber-tipped bumper, sized to prevent in-swinging door from hitting compartment-mounted accessories. Mount with through-bolts.
 4. Door Bumper: Manufacturer's heavy-duty, rubber-tipped, cast stainless-steel bumper at out-swinging doors[and entrance-screen doors]. Mount with through-bolts.
 5. Door Pull: Manufacturer's heavy-duty cast stainless-steel pull at out-swinging doors that complies with regulatory requirements for accessibility. Provide units on both sides of doors at compartments designated as accessible. Mount with through-bolts.
- C. Overhead Bracing: Manufacturer's standard continuous, extruded-aluminum head rail with antigrip profile and in manufacturer's standard finish.

- D. Anchorages and Fasteners: Manufacturer's standard exposed fasteners of stainless steel, finished to match the items they are securing, with theft-resistant-type heads. Provide sex-type bolts for through-bolt applications. For concealed anchors, use stainless steel, hot-dip galvanized steel, or other rust-resistant, protective-coated steel compatible with related materials.

2.4 MATERIALS

- A. Zamac: ASTM B 86, commercial zinc-alloy die castings, chrome plated or match existing.

2.5 FABRICATION

- A. Fabrication, General: Fabricate toilet compartment components to sizes indicated. Coordinate requirements and provide cutouts for through-partition toilet accessories, and solid blocking within panel where required for attachment of toilet accessories.
- B. Overhead-Braced Units: Provide manufacturer's standard corrosion-resistant supports, leveling mechanism, and anchors at pilasters to suit floor conditions. Provide shoes at pilasters to conceal supports and leveling mechanism.
- C. Floor-Anchored Units: Provide manufacturer's standard corrosion-resistant anchoring assemblies with leveling adjustment nuts at pilasters for structural connection to floor. Provide shoes at pilasters to conceal anchorage.
- D. Ceiling-Hung Units: Provide manufacturer's standard corrosion-resistant anchoring assemblies with leveling adjustment nuts at pilasters for connection to structural support above finished ceiling. Provide assemblies that support pilasters from structure without transmitting load to finished ceiling. Provide sleeves (caps) at tops of pilasters to conceal anchorage.
- E. Floor-and-Ceiling-Anchored Units: Provide manufacturer's standard corrosion-resistant anchoring assemblies with leveling adjustment at tops and bottoms of pilasters. Provide shoes and sleeves (caps) at pilasters to conceal anchorage.
- F. Urinal-Screen Posts: Provide manufacturer's standard corrosion-resistant anchoring assemblies with leveling adjustment at[tops and] bottoms of posts. Provide shoes[and sleeves (caps)] at posts to conceal anchorage.
- G. Door Size and Swings: Unless otherwise indicated or required, provide 24-inch- (610-mm-) wide, in-swinging doors for standard toilet compartments and 36-inch- (914-mm-) wide, out-swinging doors with a minimum 32-inch- (813-mm-) wide, clear opening for compartments designated as accessible.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas and conditions, with Installer present, for compliance with requirements for fastening, support, alignment, operating clearances, and other conditions affecting performance of the Work.
 - 1. Confirm location and adequacy of blocking and supports required for installation.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Coordinate layout and installation of supports, inserts, and anchors built into other units of work for toilet compartment anchorage.

3.2 INSTALLATION

- A. General: Comply with manufacturer's written installation instructions. Install units rigid, straight, level, and plumb. Secure units in position indicated with manufacturer's recommended anchoring devices.
 - 1. Maximum Clearances:
 - a. Pilasters and Panels: 1/2 inch (13 mm).
 - b. Panels and Walls: 1 inch (25 mm).
 - 2. Stirrup Brackets: Secure panels to walls and to pilasters with no fewer than [two brackets attached] [three brackets attached at midpoint and] near top and bottom of panel.
 - a. Locate wall brackets so holes for wall anchors occur in masonry or tile joints.
 - b. Align brackets at pilasters with brackets at walls.
 - 3. Full-Height (Continuous) Brackets: Secure panels to walls and to pilasters with full-height brackets.
 - a. Locate bracket fasteners so holes for wall anchors occur in masonry or tile joints.
 - b. Align brackets at pilasters with brackets at walls.
- B. Overhead-Braced Units: Secure pilasters to floor and level, plumb, and tighten. Set pilasters with anchors penetrating not less than 1-3/4 inches (44 mm) into structural floor unless otherwise indicated in manufacturer's written instructions. Secure continuous head rail to each pilaster with no fewer than two fasteners. Hang doors to align tops of doors with tops of panels, and adjust so tops of doors are parallel with overhead brace when doors are in closed position.

- C. Floor-Anchored Units: Set pilasters with anchors penetrating not less than 2 inches (51 mm) into structural floor unless otherwise indicated in manufacturer's written instructions. Level, plumb, and tighten pilasters. Hang doors and adjust so tops of doors are level with tops of pilasters when doors are in closed position.
- D. Urinal Screens: Attach with anchoring devices to suit supporting structure. Set units level and plumb, rigid, and secured to resist lateral impact.

3.3 ADJUSTING

- A. Hardware Adjustment: Adjust and lubricate hardware according to hardware manufacturer's written instructions for proper operation. Set hinges on in-swinging doors to hold doors open approximately 30 degrees from closed position when unlatched. Set hinges on out-swinging doors[and doors in entrance screens] to return doors to fully closed position.

END OF SECTION 102113.13

SECTION 102800 - TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Public-use washroom accessories.

1.3 COORDINATION

- A. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.
- B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
 - 2. Include anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
 - 3. Include electrical characteristics.
- B. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.
 - 1. Identify locations using room designations indicated.
 - 2. Identify accessories using designations indicated.

1.5 INFORMATIONAL SUBMITTALS

- A. Sample Warranty: For manufacturer's special warranty.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For accessories to include in maintenance manuals.

1.7 WARRANTY

- A. Manufacturer's Special Warranty for Mirrors: Manufacturer agrees to repair or replace mirrors that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, visible silver spoilage defects.
 - 2. Warranty Period: [15] <Insert number> years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 OWNER-FURNISHED MATERIALS

- A. Owner-Furnished Materials: Coordinate with drawings for the re-installation of existing accessories to be installed according to the applicable standards and requirements per each of the individual manufacturers and in conformance with all governing building codes.

2.2 PERFORMANCE REQUIREMENTS

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.3 PUBLIC-USE WASHROOM ACCESSORIES

- A. Source Limitations: If existing accessories cannot be satisfactorily installed and/or are damaged during removal/storage they shall be replaced at no cost to the Owner and shall match to the degree possible the existing accessories yet still meet all applicable codes and standards for current use.

PART 3 - EXECUTION

3.1 INSTALLATION/RE-INSTALLATION

- A. Re-install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.

- B. Grab Bars: Reinstall to withstand a downward load of at least **250 lbf**, when tested according to ASTM F 446.

3.2 ADJUSTING AND CLEANING

- A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.
- B. Remove temporary labels and protective coatings.
- C. Clean and polish exposed surfaces according to manufacturer's written instructions.

END OF SECTION 102800

AUTOMATIC SPRINKLER SYSTEM HYDRAULIC CALCULATIONS

For:

Vacaville Classroom Building
Annex Renovation Project

Prepared by:

Zari Consulting Group, Inc.
755 Baywood Drive, Second Floor
Petaluma, CA 94954
(415) 746-9274
ZCG No. 0117019

The water supply information from the San Francisco fire department was received on October 19, 2016. Data was taken on Orange Tree Circle. The values are as follows:

Static pressure: 91 psi
Residual pressure: 74 psi flowing 4,500 gpm from the 12" main

The hydraulic Remote Area is located in the classroom area, as shown on the drawings.

Hydraulic Remote Area - Classroom

Description of Hazard:	Light Hazard
Design Requirements:	
Design Area of Application:	900 square feet
Actual Area of Application:	1,122 square feet
Minimum Rate of Application:	0.10 gpm/square foot
Max. Coverage Per Sprinkler:	225 square feet
No. of Sprinklers Calculated:	13
Inside/Outside Hose Stream Allowance:	100 gpm

Prepared by:

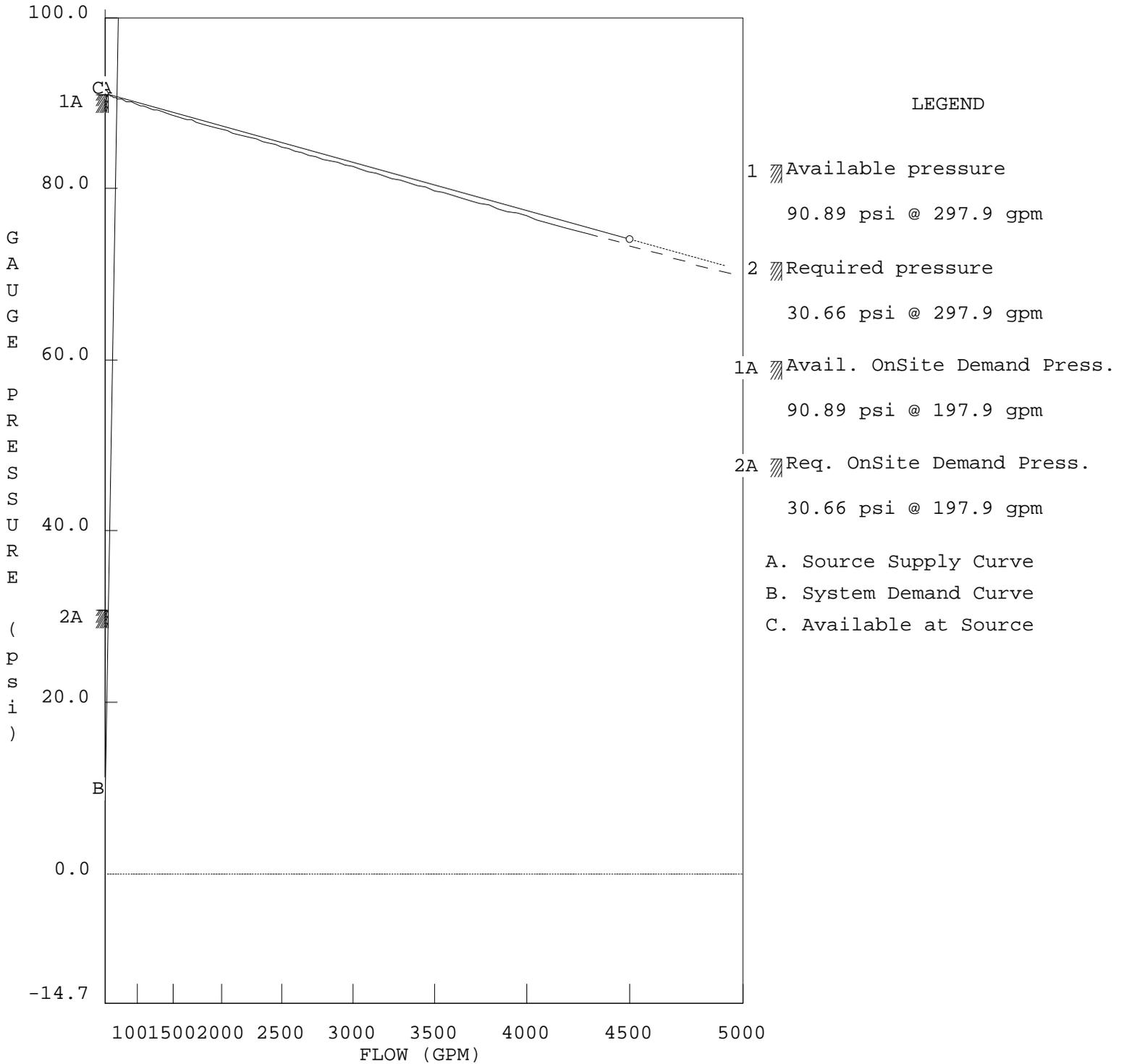
ZARI CONSULTING GROUP



Joseph P. Zari, P.E.
Principal

WATER SUPPLY ANALYSIS

Static: 91.00 psi Resid: 74.00 psi Flow: 4500.0 gpm



Note: (1) Dashed Lines indicate extrapolated values from Test Results

(2) On Site pressures are based on hose stream deduction at the source

DATE: 8/7/2017

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JOB TITLE:

NFPA WATER SUPPLY DATA

SOURCE NODE TAG	STATIC PRESS. (PSI)	RESID. PRESS. (PSI)	FLOW @ (GPM)	AVAIL. PRESS. (PSI)	TOTAL @ DEMAND (GPM)	REQ'D PRESS. (PSI)
SOURCE	91.0	74.0	4500.0	90.9	297.9	30.7

AGGREGATE FLOW ANALYSIS:

TOTAL FLOW AT SOURCE	297.9 GPM
TOTAL HOSE STREAM ALLOWANCE AT SOURCE	100.0 GPM
OTHER HOSE STREAM ALLOWANCES	0.0 GPM
TOTAL DISCHARGE FROM ACTIVE SPRINKLERS	197.9 GPM

NODE ANALYSIS DATA

NODE TAG	ELEVATION (FT)	NODE TYPE	PRESSURE (PSI)	DISCHARGE (GPM)	NOTES
BFP1	-3.0	- - - -	30.5	- - -	
BFP2	-3.0	- - - -	25.5	- - -	
BOR	-3.0	- - - -	25.1	- - -	
TOR	16.5	- - - -	16.6	- - -	
T	16.5	- - - -	13.9	- - -	
1	16.5	- - - -	13.5	- - -	
2	16.5	- - - -	13.6	- - -	
3	16.5	- - - -	13.7	- - -	
4	16.5	- - - -	12.6	- - -	
5	16.5	- - - -	11.6	- - -	
6	16.5	- - - -	11.2	- - -	
7	16.5	- - - -	11.1	- - -	
8	16.5	- - - -	11.2	- - -	
9	16.5	- - - -	11.1	- - -	
10	16.5	- - - -	11.0	- - -	
11	16.5	- - - -	10.6	- - -	
12	16.5	- - - -	9.9	- - -	
13	16.5	- - - -	9.7	- - -	
14	16.5	- - - -	9.6	- - -	
1S	17.0	K= 5.60	7.7	15.5	
2S	17.0	K= 5.60	7.5	15.3	
3S	17.0	K= 5.60	7.4	15.3	
4S	17.0	K= 5.60	7.5	15.3	
5S	17.0	K= 5.60	7.7	15.6	
6S	17.0	K= 5.60	7.5	15.4	
7S	17.0	K= 5.60	7.5	15.3	
8S	17.0	K= 5.60	7.5	15.4	
9S	17.0	K= 5.60	7.6	15.4	
10S	17.0	K= 5.60	7.1	14.9	
11S	17.0	K= 5.60	7.0	14.8	
12S	17.0	K= 5.60	7.0	14.8	
13S	17.0	K= 5.60	7.1	14.9	
SOURCE	-3.0	SOURCE	30.7	197.9	

DATE: 8/7/2017

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JOB TITLE:

NFPA3 PIPE DATA

Pipe Tag	K-fac	Add Fl	Add Fl To	Fit:	L	C	(Pt)			
To Node	El (ft)	PT	(q)	Node/	Nom ID	Eq.Ln.	F	(Pe)	Notes	
Frm Node	El (ft)	PT	Tot.(Q)	Disch	Act ID	(ft.)	T	Pf/ft.	(Pf)	
Pipe: 1	0.0	0.0					53.00	100	30.5	
BFP1	-3.0	30.5	197.9	BFP2	6.000	----	0.00		0.0	
SOURCE	-3.0	30.7	197.9		6.065		53.00	0.002	0.1	
Pipe: 2		0.0								
BFP2	-3.0	25.5	197.9	BOR			197.9			Fixed Pressure Loss Device
BFP1	-3.0	30.5	197.9							5.0 psi, 197.9 gpm
Pipe: 3	0.0	0.0					174.00	100	25.1	
BOR	-3.0	25.1	197.9	TOR	6.000	E:10.0	9.99		0.0	
BFP2	-3.0	25.5	197.9		6.065		183.99	0.002	0.5	
Pipe: 4	0.0	0.0					19.50	100	16.6	
TOR	16.5	16.6	197.9	T	6.000	E:10.0	9.99		8.4	
BOR	-3.0	25.1	197.9		6.065		29.49	0.002	0.1	
Pipe: 5	0.0	141.0	4				13.33	100	13.9	
T	16.5	13.9	56.9	3	2.500	----	0.00		0.0	
TOR	16.5	16.6	197.9		2.469		13.33	0.196	2.6	
Pipe: 6	0.0	19.5	10				5.67	100	13.7	
3	16.5	13.7	37.4	2	2.500	T: 8.6	8.56		0.0	
T	16.5	13.9	56.9		2.469		14.23	0.020	0.3	
Pipe: 7	0.0	18.9	9				10.92	100	13.6	
2	16.5	13.6	18.6	1	2.500	----	0.00		0.0	
3	16.5	13.7	37.4		2.469		10.92	0.009	0.1	
Pipe: 8	0.0	0.0					10.92	100	13.5	
1	16.5	13.5	18.6	8	2.500	----	0.00		0.0	
2	16.5	13.6	18.6		2.469		10.92	0.002	0.0	
Pipe: 9	0.0	17.0	11				4.50	100	12.6	
4	16.5	12.6	124.0	5	2.500	T: 8.6	8.56		0.0	
T	16.5	13.9	141.0		2.469		13.06	0.105	1.4	
Pipe: 10	0.0	47.2	9S				11.58	100	11.6	
5	16.5	11.6	76.8	6	2.500	----	0.00		0.0	
4	16.5	12.6	124.0		2.469		11.58	0.083	1.0	
Pipe: 11	0.0	38.5	5S				11.83	100	11.2	
6	16.5	11.2	38.3	7	2.500	----	0.00		0.0	
5	16.5	11.6	76.8		2.469		11.83	0.034	0.4	
Pipe: 12	0.0	0.0					11.83	100	11.1	
7	16.5	11.1	38.3	1S	2.500	----	0.00		0.0	
6	16.5	11.2	38.3		2.469		11.83	0.009	0.1	
Pipe: 13	5.60	15.5	Disch				43.00	100	7.7	
1S	17.0	7.7	22.8	2S	1.500	----	0.00		0.2	
7	16.5	11.1	38.3		1.610		43.00	0.075	3.2	

DATE: 8/7/2017

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JOB TITLE:

Pipe Tag	K-fac	Add Fl	Add Fl	To	Fit:	L	C	(Pt)	Notes
To Node	PT	(q)	Node/	Nom ID	Eq.Ln.	F		(Pe)	
Frm Node	PT	Tot.(Q)	Disch	Act ID	(ft.)	T	Pf/ft.	(Pf)	
Pipe: 14	5.60	15.3	Disch			6.67	100	7.5	
2S	17.0	7.5	7.5	3S	1.500	----	0.00	0.0	
1S	17.0	7.7	22.8		1.610		6.67	0.029	0.2
Pipe: 15	5.60	15.3	Disch			6.67	100	7.4	
3S	17.0	7.4	-7.8	4S	1.500	----	0.00	0.0	
2S	17.0	7.5	7.5		1.610		6.67	0.004	0.0
Pipe: 16	5.60	15.3	Disch			6.67	100	7.4	
3S	17.0	7.4	-7.5	2S	1.500	----	0.00	0.0	
4S	17.0	7.5	7.8		1.610		6.67	0.004	0.0
Pipe: 17	5.60	15.6	Disch			43.00	100	7.7	
5S	17.0	7.7	23.0	6S	1.500	----	0.00	0.2	
6	16.5	11.2	38.5		1.610		43.00	0.076	3.3
Pipe: 18	5.60	15.4	Disch			6.67	100	7.5	
6S	17.0	7.5	7.6	7S	1.500	----	0.00	0.0	
5S	17.0	7.7	23.0		1.610		6.67	0.029	0.2
Pipe: 19	5.60	15.3	Disch			6.67	100	7.5	
7S	17.0	7.5	-7.8	8S	1.500	----	0.00	0.0	
6S	17.0	7.5	7.6		1.610		6.67	0.004	0.0
Pipe: 20	5.60	15.3	Disch			6.67	100	7.5	
7S	17.0	7.5	-7.6	6S	1.500	----	0.00	0.0	
8S	17.0	7.5	7.8		1.610		6.67	0.004	0.0
Pipe: 21	5.60	15.4	Disch			34.67	100	7.6	
9S	17.0	7.6	31.8	10S	1.500	----	0.00	0.2	
5	16.5	11.6	47.2		1.610		34.67	0.111	3.8
Pipe: 22	5.60	14.9	Disch			8.33	100	7.1	
10S	17.0	7.1	16.9	11S	1.500	----	0.00	0.0	
9S	17.0	7.6	31.8		1.610		8.33	0.054	0.4
Pipe: 23	5.60	14.8	Disch			6.67	100	7.0	
11S	17.0	7.0	0.0	12S	1.500	----	0.00	0.0	
10S	17.0	7.1	2.1		1.610		6.67	0.017	0.1
Pipe: 24	5.60	14.8	Disch			6.67	100	7.0	
12S	17.0	7.0	-12.7	13S	1.500	----	0.00	0.0	
11S	17.0	7.0	2.1		1.610		6.67	0.000	0.0
Pipe: 25	5.60	14.8	Disch			6.67	100	7.0	
12S	17.0	7.0	-2.1	11S	1.500	----	0.00	0.0	
13S	17.0	7.1	12.7		1.610		6.67	0.010	0.1
Pipe: 26	5.60	14.9	Disch			64.83	100	7.1	
13S	17.0	7.1	12.7	12S	1.500	----	0.00	0.2	
12	16.5	9.9	27.6		1.610		64.83	0.041	2.7

DATE: 8/7/2017

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JOB TITLE:

Pipe Tag	K-fac	Add Fl	Add Fl	To	Fit:	L	C	(Pt)	Notes
To Node	PT	(q)	Node/	Nom ID	Eq.Ln.	F		(Pe)	
Frm Node	PT	Tot.(Q)	Disch	Act ID	(ft.)	T	Pf/ft.	(Pf)	
Pipe: 27	5.60	15.4	Disch			64.83	100	7.5	
8S	17.0	7.5	7.8	7S	1.500	----	0.00	0.2	
13	16.5	9.7	23.1		1.610	64.83	0.030	1.9	
Pipe: 28	5.60	15.3	Disch			64.83	100	7.5	
4S	17.0	7.5	7.8	3S	1.500	----	0.00	0.2	
14	16.5	9.6	23.1		1.610	64.83	0.030	1.9	
Pipe: 29	0.0	0.0				11.50	100	9.6	
14	16.5	9.6	23.1	4S	2.500	T: 8.6	8.56	0.0	
13	16.5	9.7	23.1		2.469	20.06	0.004	0.1	
Pipe: 30	0.0	23.1	14			11.83	100	9.7	
13	16.5	9.7	23.1	8S	2.500	T: 8.6	8.56	0.0	
12	16.5	9.9	46.2		2.469	20.39	0.013	0.3	
Pipe: 31	0.0	46.2	13			11.53	100	9.9	
12	16.5	9.9	27.6	13S	2.500	T: 8.6	8.56	0.0	
11	16.5	10.6	73.9		2.469	20.09	0.032	0.6	
Pipe: 32	0.0	73.9	12			11.17	100	10.6	
11	16.5	10.6	-17.0	4	2.500	T: 8.6	8.56	0.0	
10	16.5	11.0	56.9		2.469	19.73	0.020	0.4	
Pipe: 33	0.0	56.9	11			9.83	100	11.0	
10	16.5	11.0	-19.5	3	2.500	T: 8.6	8.56	0.0	
9	16.5	11.1	37.4		2.469	18.39	0.009	0.2	
Pipe: 34	0.0	37.4	10			11.50	100	11.1	
9	16.5	11.1	-18.9	2	2.500	T: 8.6	8.56	0.0	
8	16.5	11.2	18.6		2.469	20.06	0.002	0.0	
Pipe: 35	0.0	73.9	12			119.83	100	10.6	
11	16.5	10.6	-56.9	10	1.500	----	0.00	0.0	
4	16.5	12.6	17.0		1.610	119.83	0.017	2.0	
Pipe: 36	0.0	56.9	11			119.83	100	11.0	
10	16.5	11.0	-37.4	9	1.500	2E: 5.7	5.71	0.0	
3	16.5	13.7	19.5		1.610	125.54	0.022	2.7	
Pipe: 37	0.0	37.4	10			119.83	100	11.1	
9	16.5	11.1	-18.6	8	1.500	----	0.00	0.0	
2	16.5	13.6	18.9		1.610	119.83	0.020	2.4	
Pipe: 38	0.0	0.0				119.83	100	11.2	
8	16.5	11.2	18.6	9	1.500	----	0.00	0.0	
1	16.5	13.5	18.6		1.610	119.83	0.020	2.4	

DATE: 8/7/2017

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JOB TITLE:

NOTES (HASS):

- (1) Calculations were performed by the HASS 8.7 computer program in accordance with NFPA13 (2017) under license no. 38041918 granted by
 HRS Systems, Inc.
 208 Southside Square
 Petersburg, TN 37144
 (931) 659-9760
- (2) The system has been calculated to provide an average imbalance at each node of 0.003 gpm and a maximum imbalance at any node of 0.101 gpm.
- (3) Total pressure at each node is used in balancing the system. Maximum water velocity is 13.3 ft/sec at pipe 5.
- (4) Items listed in bold print on the cover sheet are automatically transferred from the calculation report.
- (5) Available pressure at source node SOURCE under full flow conditions is 90.67 psi with a flow of 535.17 gpm.

(6) PIPE FITTINGS TABLE

Pipe Table Name: STANDARD.PIP

PAGE: A MATERIAL: S40 HWC: 120

Diameter (in)	Equivalent Fitting Lengths in Feet								
	E Ell	T Tee	L Lng	C Ell	B ChkVlv	G BfyVlv	A GatVlv	D AlmChk	N DPVlv
1.610	4.00	8.00	2.00	9.00	6.00	1.00	10.00	10.00	8.00
2.469	6.00	12.00	4.00	14.00	7.00	1.00	10.00	10.00	12.00
6.065	14.00	30.00	9.00	32.00	10.00	3.00	28.00	28.00	30.00



Section 21 00 00 Fire Protection

EQUIPMENT & MATERIALS SUBMITTALS AUTOMATIC SPRINKLER SYSTEM

**VACAVILLE CLASSROOM BUILDING
(ANNEX) RENOVATION PROJECT
2000 NORTH VILLAGE PARKWAY
VACAVILLE, CALIFORNIA**

PREPARED FOR:

**SOLANO COMMUNITY COLLEGE DISTRICT
VACAVILLE, CALIFORNIA**

ZCG Project No. 0117019

August 07, 2017

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UL Listed for Fire Sprinkler Branch line applications per UL subject 2573—"Automatic Air Release Valves for Fire Protection Service"

FM Approved "Automatic Air Release Valve for Sprinkler Systems"

Service Pressure: Up to 175 PSIG

Temperature Range: 40°F to 120°F (4.5°C to 49°C)

Air Vent: 1/2" NPT inlet/ 1/2" MNPT outlet to drain
5/64" Orifice
Brass construction

Optional Accessories:

Ball valve supervisory switch model RBVS (Supervisory switch only) Used to monitor the position of the isolation valve.

Outdoor vent screen assembly for outdoor installations above 40°F. See Figure 2.

Ordering Information:

Stock No.	Model / Description
1119720	PAV - Potter Air vent

Optional Equipment:

Stock No.	Model / Description
5020384	Outdoor Vent Screen Assembly
1000040	RBVS Retrofit Ball Valve Switch (w/o cover tamper)
1000035	RBVS-T Retrofit Ball Valve Switch (w/ cover tamper)

GENERAL DESCRIPTION

The PAV is an automatic float type air vent used to reduce the amount of air trapped in a pressurized fire sprinkler system. Reducing the amount of air in a fire sprinkler system is essential to help protect the system piping from the effects of corrosion that is often found at the air/water interface in the fire sprinkler system piping.

Removing as much air as possible will also have a positive effect on the performance of vane type waterflow detectors. The operation of vane type waterflow detectors can be delayed or prevented if too much air is trapped in the system piping.

The intent of the product is to vent as much air from the fire sprinkler system as possible. The PAV provides automatic venting of air as the system is being filled. Furthermore, trapped air can also be vented as the air in the system migrates to the vent location over time. The air vent will automatically close when water reaches the vent. The PAV provides a 1/2" NPT-male connection which will allow installers to safely pipe to a drain, any inadvertent discharge of water that is inherent in the operation of the automatic air vent.

INSTALLATION AND SERVICING (See Figures 1 - 2)

NOTICE

It is strongly recommended to install a ball valve in line with the PAV to assist in servicing the strainer without disabling the sprinkler system.

1. Read and understand the instructions provided before you proceed with installation. The PAV shall be installed in accordance with local ordinances and the applicable NFPA13, NFPA13D, or NFPA13R standard.
2. The Engineer of Record should select the Model PAV, Potter Air Vent installation location. Usually at a point in the system that will vent the most air.
3. The location of the PAV must not interfere with the spray pattern of any sprinkler head. The connection point must be off the top of the pipe. (See Fig. 1)
4. The piping must be level or pitch back toward the fire sprinkler system piping and arranged in such a manner that water will not become trapped.
5. Immediately after installation and filling of the fire sprinkler system, the PAV should be inspected for leaks and proper operation. The unit should be inspected periodically. Thereafter the manufacturer recommends quarterly or more frequently.
6. Inspection should include removal and cleaning of the strainer screen. Remove the screen and flush with clean water. Use a wire brush if necessary to remove any particles trapped in the screen.
7. Pipe the output of the air vent to a drain or other suitable location in the event there is an inadvertent discharge of water from the vent.

REPLACEMENT

The vent used in the PAV is not field replaceable. If the vent should fail, the entire unit must be replaced.

FIG. 1 PAV OUTLINE DRAWNG

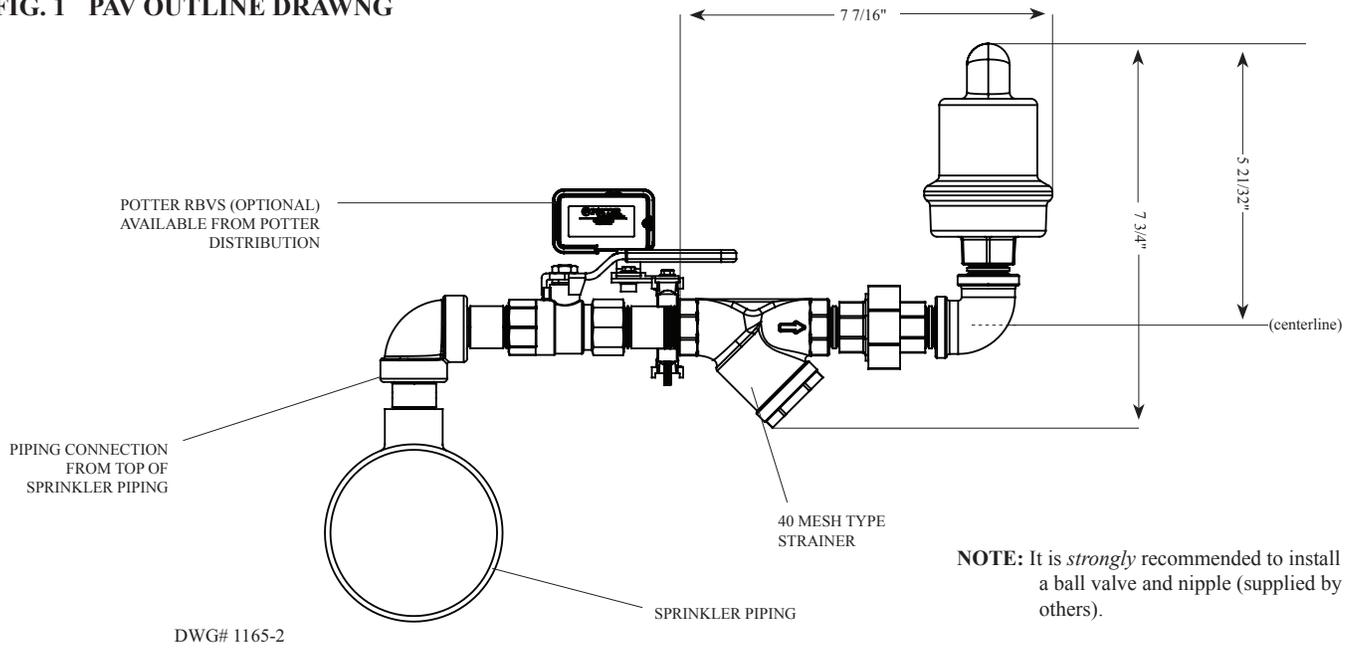
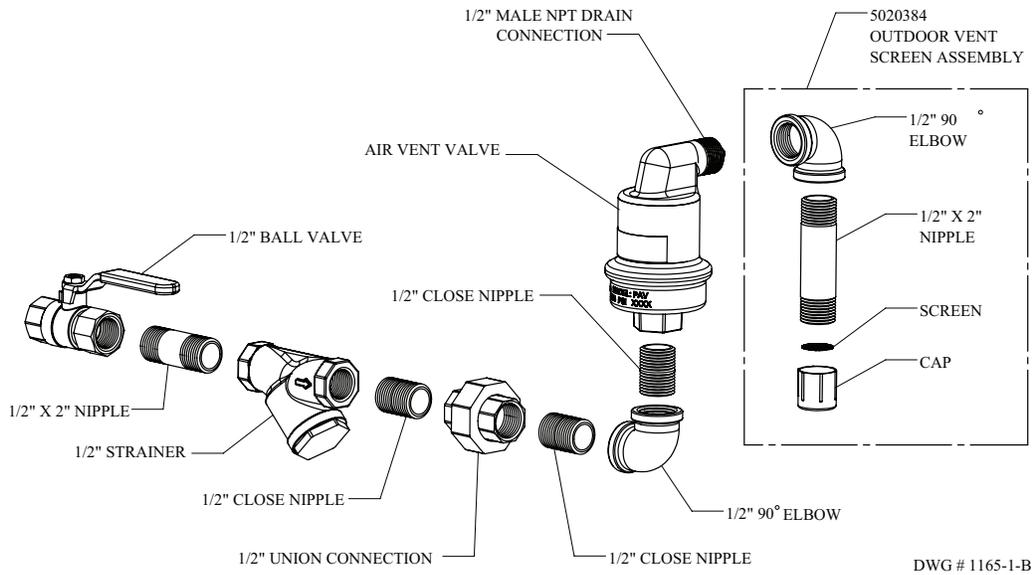


FIG. 2 PAV ASSEMBLY



NOTE: It is *strongly* recommended to install a ball valve and nipple before the strainer. The ball valve and nipple are supplied by others.

TOLCO™ Branch line restraints
for fire protection systems
per NFPA 13 (2010-2013)



TOLCO™ Branch Line Restraints for Fire Protection Systems

TOLCO™ Seismic Bracing for Branch Line Restraints

Rely on us for all your seismic and engineering needs

TOLCO Seismic Bracing products are manufactured in California, which is located on the “Ring of Fire” - locations that experience multiple earthquakes a year. Most are small, but some are significant and the potential for a major catastrophic earthquake is always present.

Being located in a virtual “living laboratory of seismic activity” has driven our team of engineers to develop some of the best seismic bracing product designs in the industry. Our products are known

and respected by installers, designers, and fire protection authorities worldwide.

For over 45 years, TOLCO Seismic Bracing products have been installed around the world where earthquakes are prevalent. Our UL Listed and FM approved quality seismic bracing products are confidently relied upon to help protect lives and property, from these devastating forces.

TOLCO Seismic Bracing products are specified worldwide for bracing fire

sprinkler systems against damage from earthquakes. Installing our UL Listed and FM approved bracing products helps to ensure compliance with the National Fire Protection Association Standard for the installation of fire sprinkler systems (NFPA 13).

This brochure is intended to show examples of how TOLCO Seismic Bracing can help you meet the NFPA 13 Guidelines for Branch Line Restraints.

NFPA 13 GUIDELINES FOR BRANCH LINE RESTRAINTS*

The National Fire Protection Association Pamphlet 13 (2010-2013) as part of a complete seismic bracing system, requires that sprinkler mains and cross mains be braced and that branch lines 2 inches and smaller be restrained.

How branch lines are to be restrained is defined in Section 9.3.6.1; also see Annex Section A.9.3.6.1(5) and Annex Figures A.9.3.6.1(5)(a)&(b). NFPA 13 (2010-2013) in Section 9.3.6.1 for additional information.

Per these guidelines, restraints are considered a lesser degree of resisting loads than bracing and shall be provided by use of one of the following*:

1. Listed Sway Brace
2. Wrap-around U-Hook satisfying the requirements of 9.3.5.5.11
3. No. 12, 440 lb. (200 kg) wire installed at least 45 degrees from the vertical plane and anchored on both sides of the pipe
4. CPVC hangers utilizing two points of attachment
5. Hanger not less than 45 degrees from vertical installed within 6 inches (152 mm) of the vertical hanger arranged for restraint against upward movement, provided it is utilized such that l/r does not exceed 400, where the rod shall extend to the pipe or have a surge clip installed
6. Other approved means

It should be noted that devices that are listed by UL as seismic restraint devices, as tested and defined by UL 203A, only meet the criteria of option 6 noted above. As such it is appropriate for the area authority to require test results or structural calculations for the specific installation under review.

* For the most up-to-date and full details on the NFPA guidelines, please refer to the NFPA website: www.nfpa.org

A Listed Sway Brace Device used as a Branch Line Restraint

Satisfies Requirements of NFPA 13 2010 & 2013 Section 9.3.6.1(1)



This option while providing some of the best resistance to horizontal loads should be considered carefully. Seismic brace components have published maximum loads and when submitted for review, should be accompanied with zone of influence (ZOI) calculations per NFPA 13; 10 & 13 Section 9.3.5.6 that take into consideration the orientation of the fastener and the brace angle so as not to exceed these loads. An area authority should request these calculations for branch line restraints as well to verify they have the capacity to restrain the required loads.

It should be noted that devices that are listed by UL as seismic restraint devices, as tested and defined by UL 203A, only meet the criteria of option 6, other approved means, noted on previous page. As such it is appropriate for the area authority to require test results or structural calculations for the specific installation under review.

Sway Brace Assembly Example

- TOLCO Fig. 980 Universal Swivel Sway Brace Attachment
- TOLCO Fig. 1001 Sway Brace Attachment
- 1" Brace Pipe

Wrap-Around U-Hook

Satisfies Requirements of NFPA 13 (2010; Section 9.3.6.1(2) "other approved means"; Section 9.3.5.3.10) (2013; Section 9.3.5.5.11)

This option is clearly defined and requires no additional calculations to prove its performance.



Fig 120W

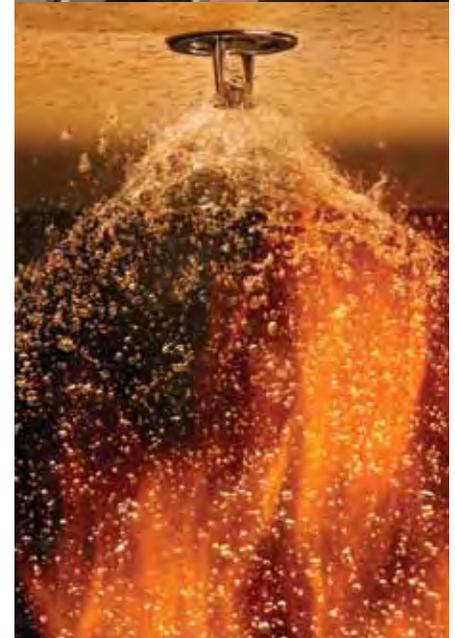


Fig 120RWA

No. 12, 440 lb. (200 kg) wire installed at least 45 degrees from the vertical plane and anchored on both sides of the pipe

Satisfies Requirements of NFPA 13 2010 & 2013 Section 9.3.6.1(3)

While this option can be more difficult to install, the process is clearly defined and details are provided by NFPA to make inspection by area authorities easier. No additional calculations are required. However, please note that two points of contact are required, which can increase the installation time and cost.



CPVC Hangers Utilizing Two Points of Attachment

Satisfies Requirements of NFPA 13 2013 Section 9.3.6.1(4)

Typical CPVC hangers utilize two #10 x 1" screws and attach the sprinkler pipe directly to the structure. Similar to the wrap-around u-hanger option this sufficiently restrains the pipe and requires no additional calculations. Please note to be careful when selecting this option as not all CPVC hangers are UL Listed as both hangers and restrainers.

TOLCO CPVC Hanger Options



Fig 22



Fig 23



Fig 24



Fig 28



Fig 28M



Fig 29 & Fig 22L2 not shown

Hanger not less than 45 degrees from vertical

Installed within 6 inches (152 mm) of the vertical hanger arranged for restraint against upward movement, provided it is utilized such that L/r does not exceed 400, where the rod shall extend to the pipe or have a surge clip installed.

Satisfies Requirements of NFPA 13 2010 & 2013 Section 9.3.6.1(5) see also NFPA 13 2013 Annex A.9.3.6.1(5) and Figures 9.3.6.1(5)(a)&(b)

This option is clearly defined by NFPA 13 and if UL Listed hanger components are used then no additional calculations or test data is required for use.

- Use of all thread rod or machine threaded rod should comply with the requirements of NFPA 13 2010 Section 9.3.5.8.7(a,b&c) and NFPA 13 2013 Section 9.3.5.11.8(a,b&c)
- L/R should not exceed 400
- If two opposing rod assemblies are installed at a location then the limitations of the table below regarding all thread rod length do not apply, subject to the approval of the area authority having jurisdiction

Allowable Rod Lengths per NFPA 13 (2010 & 2013)

Rod Size (in)	Area (sq. in)	Least Radius of Gyration (in)	L/R=100 (max length)	L/R=200 (max length)	L/R=300 (max length)	L/R=400 (max length)
3/8"	.07	.075	0'-7"	1'-2"	1'-10"	2'-6"
1/2"	.129	.101	0'-10"	1'-8"	2'-6"	3'-4"

Other Approved Means

Satisfies Requirements of NFPA 13 2010 Section 9.3.6.1(5) and 2013 Section 9.3.6.1(6)

This option gives the area authority latitude to approve other methods in the case where none of the other methods can be applied. Not defined at all, when used it would most likely require supporting structural calculations or test data. To help meet this option, TOLCO offers the services of our Seismic Engineering Department with a professional Structural Engineer on staff to supply wet-stamped structural calculations as required.



Fig. 76

Fig. 77

Other Approved Means Example

TOLCO Fig. 76 Structural BLR Attachment, is designed to use both 3/8" and 1/2" rod, and multiple types of fasteners for various structure types. Fig. 77 System BLR Attachment is designed to use both 3/8" and 1/2" rod and easily snaps on to either side of plastic pipe.

Create a Complete Submittal Package with TOLBrace™ Software

Designed for ease of use, the TOLBrace software steps the user through a series of questions to determine the scope of the project. It helps the user create detailed reports of the appropriate seismic bracing components and TIFF files for CAD use. It calculates the correct bracing loads per NFPA 13 guidelines, Uniform Building Code (UBC) and International Building Code (IBC). Also, to help ensure users are following the latest codes, standards, and product requirements, TOLBrace software also includes an automatic update feature.

TOLBrace software assists fire sprinkler system designers in:

- Seismic force factor calculations (Fp)
- Zone of influence calculations
- Sway brace orientation and angle selection
- Structural attachment of sway braces
- Brace material selection
- Appropriate selection of UL Listed and FM approved sway brace components
- Creating a submittal sheet with all relevant information with the click of a mouse
- Selection of Branch Line Restraint details from NFPA 13 approved methods
- Available in English & Spanish

TOLBrace follows the requirements of:

- NFPA 13, 1999, 2002, 2007, 2010 & 2013
- Factory Mutual
- International Building Code (IBC)

For additional support, contact your TOLCO Seismic Bracing Specialist at:
Phone: 909-427-9773

Email: SeismicQuotes@Eaton.com

Email: TolcoSupport@Eaton.com

To learn more, visit www.cooperblinc.com/fireprotection.



For more information, visit
www.cooperblinc.com/fireprotection.

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Powering Business Worldwide

SECTION 22 06 00

PIPING SYSTEMS AND AUXILIARIES

PART 1 - GENERAL

1.1 Related Documents:

- A. Refer to Section 230100 - Mechanical General Provision for related work.

1.2 Description of Work:

- A. This Section is applicable to the work involved in the Plumbing sections.
- B. Where Manufacturers product names are listed in this Section of the specifications, alternate names may be acceptable through the submittal process.

PART 2 - PRODUCT

2.1 Pressure Piping Systems:

- A. Cold and heated water and relief valve piping:
 - 1. Copper pipe with Solder or Brazed Joints; Type L hard drawn copper per ASTM B-88, plain ends. Wrought copper soldered fittings per ANSI Standard B16.22 or cast red bronze, Cast red brass soldered unions, joined with 95% tin, 5% antimony solder, non-corrosive flux or 15% silver brazing alloy, silver brazing flux. Use dielectric connector or cast brass adaptors between dissimilar metals.

2.2 Drainage Piping Systems:

- A. Soil (sewage collection and drainage), vent and roof drainage piping:
 - 1. Cast Iron Gasketed Joints; Service weight with plain ends and hot coal tar pitch coating inside and outside, per ASTM A-74; gasketed joint fittings; joined with Duo-Seal neoprene insertion type double seal compression gasket per ASTM C-564, coated with manufacturer's recommended lubricant before installing.
- B. Waste (local collection and drainage), vent and roof drainage piping:
 - 1. Hubless Cast Iron/Sleeve-Clamped Joints; Service Weight cast iron, hubless with hot coal tar pitch coating inside and outside, per Cast Iron Soil Pipe Institute Standard 301; hubless type fittings, each matched with pipe and identified with the manufacturer's name or trademark, the Cast Iron Soil Pipe Institute symbol, and the pipe size; joined with Husky, Clamp-all or acceptable alternate, use 4 clamp fittings for piping below slab and 2 clamp fittings elsewhere with, neoprene sleeve type specifically designed for connecting hubless cast iron pipe, coat gasket with manufacturer's recommended lubricant before installing; stainless steel band clamp and shield over sleeve.

C. Vent piping:

1. Steel/Cast Iron Threaded Drainage Fittings; galvanized steel per ASTM-A-120, threaded ends, Standard Weight Schedule 40; cast iron threaded drainage type, black coated, with recessed shoulder and pitched threads, per ASTM A-126 Class B; Joined with pure lead and graphite thread lubricant.

2.3 Piping Auxiliaries:

A. Piping supports and Accessories; Superstrut, Unistrut or Kin-line Supports.

1. Horizontal piping, general:

- a. For racked piping, use two-part bolted clamps:

Copper tube - #701 Tubing Strap

Pipe - #702 Pipe clamp.

- b. For suspended piping, use #C-711 Series J type or #C-711 clevis type (CTL 710 for non-insulated copper).

B. Bare Metal Pipe Isolators: Stoneman "Trisolator", Superstrut "Cush-A-strip" or Unistrut.

C. Insulated Pipe Shields: Pipe Shields Inc. "Thermal Hanger Shield", 360 degree calcium silicate with sheet metal vapor barrier jacket; thickness shall match adjoining pipe insulation.

D. Sleeves: Pipe Shields Inc., Model WFB-CS, or WFB-CS-CW galvanized steel.

E. Sleeves Below Slab or Grade: Schedule 40 PVC, two pipe sizes larger than penetrating pipe. Use split fittings where necessary to facilitate installation, terminate sleeve as detailed. Wire and solvent weld split sections together. Encase all split fittings or sleeve sections in 4" minimum concrete envelope.

F. Packing: Sealite White Oakum #110, jute core yarn.

G. Sealant: 3-M, Fire Barrier 2000 silicone sealants or acceptable alternated.

H. Plates/Collars: 24 gauge galvanized sheet metal. Escutcheons: Polished chrome plated brass in finished areas and painted poly propylene in clean room areas.

I. Flashings: Stoneman.

1. Vandalproof assemblies - No. 1000-3, No. 1000-5.

2. Open top assemblies - No. 1-000-2, No. 1000-4.

- J. Pipe Penetration Seals: Link seal, interlocking synthetic rubber links, able to form a watertight seal.
- K. Piping Protective Covering:
 - 1. X-Tru-Coat, factory applied plastic coating with additional field applied double layer wrapping of Scotchrap #51, 20 mil plastic tape.
- L. Piping Flexible Connectors and Expansion Joints (Hot & Cold Water):
 - 1. Metallic Piping Systems: Metraflex Elastomer connectors and joints. Maximum working pressure of 225 psig.
- M. Flexible Hose and Couplings (Gas connections to equipment):
 - 1. Hose: Metraflex Elasto-Flex pipe with stainless steel couplings, not to exceed 12" in length. Maximum working pressure of 150 psig.
- N. Cleanouts:
 - 1. Provide plugs in accordance with manufacturer's recommendations for the particular piping material. Indicate service on cleanout.
 - 2. Furnish tee handle wrench to suit plugs.
 - 3. Install at 50 feet maximum intervals for piping 4" and smaller and at 100 feet maximum intervals, for piping 6" and larger, at bends exceeding 90 degrees and elsewhere as shown on drawings or required by Code.

PART 3 - EXECUTION

3.1 General:

- A. Additional installation details may be specified in other piping sections of Division 22.

3.2 Installation:

- A. Piping installation:
 - 1. Install piping level, plumb, and parallel to structure line except where shown otherwise or required by function or regulation to be angled or sloped.
 - 2. Install piping concealed within spaces provided in the structure except where shown as exposed.
 - 3. Install piping without bending, springing, forcing, or placing undue stress on the pipe, fittings, connected equipment, or terminals.
 - 4. Install piping to allow for expansion, contraction, and structural settlement.

5. Install piping so it does not directly contact the structure except where shown or specified otherwise.
 6. Install piping in trenches as soon as trench is prepared for pipe installation.
 7. Install piping so that it does not interfere with equipment access.
 8. Prior to installation of heat fused joints in piping, contact an authorized factory representative to arrange for a job site demonstration covering manufacturer's installation procedures. Submit to Engineer written confirmation that such a demonstration has taken place. Written confirmation shall include date, name of installing contractor, system reviewed, name of authorized factory representative, and attendees.
- B. Pipe sizes shown are nominal. Should size not be shown, or erroneously shown undersized for any intermediate section of piping run, install pipe of the same size as the largest pipe connecting to the section in question. Run full pipe size through shut-off valves, gas cocks, balancing valves, etc. Change pipe size within three pipe size diameters of final connection to equipment.
- C. Cut pipe with square ends and true to size; cut with wheel, chain or other appropriate sharp cutters only and ream ends after cutting. Fit piping and make changes of size or direction only with proper manufactured fittings; do not bend pipe or use job-fabricated fittings, street ells, bushings, reducing flanges, or close nipples.
- D. Provide unions at connections to equipment, on service side of valves, and elsewhere as required to facilitate maintenance.
- E. Provide dielectric connectors between copper and dissimilar metals.
- F. Provide brass piping connection of copper tubing to threaded terminals or equipment.
- G. Make connections between domestic water systems and equipment or face piping with approved backflow prevention device as required.
- H. Piping Supports and Space Auxiliaries:
1. Support all piping with appropriate manufactured devices as specified in Part 2 above.
 2. Size hanger rods, screws, bolts, nuts, etc., according to manufacturer's recommendations. Size hangers to fit around bare pipe, isolator, or insulated pipe shield as appropriate.
 3. Use cadmium plated or galvanized hangers, attachments, rods, nuts, bolts and other accessories in high humidity areas, or where exposed to weather.
 4. At each support on bare copper tubing system, install an isolator. At each support point on insulated piping systems, install an insulated pipe shield. Use Pipe

Shields Model CS on all piping except use Model CS-CW on piping conducting refrigerant.

5. Suspend all horizontal pipelines individually and not in contact with the structure except as specified below. Support each branch line with at least one hanger.
6. Parallel pipelines may be supported on trapeze type hangers. Size trapeze hangers to support weight of piping plus seismic force.
7. Support point spacing in accordance with the latest recommendations of ASHRAE.
8. Support all horizontal piping near the floor by means of adjustable steel pipe stanchions with welded end plates. Secured to the floor.
9. Where pipes penetrate members of the structure, install proper sleeves, packing, flashing, and collars as follows unless shown otherwise:
 - a. Penetrations of concrete walls, footings, floors or slabs: Model WFB sleeve, diameter 1" minimum larger than outside of pipe or pipe insulation, cast in place. Pack annular space with oakum to 3/4" from each exposed face of concrete; fill remaining depth with sealant flush with face of concrete. At concrete walls and intermediate floors, core drilled holes are acceptable. Packing and sealing to be the same as for sleeves. Link Seal may be provided as an alternate method.
 - b. Penetrations of fire rated partitions, walls, and plenum walls other than concrete: Bare pipe - use Model WFB sleeve; insulated pipe - use Model WFB-CS except pipe conducting chilled water or refrigerant use Model WFB-CS-CW.
 - c. Penetrations of Non-Rated Stud Walls: Cut neat hole in wall covering, seal exposed edges with sealant and provide escutcheon. At exposed face of wall, floor, soffit or ceiling, fit penetrating pipe with a neat, rigid, securely attached collar or escutcheon. In unfinished areas use galvanized plate. In finished areas use chrome plated escutcheon.
 - d. Penetrations of roof: Vent piping - vandalproof assembly; through piping - open top assembly.
10. Seismic restraint of Mechanical Systems and Plumbing Systems shall be installed in accordance with the latest addition of the Sheet Metal and Air Conditioning contractor National Association Recommendations Standards (SMACNA).

3.3 Field Quality Control:

A. Piping Cleaning:

After installation and before installing valves or making final connections, flush piping systems clean of foreign substances, using water to flush piping conducting liquids

and compressed air to clear piping conducting gases, except as specified otherwise in other piping sections.

B. Piping Testing:

1. Before covering, concealing, or using any piping system or parts thereof, test and prove tight; obtain certification of the inspector that this has been accomplished. Valves and connected equipment or any system component with a pressure rating less than the system test pressure shall not be subjected to the test. If systems are tested in sections, include connections to preceding tested sections in ensuing tests.
2. All systems specified to be tested using water as the test medium shall be first checked by pre-testing the test section or system with compressed air at five (5) psig for a period of thirty (30) minutes. Correct any major leak disclosed by this pre-test before proceeding with the specified testing using water as the test medium.
3. After producing the specified test pressure, disconnect the pressurizing source; do not introduce further pressure for the duration of the test period. Should any pressure loss or detectable leak occur within test period, repair piping and retest. Repeat the procedure until the system is proved tight.

C. Disinfecting:

1. Potable Water: After completing domestic water supply systems, disinfect in accordance with requirements of U.S. Public Health Department. Use 50 parts per million of chlorine with 24 hour retention and flush to leave a residual no greater than supply source. Submit written certification of disinfection completion.

END OF SECTION

SECTION 22 11 00 VALVES AND PIPE MOUNTED DEVICES

PART 1 - GENERAL

1.1 Related Documents:

- A. Refer to Section 230100 - Mechanical General Provisions for Related Work.

1.2 Description of Work:

- A. This Valve and Pipe mounted device Section is applicable to the work involved in the Plumbing, Fire Protection and HVAC Sections.
- B. Where manufacturer's names are listed in this section of the specifications, alternate names may be acceptable through the submittal process.

PART 2 - PRODUCT

2.1 General Usage Valves:

- A. Gate Valves:
 - 1. Shut-off Valves:
 - a. Sizes 2" and smaller: Fig. T-134-70; bronze body, threaded ends, union bonnet, rising stem.
 - 2. Stop Valve Service:
 - a. Class 125, solid wedge gate, OS&Y pattern, Nibco.
 - b. Sizes 2" and larger: Fig. F-617; iron body, brass mounted, threaded ends, bolted bonnet, rising stem.
- B. Check Valves:
 - 1. Swing check, Class 125 Buna-N Disc, Stockham.
 - a. Sizes 2" and smaller: Fig. B-320; bronze body, threaded ends, plug type bonnet.
- C. Ball and Plug Valves:
 - 1. Shut-off Service:
 - a. Bronze body. Nibco.

- b. Sizes 2" and smaller: Fig. T-580-70, threaded ends, 600 psi, TFE seats, handle with stops, bronze trim.
2. Shut-off service, natural and LP gas, Nibco.
 - a. Sizes 2" and smaller: Nibco T-580-70, full port ball valve; 600 psi gas service rating; bronze body and ball, TFE seat, quarter turn handle with stops.
- D. Water Vents:
 1. Hoffman, Apco, cast brass body, threaded end connection, safety drain connection. Pressure rating to match system operating pressure.
- E. Gas Valves:
 1. Shut-off service.
 - a. Milwaukee Series BB2-102 gas valve, AGA approved for shut-off service or acceptable alternate.

2.2 Strainers:

- A. Y-Type:
 1. B&G, Armstrong, Sarco, cast iron body, monel screen with .045" perforations.
 2. Sizes 2-1/2" and smaller: 250 psi body, threaded ends, threaded retainer.

2.3 Hose Bib:

- A. Woodford, Model Y24, rough brass exterior, chrome finish, vacuum breaker and key.

PART 3 - EXECUTION

3.1 General:

- A. Application/installation:

Specific application of products shall be as described in other piping sections of the division.

3.2 Installation:

- A. Valves and Strainers:

1. Provide valves and strainers of the same size as the pipe in which they are mounted unless specifically shown otherwise.

2. Connect valves and strainers in copper piping systems with solder-to-threaded brass adapters.
 3. Provide valves with trim proper to the service on which they are applied.
 4. Locate above-grade valves:
 - a. With stems above the horizontal plane of the pipe.
 - b. Within six feet of floor where possible and reasonable.
 - c. Out from under equipment.
 - d. Readily accessible with adequate clearance around operating wheel or lever handle.
- B. Instrumentation:
1. Install all instrumentation items in a location where they are readily viewable and serviceable.

END OF SECTION

SECTION 22 15 00 PLUMBING WORK

PART 1 – GENERAL

1.01 Related Document:

- A. Refer to Section 230100 – Mechanical General Provisions for related work.

1.02 Description of Work:

- A. Where manufactures product names are listed in this Section of Specifications, alternate names may be acceptable through the submittal process.
- B. Work Included:
 - 1. Furnish and install all plumbing piping, equipment and accessories indicated on the contact drawings or described herein.
 - 2. Service connections to utilities, equipment or other' as shown on the contract drawings or described herein.

PART 2 – PRODUCTS

2.01 Pipe and Fittings:

- A. Refer to Piping Systems and Auxiliaries:
Section 220600.
- B. Refer to Valves and Pipe Mounted Devices:
Section 221100.
- C. Refer to Insulation:
Section 230800.
- D. Equipment:
As scheduled on drawings.
 - 1. Gas Pressure Regulators:
Rockwell, Reliance
 - 2. Water Pressure Regulators:
Clayton, Wilkens

3. Backflow Preventers:

a. Vacuum breaker type:

Febco

b. Double check valve type:

Clayton, Hersey, Febco

c. Reduced pressure type:

Clayton, Febco

4. Water Hammer Arrestors:

Jay R. Smith Hydrotol Series 5000, Wade, Zurn, Josam; to suit application type, size, etc., as scheduled on drawings.

5. Hoss Bibbs/Faucets:

Acorn, Chicago

6. Trap Printers:

Jay R. Smith, Wade, Zurn, Josam

7. Water Softeners:

Sta-Rite, Bruner, Culligan.

8. Gas-Fired Water Heaters:

A.O. Smith, P.V.I

9. Gas-Fueled Water Heaters:

PVIA. O. Smith, Rheem

10. Roof Drains:

Jay R. Smith, Wade, Zurn, Josam:

11. Storm Drains: (Specify)

12. Floor Drains and Receptors:

13. Traps:

Jay R. Smith, Wade, Zurn, Josam cast iron

14. Interceptors:

Jay R. Smith, Wade, Zurn, Josam

15. Cleanouts:

Jay R. Smith, Wade, Zurn, Josam

Plug – Countersunk brass with lead seal.

Furnish tee handle wrench to suit plugs.

16. Access Boxes:

For below grade valves and piping devices:

- a. Christy Concrete Products Company, Brooks, with galvanized steel checker plate recessed traffic lid flush with rim of box. Lids for boxes located in areas subject to vehicular traffic shall be constructed to withstand H20 Live loading as defined by the American Association of State Highway Officials (16,00 lb. maximum individual wheel load). Service identification shall be conspicuously welded on lid before galvanizing. For gas service, drill twelve (12) 3/8" diameter vent holes through lid before galvanizing. Provide manufacturer's box extensions to bring box bottom 3" below of valve and box top flush with finish grade.

17. Access Panels:

For concealed valves or other manually operated devices use Milcor, Acorn, wall and ceiling access panels which shall be:

- a. Square or rectangular, size as shown or appropriate, flush mounting.
- b. Suited to proper mounting into the surrounding construction (wood, concrete, plaster, acoustical tile or other),
- c. Finished to match surrounding surface; exception: in ceramic tile, panel shall be polished chrome plated brass or satin finish stainless steel.
- d. Fire rated to match the wall or ceiling in which installed (where applicable).
- e. Hinged on one edge, latched on the opposite edge. Hinge shall be non-protruding; latch shall be lock type, keyed the same for all panels.

E. Fixtures: As scheduled on drawing MP0.

1. Customary Fixtures:

- a. American Standard

- i. These include water closets, urinals, lavatories sinks, etc.
- ii. White in color unless stipulated otherwise on drawings.

2. Other Fixtures:

- a. Drinking fountains (uncooled):

Elkay

F. Fixture Trim:

1. Fixture Brass:

- a. All exposed items:

Polished chromium plated unless noted otherwise on drawings.

- b. Faucets, spouts:

Delta

- c. Stops and supplies:

Speedway, American Standard

- d. Traps:

17 gauge chrome plated tube; cast brass if concealed behind access panel.

- e. Flush valves:

Sloan Valve Co., Delaney

2. Water Closet Seats:

- a. Olsonite, Bemeke

White in color unless noted otherwise on drawings.

G. Fixture Supports and Fittings:

1. Supports and Fittings:

- a. Jay R. Smith, Wade, Zurn, Josam; match to fixtures per manufacture's recommendations.

2. Connectors:

- a. Herco, Tyler, flanges for floor-mounted fixtures.

H. Miscellaneous Items:

1. Access Products:

- a. Acorn.

2. Circulating Pumps:

- a. Bell and Gossett, Thrush.

3. Relief Valves:

- a. Cash ACME, Watts.

4. Flues/Vents:

- a. Duravent, Metalbestos, double wall flue pipe; include all necessary fittings, thimbles, caps, etc. or PVC flue and combustion air intake with concentric fitting for high efficiency furnaces.

PART 3 – EXECUTION

3.01 Preparation:

- A. Utility Services: See Section 230100.

B. General:

Coordinate requirements of items furnished under other Divisions of the Specifications.

- C. Fixtures: Check clearances, floor and wall finishes, and other job conditions or requirements before installing to insure proper installation.

3.02 Pipe and Valve Applications:

A. General:

For full description of piping systems specified below, refer to Part 2 of Section 220600, Piping Systems and Auxiliaries.

1. Cold Water:

- a. Service: Meter to building, below grade.
 - i. Copper with soldered or brazed joints. Type K, wrought copper fittings, silver brazed joints.

- b. Distribution above grade:
 - i. Copper with soldered or brazed joints. Type L, 95-5 solder except silver brazing on concealed joints.
 - c. Valves:
 - i. Gate Valves:
 - ii. Swing Check.
 - iii. Ball Valve.
2. Heated Water:
- a. Below grade or slab.
 - i. All sizes: Use copper with soldered or brazed joints. Type K cooper, wrought copper fittings, silver brazed joints.
 - b. Above grade.
 - i. Same as Cold Water Distribution above grade.
 - c. Valves.
 - i. Gate Valves.
 - ii. Swing Check.
 - iii. Ball check.
3. Soil (Sewage Collection and Drainage).
- a. Sewer: Building to street sewer, below grade.
 - i. All sizes: Use cast iron with gasketed joints or hubless cast iron with sleeve-clamped joints; (2) two clamp above grade and (4) four clamp below grade or approved PVC soil piping.
 - b. Within building to five feet outside below grade.
 - i. All sizes: use cast iron with gasketed joints or hubless cast iron with sleeve-clamped joints.
4. Waste-Local Collection and Drainage
- a. Above grade:

- i. All sizes: Use cast iron with gasketed joints or hubless cast iron with sleeve-clamped joints; (2) two sleeve clamp.
 - b. Below grade or slab:
 - i. All sizes: Use cast iron with gasketed joints or hubless cast iron with sleeve-clamped joints; (4) four sleeve clamp joints.
5. Vent:
- a. Below grade or slab:
 - i. All sizes: Use cast iron with gasketed joints or hubless cast iron with sleeve-clamped joints.
 - b. Above grade:
 - i. All sizes: Use Cast iron with gasketed joints or hubless cast iron with (2) two sleeve-clamped joints.

3.03 Other Applications:

A. Piping Insulation:

- 1. Cold water:
 - a. Apply to concealed piping above grade and where indicated on drawings, using Ridgid Molded Sectional with jacket thickness to meet Title 24 requirements.
- 2. Heated water:
 - a. Apply to all supply and recirculating piping using Rigid Molded Sectional with jacket 1" thickness above grade.
- 3. Roof drainage and overflow drains:
 - a. Apply to concealed horizontal runs only, using Rigid Molded Sectional with jacket 1" thickness.

B. Piping Protective Covering:

- 1. Apply to fuel gas piping below grade, extending to 6" above grade.

3.04 Installation:

A. General:

1. Coordinate plumbing work with that specified in other sections of divisions of the work.

B. Piping:

1. Size local piping, fixture supplies, vent, and drainage, per schedules on drawings.
2. Provide trenching and backfill for buried piping and install below the frost line or with the following minimum cover (whichever is deeper) unless shown otherwise:
 - a. Water – 24"
 - b. Sewer – 24"
3. Water piping:
 - a. Arrange pitch, and valve for complete drainage and control of each system.
 - b. Separate all parallel runs of cold and heated water by at least 6".
 - c. Install water hammer arrestors where shown or as required to prevent water hammer and vibration; follow manufacture's directions.
 - d. Where laid in same trench with sewer line, install on trench shelf at least 12" above top of sewer pipe.
4. Soil and Waste Piping:
 - a. Slope lines 3" and smaller $\frac{1}{4}$ " per foot minimum and 4" and larger $\frac{1}{8}$ " per foot minimum unless directed otherwise.
 - b. Install cleanouts at 100 ft. maximum intervals, at bends exceeding 45 degrees, and elsewhere as shown on drawings. Make take off from horizontal run with Two (2) $\frac{1}{8}$ bend fittings or wye and $\frac{1}{8}$ bend fittings.
 - c. Provide trap at each inlet to sanitary sewer system. Provide trap primers as required by code.
5. Vent piping;
 - a. Pitch to drain; collect risers where practical; offset toward center of building and extend through the roof. Vent all traps, sumps, and fixtures.
6. Flashing:
 - a. Furnish and install around each pipe, where it passes through roof, a flashing and conterflashing. All flashings shall be made of four pound sheet lead with 8" minimum skirt, conterflash with Semco 1100-2 or 1100-4 flashing fittings or

acceptable alternate. For vents provide Semco 1100-3 or 1100-5, or equal, vandalproof top and flashing combination.

3.05 Field Quality Control:

A. Piping Cleaning:

1. After installation and before installing valves or making final connections, flush or purge piping systems clean of foreign substances; use water to flush piping conducting liquids and compressed air to clear piping conducting gases.
2. After completing cold and heated water systems, disinfect in accordance with requirements of U.S. Public Health Department. Use 50 parts per million of chlorine with 24 hour retention and flush to leave a residual no greater than supply source. Submit written certification of disinfecting completion.
3. After installation and testing of systems and before putting into service, remove all strainer screens thoroughly and reinstall.

B. Piping Testing:

1. Comply with Section 220600.

2. Testing Criteria:

TEST

System	Medium	Pressure	Duration
Water	Water	150 psig	4 hours
Drainage & Vent	Water	10 ft. water	4 hours

END OF SECTION

SECTION 23 01 00

MECHANICAL GENERAL PROVISIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Refer to the General Conditions, Supplemental General Conditions, Division 1 General Requirements and all other applicable Sections of the specifications.
- B. Provisions of this Section shall apply to all sections of Division 22 and 23.

1.2 DESCRIPTION OF WORK

- A. Furnish and install all materials and equipment and provide all labor required and necessary to complete the work shown on the drawings and/or specified in all Sections of Division 22 and 23.
- B. Provide all necessary piping, ductwork, equipment and auxiliaries as specified.
- C. Provide all excavation and backfill and all cutting and patching including concrete saw cutting, core drilling and concrete replacement required for execution of work performed under this Section and not provided under other Sections.
- D. All work indicated anywhere on the drawings, including valves and other items shown on details or schematics and not on Drawings shall be part of this work. Items not specifically indicated but required for proper functioning of equipment, shall be installed by the craft furnishing the equipment.
- E. Provide flushing out of all piping and chlorination of domestic water piping as specified herein for the protection of user. This must be done and verified prior to allowing personal use of the water.

1.3 DEFINITIONS

- A. Above Grade: Not buried in ground and not embedded in concrete slab on ground.
- B. Below Grade: Buried in ground or embedded in concrete slab on ground.
- C. Concealed: Inside building, above ground and located within walls, furred spaces, crawl spaces, attics, above suspended ceilings, etc. In general any item not visible or directly accessible.
- D. Exposed: Either visible or subject to mechanical or weather damage, indoor, or outdoors, including areas such as mechanical and storage rooms. In general, any item that is directly accessible without moving panels, walls ceiling or other parts of structure.

- E. Indoor: Enclosed within building structure, including inside crawl spaces, etc.
- F. Outdoor: Outside of building structure, including inside crawl spaces, etc.
- G. Contractor: Mechanical Subcontractor, unless stated otherwise.
- H. Connect: Complete hook-up of item with required services.
- I. Furnish: Supply and deliver complete.
- J. Install: Place, secure and connect as required to make fully operational.
- K. Rough-in: Provide all indicated services in the necessary arrangement for making final connections to fixture or equipment.
- L. Start-up: Place system or systems in operation using proper sequence for starting and where required equipment personnel to start equipment.

1.4 LEGAL REQUIREMENTS, CODES, REGULATIONS

- A. General: Comply with applicable sections of State and local codes, laws, ordinances, rules and regulations of authorities having jurisdiction.
- B. Published specifications, standards, tests or recommended methods of trade, industry, or governmental organizations apply to the work of this Section where cited by abbreviations noted below.
- C. All regulations and standards shall be the latest issue unless the governing authorities require the use of an earlier issue.
 - 1. Air Moving and Conditioning Association (AMCA).
 - 2. American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE).
 - 3. American National Standards Institute (ANSI).
 - 4. American Society of Mechanical Engineers (ASME).
 - 5. American Society of for Testing and Materials (ASTM).
 - 6. American Conditioning and Refrigeration Institute (ARI).
 - 7. Associated Air Balance Council (AABC).
 - 8. American Welding Society.
 - 9. State of California Title 24 (2016 Edition) Part 1 Building Standards Administration Code
 - 10. State of California Title 24 (2016 Edition) Part 2/ Volume 1 California Building Code
 - 11. State of California Title 24 (2016 Edition) Part 2/ Volume 2 California Building Code

12. State of California Title 24 (2016 Edition) Part 3 California Electrical Code
13. State of California Title 24 (2016 Edition) Part 4 California Mechanical Code
14. State of California Title 24 (2016 Edition) Part 5 California Plumbing Code
15. State of California Title 24 (2016 Edition) Part 6 California Energy Code
16. State of California Title 24 (2016 Edition) Part 9 California Fire Code
17. State of California Title 24 (2016 Edition) Part 11 California Green Building Standards Code
18. State of California Title 24 (2016 Edition) Part 12 California Reference Standards Code
19. Title 19, CCR, Public Safety, State Fire Marshal Regulations
19. National Electrical Manufacturers Association (NEMA).
20. National Fire Protection Association (NFPA).
21. National Environmental Balancing Board (NEBB).
22. Sheet Metal and Air Conditioning Contractor's Association (SMACNA).
23. Underwriters Laboratories, Inc. (U.L.).
24. Occupational Safety and Health Administration (OSHA).
25. Owner's Insurers.
26. State Fire Marshal.
27. Any other applicable Federal, State, and Local laws and regulations.

D. Minimum Requirements:

1. Comply with requirements of authorities as minimum acceptable work.
2. The drawings and specifications take precedence when they call for materials or construction of better quality or larger size than required by code, laws, rules and regulations.
3. Do not construe anything in these drawings and specifications, to permit work not conforming to these requirements. The regulations shall govern where they require higher standards or are violated by the drawings and specifications. Consider ruling and interpretations of the reinforcing agencies as part of these specifications.

1.5 Related Work Under Other Sections

- A. Perform following work, in accordance with appropriate sections of the specifications cited as necessary to furnish a complete working mechanical installation.
- B. Miscellaneous metal work: Include fittings, brackets, supports, welding, and pipe as required for equipment and piping supports.

- C. Moisture protection: Include membrane clamps, sheet metal flashing, caulking and sealant and vapor barriers as required for waterproofing pipes and ductwork penetrations through roof.
- D. Painting: Include surface preparation, priming and finish coating as required on unpainted equipment, exposed insulation piping and ductwork where specified, refer to Division 9, Finishes work. Where color selections are required coordinate with Architect.
- E. Concrete: Include equipment mounting pads, anchors, tie- down blocks and other miscellaneous concrete work relating to the mechanical work, refer to Division 3, Concrete work.
- F. Electrical: Coordinate work as required to insure equipment supplied to be compatible with power available, refer to Division 26, Electrical work.

1.6 QUALITY ASSURANCE

- A. Avoid cutting and boring holes through structure or structural members wherever possible. Obtain prior approval of architect and conform to all structural requirements where this becomes necessary.
- B. To insure safety to occupants, operating personnel, conformity to code authorities and contract documents during the installation of this project.
- C. Ascertain and check conditions and elevations and take measurement that affect this work. No allowance shall subsequently be made for any extra expense due to failure or neglect to make examinations.
- D. Material and equipment incorporated in this work shall be new and manufactured or fabricated without defect and in conformance with applicable standards. The same manufacturer shall furnish all items of similar nature.
- E. Employ only experienced, competent and properly equipped workman on this project. Welders shall be certified in accordance with the American Welding Society "Standard Qualification Procedure". Refrigeration work installers shall be certified by American Refrigeration Contractors Association qualification procedures.

1.7 ACCURACY OF DATA

- A. The general arrangement of existing underground piping, drainpipes, conduits, apparatus, etc. is shown on the drawings from data off existing as-built drawings where available. Minor changes may be necessary to accommodate work and shall be made by this Contractor without extra expense to the Owner. Extreme accuracy of data given herein and on the Drawings is not guaranteed. The Drawings and Specifications are for the assistance and guidance of the contractor, and exact locations, distances and elevations will be governed by actual field conditions.

The Contractor shall examine the contract documents to determine exact routing and final termination for all conduits and placement of equipment.

1.8 MATERIALS AND SUBSTITUTIONS

- A. Materials shall be new and have specified quality. Deliver materials to and store them at the project in unbroken factory containers, indicating manufacturer's brand, and name of materials, which shall be used throughout the work.
- B. Clearly and permanently mark or stamp all materials with manufacturer's nameplate showing the model number and performance data. All materials shall be new and unused and provided with nameplates to indicate what function it serves.
- C. Brands or trade names are mentioned to set standards of quality; use no substitute materials unless acceptable in writing by the Architect. Acceptance of substitute materials does not relieve the Contractor of responsibility for providing a workable and functioning system as designed.
- D. Proof of equality is the sole responsibility of the Contractor. Descriptive data must be adequate to show the Architect why the materials or equipment meets the job requirements. The Contractor shall submit the elements to a testing laboratory for comments on equality in case of dispute or question, or upon request of the Architect without additional cost.
- E. Material submission is a requirement of these specifications. No payment for any work will be approved until this is done. Partial compliance or partial submittals will not be considered to show intent or ability to perform the work properly.
- F. Mark submittal "As Specified", or accompanied by a letter from the supplier explaining in detail what the difference, if any, exists between the submitted item and the specified item. Failure to point out differences will be considered cause for non-acceptance. The Architect and the Engineer will not assume any responsibility for any delays, damage, or expenses incurred by others due to such action. The Contractor assumes full responsibility for alternative items substituted and is responsible for the cost of redesign due to this substitution.
- G. Revisions or additional work required, due to the use of substitute materials, shall be fully indicated on detailed drawings submitted with the shop drawings. Substitutions proposed because of insufficient time for delivery of previously approved item shall be accompanied by the original purchase order with date and "received" stamp by the Vendor.

1.9 SUBMITTALS AND SUBSTITUTIONS

- A. Within 14 calendar days after award of contract and in ample time to avoid delay of the work, prepare a complete list and submittal of all materials including shop drawings, catalog information and other descriptive data for all items and submit to the Owner for review and comment.
- B. Submit shop drawings, catalog information, etc., neatly organized in binders with index and tabs, all at one time, for equipment furnished under this Section. Six (6) copies of

all initial submittals are required for materials offered as specified, as well as for any proposed substitutions.

C. Submittals shall clearly indicate on every copy:

1. Tag, mark, or number by which item is identified in contract documents.
2. Complete dimensional data.
3. Elevation views for complete representation.
4. Construction details.
5. Arrangement of devices and appurtenances.
6. Nameplate legends.
7. Locations and sizes of connections.
8. Finish materials and colors.
9. Complete descriptive information.

1.10 FINAL OBSERVATION REPORTS

- A. Owner's representative shall make a final observation of the job and note unacceptable items in a punch list. Final acceptance shall not be made until all items of this list have been corrected.

1.11 OPERATION AND MAINTANANCE MANUALS

- A. Submit within 14 days of Final Acceptance.
- B. Deliver to the Architect, for the Owner's use, three (3) complete operating and maintenance manuals covering all equipment and systems installed under this Division.
- C. Include spare parts, lists, wiring diagrams and operating instructions for all operating equipment, as well as approved submittals. All information shall be in a three ring binder with hard cover and tab indexes. Provide index in front cover indicating parts name, date and local vendors for furnishing parts and information on equipment.

1.12 EQUIPMENT HANDLING

- A. New equipment received at site prior to installation shall be stored indoors; when outdoors shall be mounted a minimum of 6" above grade with at least one (1) layer of heavy polyethylene plastic sheet weather proof covering anchored to prevent damage by high winds.
- B. Care shall be exercised during construction to avoid damage of any kind to mechanical equipment. Equipment shall be protected from dust and moisture during construction. Failure of the Contractor to protect the equipment as outlined herein shall be grounds for rejection of the equipment.

- C. Where equipment is specified to be installed in accordance with manufacturers recommendations, a copy of these recommendations shall be kept on the job site at all times and shall be made available to the Owners upon request.
- D. The general arrangement and location of piping, ductwork and equipment is shown on the Drawings, and shall be installed in accordance therewith, except for minor changes required by conflicts with other trades.

1.13 License, Fees and Permits:

- A. Unless otherwise specified, provide, procure and pay for all permits, services, meters, licenses, fee, etc., required to carry on and complete this work.
- B. The Contractor is responsible for all utility services, fees and connections to existing mains. For utility connections that are made by the Local Utility Authority, the Contractor shall arrange with this Authority to make the connections. On site work that relates to other crafts shall be coordinated with the work of this Section.
- C. Upon completion of the work, deliver to the Owner, all certificates of approval, signed by all authorities having jurisdiction.

1.14 JOB CONDITIONS

- A. Visit to site is required of all bidders prior to submission of bid. All bidders will be held to have familiarized themselves with all discernible conditions and no extra payment will be allowed for work required because of these conditions, whether specifically mentioned or not.

1.15 DRAWING AND SPECIFICATIONS

- A. All drawings and all divisions of these specifications shall be considered as a whole. This contractor shall inform and report any apparent discrepancies before submitting bid.
- B. Every effort to make these drawings as accurate as available information allows has been made; however, the final location of piping, ductwork and equipment shall be verified and coordinated prior to installation.
- C. Submit coordination layout drawings for all ductwork to insure no conflict occurs between piping systems and electrical systems on the project.

1.16 SAFETY AND INDEMNIFICATION

- A. Safety: The contractor shall be solely and completely responsible for conditions of the job site, including safety of all persons and property during performance of the work. This requirement will apply continually and not be limited to normal working hours. See Division 1 for General Conditions.
- B. Indemnification: The contractor performing work under this Division of the Specifications shall hold harmless, indemnify, and defend the Owner, the Engineer,

the Architect, their consultants and each of their officers, agents and employees from any and all liability claims, losses, or damage arising out of or alleged to arise from bodily injury, sickness, or death of a person or persons and for all damages arising out of injury to or destruction of property arising directly or indirectly out of or in connection with the performance of the work under this Division of the Specifications, and from the Contractor's negligence in the performance of the work described in the Construction Contract Documents, but not including liability that may be due to the sole negligence of the Owner, the Engineer, the Architect, their consultants or their officers, agents and employees.

1.17 The Contractor shall provide reproducible vellums with all deviations from original drawings clearly indicated.

1.18 GURANTEES

- A. Provide written guarantee to replace defects occurring in this work that is due to imperfection of workmanship or materials or due to failure to comply with drawings or specifications. This guarantee shall be effective for a minimum of one year after date of filing of Notice of Completion.

PART 2 - PRODUCTS

2.1 MATERIAL GENERAL

- A. The design, manufacture and testing of mechanical equipment and materials shall conform to or exceed the latest applicable NEMA, ASME, and ANSI standards.
- B. All materials must be new and bear U.L. label. Materials that are not covered by U.L. testing standards shall be tested and listed by an independent testing laboratory of a governmental agency, which laboratory shall be acceptable to the Architect, Owner and code enforcing authority.
- C. These drawings and specifications define the minimum quality of product of equipment by designating a manufacturer's trade name and catalog model number. The design has been based on this equipment selection and where more than one name given, the first is the basis of the design. Other named equipment will require a request for substitution and be submitted as indicated herein. Prior approval may be requested and only listed manufacturers will be acceptable if more than (3) names are listed

2.2 ELECTRICAL REQUIREMENTS

- A. Electrical items or parts as part of mechanical equipment shall be suitable and rated for operation on the power available.
- B. Electrical items shall meet requirements of Division 16- Electrical work, OSHA, DIS, and NEC. Items shall conform to NEMA Standards, and shall bear Underwriters' Laboratory label where applicable.

- C. Motors furnished as part of mechanical equipment shall be of size indicated and shall have starting torque sufficient to start and drive equipment load to which they are connected. Motors shall be the high-energy efficient type.
1. Motor enclosures shall be:
 - a. Drip proof for general use.
 - b. Totally enclosed for wet or unprotected exterior use.
 - c. Explosion proof for hazardous use.
 2. Motors to be installed in wet locations, chemical areas or plants, or in corrosive environment shall be General Electric Type K Custom Severe Duty, designed for severe duty and having 1.15 service factor.
 3. Variable speed drive motors shall consist of Eddy current drives and Eddy current couplings mounted in a common housing, or AC adjustable frequency drives or equal design of variable speed AC squirrel cage motors.
- D. Starters furnished integral to or specifically for mechanical equipment shall be Square D, General Electric or Cutler-Hammer, and shall comply with the following:
- | | |
|--------|-----------------|
| Type 1 | general purpose |
| Type 3 | raintight |
| Type 4 | watertight |
| Type 7 | explosion proof |
1. Thermal overload protection devices shall be provided as follows:
 - One for single phase motors.
 - Three for three phase motors.
 - One for each ungrounded conductor for each winding of multi-wound or multi-speed motors.
 2. Starters for motors up to 1/2 HP may be manual type if no interlocking is required.
 3. Starters for motors larger than 1/2 HP shall be magnetic across-the-line type except as stipulated above.
 4. Magnetic starters shall be provided with:
 - 120 volt control circuits.
 - H-O-A switch in cover.
 - Auxiliary contacts for necessary interlocking.
 - Integral disconnect switch or circuit breakers for branch circuit, short-circuit, and ground- fault protection.

5. Short-circuit interrupting capacity of starters and disconnects shall be adequate for voltage employed and for current to be interrupted. This may require use of high interrupting capacity breakers or current limiting fuses.
6. Starters shall be compatible with the motor they control.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Become familiar with all trade conditions at the jobsite and plan the installation of the mechanical work to conform to these existing conditions.
- B. Review all project drawings and specification; report any discrepancies before proceeding with the work and in time to avoid unnecessary work.

3.2 INSTALLATION

- A. Follow manufacturers directions in all cases for installation, testing and energizing.
- B. Accurately set, level, support and fasten all equipment.
- C. Piping and ductwork where exposed shall be installed parallel with walls or structural elements; vertical runs to be plumb, horizontal runs level or parallel with structure.
- D. Earthquake resistant installation fastening of all mechanical equipment shall conform to the Seismic Zone 4 general requirements and SMACNA'S Guidelines for Seismic Restraints of Mechanical Systems and Plumbing Piping Systems.
- E. Steel for equipment supports shall be new material conforming to ASTM A36, latest edition. Brackets, supports, etc., fabricated from ferrous metal shall be hot dipped galvanized after fabrication. Miscellaneous steel, bolts, nuts, washers, etc., shall be of new materials conforming to ASTM A36.
- F. Do not obstruct spaces required by code in front of or around mechanical equipment, access doors, etc.
- G. Equipment, systems or other that generate excessive vibration or which generate or emit undue noise while in operation after installation shall be repaired or replaced as appropriate to obtain acceptable operation levels of vibration or noise. Other means of suppression or absorption may be acceptable if proven effective.
- H. All line voltage power wiring connections shall be provided under Division 16, Electrical work unless specified otherwise. Equipment starters shall be furnished under Division 16, Electrical work unless an integral part of the mechanical equipment being supplied. Provide and install all control devices mounted in mechanical systems unless specified otherwise. Provide transient over voltage protection for all solid state control devices not having protection built into the device.

3.3 QUALITY OF WORK AND SUPERVISION

- A. Refer to Division 1, General Conditions.
- B. Testing and inspections of materials, equipment, and systems of this division shall be performed. Arrange for all inspections, witnessing and certification of tests when required.
- C. Provide adjustment of all operating equipment as necessary to obtain optimum operation, function, and appearance. Verify that all components are operating within the parameters set forth in these documents. Provide for all tools, apparatus, personnel and other required performing this work.

3.4 CLEANING AND PAINTING

- A. Refer to Division 1, General Requirements

3.5 FINISHING

- A. Valve Identification: Seton, Brady or Kolbi; valve identifiers, brass or plastic tags, 1 1/2 inch diameter minimum, other shapes acceptable, secured to valve body with chain, 1/2 inch minimum height letters stamped or engraved in tag. Identification shall reflect service of line installed.
- B. Piping Identification: Seton, Brady or Kolbi self-adhering tape markers, sized to suit pipe being marked. Marker shall conform to ANSI standards for tape color codes.
- C. Equipment Identification: Seton, Brady or Kolbi engraved plastic tags with 1/2 inch minimum height letters permanently secured to the equipment being identified.
- D. Where work or equipment has been installed under other divisions, and has been damaged by the work of this division, the contractor shall provide for patching, repair or replacement of the damaged work and pay all costs thereof. Where work and equipment installed under this division has been damaged, the contractor shall repair, replace or otherwise to bring the damaged work to acceptance condition or appearance.
- E. Clean up all debris and remnants resulting from the work of this division for a finished appearance of all work.
- F. Familiarize the owner's personnel in the proper operation and maintenance of all systems. Provide "Operations and Maintenance" manuals for review at this time. Provide people who are knowledgeable about the equipment and systems to indoctrinate the owner's personnel.

END OF SECTION

SECTION 23 08 00 INSULATION

PART 1 - GENERAL

1.1 Related Documents:

- A. Refer to Section 230100 - Mechanical General Provisions for Related Work.

1.2 Description of Work:

- A. This insulation specification is applicable to the Plumbing specifications.
- B. Where manufacturers' names are listed in this specification, alternate names may be acceptable through the submittal process.
- C. Insulation thicknesses shall be as specified by Title 24 California Code of Regulations Part 4 CMC.

PART 2 - PRODUCTS

2.1 Piping Insulations:

- A. Rigid Molded Sectional with Jacket:

- 1. Regular shape (straight run)

- a. Molded sectional, factory fabricated of heavy density resin-bonded fibrous glass, with integral factory-applied all-service jacket of Kraft paper/aluminum foil/glass fiber reinforcement.
- b. Insulation shall have a thermal conductivity k factor of 0.23 at 75 degrees F mean temperature and be suitable for direct application and service on piping having operating surface temperatures of -60 to 450 degrees F.
- c. Jacket:
 - i. Extend 1-1/2" (minimum) along one edge of longitudinal joint to form a sealing lap which shall be faced inside with a paper-protected pressure sensitive adhesive.
 - ii. Have a permeance rating of 0.02 perm/in. and a Beach puncture resistance of 50 units.
 - iii. Have an exterior suitable for painting with latex or water base paint.
- d. Fiberglass ASJ/SSL-II, Certained Snap-On or Johns- Mansville Micro-Lok 650.

- 2. Irregular Shape (fittings, flanges, valves, etc.)

- a. Fibrous glass of same density, thickness, and other properties or characteristics as the adjacent regular shape insulation, either pre-molded or field-formed to fit the item being insulated.
- b. Insulation shall be snugly jacketed with John- Mansville Zeston, Certainteed Snap-Form, factory- molded PVC covers.

PART 3 - EXECUTION

3.1 Installation:

A. General:

1. Apply insulations in accordance with the manufacturer's recommendations and with instructions specified herein or noted on the drawings.
2. Fit insulation snugly to the item being insulated; butt all joints tightly with no voids, spaces, or thin spots.
3. Seal all joints completely; where sealing tape is used, center the tape over the joint.
4. Except where specified or necessary, do not use staples or fasteners which penetrate vapor barrier jackets or covers on cold systems or equipment; where such penetrating fasteners are used, seal each penetration completely to maintain the vapor barrier integrity.
5. Use adhesives, mastics, cements, sealants, and finishes undiluted unless specifically directed otherwise; apply per manufacturer's directions.
6. Install outdoor jacketing or other specified weather proofing or finishing on all insulations outdoors (exposed to the weather).

3.2 Piping Insulations:

A. General

1. Unless specifically excluded herein or on the drawings, insulate all parts of hot and cold piping systems including fittings, flanges, valves, and pipe-mounted devices, except do not cover nameplates on devices.
2. Install insulation butted tightly to transitions such as insulated pipe shields, insulated pipe sleeves, equipment connections, etc.
3. Insulate equipment face piping completely to the point of equipment connection.

B. Rigid Molded Sectional/Jacketed:

1. Apply to all hot and cold piping installed above grade indoors and outdoors, concealed or exposed.

2. Seal all transverse joints with circumferential applied 3" minimum width tape of same material as the jacket, faced with the same adhesive as the longitudinal lap. Seal transverse joints at PVC tape and vapor barrier mastic adhesive.
3. Fit insulation terminations with Zeston or SnapForm end cap jackets, or seal with Hardcast tape as specified above for joints.
4. On all piping installed outdoors, install outdoor jacketing. Install aluminum sheet jacket with all joints turned down at 45 degrees below horizontal; secure in place with non-corroding bands and/or blind rivets.

3.3 Finishings:

A. Finishes and Protection:

1. Insure that the exterior finish of all insulation is applied and complete as required, ready for painting, or painted where required.
2. Install all required metal jackets or protective sheathing.

B. Repair, Touchup:

1. Properly repair and touchup all dents, rips, tears, or other damage inflicted on jackets or exterior surfaces of insulation.

END OF SECTION

SECTION 23 81 50 HVAC DUCTWORK

PART 1 - GENERAL

1.1 Related Documents:

- A. Refer to Section 230100 Mechanical General Provisions for related work.

1.2 Description of Work:

- A. Provide all ductwork and accessories for all supply, return and exhaust air systems as specified or shown on the drawings.
- B. Where manufacturer's names are listed in this Section of the specifications, alternate names may be acceptable through the submittal process.

1.3 Definitions:

- A. Ductwork Classifications:

- 1. Supply air ducts are classified as follows:

Low Pressure: Velocity less than 2,000 feet per minute (fpm) and static pressure (s.p.) less than 2" water gauge (w.g.)

Medium Pressure: Velocity greater than 2,000 fpm and s.p. between 2" w.g. and 6" w.g.

- 2. All return and exhaust air ductwork is classified as low pressure.

1.4 Submittals:

- A. Refer to Section 230100 Mechanical General Provisions.

PART 2 - PRODUCTS

2.1 Normal Construction:

- A. Requirements:

- 1. Shop fabricated ductwork:

- a. Fabricate ductwork as required by classification and to requirements specified below, and of configuration and sizes shown on the drawings. Note that duct sizes shown are net inside; where ducts are lined, fabricate larger than shown to accommodate lining.

- b. Fabricate ducts and fittings as shown on drawings, or if not detailed, in accordance with SMACNA "HVAC DUCT CONSTRUCTION STANDARDS" Metal and Flexible ductwork handbook. This applies to all ductwork specified herein.
 - c. Factory fabricated ductwork construction shall conform to applicable requirements stipulated above for shop fabricated ductwork.
- B. Galvanized Steel Ductwork:
- 1. Rectangular and Circular Cross Section:
 - a. Shop-fabricated of prime grade lock form quality galvanized steel sheet.
- C. Aluminum Ductwork:
- 1. Rectangular and round cross section:
 - a. Shop fabricated of Commercial Designation 3003 Temper H14 or Duct Sheet aluminum alloy sheet.
 - b. Ductwork, plenums, auxiliaries as specified for galvanized steel ductwork.
- D. Stainless Steel Ductwork:
- 1. Rectangular and round cross section:
 - a. ASTM A 480/A 480M, Type 304, and having a No. 2D finish for concealed ducts and No. 4 for exposed ducts.
- E. Flexible Fiberglass Ductwork:
- 1. Round cross section:
 - a. Thermaflex, Type M-KA insulated flexible glass fiber duct factory fabricated with a resilient core of continuous inner air barrier and a reinforced vapor barrier jacket. Product shall qualify as Class I Air Duct per UL 181.
 - b. Joint sealant: Fiberglass Type II glass fabric duct tape.

2.2 Duct Supports:

- A. Rectangular and Round Ducts:
- 1. Support in accordance with SMACNA "HVAC Duct Construction Standards" Metal and Flexible ductwork and Seismic Restraints of Mechanical Systems.

2.3 Ductwork Auxiliaries:

- A. Flexible Connectors:

1. Duro Dyne, Ventlok Duralon flexible fabric with Metalfab connectors at connections to fans and air handling equipment.
- B. Air Turning Vanes and Devices:
1. Install in square turn in elbows: Air Devices Airturns, Aero Dyne Type HEP turning vanes.
 2. Install at duct branches or take-offs: Air Devices Deflectrols.
- C. Volume Dampers and Accessories:
1. United McGill or acceptable alternate, opposed blade dampers with 6" maximum blade width and 14" \varnothing maximum single blade in accordance with SMACNA recommendation.
 2. Provide operating rod extension, offsets, combination bearing sets, steel angle gears, spacers on insulated ducts or other trim as necessary to connect manual or automatic operator.
 3. Provide damper operators, "Belimo" or acceptable alternate regulators: Automatic as specified in the HVAC Controls; Manual regulators: Ventlok, Young #666 or 677 in finished areas, #688 in exposed areas, #637 in mechanical rooms and concealed areas.
 4. Provide "Ruskin" model IAQ40 damper with integral pressure measuring ports in outdoor intake ducts or openings. Damper shall meet ASHRAE Standard 62-89 minimum ventilation rate.
- D. Splitter Dampers and Accessories:
1. Construct dampers of 18 gauge galvanized sheet metal.
 2. Manual regulators: Ventlok, Young #690 on exposed ductwork, #691 on concealed duct. Provide stop to prevent damper from being wound off end of rod. Where access is limited at side of duct, provide combination bearing sets, offset rods, cut steel angle gears and other trim as required.
- E. Fire Dampers:
1. Provide fire dampers or fire damper assemblies which are U.L listed and California State Fire Marshall approved.
 2. Blade widths shall be such that the blades do not interfere with adjacent ductwork components or auxiliaries.
 3. Dampers shall be held open by hooked connection of a fusible link. Links installed in dampers near forced air furnaces shall be rated at 212 degrees F; links installed elsewhere shall be rated at 160 degrees.

4. Each fire damper to be installed in or through a fire rated wall or other vertical fire separation shall be factory mounted in a sleeve which extends 3" beyond each face of the wall. Connect the duct to the sleeve with "S" clips only.
5. Shutter type dampers shall be designed so that the blade stack in the open position is held clear of the duct airflow.
6. Identifications:
 - a. Label all fire damper access doors or panels with the words "Fire Damper" in letters not less than 1/2" in height.

F. COMBINATION FIRE AND SMOKE DAMPERS

1. General Description: Labeled according to UL 555S for use in dynamic and static systems. Combination fire and smoke dampers shall be labeled according to UL 555 for 1-1/2-hour or 3-hour rating.
2. Fusible Links: Replaceable, 165 deg F rated.
3. Frame: 16 gauge galvanized, hat shaped steel channel.
4. Blades: Opposed blade action, airfoil shaped, double skin construction with 14 gauge equivalent thickness and maximum 6-inches wide.
5. Bearings: Stainless steel sleeve, pressed into frame.
6. Jamb Seals: Stainless steel, flexible metal compression type.
7. Blade Seals: Silicone edge type for smoke seal to 450 degree F and galvanized steel for flame seal to 1900 degree F.
8. Mounting Sleeve: Factory-installed, 0.052-inch thick, galvanized sheet steel; length to suit wall or floor application.
9. Damper Motors: Provide for two-position action with end switches at both positions.
 - a. Permanent-Split-Capacitor or Shaded-Pole Motors: With oil-immersed and sealed gear trains.
 - b. Spring-Return Motors: Equip with an integral spiral-spring mechanism. Enclose entire spring mechanism in a removable housing designed for service or adjustments. Size for running torque rating of 150 in. x lbf and breakaway torque rating of 150 in. x lbf.
 - c. Outdoor Motors and Motors in Outside-Air Intakes: Equip with O-ring gaskets designed to make motors weatherproof. Equip motors with internal heaters to permit normal operation at minus 40 deg F.

d. Electrical Connection: 115 V, single phase, 60 Hz.

G. Access and Inspection Panels and Doors:

1. Inspection panels: Air Balance Inc. #FSA 100 G, 10"x10" size for un-insulated and insulated ducts.
2. Access panels: United Sheet Metal Type AR-W, with transparent shatter proof cover, 18" wide by 3/4 of the duct height.
3. Plenum doors: In accordance with SMACNA "HVAC Duct Construction Standards"

H. Duct Penetrations:

1. Where ducts penetrate fire separations in the building, provide fire dampers as specified above.
2. Where ducts penetrate roof or exterior walls, provide 24 gauge minimum, galvanized sheet metal flashing and counter flashing: solder all joints and make watertight.

I. Sealants:

1. Products Research Co., 3-M; Rubber Caulk 5000 one part polysulfide base sealant in gray color.
2. Silicone sealer shall be used in all areas subject to acid or corrosive fumes.
3. Provide for securing pipe and duct supports to sprayed on roofing materials with either silicone, such as General Electric Silicone, or single component polyurethane elastomer, such as Vulkem-921 or Sikaflex-la. Roof field caulking shall be compatible with the respective elastomeric coating. Verify with Owner on each project.

J. Tapes and Adhesives:

1. Pressureless tapes: Hardcast, 4" wide Type DT mineral impregnated woven fiber tape with manufacturer's FTA-20 activator adhesive indoors and RTA-50 activator adhesive outdoors, applied with brush or roller in accordance with manufacturer's directions.

2.4 Ductwork:

A. Intake or exhaust Screens:

1. Provide 1/2" mesh 18 gauge galvanized iron or aluminum hardware cloth bird screens at all exterior openings in mechanical systems except where provided by other.

B. Transverse Duct Connection:

1. Ductmate #35 slide on duct connection system as manufactured by Ductmate Industries Inc.
2. Install in accordance with manufacturer's recommendations and instructions.

PART 3 - EXECUTION

3.1 Ductwork:

A. Galvanized Steel Ductwork:

1. Except where specified or shown otherwise, use galvanized steel ductwork in all locations.

B. Aluminum Ductwork:

1. Use on all exhaust systems for shower or locker rooms, dishwasher and all other high humidity.

C. Flexible Fiberglass Duct:

1. Use only where specifically called for on the drawings, as connections between terminal units and air outlets. Where restricted spaces occur that prevents the use of solid metal ductwork, flexible duct may be use with prior approval.

D. Stainless Steel Duct:

1. Use only where specifically called for on the drawings.

3.2 Installation:

A. Ductwork and Supports:

1. Install all ductwork in accordance with SMACNA "HVAC Duct Construction Standards" for Metal and Flexible ductwork recommendations, and Seismic Restraint of Mechanical Systems, manufacturer's recommendation and best practice.
2. Install ductwork rigidly, securely and air tight. Seal all joints and seams on all outdoor ductwork and plenums, on all indoor supply ductwork, and on all shower or high humidity area exhaust ductwork; use one layer of pressureless tape for sealing. Seal other ductwork where noted on drawings.
3. Support ductwork independently of ductwork connected equipment.

B. Ductwork Accessories:

1. Provide a 2" minimum gap between the ductwork sections where flexible connections are to be installed. Provide a generous fold in the connector to allow for movement.
2. Provide a 24 gauge galvanized sheet metal weather shield on top and sides of the flexible duct connectors on outside installations
3. Provide turning vanes at all square elbows and elsewhere as shown on drawings.
4. Provide deflectrols at all supply air outlet connections. Secure to ductwork in accordance with manufacturer's recommendations.
5. Provide balancing dampers at each divided flow fitting in rectangular ductwork. Provide splitter dampers only where shown on the drawings. Provide means to balance each air outlet with balancing dampers above the outlet unless a damper is shown in the ductwork attached to the outlet.
6. Install Fire Dampers in accordance with the manufacturer's recommendations and approvals.
7. Provide inspection access panels and doors at each splitter damper, fire damper and other locations where as required to provide access to duct mounted panels. Coordinate size and location to obtain good access.

3.3 Field Quality Control:

A. Demonstrations:

1. Before enclosing ductwork, operate each fire damper in the presence of the job inspector or the Engineer to demonstrate that each damper is functional.

B. Observations:

1. Poor fabrication or installation as disclosed by job site observations, will be cause for rejection, replacement or repair, of defective work at no additional cost to the Owner.

C. Ductwork Cleaning:

1. Clean all ductwork in the shop prior to shipping. All ductwork shall be transported to the site in covered vans to eliminate contamination and shall be protected from contamination at the site.
2. During installation on job site, seal sections of open ductwork with plastic sheeting to prevent infiltration of dirt and debris.
3. Before final balance and connections are made, blow clean all the ductwork serving areas not classified as rated clean spaces with the system fans, operating at normal conditions.

3.4 Adjusting and Finishing:

A. General:

1. Comply with requirements of Section 230100, Mechanical General Provisions and Section 239900, HVAC Testing, Adjusting and Balancing.

END OF SECTION

SECTION 23 99 00

HVAC TESTING, ADJUSTING AND BALANCING

PART 1 - GENERAL

1.01 Related Documents:

- A. Refer to Section 230100 Mechanical General Provisions for related work.

1.02 Description of Work:

- A. Testing, adjusting, and balancing (TAB) of the air conditioning systems and related ancillary equipment will be performed by a technically qualified TAB Firm.
- B. TAB Firm shall be capable of performing the TAB services as specified in accordance with the Contract Documents, including the preparation and submittal of a detailed report of the actual TAB Work performed.
- C. TAB Firm shall check, adjust, and balance components of the air conditioning system which will result in optimal noise, temperature, and airflow conditions in the conditioned spaces of the building while the system equipment is operating economically and efficiently. This is intended to be accomplished after the system components are installed and operating as specified in the Contract Documents. It is the responsibility of the Contractor to place the equipment into service. Variable air volume systems shall be balanced in accordance with AABC Standard, Latest Edition or NEBB Standards for Testing, Adjusting, Balancing of Environmental Systems (Latest Edition).
- D. Early Field Inspection:
 1. TAB Firm shall act as a liaison between the Owner, Architect and Contractor. TAB Firm shall perform the following reviews (observations) and tests:
 - a. During construction, review all HVAC submittals such as control diagrams, air handling devices, etc., that pertain to the ability to satisfactorily balance systems.
 - b. Test at least one or at least 10 percent of the single and fan-powered terminal units if the number of units are greater than twenty (20), for casing and damper leakage when the shipment arrives at the Project Site. All testing (except for the initial terminal units) shall be performed at the Project Site.
 - c. Test one (1) lab configuration including fume hood with air valve, general exhaust air with air valve and supply air with air valve for performance capability through a full range of inlet pressures. The tracking capability of the exhaust air versus the supply air will be with the submitted hood sash fully open and as the sash is closed in 2 inch increments until fully closed. Track the valves' response time in relation to sash movement and the lab differential.
 2. During the balancing process, as the TAB Firm discovers abnormalities and malfunctions of equipment or components, the TAB Firm shall advise the Contractor in writing so that the condition can be corrected by the Contractor

prior to finishing the TAB scope of Work. Data from malfunctioning equipment shall not be recorded in the final TAB report.

1.03 Quality Assurance:

A. Codes and Standards:

1. The latest published specifications, standards, tests or recommended methods of trade, industry, or governmental organizations apply to work of this Section where cited by abbreviations (AABC) Associated Air Balance Council, National Standards for Total System Balance, (NEBB) National Environmental Balancing Board.

1.04 Submittals:

A. Requirements:

1. Refer to Section 230100, Mechanical General Provisions.

B. Evidence of Qualification:

1. Submit the name of the test and balance agency and evidence of qualification within 30 days after award of the contract. The test and balance agency shall be done by a separate independent company other than the mechanical contractor.
2. The test and balance agency shall submit the following information for review:
 - a. The name and registration number or license of the Test and Balance Engineer.
 - b. Detailed procedures.
 - c. Report forms.
 - d. AABC Performance or other approved warranty.

C. Test and Balance Report:

1. Submit three (3) typewritten copies of the complete test and balance report with all pertinent data. List specified and tested data

PART 2 - PRODUCTS

2.01 Materials:

A. General:

1. The test and balance agency shall supply all instrumentation, tools, and equipment necessary for the total system balance.

PART 3 - EXECUTION

3.01 AIR BALANCE

- A. When systems are installed and ready for operation, the TAB Firm shall perform an air balance for all air systems and record the results. The outside, supply, exhaust and return air volume for each air handling unit, supply fan and exhaust fan and the supply, exhaust or return air volume for each distribution device shall be adjusted to within +/- 5 percent of the value shown on the Drawings. Air handling unit and fan volumes shall be adjusted by changing fan speed and adjusting volume dampers associated with the unit. Air distribution devices shall be balanced with air patterns as specified. Duct volume dampers shall be adjusted to provide air volume to branch ducts where such dampers are shown.
- B. The general scope of balancing by the TAB Firm shall include, but is not limited to, the following:
1. Filters: Check air filters and filter media and balance only systems with essentially clean filters and filter media. The Contractor shall install new filters and filter media prior to the final air balance.
 2. Blower Speed: Measure RPM at each fan or blower to design requirements. Where a speed adjustment is required, the Contractor shall make any required changes.
 3. Ampere Readings: Measure and record full load amperes for motors.
 4. Static Pressure: Static pressure gains or losses shall be measured across each supply fan, cooling coil, heating coil, return air fan, air handling unit filter and exhaust fan. These readings shall be measured and recorded for this report at the furthest air device or terminal unit from the air handler supplying that device. Static pressure readings shall also be provided for systems, which do not perform as designed.
 5. Equipment Air Flow: Adjust and record exhaust, return, outside and supply air CFM(s) and temperatures, as applicable, at each fan, blower and coil.
 6. Coil Temperatures: Set controls for full cooling and for full heating loads. Read and record entering and leaving dry bulb and wet bulb temperatures (cooling only) at each cooling coil, heating coil and reheat coil at each VAV terminal unit. At the time of reading record water flow and entering and leaving water temperatures (In variable flow systems adjust the water flow to design for all the above readings).
 7. Zone Air Flow: Adjust each HVAC VAV terminal unit and VAV air handling unit for design CFM.
 8. Outlet Air Flow: Adjust each exhaust inlet and supply diffuser, register and grille to within + 5 percent of design air CFM. Include all terminal points of air supply and all points of exhaust. Note: For Labs and rooms that are negative exhaust air flow shall be set to design + 10 percent and supply to design - 5 percent. Positive areas will have opposite tolerances.
 9. Pitot Tube Traverses: For use in future troubleshooting by Owner, all exhaust ducts, main supply ducts and return ducts shall have air velocity and volume measured and recorded by the traverse method. Locations of these traverse test stations shall be described on the sheet containing the data.
 10. Maximum and minimum air flow on terminal units.

3.02 SOUND VIBRATION AND ALIGNMENT

- A. Sound: Read and record sound levels at up to fifteen (15) locations per floor in the building as designated by the Architect/Engineer. All measurements shall be made using an Octave Band Analyzer. All tests shall be conducted when the building is quiet and in the presence of the Architect/Engineer, at the Architect/Engineer's option.
- B. Vibration: Read and record vibration for all water circulating pumps, air handling units, and fans which have motors larger than 10 horsepower. Include equipment vibration, bearing housing vibration, foundation vibration, building structure vibration, and other tests as directed by the Architect/Engineer. Readings will be made using portable IRD (or approved equal) equipment capable of filtering out various unwanted frequencies and standard reporting forms. Maximum vibration at any point listed above, or specified, shall not exceed one mil on fans and one mil on pumps unless otherwise specified. Equipment manufacturer shall rectify all systems exceeding vibration tolerances.

3.03 Procedure:

A. General:

- 1. The total system balance shall be performed in accordance with the AABC standards.
- 2. Provide for a rebalance after owner has taken occupancy of the building area of a minimum of (2) days to fine tune the building

3.04 Finishing:

A. General:

- 1. Submit (3) three sets of completed test and balance reports to the Owner's representative for review. Make final adjustments to the system as required by the owner's representative.

END OF SECTION

SECTION 28000

**Fire Alarm System
Complete Material Submittal
Prepared for :**

SCCD VACAVILLE
2000 North Village Parkway, Vacaville, CA 95688

SCCD VACAVILLE
2000 North Village Parkway, Vacaville, CA 95688

Manufacturer	Device Model #	Description	C.S.F.M. #
EST	EST3	FIRE ALARM CONTROL UNIT	7165-1657:0186
EST	3-CPU3	CENTRAL PROCESSOR MODULE	7165-1657:0186
EST	3-RS485B	NETWORK COMMUNICATION CARD, CLASS B	7165-1657:0186
EST	3-SSDC1	SIGNATURE SINGLE DRIVER CONTROLLER	7165-1657:0186
EST	3-MODCOM	MODEM COMMUNICATOR AND DIALER	7165-1657:0186
EST	3-LCD	LIQUID CRYSTAL DISPLAY MODULE	7165-1657:0186
EST	3-PPS/M	PRIMARY POWER SUPPLY, 120V	7165-1657:0186
EST	12V24A	26 AH BATTERY	7165-1657:0186
EST	BC-1R	BATTERY CABINET, RED	7165-1657:0186
EST	3-CHAS7	CHASSIS ASSEMBLY FOR 7 LOCAL RAIL MODULES	7165-1657:0186
EST	3-LRMF	BLANK LOCAL RAIL MODULE FILLER	7165-1657:0186
EST	3-FP	FILLER PLATE FOR LRM DOOR	7165-1657:0186
EST	3-CAB7B	RED DOOR ASSEMBLY FOR 3-CAB7	7165-1657:0186
EST	3-CAB7DR	RED DOOR ASSEMBLY FOR 3-CAB7	7165-1657:0186
EST	SIGA-PD	PHOTO SMOKE DETECTOR	7272-1657:0331
EST	SIGA-SB4	DETECTOR BASE	7300-1657:0120
EST	SIGA-278	MANUAL PULL	7150-1657:0129
EST	SIGA- CT1	SINGLE MONITOR MODULE	7300-1657:0121
EST	SIGA- CT2	DUAL MONITOR MODULE	7300-1657:0121
EST	SIGA- CR	CONTROL RELAY MODULE	7300-1657:0121
EST	SIGA-CC1S	SYNCHRONIZATION OUTPUT MODULE	7300-1657:0121
EST	G1RF-VM	STROBE, WALL MOUNT, RED	7125-1657:0218
EST	G1RF-HDVM	HORN STROBE, WALL MOUNT, RED	7125-1657:0202
EST	BPS6A	REMOTE BOOSTER POWER SUPPLY	7125-1657:0229
EST	12V6A5	7.2AH 12VDC BATTERY	NA
EST	SIGA-SD	SUPER DUCT DETECTOR	3242-1657:0223
EST	SD-TRK	DUCT REMOTE KEYED TEST	3242-1657:0226
EST	SD-T60	DUCT SAMPLE TUBES	3242-1657:0223
SPE	SSU00685/FAD	DOCUMENT CAN WITH 4 GIG FLASH DRIVE	7300-0553:0110



EST3 Base Platform

With Signature Series Fire Alarm



Overview

EST3 is a modular control platform uniquely designed to meet the needs of applications ranging from standalone single panel fire alarm systems to multi-panel networks with unified fire alarm, security, and Mass Notification functions. Each function uses many of the same components, simplifying system layouts.

Virtually all EST3 operating features are software-controlled. A powerful System Definition Utility program helps define system operations in a fraction of the time required by previous methods. This gives EST3 great site flexibility and ensures operational changes and upgrades will be possible years after the initial installation.

EST3 is uniquely designed to meet the life safety needs of any size facility. The function of each panel can be customized by using an extensive selection of plug and play local rail modules.

With support for 64 nodes of up to 2,500 devices each, this network's multi-priority peer-to-peer token ring protocol delivers a fast alarm response time across any size network. Add to that the ability to network panels with fiber or copper connections with an overall length of 160,000 ft - that's 30 miles - and you've got virtually unlimited networking options.

The EST3 is modularly listed under the following standards: UL 864 categories: UOJZ, UOXX, UUKL and SYZV, UL 294 category ALVY, UL 609 category AOTX, UL 636 category ANET, UL 1076 category APOU, UL 365 category APAW, UL 1610 category AMCX, UL 1635 category AMCX, UL2572 Mass Notification. Also listed to ULC-S527, ULC-S303, and ULC/ORD-C1076.

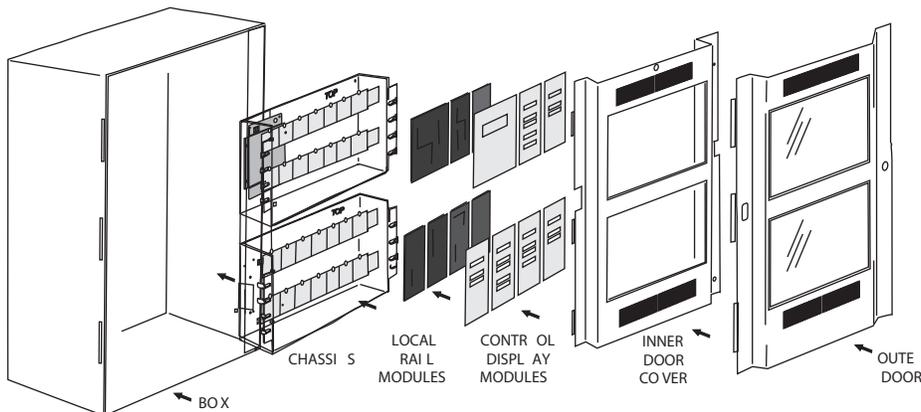
Standard Features

- Listed for Mass Notification/Emergency Communication, Fire, Security, and Emergency Voice Alarm
- 168-character LCD
- Exceptional alarm response times
- Network supports copper, multi-mode fiber, single-mode fiber, or a combination of all three
- Total network wiring over 160,000 feet
- Eight channels of multiplexed digital audio on a single pair of wires or fiber filament
- Zoned, distributed and banked audio amplifier options
- Local, Proprietary, and Central Station system operations
- In retrofit applications, existing wiring may be used if code compliant
- Supports Edwards Signature Series detectors and modules
- Designed in accordance with ISO-9000 quality standards
- UL864 Ninth Edition Listed
- UL2572 Listed for Mass Notification
- Optional earthquake hardening: OSHPD seismic pre-approval for component Importance Factor 1.5

Outstanding Features

EST3 system components are arranged in layers, starting with the backbox and finishing with inner and outer doors. Cabinets are available with room for up to 20 modules and system batteries up to 65 AH. A single 24-volt battery can act as the secondary power supply for all four internal power supplies. Once the backbox is installed, up to four power supplies can be installed in the chassis assembly. The power supplies use a unique paralleling arrangement that ensures the optimum use of each supply. Each supply has the capacity to deliver up to 7 amps at 24 Vdc (28 amps total).

The function of each life safety network panel is determined by the Local Rail Modules (LRMs) plugged into the panel's chassis. An extensive variety of modules are available, including central processing units, input/output circuit modules, communication modules, security modules, and audio amplifier modules.



The top layer of the LRMs is referred to as the user interface layer. This layer is made up of the Main Display Interface module and a system of generic control/display modules. Any control/display module can mount on any LRM. This maximizes flexibility of design for custom systems. The inner and outer doors finish and secure the enclosure.

A single panel can support up to 2,500 addressable points, provide 28 amps @ 24 Vdc and still have room for future expansion. If a single panel is not large enough or you need to distribute functionality throughout the project, then you can network up to 64 panels together!

Networking/Communications

The EST3 Life Safety Network uses a multi-priority peer-to-peer token ring protocol. The protocol gives EST3 the exceptionally fast alarm response time of less than three seconds across the network, virtually independent of the total number of nodes. The EST3 token ring network configuration also affords long distances between panels. The distance between any three panels on #18 AWG (1.0 mm²) is 5,000 ft (1,523m) for both network control and digital audio signals. Supporting a maximum of 64 panels on a network, the total network length can be in excess of 160,000 ft (48,768m). Network and audio communication are via RS-485 serial ports. Each two-wire circuit supports Class A (Style 7) or Class B (Style 4) wiring configurations. Fiber optic media is also available.

As an indication of the high level of system integration, off-premise communications is handled by the Modcom modem communicator module. This module provides the Digital Alarm Communicator Transmitter (DACT) function, sending system status signals for up to 255 accounts to up to 80 different central monitoring stations and/or commercial paging carriers.

Digital Audio

EST3 digitized audio can deliver up to eight audio messages *simultaneously* over a single pair of wires! This is plenty of capacity for both live and pre-recorded messages. EST3 easily supports the needs of mass notification messaging, and fire alarm messaging by providing the ability to bring not only pre-recorded messages but also live voice messaging supporting not only evacuation announcements but the messaging needed to support the risks that may require shelter-in-place and relocation messaging.

All audio messages and live pages originate at the Audio Source Unit (ASU) that can store up to 100 minutes pre-recorded audio

messages as .wav files. These messages can be automatically directed to various areas in a facility under program control. On the receiving end, zoned amplifiers installed in remote fire alarm cabinets receive and decode the digital messages. The messages are then amplified and sent out to the speakers.

The availability of eight different channels opens a number of new *simultaneous* notification possibilities:

- 1) Live voice page for MNEC or fire-related instructions;
- 2) Emergency floor evacuation/notification message;
- 3) Alert message on floors above and below the emergency;
- 4) Stairwell evacuation reinforcement message;
- 5) Elevator cab information messages;
- 6) Lobby message instructing occupants to exit the building;
- 7) Concourse instructions to occupants not to enter the lobby;
- 8) Other instructions to areas not directly affected by the emergency.

Any combination of the eight audio channels can be automatically directed to any or all areas of the building, with total manual override as required. Eight channel capability assures that one message is never interrupted in order to process another, a common fault with two-channel systems. This eliminates any chance of confusing the occupants with conflicting messages.

Survivability is also an integral part of EST3's digitized audio system. Default audio messages are continuously transmitted to all network amplifiers by the ASU. These messages provide audio supervision for the digital audio chain, and act as a default signal if the network data circuit fails or should message control information fail to reach the ASU. If the audio data circuit fails, each amplifier generates a 1KHz temporal (3-3-3) tone that is transmitted during an alarm. In the event of an amplifier failure, a backup audio amplifier is automatically substituted for the failed amplifier in the cabinet, restoring audio capability. In the unlikely event of multiple amplifier failures, the backup amp replaces the amplifier actively processing the highest priority message in the cabinet. When messages are no longer directed to a failed amplifier such as when a high priority page message ends, the backup amp is dynamically reassigned to the next highest priority failed amplifier actively processing messages.

The Firefighters Telephone Control unit (FTCU) provides two-way communications between remotely located phones and the fire command center. The alphanumeric display makes operation intuitive, and a single switch permits the phone signals to be used to issue pages in the facility.

Digitized audio increases notification messaging flexibility, reduces wiring and installation costs, provides enhanced supervision and survivability, and is easy to use.

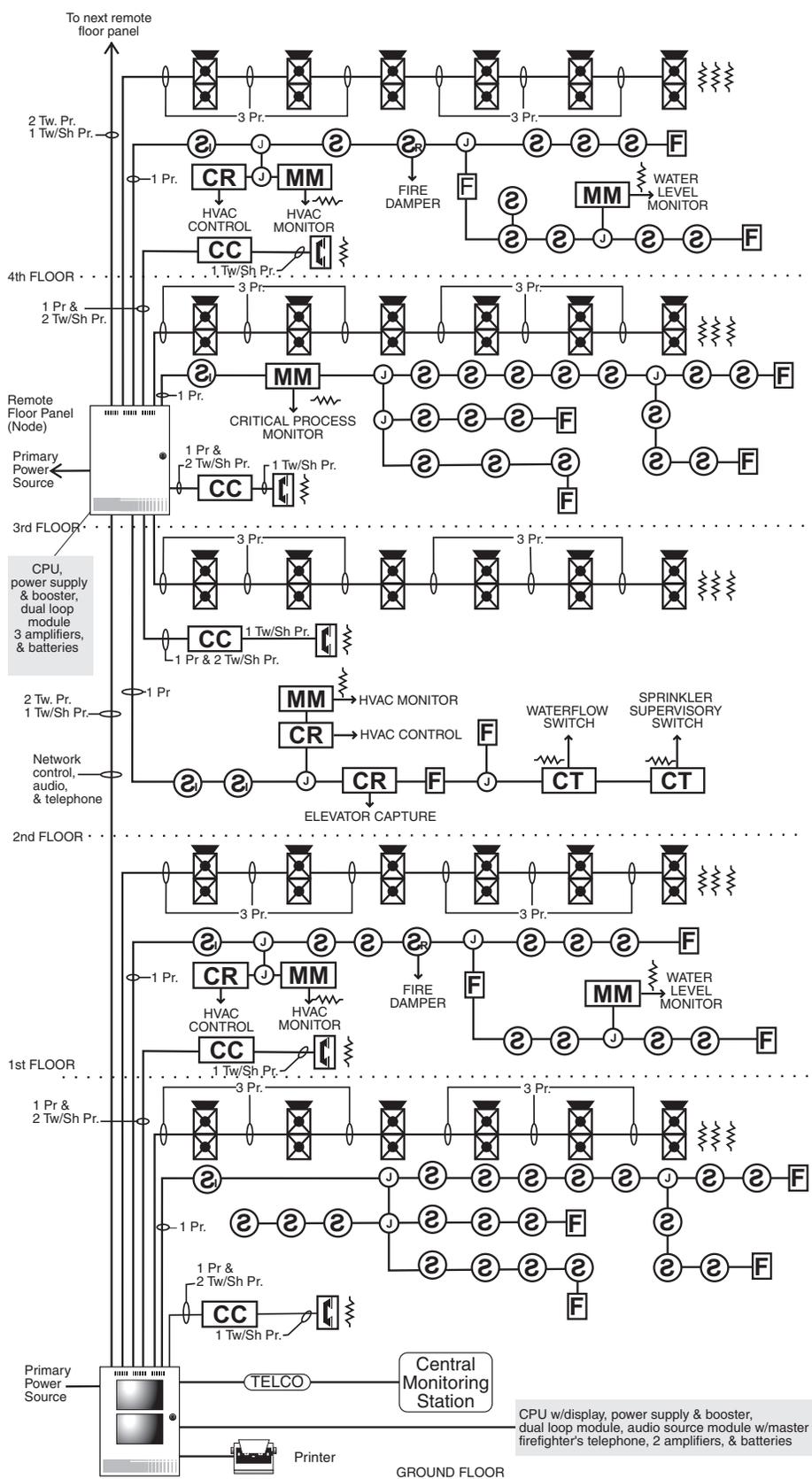
Enhanced Reliability & Survivability

The EST3 uses distributed technology, designed to survive expected and unexpected events including earthquakes. Simple-to-install kits provide internal hardening that meets requirements defined by *Uniform Building Code (UBC 1997)*; *International Building Code (IBC 2006)*; and, *Acceptance Criteria for Seismic Qualification by Shake-Table Testing of Nonstructural Components and Systems (AC-156)*. Seismic component importance factor of 1.5 can be met by adding appropriate anchorage for local conditions. There is no need for special installation methods for EST3 field devices including signals and detection devices. By following standard mounting methods, along with any local requirements, seismic Importance Factor 1.5 may be gained in order to further enhance system survivability.

On the initiating side, intelligent Signature Series detectors can make alarm decisions on their own, and do not involve other system components in this important decision-making process. Sensor-based technology must communicate data to a remotely located common panel where alarm decisions are made. Failure of this centralized processor can cripple sensor-based systems. With EST3, a panel CPU failure does not disable a panel's ability to provide protection. In the event of a CPU failure, the intelligent device controllers can still receive alarms and distribute the alarm information to all other modules in the panel. Modules in the panel are capable of responding with a programmed standalone alarm response.

When a network is wired in a Class B configuration, a single break or short on the wiring isolates the system into two groups of panels. Each group continues to function as a peer-to-peer network, working with their combined databases. When wired using a Class A configuration, a single break or short on the network wiring causes the system to isolate the fault, and network communication continues uninterrupted – without any loss of

Typical Wiring





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function. Should multiple wiring faults occur, the network re-configures into many sub-networks and continues to respond to alarm events from every panel that can transmit and receive network messages. Survivability is maximized as responses originating and executed by a single panel are always carried out because a copy of the system database is stored in the panel's memory.

Scheduled maintenance improves system availability, and EST3 is designed to make system maintenance easy. System components are designed to assist in routine and time-consuming service functions.

- EST3 service groups are defined by location, not by system wiring. There is no need to disable an entire floor to test a single device.
- According to their UL listings, Signature Series detectors do not require routine sensitivity testing – a real timesaver.
- Comprehensive internal and external monitoring quickly identifies most problems to a component level, including ground faults that can be identified down to the module.
- Parts are easy to replace. Modules plug in and use automatic addressing and plug-in field wiring. No DIP switches are used.
- Firmware in system modules and Signature devices is easily upgraded as new advances in detection and control technology are made available.
- Advanced system diagnostics are provided in the EST3 System Definition Utility.

User Friendly

A comprehensive survey of users resulted in system features and controls that are easy to use.

The main display interface shows the operator the first and most recent system events – without ever touching a single control! All system events are sent to one of four message queues. Alarm messages are never intermixed with trouble or supervisory signals, eliminating confusion. For more information the *Details* switch provides additional information about the highlighted device. The operator can easily review supervisory, trouble, and monitor messages by simply selecting the appropriate message queue. After a few minutes of inactivity, the system automatically returns to displaying the first and most recent events.

Optional manual control switches and display modules can be arranged on the system operator layer to suit the application. These modules can be used to provide additional HVAC controls, manual selection of audio circuits, or other required manual control functions.

The digital audio system uses only five basic controls to direct all paging messages.

- ALL CALL directs page messages to all zones in the facility.
- Page to EVACUATION automatically directs page messages to the fire area.
- Page to ALERT automatically directs page messages to the areas receiving the alert message.
- All Call Minus automatically directs page messages to the areas NOT receiving the evacuation or alert messages.
- Page by Phone selects the firefighters' telephone system as the source for paging.

The Firefighters' Telephone Control Unit (FTCU) uses an alphanumeric display to indicate the source of incoming calls. Operators simply scroll through the list and hit the "Connect" button when the desired call is highlighted. There is no need to look through rows of lamps and switches to determine the source of calls. Up to five remote locations can be in simultaneous two-way communications with the FTCU.

System Configuration

The powerful EST3 System Definition Utility (SDU) helps define flexible system operations in a fraction of the time required by other systems. Based on an object-oriented system of rules, virtually all EST3 operating features are software-controlled. This gives the designer great flexibility in integrating mass notification, fire, and security functions into a single seamless design.

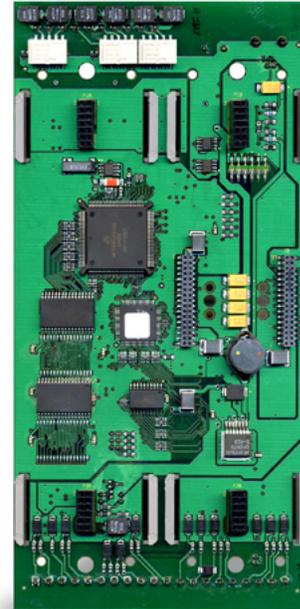
A report generator provides a complete library of system reports that are invaluable for troubleshooting, including a printout of Signature device connections as the devices are actually wired.

Use of software-based components permits the SDU to add new features to the system. Even the Signature Series devices are capable of upgrading firmware as new detection algorithms become available.



EST3 Central Processor Unit

3-CPU3, 3-RS485A, 3-RS485B,
3-RS232



S3000

7165-1657:
0186**FDNY**
COA 6086

EN54-2:1997+A1 and
EN54-4:1997+A1:2002+A2
pending.

Overview

The 3-CPU3 is the Central Processing Unit Module monitoring the status of all modules and providing the link for network communications. Although each local rail card contains their own micro-processor, the 3-CPU3 provides all inter-module communication and has the ability to download rail module operating parameters. Upon power up the 3-CPU3 automatically learns all local rail module attributes and locations. Site specific software is loaded into the 3-CPU3 which then downloads data to each local rail module. Firmware upgrades are also done from the 3-CPU3 eliminating the need to unplug chips on rail modules.

Mounting must be in the first two local rail spaces of the upper 3-CHAS7 (module chassis). Options for the 3-CPU3 include the addition of an LCD display and User Interface, RS-232 Communication Card, and RS-485 Series Network Communication Cards.

The 3-CPU3 is fully compatible on the same network with the 3-CPU and 3-CPU1 modules.

Standard Features

- Up to 1,000 history events
- RS-485 local rail communications
- Multiplexed audio channels
- Network communication media can consist of twisted copper RS485, short-haul modems and/or single or multimode fiber optic cables
- RS-232 communication card
- Form 'C' contacts for: Alarm, Supervisory and Trouble
- Low voltage memory write protection
- Non-volatile memory

Application

The 3-CPU3 helps make EST3 an extremely powerful and flexible system. As a single node, stand alone system a single 3-CPU3 controls 1 to 19 additional local rail modules. For larger systems, up to 64 nodes interconnect on a peer-to-peer multi-priority token ring protocol network.

The 3-CPU3 controls all local panel responses to automatic, user initiated, or network reported events. As a network node, it is an equal among peers, there is no master on the network. This gives exceptional response times over the network, less than three seconds.

Each 3-CPU3 provides slots at the back for mounting Network, and RS-232, cards. Removable terminal blocks on the 3-CPU3 support connection of network and audio data wiring. On board common relays also terminate at the 3-CPU3 terminals. To aid in trouble shooting and service, status LEDs monitor local rail, network, RS232 and audio data communications.

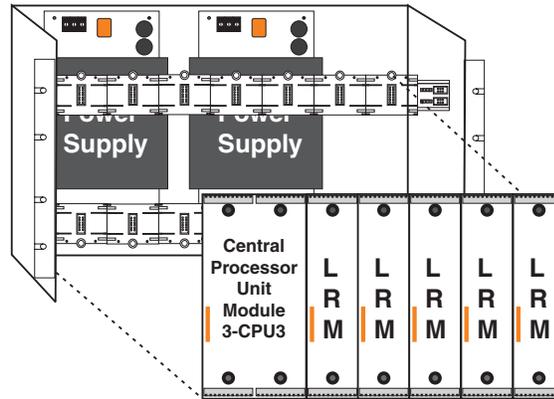
The **Network Communications** card mounts to the back of the Central Processor Unit. The 3-RS485A card provides a Class A (Style 7) or Class B (Style 4) circuit for network communications signals and support for a Class B (Style 4) or Class A (Style 7 - dual Style 4) circuit for the digitized audio signals. The 3-RS485B card provides a Class B (Style 4) or Class A (Style 7) circuit for network communications signals and a second Class B (Style 4) circuit for the digitized audio signals. Network messages received by the Network Communications card are re-transmitted to the next network node. Re-transmission maximizes the wire run lengths between nodes. With 64 nodes miles of network length is possible. Fail safe mechanisms built into the card direct connect the data input and output ports should the network card or its related Central Processor fail. Network communications may be configured via copper or fiber media using the 3-FIBMB.

The **3-RS232 Communication Card** mounts to the back of the 3-CPU3. The 3-RS232 has two optically isolated RS-232 ports. The ports support connection of a printer and/or an external command center. Entire network downloading from one location (to all 64 nodes) is available through the RS-232 card.

Engineering Specification

It must be possible to support a single stand alone node or up to 64 nodes communicating on a peer-to-peer token ring protocol network. Network and digitized audio wiring shall be run in a [choose one: Class A (Style 7) or Class B (Style 4)] configuration. Network alarm response from alarm input to signal activation must be under 3 seconds. All field wiring must be to removable terminal blocks. Status LEDs must be provided for communications of network and internal rail communications. Inter-node communication speed must be programmable. Internal rail communications speed must be programmable.

Installation and Mounting



Data

Maximum resistance between any 3 panels	90 Ohms
Maximum capacitance between any 3 panels	0.3 μ F
Maximum distance between any 3 panels via RS485	5,000 ft. (1,524 m)

Capacitance, entire network

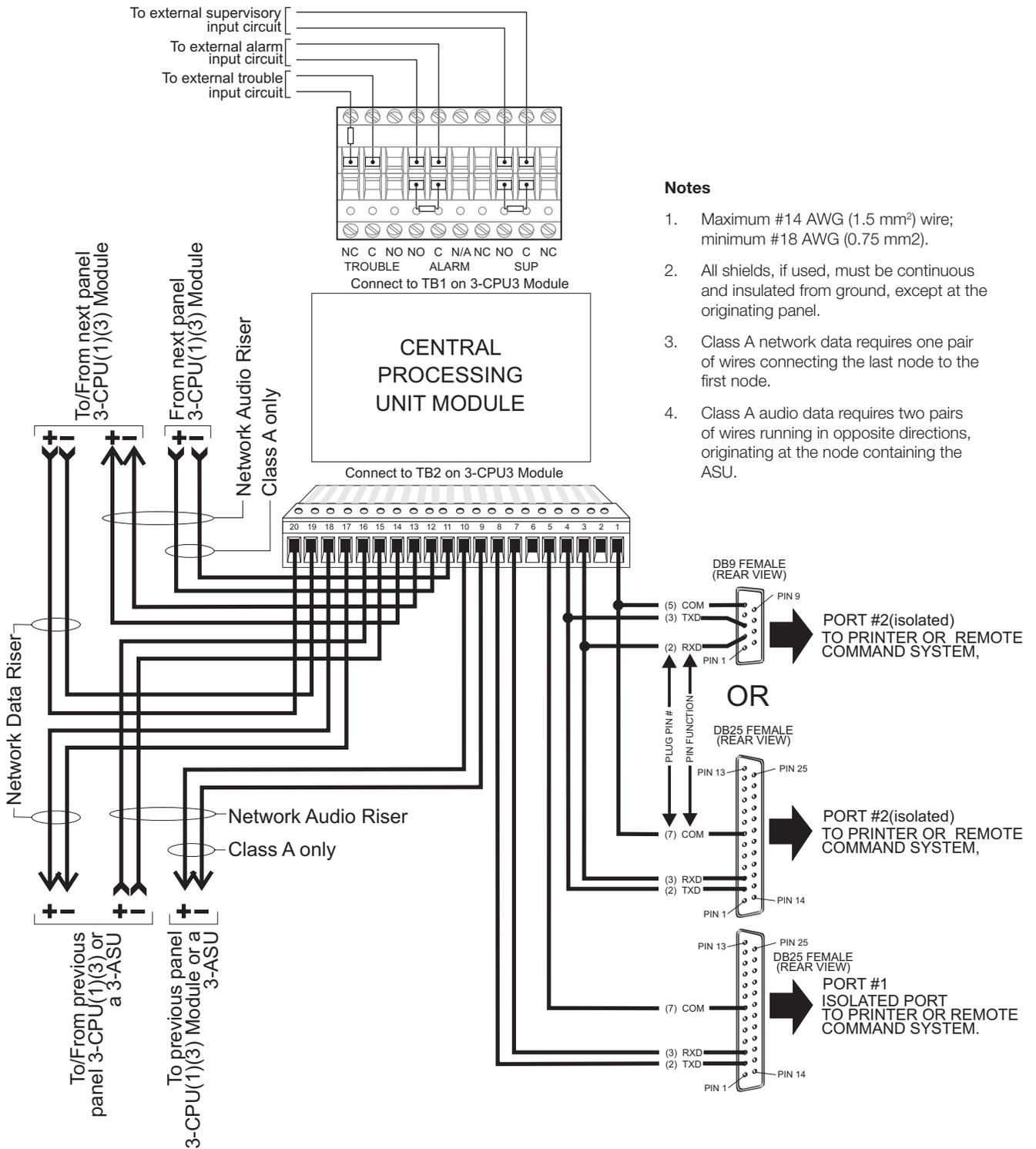
Maximum Accumulative Capacitance

Wire Size	38.4K Baud	19.2K Baud
18 AWG	1.4 μ F	2.8 μ F
16 AWG	1.8 μ F	3.6 μ F
14 AWG	2.1 μ F	4.2 μ F

Audio

Maximum resistance between any 3 panels	90 Ohms
Maximum capacitance between any 3 panels	0.09 μ F
Maximum distance between any 3 panels via copper RS485	5,000 ft. (1,524 m)

Typical Wiring



Notes

1. Maximum #14 AWG (1.5 mm²) wire; minimum #18 AWG (0.75 mm²).
2. All shields, if used, must be continuous and insulated from ground, except at the originating panel.
3. Class A network data requires one pair of wires connecting the last node to the first node.
4. Class A audio data requires two pairs of wires running in opposite directions, originating at the node containing the ASU.



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Specifications

3-CPU3

Agency Listings	UL, ULC, CSFM, CE, LPCB EN54* pending.
Mounting	2 - Left most local rail spaces
Terminal Size	18-12 AWG (1.0mm ² to 2.5mm ²)
Standby Current	155 mA
Alarm Current	165 mA
Contact Ratings	Nonbypassable Alarm, Supervisory and Trouble Form 'C' 1A at 30 Vdc
Data Down Loading	RJ14 Jack
Operating Environment	0°C - 49°C (32° F - 120° F); 93% at 40° C Non-Condensing

*EN54-2:1997+A1 and EN54-4:1997+A1:2002+A2 pending

Note: CPU current includes the main power supply, since the CPU and PPS cannot be measured separately.

Option Cards

Catalog number	3-RS232	3-RS485A	3-RS485B
Standby Current	58 mA	98 mA	98 mA
Alarm Current	58 mA	98 mA	98 mA
Communication Ports	Two optically isolated RS-232	Three RS-485 Class A (Style 7)	One Class B (Style 4) or Class A (Style 7) network data circuit and one Class B (Style 4) audio data circuit
Agency Listings	UL, ULC, CSFM, CE, LPCB, EN54 pending*.		
Mounting	Back of 3-CPU3		
Operating Environment	0° C - 49° C (32° F - 120° F); 93% at 40° C Non-Condensing		

*EN54-2:1997+A1 and EN54-4:1997+A1:2002+A2 pending

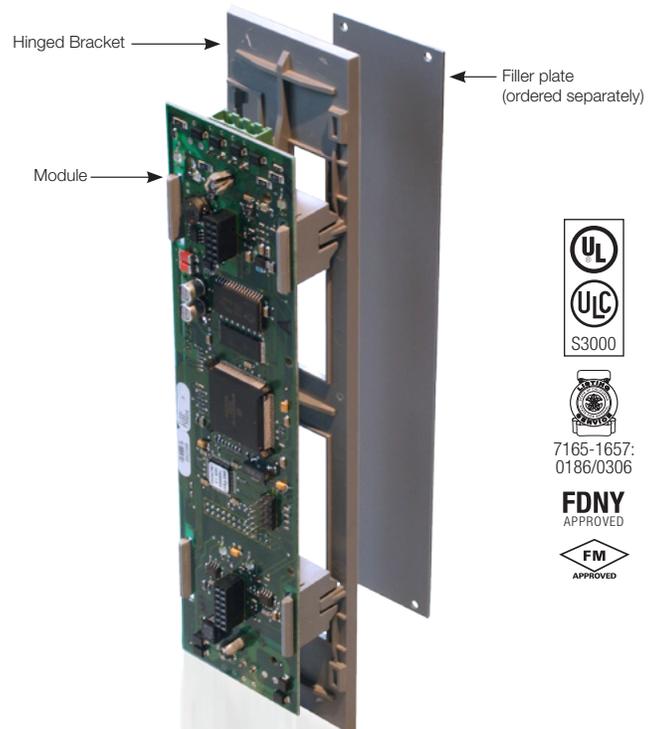
Ordering Information

Catalog Number	Description	Ship Wt. lb (kg)
3-CPU3	Central Processor Unit Module	0.71b (0.32kg)
3-RS485A	Network Communications Card, Class A (Style 7)	0.33lb (0.15kg)
3-RS485B	One Class A/B network data circuit and one Class B audio data circuit	0.33lb (0.15kg)
3-RS232	RS-232 Communication Card	0.33lb (0.15kg)
3-CPUDR	CPU doors with filler plates. Order separately, one required per CPU where no LCD display is installed.	0.25lb (0.11kg)



Modem Communicator

3-MODCOM, 3-MODCOMP



Overview

The Modem Communicator is a two-way local rail module that performs a variety of off-premise communications functions for the EST3 system.

Using the latest in digital signal processing (DSP) techniques, the Modcom provides off premise communication features unavailable on any other system.

The module has provisions for supervising two loop-start telephone lines. The module features a modular jack for telephone line connections. The Modcom's configuration and firmware can also be updated from any network node.

Modcom series modules occupy a single local rail space and can be mounted in any node on the network. Any EST3 Control/Display module can be mounted on the face of a Modcom series module. Power for the Modcom is supplied by the EST3 system supply.

The Modcom provides an enhanced level of survivability in the event of a network CPU failure by notifying the Central Monitoring Station of the failure and entering a degraded mode of operation. In degraded mode, the Modcom can transmit a default fire alarm message during a fire alarm condition.

Standard Features

- Listed for fire, security and access control
- V.32bis 14.4K full duplex modem
- Digital alarm communicator transmitter supporting: SIA DCS protocol, Contact ID protocol, 3/1 and 4/2 pulse format protocol
- Supports "tap" alphanumeric pager protocol
- Fully programmable messages
- Alarm override of upload/download
- Two phone line capability
- Field upgradable firmware
- Split and multiple reporting to as many as 80 different receivers
- 255 subscriber accounts
- Supports control/display modules
- Supervised by the network controller

Application

Two versions of the Modcom are available:

3-MODCOM - Has an internal V.32bis 14.4K baud full duplex modem. The modem permits upload and download of system data remotely via a telephone line. In addition, the 3-MODCOM has a Digital Alarm Communications Transmitter (DACT) or dialer function that transmits network status information to Central Monitoring Stations (CMS) via telephone. Four DACT protocols are available:

1. Digital Communicator Standard (DCS) "SIA forma" Dialer – 300 baud format, which transmits alphanumeric system status data to the CMS;
2. Contact ID;
3. SIA 3/1 dialer; and,
4. SIA 4/2 dialer.

Alarm code content is determined by system rules.

3-MODCOMP – In addition to all modem and dialer (DACT) functions of the 3-MODCOM, the 3-MODCOMP can dial directly into paging systems using Telelocator Alphanumeric Protocol (TAP). Alphanumeric system data can be sent to a single pager or group(s) of pagers. Some pager services can forward messages via e-mail and Fax.

Multiple Priority

Each Modcom can buffer up to 500 events in its event queue. It reviews all active events in the queue and identifies the highest priority event and dials the associated receiver. When the receiver is contacted, the MODCOM will transmit the highest priority message for that receiver. If the message is successfully received, the MODCOM identifies the next highest priority message and the process repeats.

Phone Line Friendly

The Modcom series has been designed for installation on the same phone lines with other devices such as phones and faxes. The module makes its first dial out attempt on either of the two phone lines that is not in use. This prevents unnecessary interruption of calls in progress by the line seizure relays. In the event that both lines are busy, the module seizes line one.

A fixed DACT testing time can be set at an off-hour, e.g. 2:00am, again minimizing interruptions and phone line costs. The call time is programmable, and allows testing of the DACT with the central station.

The Modcom series also has the ability to detect Type 1, Type 2 and Type 3 distinctive ringing patterns, permitting it to share its phone lines with other devices and still have a unique phone number for incoming modem calls.

Multiple Modcoms per Network

Multiple Modcoms can be installed in a single cabinet or located in nodes throughout the network to provide added availability and enhanced redundancy of off premise communications.

Multiple Receiver Capability

In large system applications the EST3 system may be partitioned such that it supports a number of different customers, each using different Central Monitoring Stations and/or paging companies. The Modcom can accommodate up to 255 different accounts using up to 80 different receivers.

The Modcom supports split reporting, a process where the system directs the Modcom to send some events or event types to one receiver, and different events to alternate receivers. The module's

multi-dial reporting capability permits an individual event to be transmitted to multiple receivers, including pagers.

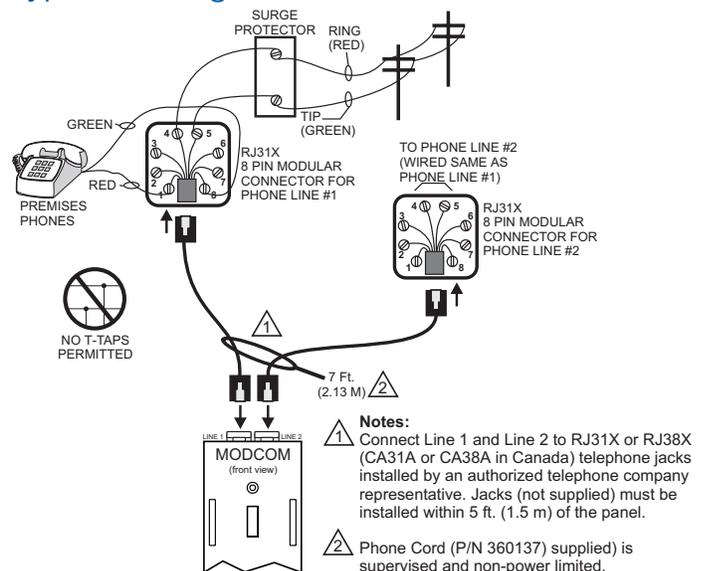
Remote Data Upload/Download

The modem permits data to be downloaded into the memories of the various components making up an EST3 system. Data can be remotely uploaded and downloaded for use with the Edwards Access Control Database Program. In the event that an alarm is received during upload/download activity, the Modcom automatically terminates the call and transmits the alarm events to the appropriate receivers. When completed sending the events, the download will continue where it left off.

Engineering Specification

The system shall provided an off premise communications module capable of transmitting system events to multiple Central Monitoring Station (CMS) receivers. The module shall provide the CMS with point identification of system events via 4/2, Contact ID or SIA DCS protocols. <The module shall also be capable of transmitting alphanumeric system activity by event to a commercial paging system using TAP Pager protocol.> The dialer shall have the capability to support up to 255 individual accounts and to send account information to eighty (80) different receivers, each having a primary and secondary telephone access number. System events shall be capable of being directed to one or more receivers depending on event type or location as specified by the system designer. The module shall have a degrade mode capable of transmitting fire alarm signals to the CMS in the event of system CPU failure. The module shall provide a high speed (V.32bis or greater) modem function in order to upload and download system data to/from a remote location.

Typical Wiring



Specifications

Agency Listings	UL, FCC Part 68 / CFR 47, ULC. See Note 1.	
Installation	Takes up one LRM space in 3-CHAS7	
Input Power	24 Vdc @ 60mA standby, 95 mA active	
Modem Protocol	ITU - V.32bis 14.4K baud full duplex using standard PC modem compatible data	
Dialer Protocol	SIA 3/1 (format P2) and 4/2 (format P3): 20 pulses per second, double round Contact ID (DTMF format) Digital Communications Standard (DCS) "SIA format": Level 2 (300 baud, Bell 103)	
Pager Protocol (3-MODCOMP only)	Telocator Alphanumeric Protocol (TAP), Version 1.8, 300 baud, Bell 103	
Telephone	Dialing	Pulse or Tone (DTMF)
	Connector	Two 8-position modular phone jacks
CMS Telephone Numbers	Quantity	Two per receiver - 160 max.
	Available Digits	Up to 24 digits per number
Receivers	Supports up to 80 individual receivers.	
Event Buffer	500 events	
Operating Environment	32°F (0°C) to 120°F (49°C), 93% RH Non-condensing	

Receivers Tested			
Format	Manufacturer	Model	Receiver Card
4/2 and 3/1	Ademco	685	685-1 or 685-8
	FBI (Fire Burglary Instruments)	CP220	
	Osborne-Hoffman	OH2000	
	Radionics	D6600	
	Silent Knight	9000	9032
	Sur-Gard	MLR2, SG-SLR	
	MCDI	TLR, TLR+	
Contact ID	Ademco	685	685-8
	Osborne-Hoffman	OH2000	
	Sur-Gard	MLR2, SG-SLR	
	Radionics	D6600	
	Silent Knight	9000	9032
	MCDI	TLR, TLR+	
SIA DCS	Sur-Gard	MLR2, SG-SLR	

Note 1:

The EST3 is modularly listed under the following standards:

UL 864 categories: UOJZ, UOXX, UUKL and SYZV, UL 294 category ALVY, UL 609 category AOTX, UL 636 category ANET, UL 1076 category APOU, UL 365 category APAW, UL 1610 category AMCX, UL 1635 category AMCX
ULC-S527, ULC-S301, ULC-S302, ULC-S303, ULC-S306, ULC/ORD-C1076 and ULC/ORD-C693

Please refer to EST3 Installation and Service Manual for complete system requirements.

Ordering Information

Catalog Number	Description	Ship Wt. lb (kg)
3-MODCOM	Modem/Dialer (DACT) version	0.5 (0.23)
3-MODCOMP	Modem/Dialer (DACT) w/TAP Pager Protocol	0.5 (0.23)
3-FP	Filler Plate, order separately when no LED or LED/Switch module installed.	0.1 (0.05)



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Signature Driver Controller Modules

3-SSDC1, 3-SDDC1, 3-SDC1



EN54-2:1997+A1: 2006
and EN54-4:1997+2002
+A2 : 2006

Overview

The 3-SSDC1 and 3-SDDC1 Signature Driver Controller modules provide an intelligent interface between the 3-CPU3 module and Signature Series devices. Each module contains its own microprocessor used to coordinate, process and interpret information received from and sent to Signature devices. Power and communications is received directly from the control panel rail assembly. The 3-SSDC1 Single Signature Driver Controller module supports one Signature Data circuit, while the 3-SDDC1 Signature Dual Driver Controller module supports two Signature circuits. Both modules occupy one rail space in the fire alarm control cabinet and provide removable field wiring terminals to aid installation.

Innovative design gives the 3-SSDC1/3-SDDC1 and Signature devices truly “distributed intelligence”. Signature detectors and modules have their own on-board microprocessor communicating with the loop controller in a fully digital communication format. This increases the accuracy of the information coming to and from the loop controller by reducing the effects of capacitance and noise.

With decentralized intelligence much of the decision making moves from the loop controller to the devices. Advanced fire detection algorithms processed within the Signature devices effectively end unwanted alarms. Environmental compensation and multiple sensing element decision making operations are resident in the devices. Intelligent devices allow the Signature Controllers to execute communication and system functions with greater speed and low baud rates, increasing the accuracy of information transmitted between the loop controller and devices.

Standard Features

- One or two circuit versions
- Dedicated microprocessor control
- Full digital communication
- Specialized communication protocol
 - Less sensitive to cable characteristics
 - Utilize existing wiring in most applications
- Loop alarm in under 750 milliseconds
- Device location supervision
 - Unexpected additional device addresses
 - Missing device addresses
 - Switched device locations
 - Programmed device parameters
- Automatic nonvolatile as-built mapping
 - Stores “actual” and “expected” device data
 - Stores physical connection sequence including “T” taps
- Automatic day/night sensitivity
- Supports up to 250 intelligent Signature detectors and 250 Intelligent Signature Modules
- Up to five 3-SDDC1s per node
 - Total of 10 Signature circuits
- Removable field wiring terminal blocks
- Multiple survival modes — stand alone
- Fully backward compatible with 3-SSDC and 3-SDDC
- Supports the full line of Signature II devices, including carbon monoxide detection

Application

Up to 125 detectors and 125 modules are supported over a single pair of wires by the 3-SDC1 Signature Cards that plug into the Signature controller modules. Both Class A wiring (style 6 or style 7) and Class B (style 4) wiring are supported. Loop distances over 11,000 feet (3300m) are possible.

The 3-SSDC1 and 3-SDDC1 use advanced communication formats that provide exceptional response. Using a "BROADCAST POLL" the loop controller checks the entire device circuit for any changes of state. Should one or more devices report a change the 3-SSDC1/3-SDDC1 uses "DIRECT ADDRESS SEARCH" to find reporting device(s). Devices that have entered the alarm state or become active are located nearly instantaneously.

The unique use of "BROADCAST POLLING" combined with "DIRECT ADDRESS SEARCH" ensures that only new information is transmitted allowing a reduced baud rate with fast response time. The low baud rate is ideal for retrofit applications since in most applications existing wiring can be used.

To enhance survivability of the system the 3-SSDC1/3-SDDC1 supports a standalone mode for Signature devices. Two catastrophic failure modes are supported. If the 3-CPU(1/3) fails, the loop controller will continue to poll its devices. If an alarm is detected it will be sent on the local rail communication bus and received by other local rail modules. A common alarm condition throughout the panel will result. If the local rail module (3-SSDC1/3-SDDC1) fails, and a device (smoke or module) detects an alarm, specialized circuitry will make the node aware of the alarm condition. The 3-CPU(1/3) will communicate the alarm condition to the rest of the network. Having multiple redundant modes is paramount in a life safety system.

Every time the 3-SSDC1/3-SDDC1 communicates with a detector a green LED on the detector flashes. Normal green LED activity is not disturbing to building occupants, but can be quickly spotted by a maintenance technician. A red LED on the detector turns on only in the alarm condition.

The 3-SSDC1/3-SDDC1 also supervises the device wiring, physical location of each device and the programmed device characteristics. This Edwards/Signature Series unique characteristic is accomplished by "MAPPING" the Signature circuit and committing the map to memory. Upon power up the loop controller will scan device serial numbers and map their physical location sequence on the loop, including "T" taps. After mapping is complete the controller automatically addresses each detector and module through downloading over the loop. There are no switches or dials to set. Each device is assigned a unique soft address generated by the site specific program.

The 3-SSDC1/3-SDDC1 then compares the "Actual" physical device data to the "Expected" site specific program data. If any correlations are different, the loop controller issues a trouble to the CPU identifying the devices which do not match and posting a map fault. Through the 3-CPU3's RS-232 port a graphical map of the loop can be uploaded depicting each device's location on the loop, including branches (T-Taps) and all of the physical attributes associated with the device. This diagnostic information is unparalleled in the fire detection industry and vital for keeping accurate records on how the system was installed.

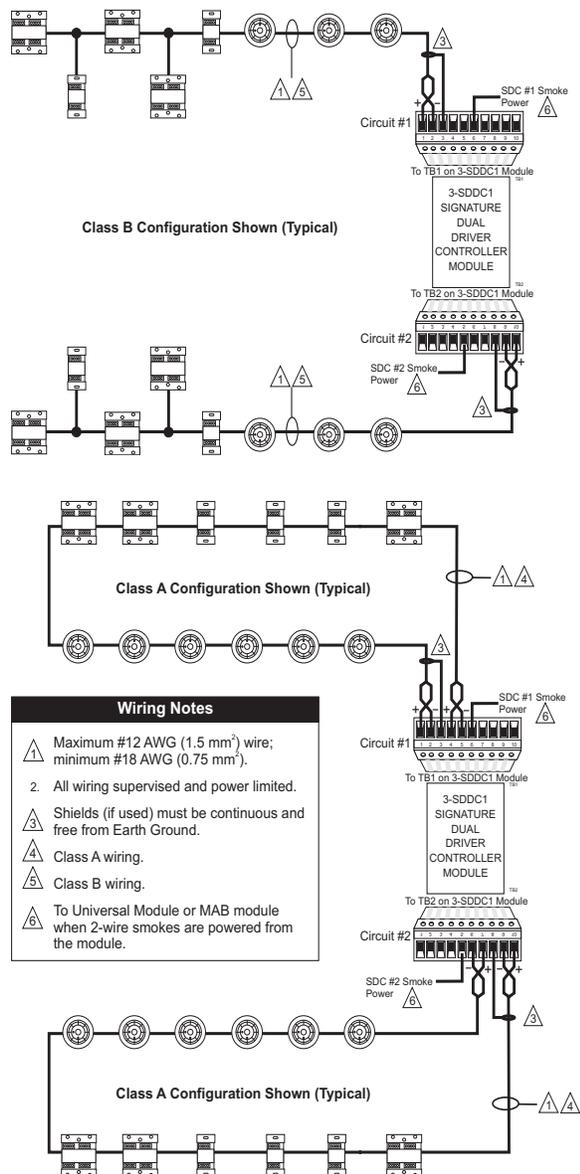
During installation a common problem with analog/ addressable systems is locating ground faults. The 3-SSDC1 and 3-SDDC1 controllers have the ability to locate ground faults by specific module, speeding up the troubleshooting process. Another significant advantage of the 3-SSDC1/3-SDDC1 controllers during commissioning is electronic addressing and mapping. This eliminates duplicate addresses, which are also very difficult for most systems to locate.

During maintenance, should groups of detector heads be removed for service and returned into the wrong smoke detector base (location), the 3-SSDC1/3-SDDC1 will automatically detect the problem. If the attributes of the switched devices are the same, the system will automatically download the correct soft addresses and algorithms to the devices (maintaining location supervision).

If the attributes are not the same the 3-SSDC1/3-SDDC1 will send a map fault indication to the 3-CPU3 and post a trouble indicating the specific devices in fault.

The 3-SSDC1/3-SDDC1 also monitors the Signature Series devices for maintenance and trouble conditions. Each smoke detector contains intelligence to adjust with environmental changes. This expands the amount of time required between cleaning while maintaining a constant alarm threshold. As the detector begins to exhaust the environmental compensation, and reaches the 80% level, the 3-SSDC1/3-SDDC1 will indicate a maintenance alert or dirty condition to the 3-CPU3 and indicate the specific device requiring cleaning. If cleaning is not performed the detector will continue to operate until all of its environmental compensation is

Typical Wiring



utilized. At this point the 3-SSDC1/3-SDDC1 sends a dirty trouble indication to the 3-CPU and posts a trouble condition. If maintenance is still not performed the Signature detector will automatically remove itself from service once the programmed threshold window has been breached (preventing a false alarm).

When a detector includes carbon monoxide (CO) detection, the detector monitors its CO life remaining for the CO sensor element and provides this information automatically to the panel. For maintenance of the system the CO life remaining is also available by simply running a maintenance report at the panel or through the FireWorks graphical interface. A unique CO maintenance signal is automatically generated by the panel when there is 8% (several months) of CO element life remaining. Should the CO sensor element not be replaced after the maintenance signal is reported, an

“End of Life” trouble automatically posts on the panel when the CO sensor detection capability is exhausted.

Remote test capability permits devices to be put in alarm, pre-alarm, supervisory, monitor, or security alarm, or trouble from the panel menu or controls. This facilitates testing of smoke and heat detectors as well as monitor and security devices. Fast test is also provided for CO detectors allowing these devices to be tested quickly in the field.

The 3-SSDC1 and 3-SDDC1 local rail modules modules are fully backwards compatible with the 3-SSDC and 3-SDDC local rail modules. 3-SSDC1 and 3-SDDC1 modules provide additional onboard memory to facilitate future Synergy functions. To upgrade a 3-SSDC/3-SDDC to a 3-SSDC1/3-SDDC1 respectively, replace the 3-SSDC/3-SDDC Local Rail Module with a 3-SDDC1-MB Local Rail Module and reuse the 3-SDC Signature Device Cards and filters.

Specifications (Signature Circuits)

Charts assume wire and devices are evenly distributed over length of circuit

Non-twisted, non shielded wire

Device type	# of Detectors	# of Module Addresses	#14 AWG (20pf/foot) (2.53 Ohm/1000ft)	#16 AWG (20pf/foot) (4.02 Ohm/1000ft)	#18 AWG (20pf/foot) (6.38 Ohm/1000ft)
Detectors only	125	0	14,752 feet (4,497 meters)	9,275 feet (2,827 meters)	5,839 feet (1,780 meters)
Modules only	0	125	12,599 feet (3,840 meters)	7,921 feet (2,414 meters)	4,986 feet (1,520 meters)
Detectors and Modules	125	125	5,738 feet (1,749 meters)	3,608 feet (1,100 meters)	2,271 feet (692 meters)
Detectors and Modules with 2-wire smokes	63	55 + 9 SIGA-UM	7,623 feet (2,324 meters)	4,793 feet (1,461 meters)	3,017 feet (920 meters)
Modules with 2-wire smokes	0	107 + 9 SIGA-UM	3,798 feet (1,158 meters)	2,388 feet (728 meters)	1,503 feet (458 meters)

Twisted pair non shielded wire

Device Type	# of Detectors	# of Module Addresses	#14 AWG (38pf/foot) (2.53 Ohm/1000ft)	1.5mm ² (36pf/foot) (3.75 Ohm/1000ft)	#16 AWG (36pf/foot) (4.02 Ohm/1000ft)	1.0mm ² (25pf/foot) (5.51 Ohm/1000ft)	#18 AWG (25pf/foot) (6.38 Ohm/1000ft)
Detectors only	125	0	13,157 feet (4,010 m)	9,933 feet (3,028 m)	9,275 feet (2,827 m)	6,760 feet (2,061 m)	5,839 feet (1,780 m)
Modules Only	0	125	12,599 feet (3,840 m)	8,483 feet (2,586 m)	7,921 feet (2,414 m)	5,774 feet (1,760 m)	4,986 feet (1,520 m)
Detectors & Modules	125	125	5,738 feet (1,749 m)	3,864 feet (1,178 m)	3,608 feet (1,100 m)	2,630 feet (802 m)	2,271 feet (692 m)
Detectors and modules with 2-wire smokes	63	55 + 9 SIGA-UM	7,623 feet (2,324 m)	5,133 feet (1,565 m)	4,793 feet (1,461 m)	3,494 feet (1,065 m)	3,017 feet (920 m)
Modules with 2-wire smokes	0	107 + 9 SIGA-UM	3,798 feet (1,158 m)	2,558 feet (780 m)	2,388 feet (728 m)	1,741 feet (531 m)	1,503 feet (458 m)

Twisted pair shielded wire

Device Type	# of Detectors	# of Module Addresses	#14 AWG (84pf/foot) (2.53 Ohm/1,000ft)	#16 AWG (82pf/foot) (4.02 Ohm/1,000ft)	#18 AWG (58pf/foot) (6.38 Ohm/1,000ft)
Detectors only	125	0	5,952 feet (1,814 meters)	6,098 feet (1,859 meters)	5,839 feet (1,780 meters)
Modules Only	0	125	5,952 feet (1,814 meters)	6,098 feet (1,859 meters)	4,986 feet (1,520 meters)
Detectors & Modules	125	125	5,738 feet (1,749 meters)	3,608 feet (1,100 meters)	2,271 feet (692 meters)
Detectors and modules with 2-wire smokes	63	55 + 9 SIGA-UM	5,952 feet (1,814 meters)	4,793 feet (1,461 meters)	3,017 feet (920 meters)
Modules with 2-wire smokes	0	107 + 9 SIGA-UM	2,558 feet (780 meters)	2,388 feet (728 meters)	1,503 feet (458 meters)



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Engineering Specification

The communication format between the control panel and analog devices shall be 100% digital.

Loop alarm recognition must be within 750 milliseconds of a device going into the alarm state, with system response time no greater than 3 seconds. All devices shall support remote testing.

It must be possible to wire the circuit as Class A or Class B with non-shielded, non-twisted wire. It must be possible to wire branches (T-taps) with Class B wiring.

The driver controller must be manufactured in accordance with ISO 9001 standards.

The system must have tolerance to multiple failures. There must be a standalone mode of operation that will ensure the system is aware of alarms even if the local rail or main CPU fails.

Specifications (controllers)

Catalog Number	3-SSDC1	3-SDDC1
Installation	1 LRM Space	1 LRM Space
Module Configuration	1 Addressable circuit (3-SDC1 Card) expandable to 2 circuits.	2 Addressable circuits (3-SDC1 Cards)
Operating Current [Note 2]	Standby 144 mA Alarm 204 mA	Standby 264 mA Alarm 336 mA
Operating Voltage	24 Vdc, Nominal	
Address Requirements	Automatic	
Detectors Supported	125 per 3-SDC1 Card	
Modules Supported	125 Module Addresses per 3-SDC1 Card	
2-Wire Smoke Power Output	100 mA per 3-SDC1 Card (not included in <i>Operating Current</i> above)	
Conventional detectors supported	150 of 100 µA type per circuit.	
Signature Circuit Voltage	20 VDC +/- 5%	
Maximum Signature Circuit Resistance	100 Ohms	
Maximum Signature Circuit Capacitance	0.33 µF	
Communications Format	100% Digital	
Circuit Wiring Styles	Class A or Class B	
Termination	Removable plug-in terminal strip(s) on module	
Permissible Wire Size	18 to 12 AWG (0.75 to 2.5 mm ²)	
Agency Listings	UL, ULC, CE (see Note 1), LPCB EN54 (see Note 3).	
Operating Environment	32 °F (0 °C) to 120 °F (49 °C) 93% RH, non-condensing	

Note 1: Other EST3 components are modularly listed under the following standards:
 UL 864 categories: UQJZ, UOXX, UUKL and SYZV, UL 294 category ALVY, UL 609 category AOTX, UL 636 category ANET, UL 1076 category APOU, UL 365 category APAW, UL 1610 category AMCX, UL 1635 category AMCX

ULC-S527, ULC-S301, ULC-S302, ULC-S303, ULC-S306, ULC/ORD-C1076, ULC/ORD-C693
 Please refer to EST3 Installation and Service Manual for complete system requirements.

Note 2: Current shown Includes full loop of devices.

Note 3: EN54-2:1997+A1: 2006 and EN54-4:1997+2002 +A2 : 2006 (verify device and loop controller compatibility)

Ordering Information

Catalog Number	Description	Shipping Wt. lb (kg)
3-SSDC1	Single Signature Driver Controller. Comes with one 3-SDC1 Device Card. Mounts to Local Rail. <i>Add suffix "-E" for EN54 compliant versions.</i>	0.5 (0.23)
3-SDDC1	Dual Signature Driver Controller. Comes with two 3-SDC1s. Mounts to Local Rail. <i>Add suffix "-E" for EN54 compliant versions.</i>	0.5 (0.23)
3-SDC1	Signature Device Card - upgrades a 3-SSDC1 to a 3-SDDC1	0.25 (0.11)
3-FP	Filler Plate, order separately when no LED or LED/Switch module installed.	0.1 (0.05)



Liquid Crystal Display Module

3-LCD



EN54-2:1997+A1 and
EN54-4:1997+A1:2002+A2
pending

Overview

The Main Display interface is the primary user interface in the EST3 Life Safety System. The main display interface focuses on the emergency user by putting information important to the user up front. Hands free, the first highest priority event is shown. The display always gives the last highest priority event. Arriving at the panel and without opening the door the first and last alarm is given. Simple to understand lights and switches help the emergency user execute system commands with confidence.

A menu system supports maintenance functions such as disables or reports for use by staff or service personnel.

Standard Features

- Uses simple lights and switches
- Displays information important to user
- Hands free first alarm display
- Last event of highest priority always displays
- Eight lines by 21 character graphic LCD display — 168 characters total
- Multilingual
Supports English, French, Spanish, and Russian
- Uses queues to sort events
A queue is a list of messages Alarm, Supervisory, Trouble and Monitor
- Slide in LED and switch labels
Makes customization for regional language easy

Application

The 3-LCD module mounts to the local rail over the nodes Central Processing Unit Module (3-CPU). The 3-LCD module is optional in any network node.

Ensuring information clarity the 3-LCD uses a backlit high contrast supertwist graphical display. Eight lines of 21 characters provide the room needed to convey emergency information in a useful format.

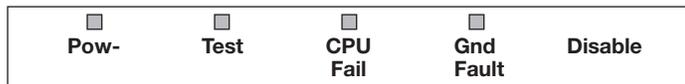
The 3-LCD always displays the last highest priority event even when the user is viewing other message queues. Further message flexibility is provided with EST3's message routing ability. Messages from a node can display at every node on the network or messages can route to specific nodes only. Routing can be initiated at a specific time/shift change. There is no need to have messages display in areas that are not affected by an event.

The 3-LCD can display messages in English, Spanish, French, and Russian. The bilingual display lets the operator select between either of two languages. Consult your representative for available language combinations.

The EST3 system configures for Proprietary, Local or EN54 market operations. The mode of operation is selected through the System Definition Utility (SDU) which may adjust the following operations slightly to fit the system operation selected.

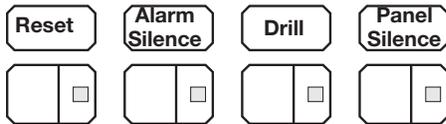
LEDs and Switches

Further enhancing the 3-LCD user interface are easy to read and understand lights and switches. All functions are laid out in a logical order. At the top of the 3-LCD are five system status LEDs. Here determining the general condition of the system is easy.



Power LED: Green, on when AC power is on.

Test LED: Yellow, on when any portion of the system (Group) is under test.



CPU Fail LED: Yellow, on when CPU stops running.

Gnd Fault LED: Yellow, on when a ground exists on the system (group)

Disable LED: Yellow, on when any point or zone is disabled by a user.

Below the general status LEDs are located four, LED / Switch common controls. The versatility of EST3 allows system designers to define the features as affecting a domain (defined group of nodes) or as global (affects all nodes) across the network. This feature is very useful when configuring systems with multiple buildings on one network. As an example, operating the reset in one building may have adverse effect in other buildings. With EST3 having operational differences between buildings on the same network is not a problem.

Pressing **Reset** starts the system's reset operation. The yellow LED has three flash rates during reset. The LED flashes fast during the smoke power down phase of reset, flashes slow during the restart phase, and turns on steady for the restoral phase. The Reset LED turns off when the system is normal.

Pressing **Alarm Silence** turns off all Notification Appliance Circuits defined as audible. The yellow LED turns on when silence is active

via the Alarm Silence switch or via alarm silence software timers.

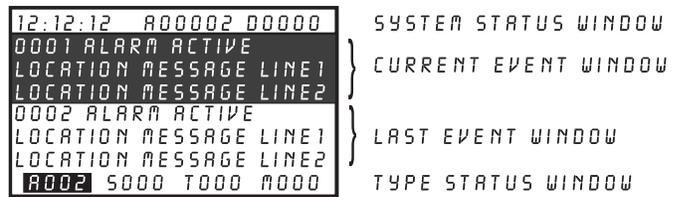
Pressing **Panel Silence** turns off the system's internal audible signal. The yellow LED turns on when panel silence is active. The EST3 panel buzzer has user programmable signal rates for alarm, supervisory, trouble and monitor conditions.

Pressing **Drill** turns on the drill LED and all signals sound evacuation. Drill does not activate city tie connections. Auxiliary relays will not activate unless programmed to do so with drill.



In the center of the 3-LCD is the Liquid Crystal Display. In the normal condition the date and time plus a definable system title display on the LCD. The last line of the display gives an alarm history. This total equals the number of times the system has entered the alarm state from the normal state.

When active events are on display, the LCD formats into four logical windows.

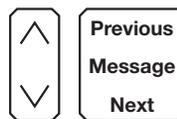


In the system status window, the display shows the time and the status of active and disabled points.

The current event window, lines 2, 3, 4 automatically display the first active event of the highest priority if the user has not taken control of the system. Once the emergency user takes control, this window displays user message selections.

The second line of the display shows system event information. In the example above the display shows the chronological number of the event (0001 is the first alarm) followed by the event type (Alarm Active). EST3 supports over 45 event type messages from which system designers choose. The last two lines of the current event window are custom programmable location message lines with space for 42 characters.

The last event window shows the last highest priority event. This window is always displayed and updated automatically by the system. Here the emergency user can monitor the progress of a fire.

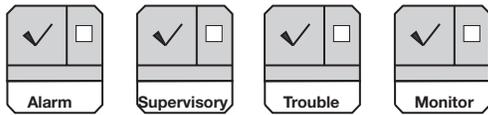


When EST3 is configured for a local mode system viewing the second alarm message is easy, just press the NEXT key. The next message scrolls into the current event window.

The last highest priority event always remains on view. No matter what queue the user selects for viewing, the LCD always displays the most recent alarm. A new alarm event resounds the panel audible signal and appears immediately on display without overwriting information the user selected for view.

The final window of the LCD the type status window shows the total number of active events by queue type. A is alarm, S is supervisory, T is trouble, and M is monitor. The number following each letter is the number of active events existing in each queue.

EST3 breaks down event types into queues and automatically displays the first event of the highest priority type.



Priority order is alarm, supervisory, trouble, monitor. By using queues an emergency user does not waste time scrolling through a mixed event list looking for alarms or confusing an alarm message with other message types.

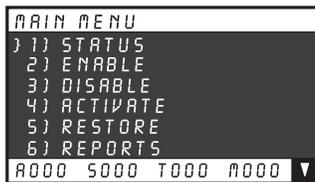
EST3 configures for **Remote proprietary** system operation where every event must be acknowledged by viewing them before the internal buzzer will silence. Or the EST3 will configure for **Local** operation. Here the internal buzzer silences by pressing panel silence. If any events exist in queues that have not been viewed the queue LED continues to flash informing the user of un-seen events.

When all events in a queue are acknowledged or 'seen', the LED associated with the queue turns on steady. If a new event is added to the queue, the EST3 internal buzzer resounds and the queue LED flashes.

EST3 allows device grouping into logical group zones. Here two or more alarm devices (such as detectors or pull stations) make up the zone. When a device in the zone activates, the LCD displays the zone description. Each zone only displays once, regardless of the number of devices active within the zone.

 **Details** To display device information the user presses the Details key. The device with the lowest address displays in the first window.

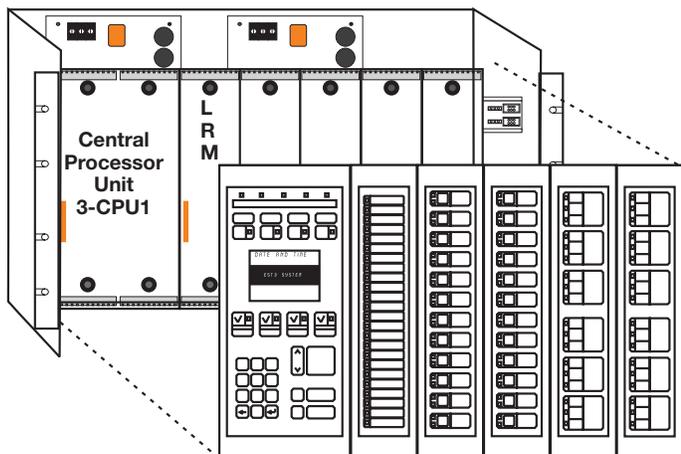
If multiple devices are active each is available for viewing by using the arrow associated with the Previous Message Next key and scrolling through the device list.



The common controls easily expand beyond the Main Display interface by adding a Control Display Module and assigning features to its switch controls.

For Maintenance users, the EST3 provides a smooth operating menu system providing powerful tools for system management, reports, and trouble shooting.

Installation and Mounting

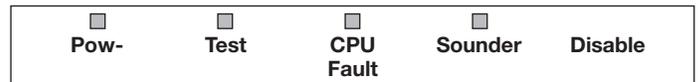


EN54 Compliance

In 1998 the British-based Loss Prevention Certification Board (LPCB) certified EST3 control panels and power supplies as having surpassed the requirements of the pivotal EN54 standard, parts two and four. LPCB Certificate #257c for EST3 fire alarm control panels marked the first such certification since the stringent EN54-2 : 1997 and EN54-4 : 1997 were published by the European Committee for Standardization (CEN). In order to meet these standards, display and control functions have undergone slight modifications for the EN54 marketplace. These differences are highlighted below. All other control and annunciation features remain unchanged.

Note: EN54-2:1997+A1 and EN54-4:1997+A1:2002+A2 approval is pending.

System Status LEDs



Power LED (Green): on when DC power is on.

Test LED (Yellow): on when any portion of the system (Group) is under test.

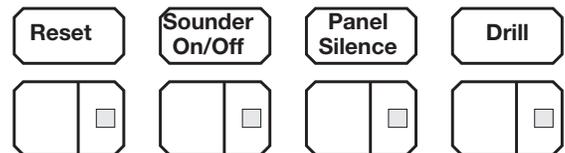
CPU Fault LED (Yellow): on when CPU stops running (processor failures must be manually reset).

Gnd Fault LED: Not available.

Sounder LED (Yellow): flashing indicates fault on sounder circuit. Steady indicates a disabled sounder circuit.

Disable LED (Yellow): on when any point or zone is disabled by a user (disabled conditions have priority over fault conditions).

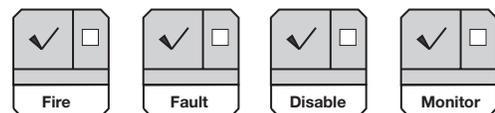
Switch Functions



Pressing **Sounder On/Off** turns off all sounder circuits defined as audible. The yellow LED turns on when silence is activated via the Sounder On/Off or via the alarm silence software timers.

See Page 2 for descriptions of Reset, Panel Silence, and Drill functions.

Event Queues



For EN54 compliance, EST3 configures for remote proprietary system operation. This requires that every event must be acknowledged by viewing them before the internal buzzer will silence. The priority order is Fire, Fault, Disable, Monitor. EN54-2:1997+A1 and EN54-4:1997+A1:2002+A2 approval is pending.



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Engineering Specification

The system shall provide a user interface that displays system events in a text format, and supports basic common control LEDs and switches. The Common Control Switches and LEDs provided as minimum will be; Reset switch and LED, Alarm Silence switch and LED, Panel Silence switch and LED, Drill switch and LED. It must be possible to add additional common controls as required through the use of modular display units. The user interface must provide an LCD that will allow custom event messages of up to 42 characters. The interface must provide a minimum of eight lines by 21 characters and provide the emergency user, hands free viewing of the first and last highest priority event. The last highest priority event must always display and update automatically. Events shall be automatically placed in easy to access queues. It shall be possible to view specific event types separately. Having to scroll through a mixed list of event types is not acceptable. The total number of active events by type must be displayed. Visual indication must be provided of any event type which has not been acknowledged or viewed. It must be possible to customize the designation of all user interface LEDs and Switches for local language requirements. It shall be possible to have a custom message for each device in addition to zone messages. Custom device messages must support a minimum of 42 characters each. Instructional text messages support a maximum of 1,000 characters each. The display shall be capable of displaying English, Spanish, French, or Russian messages.

Technical Specifications

Catalog Number	3-LCD
Agency Listings	UL, ULC, FM, CE, LPCB EN54* pending.
LCD Display	Eight lines by 21 characters backlit LCD
Mounting	Two local rail spaces on top of 3-CPU
Common Control Switches and LEDs	Reset switch and LED Alarm Silence switch and LED Panel Silence switch and LED Drill Switch and LED
Alarm Current	42mA
Standby Current	40mA

* EN54-2:1997+A1 and EN54-4:1997+A1:2002+A2 pending

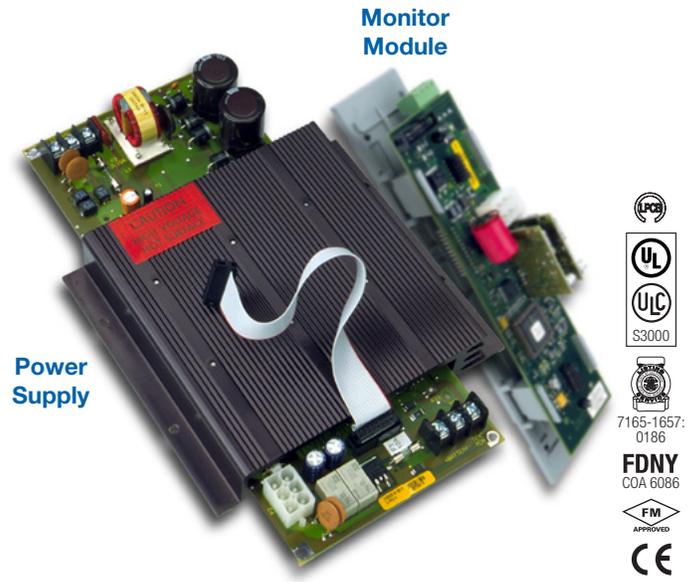
Ordering Information

Catalog Number	Description	Shipping Weight, lb. (kg)
3-LCD	Liquid Crystal Display Module	.8 (.36)
3-LKE	UK English Label Kit	.25 (.11)
3-LKF	French Label Kit	.25 (.11)
3-LKR	Russian Label Kit	.25 (.11)
3-LKS	Spanish Label Kit	.25 (.11)



EST3 Power Supplies

3-PPS/M series, 3-BPS/M series,
3-BBC/M series



EN54-2: (1997) +A1: (2006) Control and Indicating Equipment
EN54-4: (1997) +A1: (2002) +A2: (2006) Power Supply Equipment
En54-16:(2008) Voice Alarm Control and Indicating Equipment

Overview

EST3 Power supplies consist of two assemblies, a high efficiency switch mode power supply card and a power supply monitor module. The monitor module mounts to the local rail and distributes the power from its supply to the local rail. The local rail distributes power from all power supplies to other local rail modules and user interface cards resulting in "Shared Power" throughout the system. By paralleling the power supplies on a rail maximum utilization of available power is possible, resulting in fewer power supplies. Up to four power supplies combine in a single enclosure providing up to 28 amps of available power. Battery backup is provided using from one to four sets of batteries, depending on standby power requirements.

Power supplies mount to the back of the chassis units or wall-boxes. The associated power supply monitor module mounts on the local rail providing system power distribution and mounting space for any control display module. Access to auxiliary power is via easily accessible terminal blocks located on the power supply monitor module. Each power supply produces 7 Amps of filtered and regulated power. With four power supplies located in an enclosure (one primary and three booster power supplies) 28 amps of current is available for local rail modules, control display modules and the eight auxiliary 3.5 amp power outputs (two per supply).

Standard Features

- High efficiency switch mode
- Increased power distribution efficiency
 - power supplies parallel allowing up to 28 amps in a single node
- 120 or 230 Vac operation
- 7 AMP filtered and regulated
- Two 3.5 AMP outputs
- Temperature compensated, dual rated battery charger
- Electronic power limiting
- Automatic load testing of batteries
- Fully approved UL, ULC standards (see specifications section)

Application

The primary power supply provides the system with battery charging and voltage regulation. Software configures the charger to either 10-24 AH batteries or 30-65 AH batteries and controls the high/low charge rates. Batteries mounted in the same enclosure as the power supply, have their charge rate monitored and adjusted based on the local enclosure temperature, keeping charging rates within battery specification. For remote batteries a temperature probe is monitored in the remote battery cabinet and charge rates are adjusted automatically. Battery damage is unlikely to occur when environmental short term conditions are outside of normal operating ranges.

The EST3 power supplies automatically load test batteries by shutting down the battery charger and placing a load across the battery. If the battery voltage is outside the specification range the power supply reports a trouble. The trouble clears if the battery is able to recover and pass future load tests.

Battery leads are electronically short circuit protected. If a short occurs in the battery leads the charger automatically disables itself and causes a trouble. The system will constantly look to see if the short has cleared. If the short clears the system automatically restores.

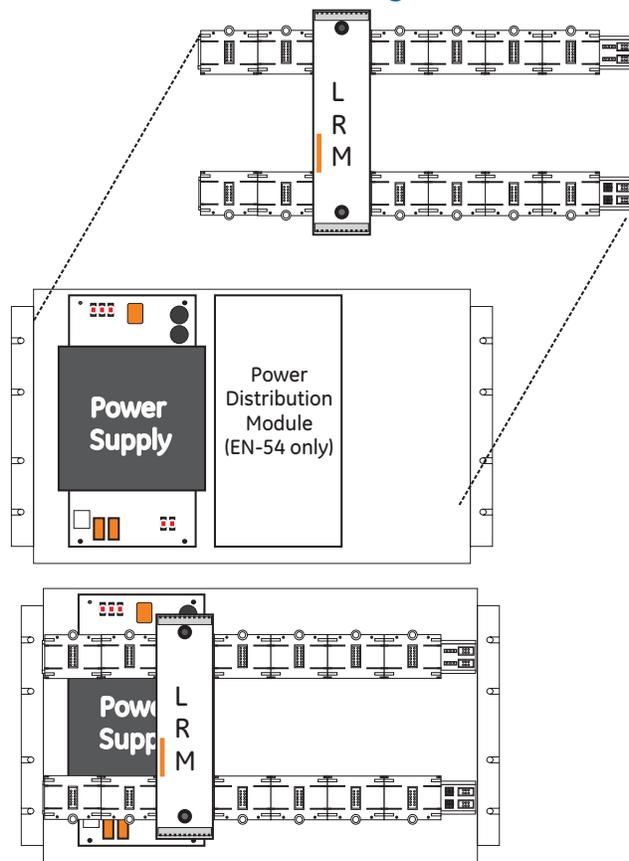
During operation on standby batteries, battery voltage is constantly monitored. A trouble is reported if the battery voltage falls below a specified value.

EST3 power supplies provide specific information back to the 3-CPU(1) designed to help speed trouble shooting of system functions. Should a power supply detect a fault, specific diagnostic codes are available to speed trouble shooting. The 3-LCD will display the power supplies address, a specific trouble code, and a text message describing the specific trouble. Text messages are easy to understand and include items like: Battery Trouble, Aux Power Overload Circuit 1, Aux Power Overload Circuit 2.

Engineering Specification

The fire alarm power supplies must be capable of being paralleled and to load share. Multiple power supplies must be capable of being backed up with a single 24 volt battery set. Each power supply shall be capable of charging up to 65 AH batteries. The power supply must be able to perform an automatic load test of batteries and return a trouble if the batteries fall outside a predetermined range. Power supplies must incorporate the ability to adjust the charge rate of batteries based on ambient temperatures. It shall be possible to adjust for ambient temperature changes in local cabinets as well as remote cabinets.

Installation and Mounting



Power Supply Rules

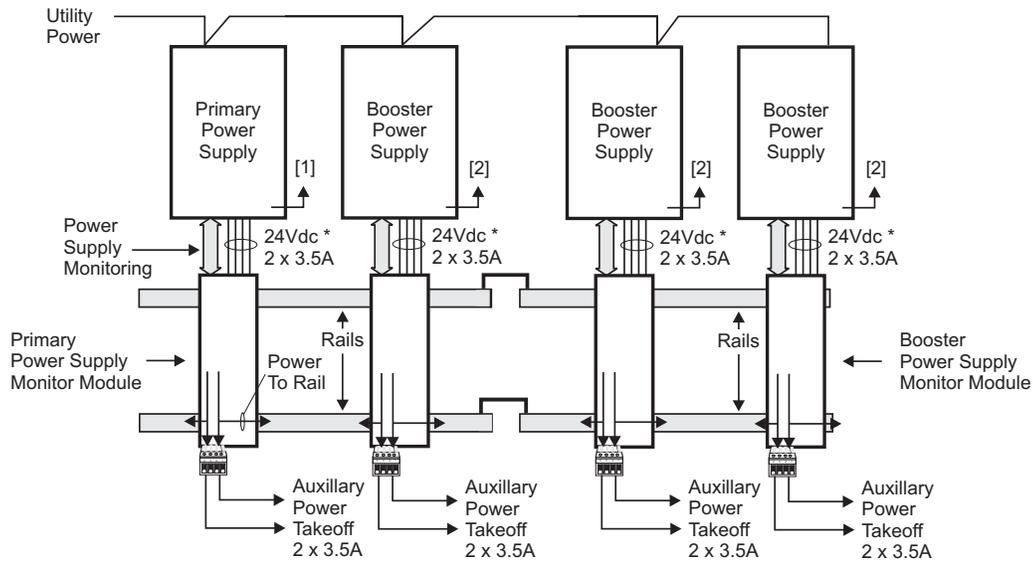
1. Each battery set needs one charger, either a 3-PPS/M or a 3-BBC/M.
2. Each power supply must be connected to a battery set using an identical length and gauge of wire to keep voltage drops identical.
3. Distribute power supplies and loads evenly across rails.
4. **All battery sets for a panel must be the same capacity (AH), same manufacturer, and same manufacturing date code.**

The Table below illustrates the combinations of power supplies and batteries that meet all the power supply rules.

24 VDC Power Supply Output Current

	7A	14A		21A		28A	
Battery Requirements	One Set, 65 AH max	One Set, 65 AH max	Two Identical Sets, 65 AH max	One Set, 65 AH max	Three Identical Sets, 65 AH max	One Set, 65 AH max	Four Identical Sets, 65 AH max
Required Modules	1 3-PPS/M	1 3-PPS/M 1 3-BPS/M	1 3-PPS/M 1 3-BBC/M	1 3-PPS/M 2 3-BPS/M	1 3-PPS/M 2 3-BBC/M	1 3-PPS/M 3 3-BPS/M	1 3-PPS/M 3 3-BBC/M

Typical Wiring



[1] From battery temperature probe terminals.

[2] From battery and from temperature probe terminals if 3-BTSEN-E used.

* Nominal Voltage

Specifications

Catalog Number	3-PPS/M & 3-BBC/M	3-BPS/M	3-PPS/M-230 & 3-BBC/M-230	3-BPS/M-230	3-PPS/M-230-E & 3-BBC/M-230-E	3-BPS/M-230-E
Agency Approvals	UL, ULC	U L, ULC	UL, ULC	UL, ULC	LPCB EN54*, CE	EN54*
Input Voltage	120 Vac (+10%, -15%), 50-60 Hz		230 Vac (+10%, -15%), 50-60 Hz			
Brownout Level	< or = 102 Vac	96 Vac	< or = 195 Vac	184 Vac	< or = 195 Vac	188 Vac
Current Requirements	3-PPS/M included with 3-CPU3 current 3-BBC/M Alarm: 70 mA Standby: 70 mA	Alarm 50mA Standby 50mA	3-PPS/M-230 included with 3-CPU3 current 3-BBC/M-230 Alarm: 70 mA Standby: 70 mA	Alarm: 50 mA Standby: 50 mA	3-PPS/M-230-E included with 3-CPU3 current 3-BBC/M-230-E Alarm: 70 mA Standby: 70 mA	Alarm: 50 mA Standby: 50 mA
Input Current	3.0 A		1.5 A			
Total Output Current	Special Applications: 7.0 Amps					
Battery Charging Capacity	65 AH Sealed Lead-Acid	None	65 AH Sealed Lead-Acid	None	30 AH Sealed Lead-Acid	None
Low Battery Trouble	24 Vdc				22.5 Vdc	
Deep Discharge Cutoff	19.5 Vdc				20.0 Vdc	
Mounting Requirements	1 LRM space, 1 chassis footprint				1 LRM Space + 3-PPS: 2 footprints 3-BBC: 1 footprint	1 LRM space, 1 chassis footprint
Output Voltage	24 Vdc Nominal					
Auxiliary Output Current	Two sources of 3.5 Amps each taken from total output current					
Auxiliary Output Terminal Capacity	18 AWG to 12 AWG (1 mm ² to 2.5 mm ²)					
Output Protection	Electronic power limiting & heat sink temperature					
Ground Fault Detection	< 10K Ohms					

* EN54-2: (1997) +A1: (2006) Control and Indicating Equipment; EN54-4: (1997) +A1: (2002) +A2: (2006) Power Supply Equipment; EN54-16:(2008) Voice Alarm Control and Indicating Equipment

EST3 is listed to the following UL and ULC standards:

UL 864, Control Units and Accessories for Fire Alarm Systems; **UL294**, Access Control System Units; **UL365**, Police Station Connected Burglar Alarm Units and Systems; **UL609**, Local Burglar Alarm Units and Systems; **UL636**, Police Station Connected Burglar Alarm Units and Systems; **UL1076**, Proprietary Burglar Alarm Units and Systems; **UL1610**, Central Station Burglar Alarm Units; **UL1635**, Digital Alarm Communicator System Units; **UL2017**, General-Purpose Signaling Devices and Systems; **ULC-S303-M91**, Local Burglar Alarm Units and Systems; **ULC-S527-99**, Control Units for Fire Alarm Systems; **ULC/ORD-C1076**, Proprietary Burglar Alarm Units and Systems; **CAN/ULC-S559-04**, Equipment for Fire Signal Receiving Centres and System; **ULC/ORD-C100**, Smoke Control System Equipment



Contact us...

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Ordering Information

Catalog Number	Description	Ship Wt., lb. (kg)
3-PPS/M	Primary Power Supply w/ local rail module 120V 50/60 Hz	5 (2.3)
3-BPS/M	Booster Power Supply w/ local rail module 120V 50/60 Hz	5 (2.3)
3-PPS/M-230	Primary Power Supply w/ local rail module 230V 50/60 Hz	5 (2.3)
3-BPS/M-230	Booster Power Supply w/ local rail module 230V 50/60 Hz	5 (2.3)
3-PPS/ M-230-E	Primary Power Supply w/local rail module 230V 50 Hz, EN54* Certified, CE	5 (2.3)
3-BPS/ M-230-E	Booster Power Supply w/local rail module 230V 50 Hz, EN54* Certified, CE	5 (2.3)
3-BBC/M	Booster/Charger Supply w/local rail module 120V 50/60Hz	5 (2.3)
3-BBC/M-230	Booster/Charger Supply w/local rail module 230V 50/60Hz	5 (2.3)
3-BBC/ M-230-E	Booster/Charger Supply w/local rail module, 230V 50/60Hz, EN54* Certified, CE	5 (2.3)
3-BBCMON(-E)	Booster/Charger Monitor Module with charger capability (upgrade 3-BPS/M(-230)(-E) to 3-BBC/M(-230)(-E))	5 (2.3)
3-BTSEN	Distribution Module required when battery installed in remote cabinet	.5 (.22)
3-BTSEN-E	Distribution and Temperature Sensor Module. Required in EN54* Markets when battery installed in a remote cabinet.	.5 (.22)
3-FP	Filler Plate, order separately when no LED or LED/Switch module installed.	0.1 (0.05)

* EN54-2: (1997) +A1: (2006) Control and Indicating Equipment; EN54-4: (1997) +A1: (2002) +A2: (2006) Power Supply Equipment; EN54-16:(2008) Voice Alarm Control and Indicating Equipment



Sealed Lead-Acid Batteries



Overview

Rechargeable sealed lead-acid batteries are ideal for use as a secondary (standby) power source as defined by NFPA 72. Their low maintenance and high energy density make them ideal for fire alarm signaling applications.

Standard Features

- Rechargeable
- Non-spillable
- Non-hazardous
- Low maintenance
- High energy density

Application

When multiple power supplies are provided, each power supply's battery requirements should be calculated individually. Consult the specific system manual to determine battery capacity requirements.

Safety Information

Due to a battery's low internal resistance and high power density, high levels of short circuit current can develop across battery terminals. Put on protective eye covering and remove all jewelry before working on batteries. Do not rest tools or cables on the battery, and only use insulated tools. Follow all manufacturers installation instructions and diagrams when installing or maintaining batteries.



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Specifications

Case Material	ABS Thermoplastic
Regulatory Information	DOT Class 60, Batteries, non-hazardous, non-spillable
Operating Environment	32° F to 120° F (0° C to 49° C) 0 to 93% RH, Non-condensing

Ordering Information

Catalog Number	Description	Shipping Weight, lb (kg)
12V1A2	1.2 Ah Sealed Lead Acid Battery - 12 Vdc	1.25 (0.57)
12V4A	4.5 Ah Sealed Lead Acid Battery - 12 Vdc	5 (2.27)
→ 12V6A5	7.2 Ah Sealed Lead Acid Battery - 12 Vdc	6 (2.72)
6V8A	8 Ah Sealed Lead Acid Battery - 6 Vdc	4 (1.81)
6V10A	12 Ah Sealed Lead Acid Battery - 6 Vdc	5 (2.27)
12V10A	11 Ah Sealed Lead Acid Battery - 12 Vdc	10 (4.45)
12V17A	18 Ah Sealed Lead Acid Battery - 12 Vdc	13 (5.90)
→ 12V24A	26 Ah Sealed Lead Acid Battery - 12 Vdc	20 (9.07)
12V40A	40 Ah Sealed Lead Acid Battery - 12 Vdc	32 (14.51)
12V50A	50 Ah Sealed Lead Acid Battery - 12 Vdc	40 (18.14)
12V65A	65 Ah Sealed Lead Acid Battery - 12 Vdc	49 (22.23)



EST3 Cabinets and Chassis

3-CAB series,
3-RCC series,
3-CHAS7 series, BC-1



3-CAB Series



3-RCC Series



EN 54-2: 1997 + A1: 2006
EN 54-4: 1997 + A1: 2002 + A2: 2006
EN 54-16: 2008

Overview

EST3 has a wide selection of cabinet arrangements allowing the greatest use of EST3's flexible modular design. Lobby enclosure wallboxes are manufactured from #14 AWG cold rolled steel with a gray baked enamel finish. Lobby enclosure doors are manufactured from #14 AWG cold rolled steel and have a modern contoured door design with integral viewing window. The exception is the small lobby enclosure 3-CAB5. The 3-CAB5 wallbox and non-contoured door are #16 AWG cold rolled steel. Lobby enclosure doors come with gray baked enamel or optional red baked enamel finishes. The EST3 lobby enclosures back boxes, doors and chassis units are ordered and shipped separately. The 3-CAB5 lobby enclosure comes complete with door and back box providing space to mount five local rail modules.

The EST3 remote closet cabinet design allows the installation of control panel electronics in electrical closets. The remote closet cabinets have left hand hinged doors and are available with red finish only. Optional display modules used for system diagnostics display, mount behind the closet cabinet door and are not visible with the door closed.

Standard Features

- Right or left hand hinging of doors
- Lag and Keyway holes for quick mounting
- Attack rated door for security applications
- Knockouts for 3/4 inch conduit
- Attractive contour door design on lobby enclosures
- Combination flush or surface mounting lobby enclosure design
- Remote closet cabinets for electrical closet mounting support up to 65 AMP hour batteries
- Optional earthquake hardening: OSHPD seismic pre-approval for component Importance Factor 1.5

Application

Lobby Enclosures

EST3 lobby enclosures provide space for control, monitoring and display modules where they remain visible even with the door closed and secure. Ideal for mounting in lobby's where appearance is important, maximum mounting flexibility is provided with doors that will mount for right or left hand opening. Lobby enclosures come in several sizes to match individual project requirements.

The **3-CAB5 series** semi-flush or surface mounts. A built in rail assembly provides space for up to five local rail modules, no chassis assembly needed. Back space for 1-1/2 footprints gives room for a power supply and a 1/2 footprint module and 10 AH batteries. The local rail module spaces provide room for amplifiers, common control and annunciation modules.

The **3-CAB7** semi-flush or surface mounts and has a contoured front door with viewing window. Space is provided for two 17 AH batteries and one chassis assembly providing seven local rail module spaces.

The **3-CAB14** semi-flush or surface mounting and has a contoured front door with viewing window. Space is provided for two 17AH batteries and two chassis assemblies each providing seven local rail module spaces.

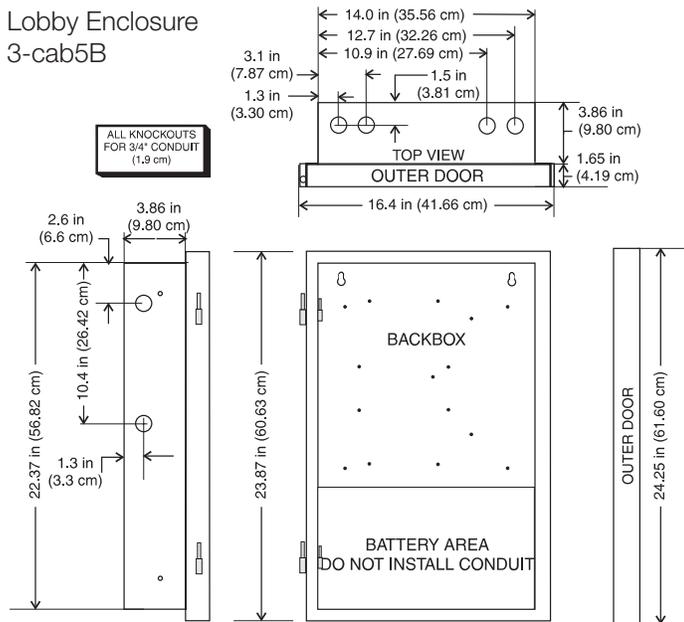
The **3-CAB21** semi-flush or surface mounts and has a contoured front door with viewing window. Space is provided for two 17AH batteries and three chassis assemblies each providing seven local rail module spaces.

Remote Closet Cabinets

Remote closet cabinets provide an economical way of installing equipment in locations where esthetics are not paramount, like electrical closets. You can have optional display modules used for system diagnostics display mounted behind the front door. These display modules will not be visible with the door closed. Remote closet cabinets are surface mounting and come in sizes providing space for one to three chassis with room for standby batteries. A UL Listed attack rated door having a 2-minute rating is available for the 3-RCC7R cabinet. This door is required for security applications.

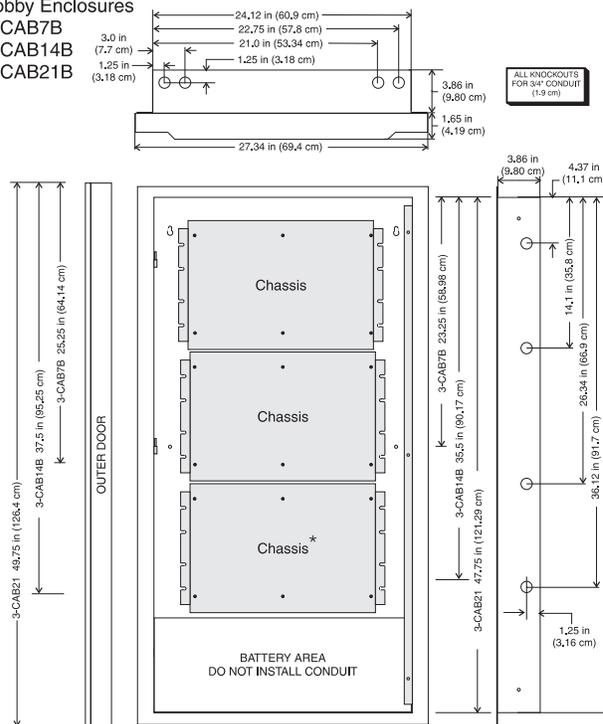
Installation and Mounting

Lobby Enclosure
3-cab5B



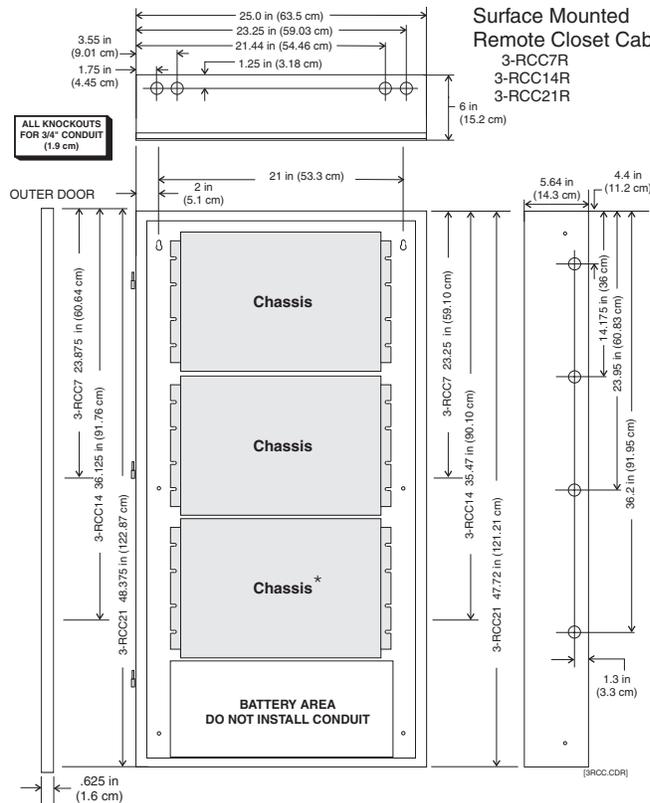
Lobby Enclosures

3-CAB7B
3-CAB14B
3-CAB21B



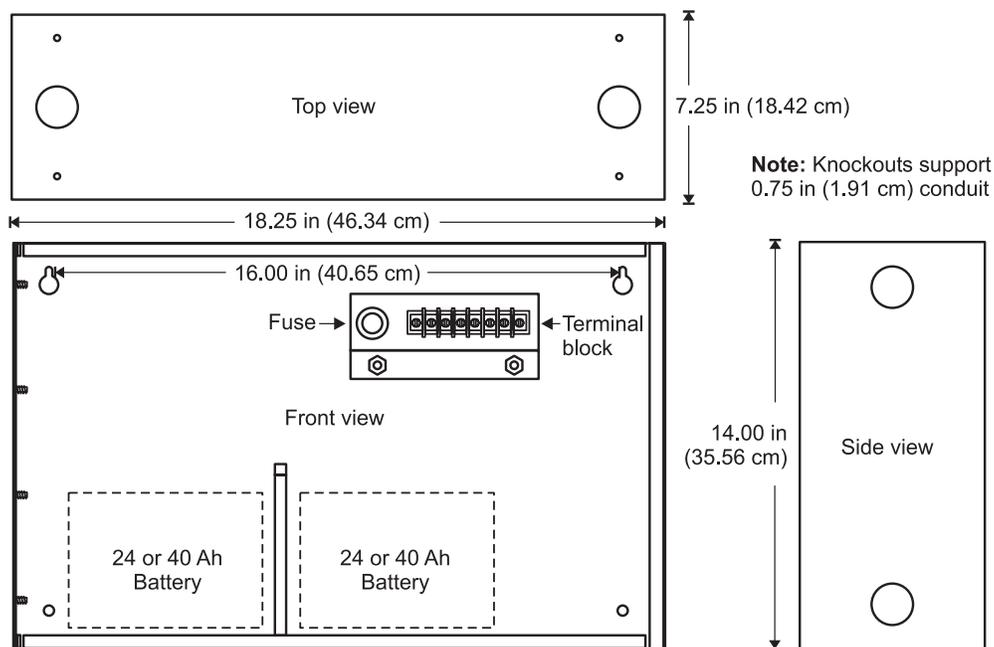
Surface Mounted Remote Closet Cabinets

3-RCC7R
3-RCC14R
3-RCC21R



* The lower mounting space can be used for an MN-BRKT1 bracket, which holds MNEC interface equipment including an MN-NETSW1 Ethernet network switch, an MN-ABPM Audio bridge, an MN-FVPN VoIP module, and an MN-COM1S Communications module.

BC-1 Dimensions



Ordering Information

Catalog Number	Description	Equipment Mounting Space	Battery Space	Ship Wt. lb. (Kg)
Lobby Enclosures – Outer doors with viewing window				
3-CAB5	Cabinet w/Wallbox, door and chassis	Five local rail modules One footprint and ½ footprint module	Two - 12V10A	30 (13.6)
→ 3-CAB7B	Wallbox only	One Chassis	Four - 6V8A Two - 12V10A Two - 12V17A	30 (13.6)
3-CAB7B-E	Wallbox only, EN54* certified CE	1 Chassis		30 (13.6)
→ 3-CAB7D(R)	Inner and outer doors for 3-CAB7B		N/A	10 (4.5)
3-CAB7D(R)-E	Inner & outer doors for 3-CAB7B, EN54*, CE			10 (4.5)
3-CAB14B	Wallbox only	Two Chassis	Four - 6V8A Two - 12V10A Two - 12V17A	42 (19.1)
3-CAB14B-E	Wallbox only, EN54* certified CE	2 Chassis		42 (19.1)
3-CAB14D(R)	Inner and outer doors for 3-CAB14B		N/A	15 (6.8)
3-CAB14D(R)-E	Inner & outer doors for 3-CAB14B, EN54*, CE			15 (6.8)
3-CAB21B	Wallbox only	Three Chassis	Four - 6V8A Two - 12V10A Two - 12V17A	55 (25)
3-CAB21B-E	Wallbox only, EN54* certified CE	3 Chassis		55 (25)
3-CAB21D(R)	Inner and outer doors for 3-CAB21B		N/A	20 (9.1)
3-CAB21D(R)-E	Inner & outer doors for 3-CAB21B, EN54*, CE			20 (9.1)
Remote Closet Enclosure – No viewing window				
3-RCC7R	Red wallbox and door	One Chassis	Four - 6V8A, Two - 12V10A Two - 12V17A, Two - 12V50A	37.5 (17)
3-RCC7R-E	Red wallbox and door, EN54* certified CE			37.5 (17)
ATCK	Attack rated door for 3-RCC7R		N/A	26 (11.8)
3-RCC14R	Red wallbox and door	Two Chassis	Four - 6V8A Two - 12V10A, Two - 12V17A	53 (24)
3-RCC14R-E	Red wallbox and door, EN54* certified CE			53 (24)
3-RCC21R	Red wallbox and door	Three Chassis	Two - 12V50A, Two - 12V65 ²	70 (31.8)
3-RCC21R-E	Red wallbox and door, EN54* certified CE			70 (31.8)

more...



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Chassis Assemblies

3-CHAS7	Takes one chassis space in wallbox, provides space for 7 local rail modules, up to two power supplies, and a ½ footprint module. Add suffix "-E" for EN54 compliant versions.	8.4 (3.8)
3-ASU**	Takes one chassis space in wallbox, provides an audio source unit /w microphone and an inner door filler plate. Add suffix "-E" for EN54 compliant versions.	15 (6.8)
3-ASU/4**	Takes one chassis space in wallbox, provides an audio source unit /w microphone and four local rail module spaces. Add suffix "-E" for EN54 compliant versions.	15 (6.8)
3-ASU/FT**	Takes one chassis space in wallbox, provides an audio source unit /w microphone and Firefighters Telephone. Add suffix "-EN" for EN54 compliant versions	20 (9.1)
3-FTCU**	Takes one chassis space in wallbox, provides Firefighters Telephone Control unit and inner door filler plate. Add suffix "-E" for EN54 compliant versions.	15 (6.8)
MN-BRKT1	Takes one chassis space in wallbox, provides mounting for MNEC interface equipment	4.0 (1.8)
FSB-BRKT2	Mounting bracket for FSB-PC2 communications bridge. Allows FSB-PC2 to mount on the side of a Chass7	1.0 (0.45)

Notes:

1. All lobby enclosures, wallboxes and doors have a textured gray enamel finish; outer doors are available in red by adding the suffix "R" to the catalog number, i.e. 3-CAB7DR.
2. Remote closet cabinets will support 65 AH batteries with the use of the 3-BATS Battery Shelf, which reduces the enclosure's chassis capacity by one chassis.
3. The EST3 is modularly listed under the following standards:
 UL 864 categories: UOJZ, UOXX, UUKL and SYZV, UL 2572, UL 294 category ALVY, UL 609 category AOTX, UL 636 category ANET, UL 1076 category APOU, UL 365 category APAW, UL 1610 category AMCX, UL 1635 category AMCX
 ULC-S527, ULC-S301, ULC-S302, ULC-S303, ULC-S306, ULC/ORD-C1076, ULC/ORD-C693
 Please refer to EST3 Installation and Service Manual for complete system requirements.

* EN 54-2: 1997 + A1: 2006 and EN 54-4: 1997 + A1: 2002 + A2: 2006 EN 54-16: 2008.

** Add "-CC" for City of Chicago, add "-E" for EN54 compliant chassis assemblies. For EN54 compliant 3-ASU/FT chassis order 3-ASU/FT-EN, for GOST R compliant order 3-ASU/FT-E.

Accessories

3-BATS	Battery Shelf for RCC Enclosures. Takes one chassis space. Room for up to one 65 AH or two 50 AH batteries.	3 (1.36)
BC-1	Battery Cabinet - supports up to two 40 amp hour batteries.	
3-BTSEN	Battery sensor/distribution module. Add suffix "-E" for EN54 compliant version.	0.5 (.2)
3-BTSEN-E	Distribution and Temperature Sensor Module. Required in EN54* Markets when battery installed in a remote cabinet.	
BC-1EQ	BC-1 - Seismic Battery hold down for BC-1. Supports up to two 40 Ahr batteries. Order BC-1 Separately.	
3-CABEQ	3-CAB - Seismic Battery hold-down for 3-CAB 7, 14 or 21. Supports two 1 2V batteries from 10 Ah up to 18 Ah. Comes with EST3 Chassis hardening hardware and instructions. Order 3-CAB7, 3-CAB14 or 3-CAB21 separately. See note 1.	
3-RCCEQ50	3-RCC series - Seismic Battery hold-down. Supports one set of two 50 Ah batteries. Comes with EST3 Chassis hardening hardware and instructions. Order 3-RCCxxR separately. See note 1.	
3-RCCEQ65	3-RCC series cabinet - Seismic Battery hold-down. Supports one set of two 65 Ah batteries (one battery in bottom of cabinet, one battery mounted on 3-BATS). Order 3-RCCxxR cabinet and 3-BATS separately. See note 1.	
3-TAMP	Tamper switch for 3-CAB7, 3-CAB14 and 3-CAB21 cabinets. Mounts to side of cabinet.	0.5 (.2)
3-TAMP5	Tamper switch for 3-CAB5. Mounts to side of cabinet.	0.5 (.2)
3-TAMPRCC	3-TAMPRCC Tamper Switch for RCC series cabinets. Mounts to side of cabinet.	0.5 (.2)

1. For earthquake anchorage, including detailed mounting weights and center of gravity detail, please refer to *Seismic Application Guide 3101676*. Approval of panel anchorage to site structure may require local AHJ, structural, or civil engineer review.



PRODUCT INFORMATION

The 3-CHAS7 chassis provides the mounting, internal power, and data distribution for up to seven plug-in local rail modules. Mounting studs for two power supplies and one interface module are provided on each chassis. Chassis design facilitates separation of power limited and non-power limited circuits by locating power limited circuitry toward the front of the chassis and non-power limited wiring at the rear of the chassis.

The 3-CHAS7 chassis mounts to the back wall of 3-CAB7, 3-CAB14, 3-CAB21, RCC-7, RCC-14, and RCC-21 cabinets. Multiple 3-CHAS7 chassis are interconnected within a cabinet using the supplied cables. The chassis are suitable for direct mounting in a standard EIA 19" rack.



INSTALLATION

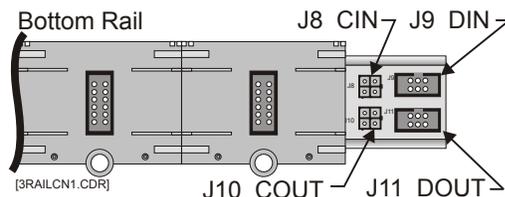
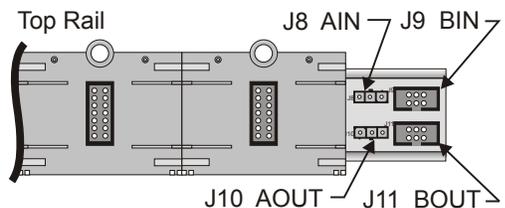
Mount the chassis assembly on the six #6-32 studs at the rear of the cabinet. Secure the chassis to the cabinet with the washers and nuts provided. An 11/32" nut driver simplifies chassis installation.

If a primary or booster power supply is used with this chassis, mount the heat sink on the four threaded stand-offs under the rails, then secure the PC board to the four threaded stand-offs.

Connect the DC power cable (P/N 250187) to connector J2 on the power supply. For the 3-PPS, connect the 16 pin data ribbon cable (P/N 250188) to connector P3 on the power supply. For the 3-BPS, connect a 14 pin data ribbon cable (P/N 250189) to connector P3 on the power supply. Route both cables up through the rails for later connection to the power supply/booster monitor module.

Chassis Power and Data Cables

When more than one chassis is installed within a single cabinet, the chassis power and data circuits must be interconnected. The chassis has four data connectors and four power connectors. The 3-CHAS7 has two power (J8 AIN and J11 AOUT) and two data (J9 BIN and J11 BOUT) connectors on the top rail. Two power (J8 CIN and J10 COUT) and two data (J9 DIN and J11 DOUT) connectors are on the bottom rail, as shown below.



Installation instructions are continued on following two pages.



SPECIFICATIONS

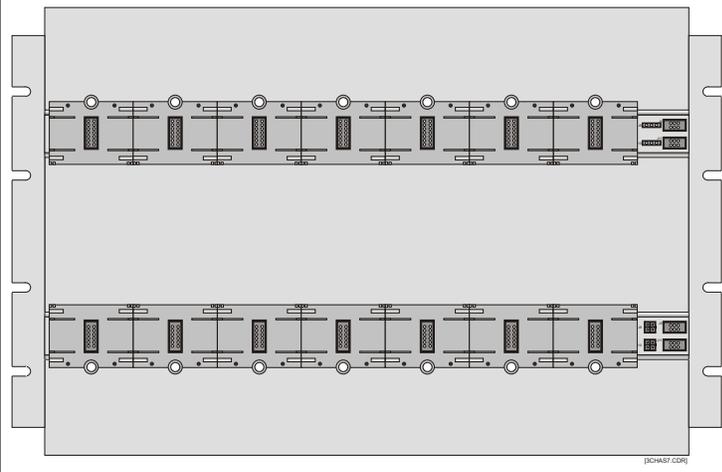
19" Rack Installation Dimensions (HWD)

12.0" x 19.0" x 5.25"
(30.48 cm x 48.26 cm x 13.34 cm)

Capacity

7 Local Rail Modules Spaces
2 Power Supplies
1 Interface Module

3-CHAS7



INSTALLATION SHEET:

3-CHAS7 Seven Local Rail Module Chassis

INSTALLATION SHEET P/N: 270484

FILE NAME: 270484.CDR

REVISION LEVEL: 2.0

APPROVED BY: K. Patterson

DATE: 06/14/99

REVISED BY: D. Miner

EDWARDS SYSTEMS TECHNOLOGY, INC.

SARASOTA, FL: 941-739-4300 FAX 941-753-1806

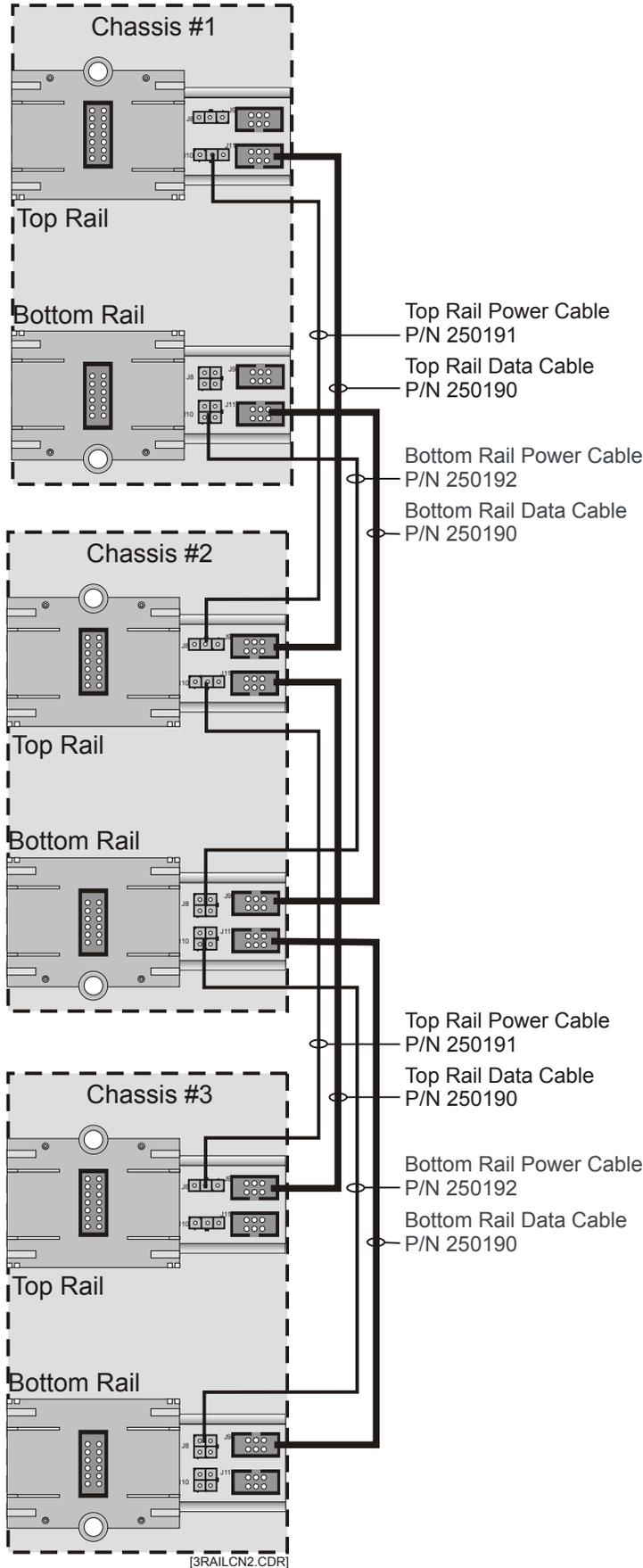
CHESHIRE, CT: 203-699-3000 FAX 203-699-3075

OWEN SOUND, CANADA: 519-376-2430 FAX 519-376-7258

INTERNATIONAL, CANADA: 905-270-1711 FAX 905-270-9553



INSTALLATION (continued)



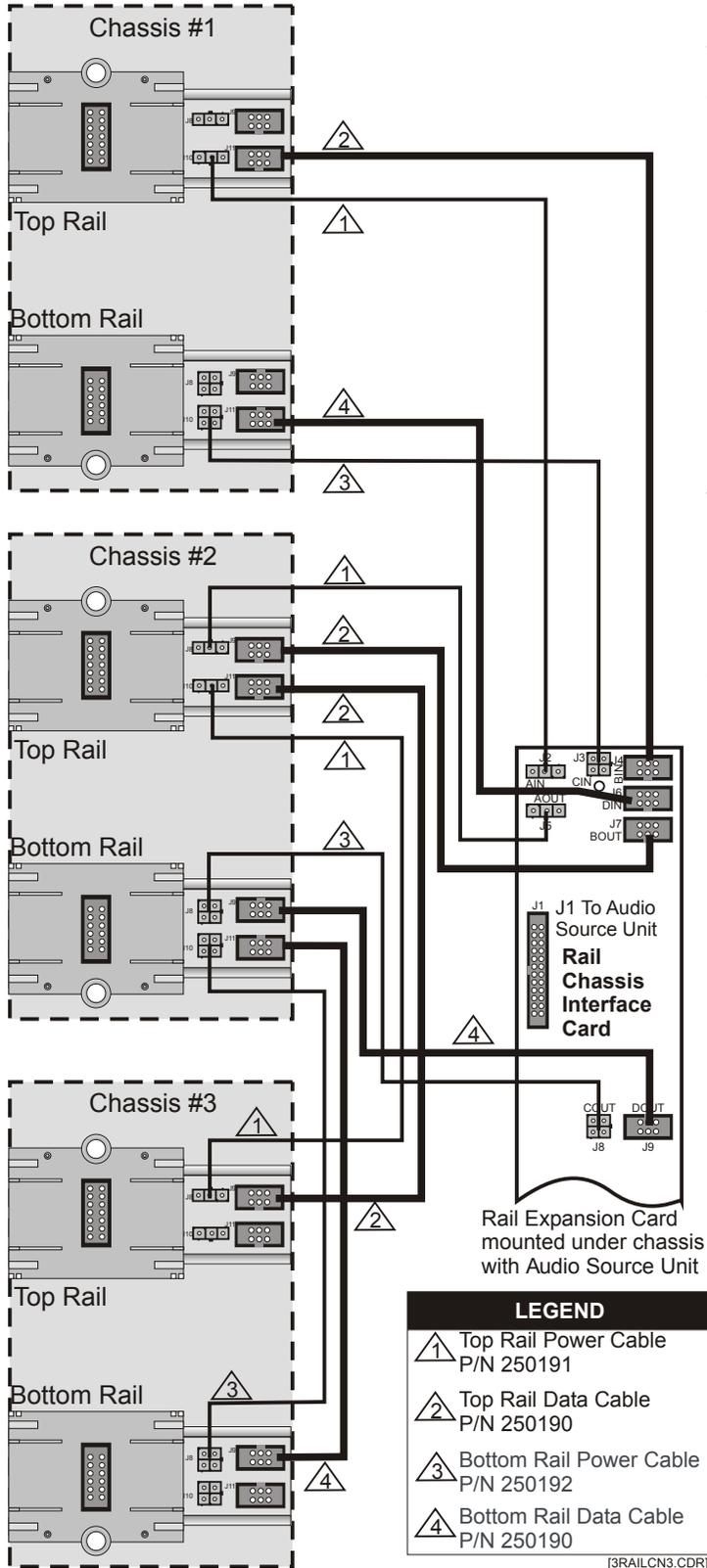
The figure on the left shows three 3-CHAS7 chassis in a common cabinet. Connect the power and data cables as follows:

1. Connect a top rail power cable (3 pin connector) to connector J10 AOUT on the top rail of chassis #1. Route the cable down to chassis #2, and connect to J8 AIN on the chassis #2 top rail.
2. Connect a top rail data cable (6 pin ribbon cable connector) to connector J11 BOUT on the top rail of chassis #1. Route the cable down to chassis #2 and connect to J9 BIN on the chassis #2 top rail.
3. Connect a bottom rail power cable (4 pin connector) to connector J10 COUT on the bottom rail of chassis #1. Route the cable down to chassis #2 and connect to J8 CIN on the chassis #2 bottom rail.
4. Connect a bottom rail data cable (6 pin ribbon cable connector) to connector J11 DOUT on the bottom rail of chassis #1. Route the cable down to chassis #2 and connect to J9 DIN on the chassis #2 bottom rail.
5. Repeat this process between chassis #2 and chassis #3.

NOTE: The chassis containing the 3-CPU1 Central Processor can only have chassis power and data connections made to connectors J10 AOUT and J11 BOUT on the top rail and J10 COUT and J11 DOUT on the bottom rail. The chassis containing the 3-CPU can never have connections coming into connectors J8 AIN, J9 BIN, J8 CIN or J9 DIN.



INSTALLATION (continued)



The figure to the left shows an Audio Source Unit (ASU) and two 3-CHAS7 chassis in a common cabinet. The ASU unit is connected to the two rails using a Rail Chassis Interface Card. The Rail Chassis Interface Card is mounted below the rails in the 1/2 footprint IRC-3 module space of the ASU unit chassis.

In this example, the ASU can be either the top or middle chassis. Connect the power and data cables as follows:

1. Connect the top rail power cable (3 pin connector) to connector J10 AOUT on the top rail of chassis #1. Route the cable down to the Rail Chassis Interface Card and connect to J28 AIN.
2. Connect the top rail data cable (4 pin connector) to connector J11 COUT on the top on bottom rail of chassis #1. Route the cable down to the Rail Chassis Interface Card and connect to J4 BIN.
3. Connect the bottom rail power cable (4 pin connector) to connector J10 COUT on the bottom rail of chassis #1. Route the cable down to the Rail Chassis Interface Card and connect to J3 CIN.
4. Connect the bottom rail data cable (6 pin ribbon cable connector) to connector J11 DOUT on the bottom rail of chassis #1. Route the cable down to the Rail Chassis Interface Card and connect to J6 DIN.
5. Connect a top rail power data cable to connector J5 AOUT on upper left side of the Rail Chassis Interface Card. Route the cable up to connector J8 AIN on the top rail of chassis #2.
6. Connect a top rail data cable to connector J7 BOUT on the upper right side of the Rail Chassis Interface Card. Route the cable up to connector J9 BIN on the top rail of chassis #2.
7. Connect a bottom rail power cable to connector J8 COUT on the left center of the Rail Chassis Interface Card. Route the cable up to connector J8 CIN on the bottom rail of chassis #2.
8. Connect a bottom rail data cable to connector J9 DOUT on the right center of the Rail Chassis Interface Card. Route the cable up to connector J9 DIN on the bottom rail of chassis #2.

CALIFORNIA DEPARTMENT OF FORESTRY & FIRE PROTECTION
OFFICE OF THE STATE FIRE MARSHAL
FIRE ENGINEERING - BUILDING MATERIALS LISTING PROGRAM



LISTING SERVICE

LISTING No. 7165-1657:0186

Page 1 of 3

CATEGORY: 7165 -- FIRE ALARM CONTROL UNIT (COMMERCIAL)

LISTEE: EDWARDS, A Division of UTC Fire & Security Americas Corporation, Inc. 8985 Town Center Parkway, Bradenton, FL 34202
Contact: Jewell Conover (941) 739-4358 Fax (941) 308-8123
Email: rhonda.conover@fs.utc.com

DESIGN: Models EST3, EST3R, EST3-230, EST3R-230, EST200, EST200R, EST200-2 and EST200R-2 fire alarm control units. Power limited. Automatic, manual, coded, noncoded, local, auxiliary, remote station, (DACT),(reverse polarity), proprietary (multiplex), central station, waterflow, sprinkler supervisory service and releasing device. Model EST3 is also suitable for mass notification system and smoke control. Refer to listee's data sheet for additional detailed product description and operational considerations. System components:

3-BPS/M, 3-BPS/M/230; Booster Power Supply
3-PPS/M, 3-PPS/M-230; Primary Power Supply
3-BBC, /230, /M, /M-230; Battery Booster Charger Power Supply
3-RS232; CPU RS232 Comm
3-XMEM; CPU Memory Option
3-IDC8/4; Zone Card
3-CPU, 3-CPU1, 3-CPU2, 3-CPU3; Central Processing Unit
3-LCD, 3-LCDXL, 3-LCDXL1; CPU LCD Display
3-OPS; Off Premises Signaling Module
3-LDSM; LED Display Module
3-LRMF; Blank LRM Filler
3-CHAS4, -CHAS-5, -CHAS-7, -CHASS; Module Chassis
3-CAB-5(R),-7(R),-14(R),-21(R) ; Module Cabinet (red)
3-TAMP, 3-TAMP5; Tamper Switch
3-TAMPRCC; Tamper Switch
3-RCC7(R),-RCC14(R),-RCC21(R); Closet Cabinet (red)
3-PSMON; Power Supply Drive Monitor
3-BPMON; Power Supply Booster Monitor
3-BBCMON; Battery Booster Charger Monitor
3-24G,-24R,-24Y,-12RY,-12SY,-12SR,-12SG; LED Display
3-12/R Y,-12/2Y,-12/2S2Y,-12/S1GY, *-12/S2R; LED Display
3-12/S1RY,-18S1G2Y,-6/3S1G2Y; LED Display
3-6/3S1GYR,-18S1GYR, -6/3S3L, *-6/3S2RY; LED Display
3-4/3SGYWR; LED Display
4X-12/S1GY, 4X-12/S1RY, 4X-12SR, 4X-24R; LED Display
4X-6/3S1G2Y, 4X-6/3S1GYR, 4X-4/3SGYWR; LED Display

*Rev. 11-19-15 gt



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Date Issued: **July 01, 2017**

Listing Expires **June 30, 2018**

Authorized By: **DAVID CASTILLO, Program Coordinator**
Fire Engineering Division

4X24Y, 4X-12RY; LED Display
 *4X-LRMF: Blank Plate
 3X-NET, 3X-NET8, 3X-FIB8; LED Display
 3X-FIB; Fiber Network Option Module
 3-CAB5BR; Enclosure
 3-SSDC, 3-SSDC1, 3-SDDC1; Single Loop Controller Module
 3-SDC, 3-SDC1, *3-SDC1-HC, *VM-SLC-HC; Signature Data Card
 3-ASU, 3-ASU/4, 3-ASUMX/100, /MM; Audio Source Module
 3-FTCU; Firefighter Phone Module
 3-ASU/FT; Audio/Firefighter Module
 3-ZA15, 20, 30, 40, 95; Amplifier
 3-RS485(130316/130410-01); Network Communication Card
 3-RS485A, 3-RS485B, 3-RS485R; Network Communication Card
 3-DSDC, 3-DSDC1; Dual Loop Controller Module
 3-FIB, 3-FIBA; Fiber/Copper Data Com Module
 3-FIBMB; Fiber Optic Interface Card
 3-CCI; City Interface
 CDR-3; Coded Output Module
 URSM; Universal Riser Supervisor Module
 RM1; Supervisory Module
 3-AADC, 3-AADC1; Analog Addressable Communication Module
 3-ATPINT, MN-ABPM; ATPC Interface Module
 3-REMICA, 3-REMICP; Remote Microphone
 PT1-S; System Printer
 PT1-P; System Printer Parallel
 3-ZA90, 3-ZA20A, 3-ZA20B; Zone Amplifiers
 3-ZA40A, 3-ZA40B, 3-ZA95; Zone Amplifiers
 ATCK; Attack Kit Cover for 3-RCC7R cabinet
 3-MODCOM, 3-MODCOMP; Modem communicator/pager interface
 3-NSHM1, 3-NSHM2; Modem Communication Cards
 3-SAC; Security Access Control Module
 3-ASUXM/100; Audio and Telephone Masters
 MN-COM1S; Interface Module
 MN-NETSW1, MN-NETSW2; Network Switching Hub
 MN-FNS8C2F3, MN-FNS4C2F3, MN-FNS8C18F2, MN-FNS8C18F3; Network Switching Hub
 MN-FNS8C18FAC; AC Power Supply
 MN-FNS8C18FDC; DC Power Supply
 MN-FNSGBDSM70K, MN-FNSFEDSM10K, MN-FNSFEMM2K; Fiber Optic Modules
 *MN-FNSGBDSMDR-XX, *MN-FNSGBDSM10K, *MN-FNSGBSSM10KD,
 *MN-FNSGBSSM10KU; Fiber Optic Modules
 MN-FNS4HDK1, MN-FNS8HDK1; Mounting Bracket
 MN-PASM, MN-PASM2; Audio Preamp Module
 MN-FVFN; VoIP Encoding/Decoding Unit
 MN-BRK1, MN-BRKT8C18F, *MN-BRKT4F; Mounting Bracket
 *MN-NRBK1, MN-BRKT1, 1F, 2, 3, 3F; Mounting Bracket

*Rev. 11-19-15 gt



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RC-BRKT; Mounting Bracket
 3-RCCEQ50, 3-RCCEQ65, 3-FTEQ, 3-CABEQ; Seismic Kits
 SMXL02, SMXH12; Fiber Tranceivers
 3-FIBMB2, MN-ABPM; Interface Module
 MN-NETRL4; Network Relay Module
 NETCOM-BRKT, MN-NRBRT; Mounting Bracket
 SMXLO, SMXH, MMXVR; Fiber Tansceiver
 3-CPUDR; CPU Door
 3-BTSEN; Battery backup distribution bus

- RATING:** EST3, EST3R, EST200, EST200-2, EST200R, EST200R-2:120 VAC
 EST3-230, EST3R-230: 220 VAC
- INSTALLATION:** In accordance with listee's printed installation instructions, applicable codes and ordinances and in a manner acceptable to the authority having jurisdiction.
- MARKING:** Listee's name, model number, electrical rating, and UL label.
- APPROVAL:** Listed as fire alarm control units for use with separately listed electrically and functionally compatible initiating and indicating devices. Also suitable for high-rise application. Refer to listee's Installation Instructions Manual for details.
 These control units can generate a distinctive three-pulse Temporal Pattern Fire Alarm Evacuation Signal (for total evacuation) in accordance with NFPA 72, 2002 Edition.
 This control unit meets the requirements of UL-864, 9th Edition Standard.
- NOTE:**
1. For ***Fire Alarm Verification Feature (delay of fire alarm signal)***, the maximum Retard/Reset/Restart period shall not exceed 30 seconds.
 2. Formerly 7165-1591:186 and 7165-1388:211
 3. Combined with 7170-1657:187

*Rev. 11-19-15 gt



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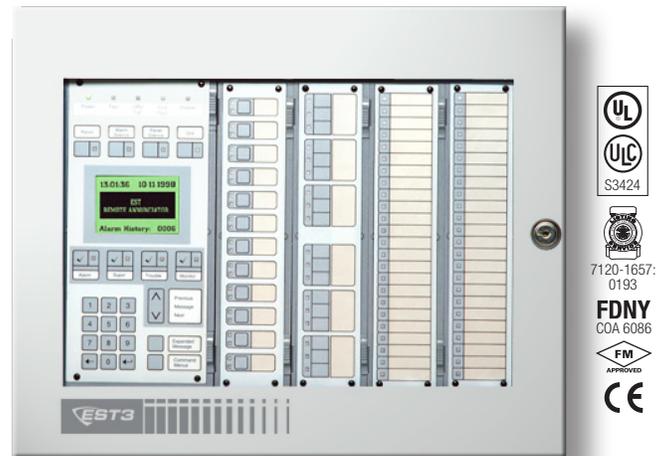
Date Issued: **July 01, 2017**Listing Expires **June 30, 2018**

Authorized By: **DAVID CASTILLO**, Program Coordinator
 Fire Engineering Division



EST3 Remote Annunciators

3-ANNCPU3, 3-LCDANN, 3-6ANN,
3-10ANN, 3-EVxxx, 3-4ANN



EN54-2:1997+A1 and
EN54-4:1997+A1:2002+A2
pending

Overview

EST3 supports a full range of annunciator options for Mass Notification/Emergency Communication (MNEC), Life Safety and other purposes. Annunciator cabinets are constructed from 16 gauge cold rolled steel. The gray textured enamel finish of the annunciators complements any decor. Both surface and semi-flush mounting cabinet configurations maximize mounting flexibility and esthetic appeal. Cabinet arrangements allow both LED and LCD annunciation to easily combine in a single enclosure. Slide in labeling for LEDs and switches provides designation flexibility for labeling in local languages. For graphic annunciation EST3 offers LED driver boards perfectly suited to operate in most graphic annunciators.

EST3 annunciators are perfect for MNEC applications. They can be used in Central Control Stations (CCS), Autonomous Control Units (ACU), Local Operating Console (LOC) and combination units. In these applications, annunciators are configured to operate as Local Operation Consoles, or even Central Command Stations, from which MNEC is initiated and controlled.

Standard Features

- Standard 3-LCD (168 characters) and large-format 3-LCDXL1 (960 character) display options
- LCD uses queues to sort events
- Variety of wallbox configurations
- Programmable LED flash rates
- Slide-in labels
Makes customization for regional language easy
- Full line of driver boards for graphic annunciators

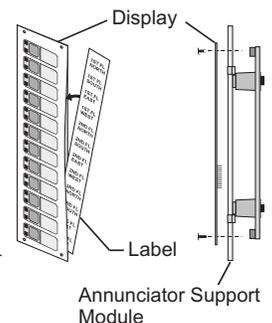
Application

Use EST3 remote annunciators when a compact system status display is needed. Annunciator configurations include: LCD only display, LED only displays or combination LED and LCD display in a single enclosure.

The LCD display uses either the 3-LCD or 3-LCDXL1 Liquid crystal display module. The 3-LCD has a 128 x 64 graphical display typically used to display eight lines of 21 characters on its LCD display while the 3-LCDXL1 has a larger 240 x 320 pixel backlit display that supports 24 lines of 40 characters. Both LCD displays provide the room needed to convey emergency information in a useful format.

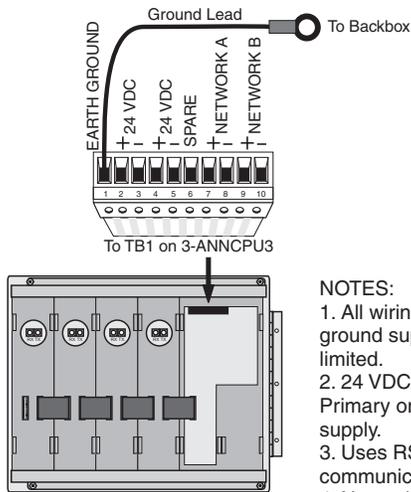
The 3-LCD always displays the last highest priority event even when the user is viewing other message queues. To give the greatest message flexibility EST3 event messages can route to specific annunciators. Routing can be initiated at a specific time/shift change. Messages need only display in areas having to respond to an event.

For LED display, the full line of EST3 Control/Display Modules support event display. Control/Display modules install over any annunciator support module maximizing annunciator design flexibility. A Lamptest feature can program to any spare control switch. If an LCD display is installed in the annunciator, simply operate the Alarm Silence and Trouble Silence switches simultaneously to lamptest all LEDs.



Typical Wiring

Rear view 3-ANNCPU3 Field Wiring 3-6ANN Shown



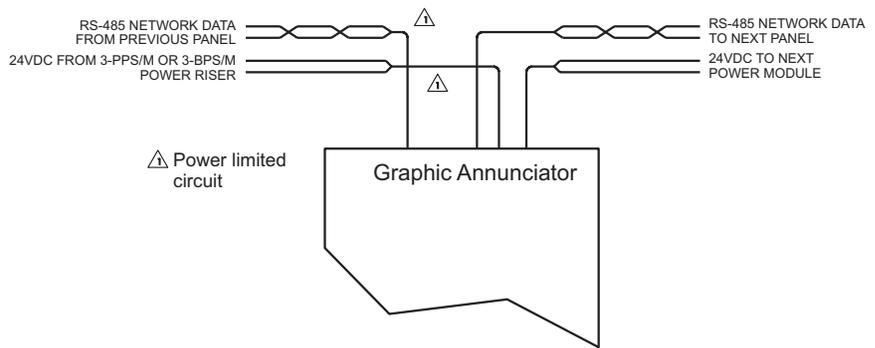
NOTES:

1. All wiring except earth ground supervised and power limited.
2. 24 VDC available from Primary or Booster Power supply.
3. Uses RS-485 Network communication format
4. Network wiring Twisted Pair

Power Riser

Calculate wire size for a maximum 3.4 Vdc total line loss from the 24 Vdc nominal voltage.

Graphic Annunciator Field Wiring



Wire Specifications

Network Data Communications - RS485 Format

Minimum Twisted Pair	18 AWG (0.75 mm ²).
Maximum Circuit Resistance	90 Ohms
Maximum Circuit Capacitance	0.3 µF
Maximum Distance between any 3 panels	5,000 ft. (1,524 m).

Capacitance, entire network

Maximum Accumulative Capacitance

Wire Size	38.4K Baud	19.2K Baud
18 AWG	1.4 µF	2.8 µF
16 AWG	1.8 µF	3.6 µF
14 AWG	2.1 µF	4.2 µF

Distance limits are determined using the maximum allowable circuit resistance and capacitance, and manufacturer's cable specifications.

Specifications

Catalog Number	3-ANNCPU3	3-ANNSM	3-LCD	3-LCDXL1
Agency Listings	UL, ULC, FM, CE, LPCB EN54* pending.			
Mounting Space	Two Spaces	One Space	Mounts over 3-ANNCPU	Mounts over 3-ANNCPU plus two spaces.
Communication Format	RS-485	N/A	N/A	N/A
Current @ 24 Vdc				
Standby	144 mA	10mA	40mA	48mA
Alarm	144 mA	10mA	42mA	50mA
Wiring Termination	Plug in terminal strip			
Wiring Size	Twisted Pair 18-14 AWG (0.75-1.5 mm ²)		N/A	
Max. Wire Distance	5000 ft (1524m) between any 3 panels			
Relative Humidity	93% non condensing at 90° F (32° C)			
Temperature Rating	0-49° C (32 - 120° F)			
Wiring Styles	Class A or Class B			

Note: For a complete list of EST3 annunciator display and control modules please refer to Edwards literature sheet part number 85010-0055.

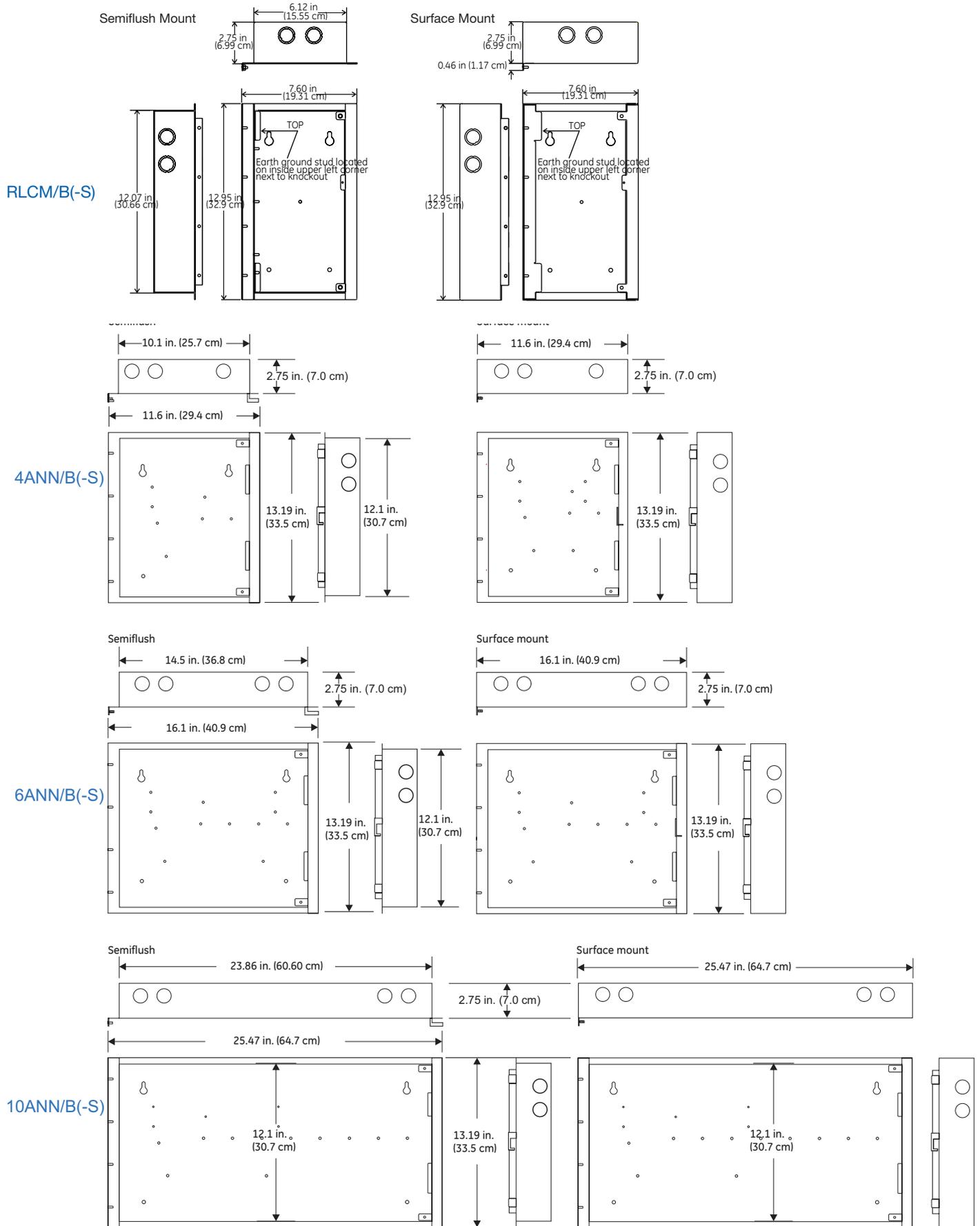
* EN54-2:1997+A1 and EN54-4:1997+A1:2002+A2 pending

Engineering Specification

The Life Safety system shall incorporate annunciation of Alarm, Supervisory, Trouble and Monitor operations. Annunciation must be through the use of both LED display strips complete with a means to custom label each LED as to its function. Where applicable control switches must be provided. Switches with LEDs must provide positive feed back to the operator of remote equipment status. An LCD display with basic common control LEDs and switches shall be provided. The Common Control Switches and LEDs provided as minimum will be: Reset switch and LED, Alarm Silence switch and LED, Panel Silence switch and LED, Drill switch and LED. It must be possible to add additional common controls as required through the use of modular display / control

units. The LCD interface must provide the ability to display custom event messages of a minimum of 40 characters. The LCD must provide the emergency user, hands free viewing of the first and last highest priority event. The last highest priority event must always display and update automatically. System events must automatically be placed in queues. It shall be possible to view specific event types separately. Having to scroll through a mixed list of events types is not acceptable. The total number of active events by type must be displayed. It must be possible to customize the designations of all user interface LEDs and switches for local language requirements. It must be possible to route system event messages to specific annunciator locations.

Dimensions



Ordering Information



Contact us...

Email: edwards.fire@fs.utc.com
 Web: www.est-fire.com

EST is an **EDWARDS** brand.
 1016 Corporate Park Drive
 Mebane, NC 27302

In Canada, contact Chubb Edwards...
 Email: inquiries@chubbedwards.com
 Web: www.chubbedwards.com

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Catalog Number	Description	Ship Wt. lb (kg)
Command Module Annunciators (Come with CPU, LCD display and doors. Order wallbox separately.)		
→ 3-LCDANN	Remote LCD Command Module Annunciator.	3.8 (1.7)
3-LCDANN-E	Remote LCD Command Module Annunciator. For EN54* market only, CE.	3.8 (1.7)
<i>Base Annunciators (Come with two 3-ANNSM annunciator support modules, a CPU, and doors. Order Display/Control modules, additional support modules & wallbox separately.)</i>		
3-4ANN	Four Position Base Annunciator.	
3-4ANN-E	Four Position Base Annunciator. For EN54* market only, CE.	
3-6ANN	Six Position Base Annunciator.	6.28 (2.85)
3-6ANN-E	Six Position Base Annunciator. For EN54* market only, CE.	6.28 (2.85)
3-10ANN	10 Position Base Annunciator.	10.5 (4.8)
3-10ANN-E	10 Position Base Annunciator. For EN54* market only, CE.	10.5 (4.8)
<i>*EN54-2:1997+A1 and EN54-4:1997+A1:2002+A2 pending</i>		
CPU, Support Module, & LCD Displays		
3-ANNCPU3	Annunciator CPU	1 (.45)
3-CPUDR	CPU doors with filler plates. Order separately, one required per CPU where no LCD display is installed.	0.25 (.11)
3-ANNSM	Annunciator Support Module	.45 (.2)
3-LCD	Liquid Crystal Display Module, eight lines.	.8 (.36)
3-LCDXL1	Liquid Crystal Display Module, 40 lines mounts in 3-4ANN, 3-6ANN or 3-10ANN annunciators. <i>Note one 3-LCDXL1KBL, (ordered separately) is required for each 3-LCDXL1 mounting into 3-6ANN or 3-10ANN annunciator boxes.</i>	
3-LCDXL1KBL	Cable for 3-LCDXL1 (Use to connect from 3-ANNCPU3 to the first annunciator support model. Not required with 3-4ANN and 3-LCDXL1 applications.)	
Control/Display Modules		
3-CPUDR	Two blank filler plates suitable for any annunciator blank space.	.5 (.22)
3-24R	24 Red LED Display Module	.35 (.12)
3-24Y	24 Yellow LED Display Module	.35 (.12)
3-24G	24 Green LED Display Module	.35 (.12)
3-12SR	12 switches with 12 Red LED Display/Control Module	.35 (.12)
3-12SY	12 switches with 12 Yellow LED Display/Control Module	.35 (.12)
3-12SG	12 switches with 12 Green LED Display/Control Module	.35 (.12)
3-12RY	12 Red LED and 12 Yellow LED Display Module	.35 (.12)
3-12/S1GY	12 switches with one Green and one Yellow LED per switch	.35 (.12)
3-12/S1RY	12 switches with one Red and one Yellow LED per switch	.35 (.12)
3-12/S2Y	12 switches with two Yellow LEDs per switch	.35 (.12)
3-6/3S1G2Y	Six groups of three switches. Each switch with one LED: Green, Yellow, Yellow.	.35 (.12)
3-6/3S1GYR	Six groups of three switches. Each switch with one LED: Green, Yellow, Red.	.35 (.12)
3-REMICA	Remote microphone for use in 3-ANN series annunciator cabinets	15 (6.8)
3-FP	Filler Plate, order separately one required per 3-ANNSM when no LED or LED/Switch module installed on operator layer.	0.1 (0.05)
Driver Modules, Power Supplies		
3-EVDVR	LED/SWITCH Driver Module, For Edwards Graphics	.35 (.12)
3-EVDVRA	LED/SWITCH Driver Module Assembly for Third-party Graphics	.35 (.12)
3-EVPWR	Power Supply for Edwards Graphics	.5 (.22)
3-EVPWRA	Power Supply Assembly c/w 19 inch rail mounting chassis assembly space for one 3-ANNCPU3 for Third-party Graphics	2.5 (1.2)
3-EVDVRX	Plastic mounting extrusion 19 inch mounting - Space for up to three 3-EVDVRA modules.	.35 (.12)
Enclosures		
→ RLCM/B	Remote Command module flush mount LCD wallbox	2.5 (1.2)
RLCM/B-S	Remote Command module surface mount LCD wallbox	2.5 (1.2)
3-RLCM/D	Inner & outer doors for RLCM/B(-S)	2.0 (0.9)
4ANN/B	Four Position LED/LCD flush mount wallbox.	6.0 (2.7)
4ANN/B-S	Four position LED/LCD surface mount wallbox.	6.0 (2.7)
6ANN/B	Six position LED/LCD flush mount wallbox	7.0 (3.2)
6ANN/B-S	Six position LED/LCD surface mount wallbox	7.0 (3.2)
10ANN/B	Ten position LED/LCD flush mount wallbox	9.0 (4.1)
10ANN/B-S	Ten position LED/LCD surface mount wallbox	9.0 (4.1)

CALIFORNIA DEPARTMENT OF FORESTRY & FIRE PROTECTION
OFFICE OF THE STATE FIRE MARSHAL
FIRE ENGINEERING - BUILDING MATERIALS LISTING PROGRAM



LISTING SERVICE

LISTING No. 7120-1657:0193

Page 1 of 2

CATEGORY: 7120 -- ANNUNCIATORS

LISTEE: EDWARDS, A Division of UTC Fire & Security Americas Corporation, Inc. 8985 Town Center Parkway, Bradenton, FL 34202
Contact: Jewell Conover (941) 739-4358 Fax (941) 308-8123
Email: rhonda.conover@fs.utc.com

DESIGN: Model EST3 remote annunciator. The unit is modular in construction. The various options for the EST3 remote annunciator is as followed:

3-ANNCPU, 3-ANNCPU1, 3-ANNCPU3 CPU; Module for Remote Annunciators
3-ANNSM; Driver
3-ANNBF; Blank Filler Module
3-LCD,*3-LCDXL1; LCD Display Module
3-RCLM, 3-6ANN, 3-10ANN ;Enclosures
3-24R, 3-24Y, 3-24G; LED Display
3-12SG, 3-12SR, 3-12SY; LED Display
3-12/S1GY, 3-12/S1RY ;LED Display
3-12/S2Y ;LED Display
3-6/3SIG2Y, 3-6/3SIGYR ;LED Display
3-6ANN/D, 3-10ANN/D ;Enclosure Door
3-RLCM/D ;Enclosure Door
3-RLCM/B, 3-6ANN/B; Enclosures
3-RLCM/B-S, 3-6ANN/B-S
3-10ANN/B-S, 3-LCDANN
3-10ANN/B
3-4ANN; Enclosure
3-4ANN/D; Enclosure Door
3-REMICA; Remote Annunciators
RLCM/B-S, RLCM/D; Enclosures
3-4/3SGYWR; LED Display
Refer to listee's data sheet for additional detailed product description and operational considerations.

RATING: 20-28 VDC

INSTALLATION: In accordance with listee's printed installation instructions, applicable codes & ordinances and in a manner acceptable to the authority having jurisdiction.

MARKING: Listee's name, model number, electrical rating, and UL label.

APPROVAL: Listed as a remote annunciator for use with listee's separately listed compatible fire alarm

*Rev 01-22-14 gt



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Authorized By: **DAVID CASTILLO, Program Coordinator**
Fire Engineering Division

control units. Refer to listee's Installation Instruction Manual for details.

NOTE:

Formerly 7120-1591:193 and 7120-1388:218

*Rev 01-22-14 gt



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Fire Engineering Division

Intelligent Smoke Detector

SIGA-PD



Overview

The Signature Series SIGA-PD optical smoke detector brings advanced sensing technology to a practical design that increases efficiency, saves installation time, cuts costs, and extends life safety and property protection capabilities. Continuous self-diagnostics ensure reliability over the long-haul, while environmental compensation helps reduce maintenance costs.

Like all Signature Series detectors, the SIGA-PD is an intelligent device that gathers analog information from its optical sensor, converting this data into digital signals. To make an alarm decision, the detector's on-board microprocessor measures and analyzes sensor readings and compares this information to historical data. Digital filters remove signal patterns that are not typical of fires, thus virtually eliminating unwanted alarms.

Standard Features

Note: Some features described here may not be supported by all control systems. Check your control panel's Installation and Operation Guide for details.

- Next Generation Optical Smoke Sensing Technology
- Wide 0.53 to 3.94 %/ft. (1.7 to 12.35 %/m) smoke obscuration
- Uses Existing Wiring
- Automatic Device Mapping
- Up To 250 Total Signature Addresses Per Loop
- Two Levels of Environmental Compensation
- Two Levels of Dirty Detector Warning
- Twenty Pre-Alarm Settings
- Five Sensitivity Settings
- Non-Volatile Memory
- Electronic Addressing
- Identification of Dirty or Defective Detectors
- Automatic Day/Night Sensitivity Adjustment
- Bicolor (Green/Red) Status Led
- Standard, Relay, Fault Isolator, and Audible Mounting Bases
- Sensor Markings Provide Easy Testing Identification

Application

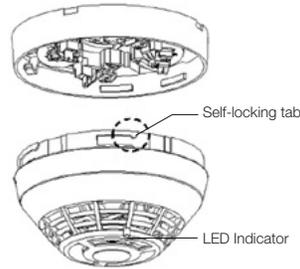
The SIGA-PD detects extremely small particles of combustion and triggers an alarm at the first sign of smoke. Thanks to its high-performance forward-scattering reflective response technology, the photoelectric smoke sensor responds quickly and reliably to a wide range of fire types, especially slow burning fires fuelled by combustibles typically found in modern multi-use buildings.

Compatibility

The SIGA-PD detector is compatible only with the Signature Loop Controller.

Installation

Signature Series detectors mount to North American 1-gang boxes, 3-1/2 inch or 4 inch octagon boxes, and to 4 inch square electrical boxes 1-1/2 inches (38 mm) deep. They mount to European BESA and 1-gang boxes with 60.3 mm fixing centers. See mounting base installation and wiring for more information.



Sensing and reporting technology

The microprocessor in each detector provides additional benefits - Self-diagnostics and History Log, Automatic Device Mapping, and Fast, Stable Communication.

Self-diagnostics and History Log - Each Signature Series detector constantly runs self-checks to provide important maintenance information. The results of the self-check are automatically updated and permanently stored in the detector's non-volatile memory.

Automatic Device Mapping - The loop controller learns where each device's serial number address is installed relative to other devices on the circuit. The mapping feature provides supervision of each device's installed location to prevent a detector from being reinstalled (after cleaning etc.) in a different location from where it was originally.

Fast Stable Communication - On-board intelligence means less information needs to be sent between the detector and the loop controller. Other than regular supervisory polling response, the detector only needs to communicate with the loop controller when it has something new to report.

Testing & Maintenance

Each detector automatically identifies when it is dirty or defective and causes a "dirty detector" message. The detector's sensitivity measurement can also be transmitted to the loop controller. A sensitivity report may be printed to satisfy NFPA sensitivity measurements, which must be conducted at the end of the first year and every two years thereafter.

The user-friendly maintenance program shows the current state of each detector and other pertinent messages. Single detectors may be turned off temporarily from the control panel. Availability of maintenance features is dependent on the fire alarm system used.

Accessories

Detector mounting bases have wiring terminals that are accessible from the "room-side" after mounting the base to the electrical box. The bases mount to North American 1-gang boxes and to 3½ inch or 4 inch octagon boxes, 1½ inches (38 mm) deep. They also mount to European BESA and 1-gang boxes with 60.3 mm fixing centers. The SIGA-SB4, SIGA-RB4, and SIGA-IB4 mount to North American 4 inch sq. electrical boxes in addition to the above boxes. They include the SIGA-TS4 Trim Skirt, which is used to cover the "mounting ears" on the base. The SIGA-AB4G mounts to a 4 inch square box only.



Remote LED SIGA-LED - The remote LED connects to the SIGA-SB or SIGA-SB4 Standard Base only. It features a North American size 1-gang plastic faceplate with a white finish and red alarm LED.

SIGA-TS4 Trim Skirt - Supplied with 4 inch bases, it can also be ordered separately to use with the other bases to help hide surface imperfections not covered by the smaller bases.

Sounder Bases - Signature Series sounder bases are designed for use where localized or group alarm signaling is required.

- **SIGA-AB4G** bases provide sounder capability to Signature Series to heat and smoke detectors. They are not intended for use with combination carbon monoxide detectors in Fire-plus-CO mode.
- **SIGA-AB4GT** bases provide sounder capability to Signature Series smoke and heat detectors, as well as carbon monoxide detectors when used with a SIGA-TCDR Temporal Pattern Generator.
- **SIGA-AB4G-LF** bases provide 520 Hz low frequency sounder capability to Signature Series smoke and heat detectors, as well as carbon monoxide detectors when used with a SIGA-TCDR Temporal Pattern Generator. The SIGA-AB4G-LF is suitable for applications requiring low frequency audible tones.

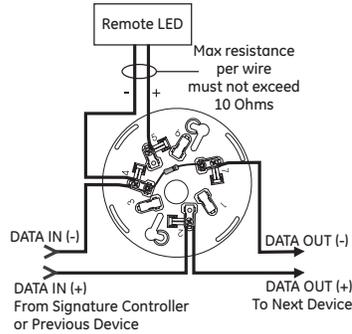
Typical Wiring

The detector mounting bases accept #18 AWG (0.75mm²), #16 (1.0mm²), #14 AWG (1.5mm²), and #12 AWG (2.5mm²) wire sizes. Sizes #16 AWG (1.0mm²) and #18 AWG (0.75mm²) are preferred for ease of installation.

Standard Detector Base, SIGA-SB, SIGA-SB4

This is the basic mounting base for EDWARDS Signature Series detectors. The SIGA-LED Remote LED is supported by this Base.

Term	Description
1	Not Used
2	DATA IN/OUT (+)
3	Not Used
4	DATA IN (-)
4	Remote LED (+)
5	Remote LED (+)
6	Not Used
7	DATA OUT (-)



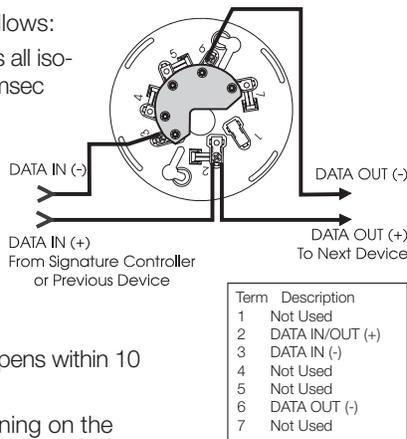
Isolator Detector Base, SIGA-IB, SIGA-IB4

This base includes a built-in line fault isolator for use on Class A circuits. A detector must be installed for it to operate. The isolator base does not support the SIGA-LED Remote LED.

The isolator operates as follows:

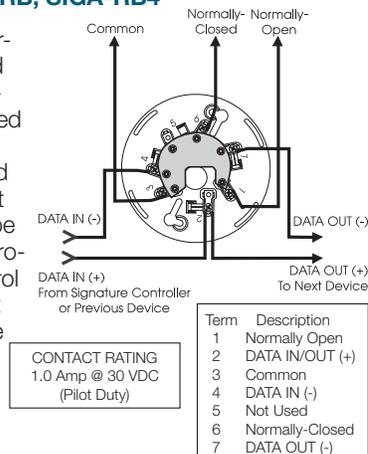
- a short on the line causes all isolators to open within 23 msec
- at 10 msec intervals, beginning on one side of the Class A circuit nearest the loop controller, the isolators close to provide the next isolator down the line with power
- when the isolator next to the short closes, it reopens within 10 msec.

The process repeats beginning on the other side of the loop controller.



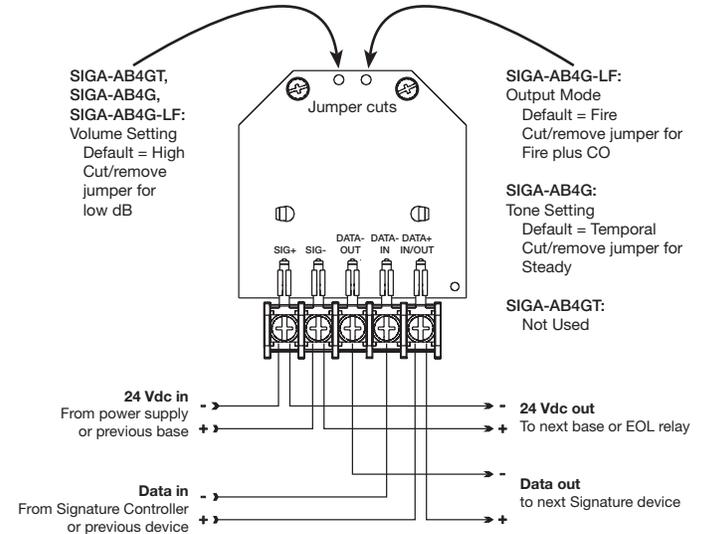
Relay Detector Base, SIGA-RB, SIGA-RB4

This base includes a relay. Normally Open or Normally Closed operation is selected during installation. The dry contact is rated for 1 amp (pilot duty) @ 30 Vdc. The relay's position is supervised to avoid accidentally jarring it out of position. The SIGA-RB can be operated as a control relay if programmed to do so at the control panel. The relay base does not support the SIGA-LED Remote LED.



Audible Sounder Bases, Fire Mode

AB4GT, AB4G, AB4G-LF sounder bases



Warnings & Cautions

- This detector does not operate without electrical power. As fires frequently cause power interruption, discuss further safeguards with the local fire protection specialist.
- This detector does not sense fires in areas where smoke cannot reach the detector. Smoke from fires in walls, roofs, or on the opposite side of closed doors may not reach the detector.
- Photoelectric detectors have a wide range of fire-sensing capabilities and are best suited for detecting slow, smoldering fires.
- In Canada, install according to CAN/ULC-S524 Standard for the Installation of Fire Alarm Systems, CSA C22.1 Canadian Electrical Code, and the local authority having jurisdiction.



LIFE SAFETY & INCIDENT MANAGEMENT

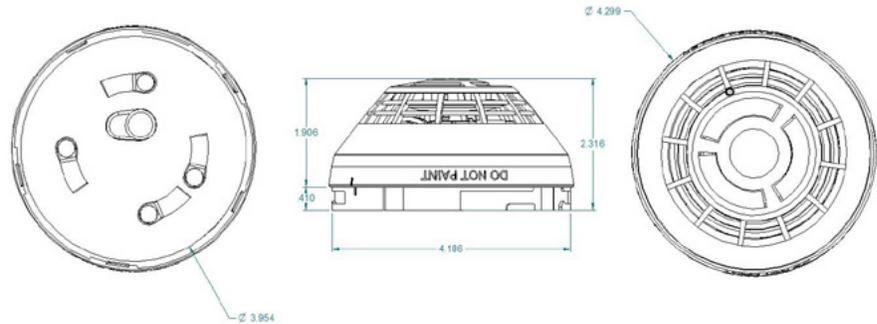
Contact us...

Email: edwards.fire@fs.utc.com
 Web: Edwards-fire.com

EDWARDS is a UTC brand.
 1016 Corporate Park Drive
 Mebane, NC 27302

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Dimensions



Specifications

Operating voltage	15.20 to 19.95 VDC
Normal operating current	32 μ A
Alarm current	32 μ A
Smoke Sensitivity Range	UL/ULC: 0.53 to 3.94 %/ft. (1.7 to 12.35 %/m) obscuration
Vibration level	10 to 35 Hz, with an amplitude of 0.01 in.
Air velocity	0 to 4,000 ft./min (0 to 20 m/s)
Wall mounting	12 in. (305 mm) max. from ceiling
Compatible bases	See Ordering Information
Compatible detector testers	Testifire 1000, Testifire 2000
Operating environment	32 to 120°F (0 to 49°C), 0 to 93% RH, noncondensing
Construction	High Impact Engineering Polymer, White
Storage temperature	-4 to 140°F (-20 to 60°C)
Environmental compensation	Automatic
Agency Listings	CAN/ULC-S529, UL 268, UL 268A

Ordering Information

Catalog Number	Description	Ship Wt. lbs (kg)
→ SIGA-PD	Intelligent Optical Smoke Detector	0.4 (0.16)

Accessories

→ SIGA-SB	Detector Mounting Base - Standard	
→ SIGA-SB4	4-inch Detector Mounting Base c/w Trim Skirt	
→ SIGA-RB	Detector Mounting Base w/Relay	
→ SIGA-RB4	4-inch Detector Mounting Base w/Relay, c/w Trim Skirt	0.2 (.09)
→ SIGA-IB	Detector Mounting Base w/Fault Isolator	
→ SIGA-IB4	4-inch Detector Mounting Base w/ Fault Isolator, c/w Trim Skirt	
→ SIGA-LED	Remote Alarm LED (not for EN54 applications)	
→ SIGA-AB4G	Audible (Sounder) Base for Fire Detectors	0.3 (0.15)
→ SIGA-AB4G-LF	Low Frequency Audible (Sounder) Base for CO and Fire Detectors	0.3 (0.15)
→ SIGA-AB4GT	Audible (Sounder) Base for CO and Fire Detectors	0.3 (0.15)
→ SIGA-TS4	Trim Skirt (supplied with 4-inch bases)	0.1 (0.04)
→ SIGA-TS	Trim Skirt - (optional for non 4-inch bases)	0.1 (0.04)
→ SIGA-DMP	Detector Mounting Plate	3.0 (1.4)
→ SIGA-RTA	Detector Removal Tool	
→ SIGA-VA	Detector Cleaning Tool	

CALIFORNIA DEPARTMENT OF FORESTRY & FIRE PROTECTION
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FIRE ENGINEERING - BUILDING MATERIALS LISTING PROGRAM



LISTING SERVICE

LISTING No. 7272-1657:0331

Page 1 of 1

CATEGORY: 7272 -- SMOKE DETECTOR-SYSTEM TYPE-PHOTOELECTRIC

LISTEE: EDWARDS, A Division of UTC Fire & Security Americas Corporation, Inc.8985 Town Center Parkway, Bradenton, FL 34202
Contact: Jewell Conover (941) 739-4358 Fax (941) 308-8123
Email: rhonda.conover@fs.utc.com

DESIGN: Model SIGA-PD Analog addressable photoelectric smoke detector. Refer to listee's data sheet for detailed product description and operational considerations.

RATING: 15.2-19.95 Vdc

INSTALLATION: In accordance with listee's printed installation instructions, NFPA 72 and applicable codes and ordinances and in a manner acceptable to the authority having jurisdiction.

MARKING: Listee's name, model number, electrical rating and UL label.

APPROVAL: Listed as an analog addressable photoelectric smoke detector for use with listee's Model EST3 (CSFM# 7165-1657-0186), Model EST3X (CSFM# 7165-1657:0306), Model Quickstart (CSFM# 7165-1657:0207), Models iO64, iO500, iO1000 (CSFM# 7165-1657:0244) control units and the following listee's bases; SIGA-SB, -SB4, -RB, -RB4, -IB, -IB4 (CSFM# 7300-1657-0120), SIGA-AB4G (CSFM# 7300-1657-0222), SIGA-AB4GT (CSFM# 7300-1657-0307) and SIGA-AB4G-LF (CSFM# 7300-1657-0322). Suitable for installation inside air ducts for air velocities up to 4,000 feet per minute. Authority having jurisdiction should be consulted prior to installation. Refer to listee's Installation Instruction Manual for details.

Model EST3X (CSFM# 7165-1657:0306), Model Quickstart (CSFM# 7165-1657:0207), Models iO64, iO500, iO1000 (CSFM# 7165-1657:0244)control units

NOTE: The photoelectric type detectors are generally more effective at detecting slow, smoldering fires, which smolder for hours before bursting into flames. Sources of these fires may include cigarettes burning in couches or bedding. The ionization type detectors are generally more effective at detecting fast, flaming fires, which consume combustible materials rapidly and spread quickly. Sources of these fires may include paper burning in a waste container or a grease fire in the kitchen.

08-04-2016 dc



This listing is based upon technical data submitted by the applicant. CSFM Fire Engineering staff has reviewed the test results and/or other data but does not make an independent verification of any claims. This listing is not an endorsement or recommendation of the item listed. This listing should not be used to verify correct operational requirements or installation criteria. Refer to listee's data sheet, installation instructions and/or other

Date Issued: **July 01, 2017**

Listing Expires **June 30, 2018**

Authorized By: **DAVID CASTILLO, Program Coordinator**
Fire Engineering Division

CALIFORNIA DEPARTMENT OF FORESTRY & FIRE PROTECTION
OFFICE OF THE STATE FIRE MARSHAL
FIRE ENGINEERING - BUILDING MATERIALS LISTING PROGRAM



LISTING SERVICE

LISTING No. 7300-1657:0120 Page 1 of 1

CATEGORY: 7300 -- FIRE ALARM CONTROL UNIT ACCESSORIES/MISC. DEVICES

LISTEE: EDWARDS, A Division of UTC Fire & Security Americas Corporation, Inc. 8985 Town Center Parkway, Bradenton, FL 34202
Contact: Jewell Conover (941) 739-4358 Fax (941) 308-8123
Email: rhonda.conover@fs.utc.com

DESIGN: Detector Bases. Refer to listee's data sheet for detailed product description and operational considerations. Base models are as follow:

BASES

5963B, 5964 B/BR

6241B-002, 6249B-001

6251, 6251B-001A, -001, -002, -003, -004, 6251B-100, -200, -R100, -R200 and 6251-2
Models 6251B-001, -002, -003 and -004 suitable for releasing device service.

P-847674-0022, -0024, -0042, -0043, -0044, -0045, -0046, -0047

SIGA-SB, -SB4, -RB, -RB4, -IB, -IB4 and -AB4
The -RB series are suitable for releasing device service.

Model AB4G-SB surface mount back box for use with listee's SIGA series sounder bases.

INSTALLATION: In accordance with listee's printed installation instructions, applicable codes and ordinances and in a manner acceptable to the authority having jurisdiction.

MARKING: Listee's name, model number, electrical rating, and UL label.

APPROVAL: Listed as mounting bases for use with separately listed compatible detectors and fire alarm control units. Refer to listee's Installation Instruction Manual for details.

NOTE: Formerly 7300-1591:120 and 7300-1388:170

7-29-10 ma



This listing is based upon technical data submitted by the applicant. CSFM Fire Engineering staff has reviewed the test results and/or other data but does not make an independent verification of any claims. This listing is not an endorsement or recommendation of the item listed. This listing should not be used to verify correct operational requirements or installation criteria. Refer to listee's data sheet, installation instructions and/or other

Date Issued: **July 01, 2017**

Listing Expires **June 30, 2018**

Authorized By: **DAVID CASTILLO, Program Coordinator**
Fire Engineering Division



Manual Pull Stations

SIGA-270, SIGA-270P,
SIGA-278



SIGA-278

SIGA-270 SERIES

Patented

MEA

7150-1657:
0129

Overview

The SIGA-270 and SIGA-278 series Manual Pull Stations are part of EST's Signature Series system. The SIGA-270 Fire Alarm Manual Pull Stations feature our very familiar teardrop shape. They are made from die-cast zinc and finished with red epoxy powder-coat paint complemented by aluminum colored stripes and markings. With positive pull-lever operation, one pull on the station handle breaks the glass rod and turns in a positive alarm, ensuring protection plus fool-proof operation. Presignal models (SIGA-270P) are equipped with a general alarm (GA) keyswitch for applications where two stage operation is required. The up-front highly visible glass rod discourages tampering, but is not required for proper operation.

EST's double action single stage SIGA-278 station is a contemporary style manual station made from durable red colored lexan. To initiate an alarm, first lift the upper door marked "LIFT THEN PULL HANDLE", then pull the alarm handle.

Standard Features

Note: Some features described here may not be supported by all control systems. Check your control panel's Installation and Operation Guide for details.

- **Traditional familiar appearance**

SIGA-270 models feature our familiar teardrop design with simple positive pull action and sturdy die-cast metal body.

- **One stage (GA), two stage (pre-signal), and double action models**

SIGA-270 models are available for one or two stage alarm systems. The single stage double action SIGA-278 features a rugged Lexan housing with keyed reset mechanism.

- **Break glass operation**

An up-front visible glass rod on the SIGA-270 discourages tampering.

- **Intelligent device with integral microprocessor**

All decisions are made at the station allowing lower communication speed while substantially improving control panel response time. Less sensitive to line noise and loop wiring properties; twisted or shielded wire is not required.

- **ADA Compliant**

Meets ADA requirements for manual pull stations.

- **Electronic Addressing with Non-volatile memory**

Permanently stores programmable address, serial number, type of device, and job number. Automatically updates historic information including hours of operation, last maintenance date, number of alarms and troubles, and time and date of last alarm.

- **Automatic device mapping**

Each station transmits wiring information to the loop controller regarding its location with respect to other devices on the circuit.

- **Stand-alone operation**

The station inputs an alarm even if the loop controller's polling interrogation stops.

- **Diagnostic LEDs**

Status LEDs; flashing GREEN shows normal polling; flashing RED shows alarm state.

- **Designed for high ambient temperature operation**

Install in ambient temperatures up to 120 °F (49 °C).

Application

The operating characteristics of the fire alarm stations are determined by their sub-type code or "Personality Code". NORMALLY-OPEN ALARM - LATCHING (Personality Code 1) is assigned by the factory; no user configuration is required. The device is configured for Class B IDC operation. An ALARM signal is sent to the loop controller when the station's pull lever is operated. The alarm condition is latched at the station.

Compatibility

Signature Series manual stations are compatible only with EST's Signature Loop Controller.

Warnings & Cautions

This device will not operate without electrical power. As fires frequently cause power interruption, we suggest you discuss further safeguards with your local fire protection specialist.

Testing & Maintenance

To test (or reset) the station simply open the station and operate the exposed switch. The SIGA-270 series are opened with a tool; the SIGA-278 requires the key which is supplied with that station.

The station's automatic self-diagnosis identifies when it is defective and causes a trouble message. The user-friendly maintenance program shows the current state of each Signature series device and other pertinent messages. Single devices may be deactivated temporarily, from the control panel. Availability of maintenance features is dependent on the fire alarm system used.

Scheduled maintenance (Regular or Selected) for proper system operation should be planned to meet the requirements of the Authority Having Jurisdiction (AHJ). Refer to current NFPA 72 and ULC CAN/ULC 536 standards.

Typical Wiring

The fire alarm station's terminal block accepts #18 AWG (0.75mm²) to #12 AWG (2.5mm²) wire sizes. See Signature Loop Controller catalog sheet for detailed wiring requirement specifications.

Wiring Notes

1. Refer to Signature Loop Controller manual for maximum wire distance.
2. All wiring is power limited and supervised.

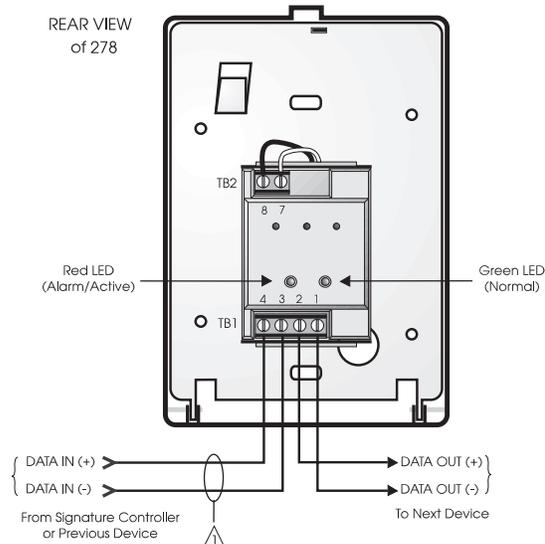


Figure 4. Single Stage Systems

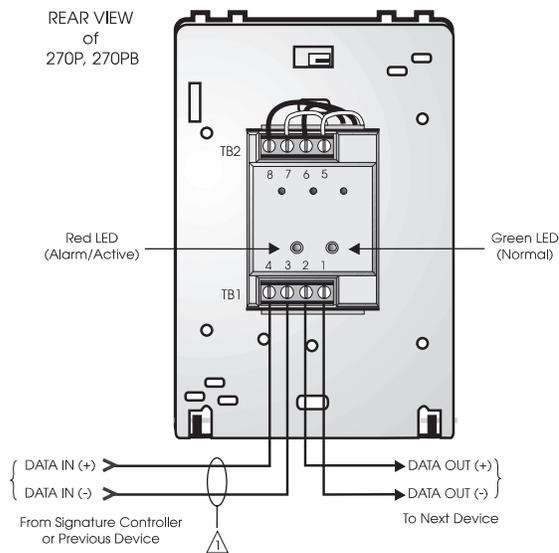


Figure 5. Two Stage Systems

Installation

Single-stage Signature Series fire alarm manual pull stations mount to North American 2½ inch (64 mm) deep 1-gang boxes.

Two stage presignal (270P) models require 1½ inch (38 mm) deep 4-inch square boxes with 1-gang, ½-inch raised covers. Openings must be angular. *Rounded openings are not acceptable.* Recommended box: Steel City Model 52-C-13; in Canada, use Iberville Model CI-52-C-49-1/2.

All models include terminals are suited for #12 to #18 AWG (2.5 mm² to 0.75 mm²) wire size. Edwards recommends that these fire alarm stations be installed according to latest recognized edition of national and local fire alarm codes.

Electronic Addressing: The loop controller electronically addresses each manual station, saving valuable time during system commissioning. Setting complicated switches or dials is not required. Each station has its own unique serial number stored in its on-board memory. The loop controller identifies each device on the loop and assigns a “soft” address to each serial number. If desired, the stations can be addressed using the SIGA-PRO Signature Program/Service Tool.

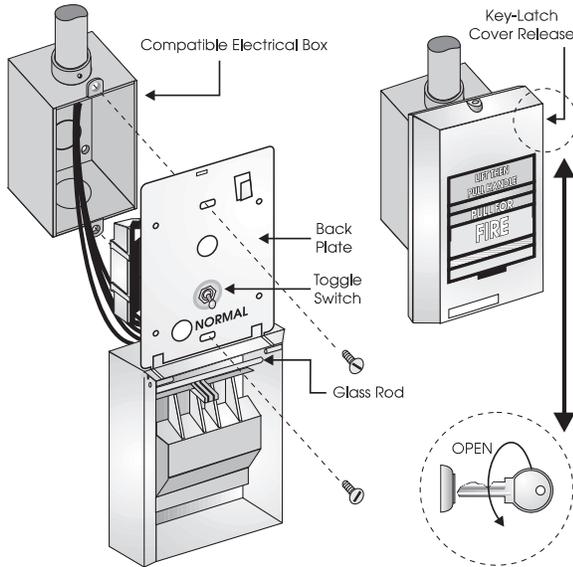


Figure 1. SIGA-278 installation

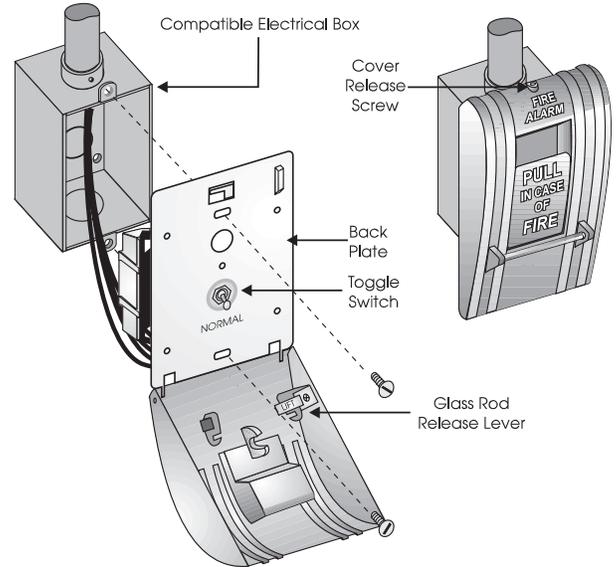


Figure 2. SIGA-270, SIGC-270F, SIGC-270B installation

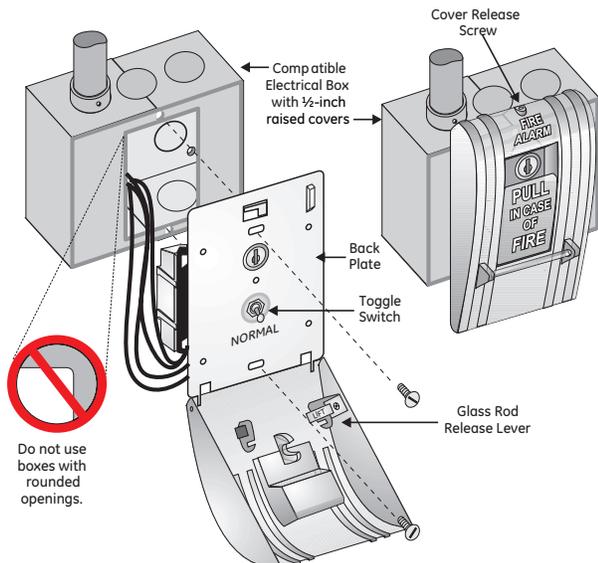


Figure 3. SIGA-270P, SIGC-270PB installation



Contact us...

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 Web: www.est-fire.com

EST is an **EDWARDS** brand.
 1016 Corporate Park Drive
 Mebane, NC 27302

In Canada, contact Chubb Edwards...
 Email: inquiries@chubbedwards.com
 Web: www.chubbedwards.com

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Specifications

Catalog Number	SIGA-270, SIGC-270F, SIGC-270B	SIGA-270P, SIGC-270PB	SIGA-278
Description	Single Action - One Stage	Single Action - Two Stage (Presignal)	Double Action - One Stage
Addressing Requirements	Uses 1 Module Address	Uses 2 Module Addresses	Uses 1 Module Address
Operating Current	Standby = 250µA Activated = 400µA	Standby = 396µA Activated = 680µA	Standby = 250µA Activated = 400µA
Construction & Finish	Diecast Zinc - Red Epoxy with aluminum markings		Lexan - Red with white markings
Type Code	Factory Set		
Operating Voltage	15.2 to 19.95 Vdc (19 Vdc nominal)		
Storage and Operating Environment	Operating Temperature: 32°F to 120°F (0°C to 49°C) Storage Temperature: -4°F to 140°F (-20°C to 60°C) Humidity: 0 to 93% RH		
LED Operation	On-board Green LED - Flashes when polled On-board Red LED - Flashes when in alarm Both LEDs - Glow steady when in alarm (stand-alone)		
Compatibility	Use With: Signature Loop Controller		
Agency Listings	UL, ULC (note 1), MEA, CSFM		

Note: SIGC-270F, SIGC-270B and SIGC-270PB are ULC listed only. Suffix "F" indicates French markings. Suffix "B" indicates English/French bilingual markings.

Ordering Information

Catalog Number	Description	Ship Wt. lbs (kg)
SIGA-270	One Stage Fire Alarm Station, English Markings - UL/ULC Listed	1 (0.5)
SIGC-270F	One Stage Fire Alarm Station, French Markings - ULC Listed	
SIGC-270B	One Stage Fire Alarm Station, French/English Markings - ULC Listed	
SIGA-270P	Two Stage (Presignal) Fire Alarm Station, English Markings - UL/ULC Listed	
SIGC-270PB	Two Stage (Presignal) Fire Alarm Station, French/English Markings - ULC Listed	
SIGA-278	Double Action (One Stage) Fire Alarm Station, English Markings - UL/ULC Listed	

Accessories

32997	GA Key w/Tag - for pre-signal station (CANADA ONLY)	0.1 (.05)
276-K2	GA Key - for pre-signal station (USA ONLY)	
276-K1	Station Reset Key, Supplied with all Key Reset Stations	
27165	12 Glass Rods - for SIGA-270 series (CANADA ONLY)	
270-GLR	20 Glass Rods - for SIGA-270 series (USA ONLY)	
276-GLR	20 Glass Rods - for SIGA-278 series	
276B-RSB	Surface Mount Box, Red - for SIGA pull stations	1 (0.6)

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LISTING SERVICE

Page 1 of 1

LISTING No. 7150-1657:0129

CATEGORY: 7150 -- FIRE ALARM PULL BOXES

LISTEE: EDWARDS, A Division of UTC Fire & Security Americas Corporation, Inc. 8985 Town Center Parkway, Bradenton, FL 34202
Contact: Jewell Conover (941) 739-4358 Fax (941) 308-8123
Email: rhonda.conover@fs.utc.com

DESIGN: Models SIGA-270, SIGA-270P, and SIGA-278 noncoded, intelligent manual pull stations*. Unit consists of a listed pull station and a remote transponder. Refer to listee's data sheet for additional detailed product description and operational considerations.

INSTALLATION: In accordance with listee's printed installation instructions, applicable codes and ordinances and in a manner acceptable to the authority having jurisdiction.

MARKING: Listee's name, model number, electrical rating and UL label.

APPROVAL: Listed as manual pull stations for use with separately listed compatible fire alarm control units.

* These manual pull boxes meet the requirements of UL Standard 38, 1999 Edition with California amendments.

NOTE: Formerly 7150-1591:129 and 7150-1388:194

7-29-10 ma



This listing is based upon technical data submitted by the applicant. CSFM Fire Engineering staff has reviewed the test results and/or other data but does not make an independent verification of any claims. This listing is not an endorsement or recommendation of the item listed. This listing should not be used to verify correct operational requirements or installation criteria. Refer to listee's data sheet, installation instructions and/or other

Date Issued: **July 01, 2017**

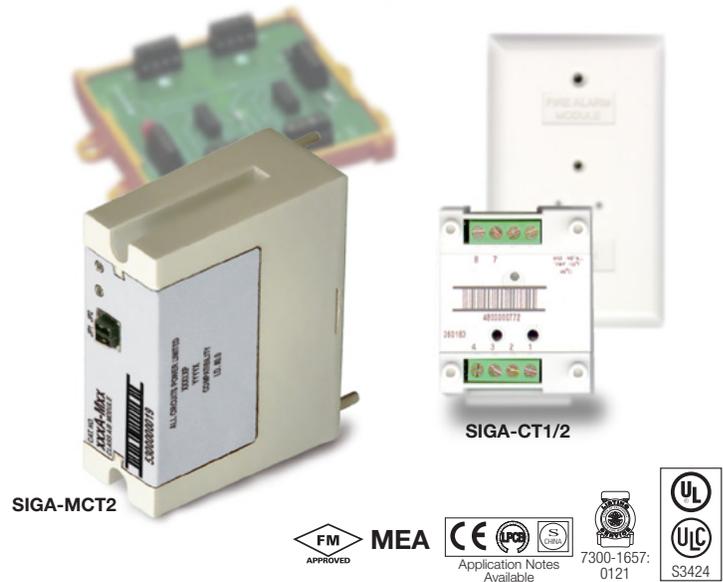
Listing Expires **June 30, 2018**

Authorized By: **DAVID CASTILLO**, Program Coordinator
Fire Engineering Division



Input Modules

SIGA-CT1, SIGA-CT1HT,
SIGA-CT2, SIGA-MCT2



Overview

The SIGA-CT1 Single Input Module, SIGA-CT1HT High Temperature Single Input Module and SIGA-CT2/SIGA-MCT2 Dual Input Modules are intelligent analog addressable devices used to connect one or two Class B normally-open Alarm, Supervisory, or Monitor type dry contact Initiating Device Circuits (IDC).

The actual function of these modules is determined by the “personality code” selected by the installer. This code is downloaded to the module from the Signature loop controller during system configuration.

The input modules gather analog information from the initiating devices connected to them and convert it into digital signals. The module’s on-board microprocessor analyzes the signal and decides whether or not to input an alarm.

The SIGA-CT1, SIGA-CT1HT and SIGA-CT2 mount to standard North American 1-gang electrical boxes, making them ideal for locations where only one module is required. Separate I/O and data loop connections are made to each module.

The SIGA-CT1HT module operates at an expanded temperature range of 32 °F to 158 °F (0 °C to 70 °C) for those applications requiring more extreme environmental temperature variation.

The SIGA-MCT2 is part of the UIO family of plug-in Signature Series modules. It functions identically to the SIGA-CT2, but takes advantage of the modular flexibility and easy installation that characterizes all UIO modules. Two- and six-module UIO motherboards are available. All wiring connections are made to terminal blocks on the motherboard. UIO assemblies may be mounted in Edwards enclosures.

Standard Features

- Multiple applications**
Including Alarm, Alarm with delayed latching (retard) for water-flow applications, Supervisory, and Monitor. The installer selects one of four “personality codes” to be downloaded to the module through the loop controller.
- SIGA-CT1HT rated for high temperature environments**
Suitable for attic installation and monitoring high temperature heat detectors.
- Plug-in (UIO) or standard 1-gang mount**
UIO versions allow quick installation where multiple modules are required. The 1-gang mount version is ideal for remote locations that require a single module.
- Automatic device mapping**
Signature modules transmit information to the loop controller regarding their circuit locations with respect to other Signature devices on the wire loop.
- Electronic addressing**
Programmable addresses are downloaded from the loop controller, a PC, or the SIGA-PRO Signature Program/Service Tool. There are no switches or dials to set.
- Stand-alone operation**
The module makes decisions and inputs an alarm from initiating devices connected to it even if the loop controller’s polling interrogation stops. (Function availability dependent upon control panel.)
- Ground fault detection by address**
Detects ground faults right down to the device level.

Signature Series Overview

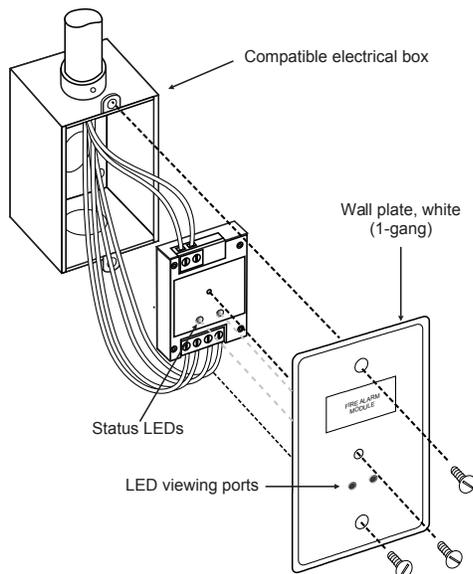
The Signature Series intelligent analog-addressable system from Edwards Security is an entire family of multi-sensor detectors and mounting bases, multiple-function input and output modules, network and non-network control panels, and user-friendly maintenance and service tools. Analog information from equipment connected to Signature devices is gathered and converted into digital signals. An onboard microprocessor in each Signature device measures and analyzes the signal and decides whether or not to input an alarm. The microprocessor in each Signature device provides four additional benefits – Self-diagnostics and History Log, Automatic Device Mapping, Stand-alone Operation and Fast, Stable Communication.

Self-diagnostics and History Log – Each Signature Series device constantly runs self-checks to provide important maintenance information. The results of the self-check are automatically updated and permanently stored in its non-volatile memory. This information is accessible for review any time at the control panel, PC, or using the SIGA-PRO Signature Program/Service Tool.

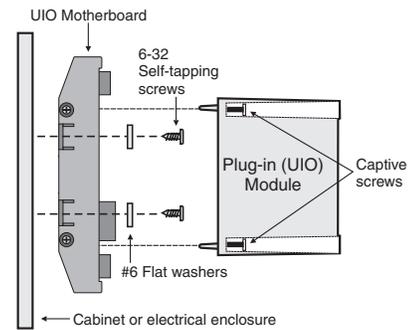
Automatic Device Mapping –The Signature Data Controller (SDC) learns where each device's serial number address is installed relative to other devices on the circuit. The SDC keeps a map of all Signature Series devices connected to it. The Signature Series Data Entry Program also uses the mapping feature. With interactive menus and graphic support, the wired circuits between each device can be examined. Layout or "as-built" drawing information showing branch wiring (T-taps), device types and their address are stored on disk for printing hard copy.

Installation

SIGA-CT1, SIGA-CT1HT and SIGA-CT2: modules mount to North American 2½ inch (64 mm) deep 1-gang boxes and 1½ inch (38 mm) deep 4 inch square boxes with 1-gang covers and SIGA-MP mounting plates. The terminals are suited for #12 to #18 AWG (2.5 mm² to 0.75 mm²) wire size.



SIGA-MCT2: mount the UIO motherboard inside a suitable Edwards enclosure with screws and washers provided. Plug the SIGA-MCT2 into any available position on the motherboard and secure the module to the motherboard with the captive screws. Wiring connections are made to the terminals on the motherboard (see wiring diagram). UIO motherboard terminals are suited for #12 to #18 AWG (2.5 mm² to 0.75 mm²) wire size.



Electronic Addressing - The loop controller electronically addresses each module, saving valuable time during system commissioning. Setting complicated switches or dials is not required. Each module has its own unique serial number stored in its on-board memory. The loop controller identifies each device on the loop and assigns a "soft" address to each serial number. If desired, the modules can be addressed using the SIGA-PRO Signature Program/Service Tool.

Edwards recommends that this module be installed according to latest recognized edition of national and local fire alarm codes.

Application

The duty performed by the SIGA-CT1 and SIGA-CT2/MCT2 is determined by their sub-type code or "Personality Code". The code is selected by the installer depending upon the desired application and is downloaded from the loop controller.

One personality code can be assigned to the SIGA-CT1. Two personality codes can be assigned to the SIGA-CT2/MCT2. Codes 1, 2, 3 and 4 can be mixed on SIGA-CT2/MCT2 modules only. For example, personality code 1 can be assigned to the first address (circuit A) and code 4 can be assigned to the second address (circuit B).

NORMALLY-OPEN ALARM - LATCHING (Personality Code 1)

- Assign to one or both circuits. Configures either circuit A or B or both for Class B normally open dry contact initiating devices such as Pull Stations, Heat Detectors, etc. An ALARM signal is sent to the loop controller when the input contact is closed. The alarm condition is latched at the module.

NORMALLY-OPEN ALARM - DELAYED LATCHING (Personality Code 2)

- Assign to one or both circuits. Configures either circuit A or B or both for Class B normally-open dry contact initiating devices such as Waterflow Alarm Switches. An ALARM signal is sent to the loop controller when the input contact is closed for approximately 16 seconds. The alarm condition is latched at the module.

NORMALLY-OPEN ACTIVE - NON-LATCHING (Personality Code 3)

- Assign to one or both circuits. Configures either circuit A or B or both for Class B normally-open dry contact monitoring input such as from Fans, Dampers, Doors, etc. An ACTIVE signal is sent to the loop controller when the input contact is closed. The active condition is not latched at the module.

NORMALLY-OPEN ACTIVE - LATCHING (Personality Code 4)

- Assign to one or both circuits. Configures either circuit A or B or both for Class B normally open dry contact monitoring input such as from Supervisory and Tamper Switches. An ACTIVE signal is sent to the loop controller when the input contact is closed. The active condition is latched at the module.

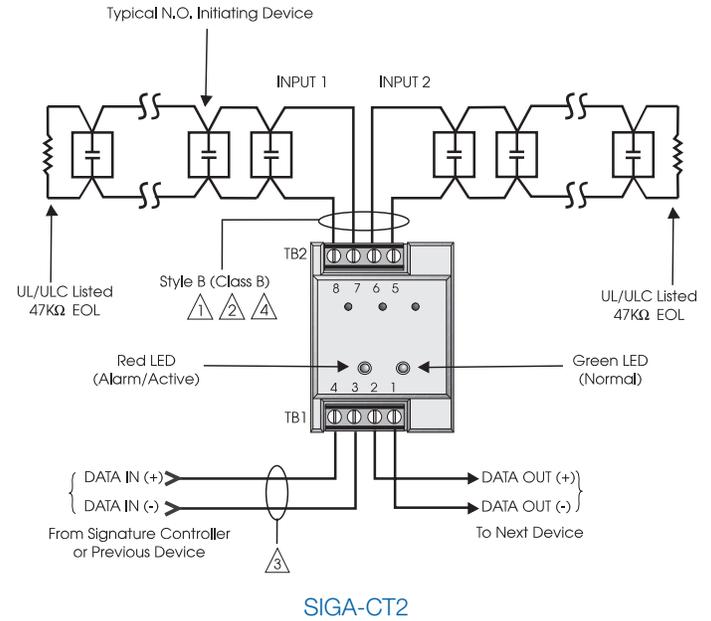
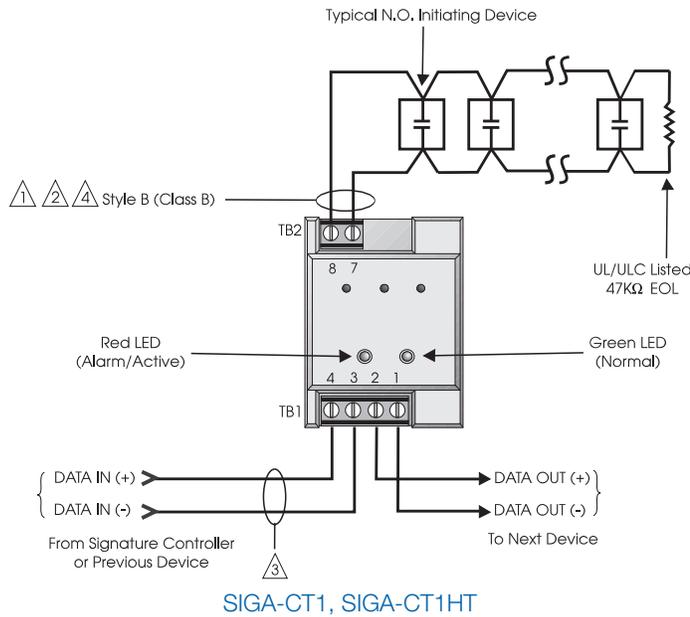
Typical Wiring

Modules will accept #18 AWG (0.75mm²), #16 (1.0mm²), and #14AWG (1.50mm²), and #12 AWG (2.50mm²) wire sizes.

Note: Sizes #16 AWG (1.0mm²) and #18 AWG (0.75mm²) are preferred for ease of installation. See Signature Loop Controller catalog sheet for detailed wiring requirement specifications.

Initiating (Slave) Device Circuit Wire Specifications

Maximum Allowable Wire Resistance	50 ohms (25 ohms per wire) per Circuit	
Maximum Allowable Wire Capacitance	0.1µF per Circuit	
For Design Reference:	Wire Size	Maximum Distance to EOLR
	#18 AWG (0.75 mm ²)	4,000 ft (1,219 m)
	#16 AWG (1.00 mm ²)	
	#14 AWG (1.50 mm ²)	
	#12 AWG (1.50 mm ²)	



NOTES

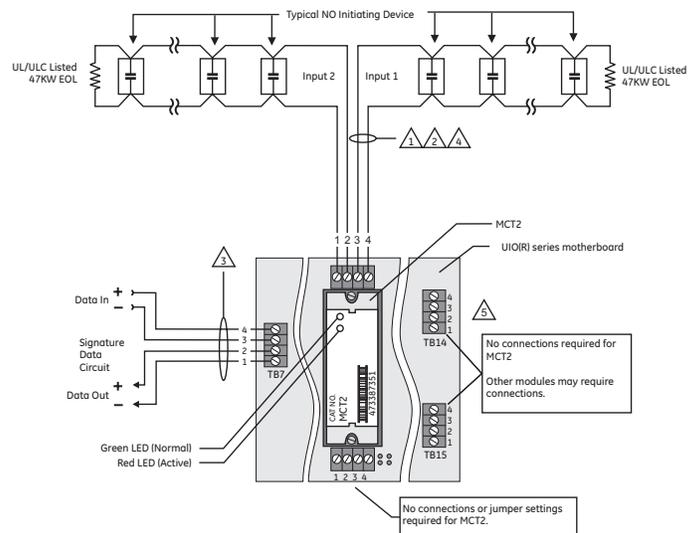
- 1 Maximum 25 Ohm resistance per wire.
- 2 Maximum #12 AWG (2.5 mm²) wire; Minimum #18 AWG (0.75 mm²).
- 3 Refer to Signature controller installation sheet for wiring specifications.
- 4 Maximum 10 Vdc @ 350 µA
- 5 The SIGA-UIO6R and the SIGA-UIO2R do not come with TB14.
- 6 All wiring is supervised and power-limited.
- 7 These modules will not support 2-wire smoke detectors.

Warnings & Cautions

This module will not operate without electrical power. As fires frequently cause power interruption, we suggest you discuss further safeguards with your local fire protection specialist.

Compatibility

The Signature Series modules are compatible only with EST's Signature Loop Controller.





Contact us...

Email: edwards.fire@fs.utc.com
 Web: www.est-fire.com

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 Mebane, NC 27302

In Canada, contact Chubb Edwards...
 Email: inquiries@chubbedwards.com
 Web: www.chubbedwards.com

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Specifications

Catalog Number	SIGA-CT1HT	SIGA-CT1	SIGA-CT2	SIGA-MCT2
Description	Single Input Module		Dual Input Module	
Type Code	48 (factory set) Four sub-types (personality codes) are available		49 (factory set) Four sub-types (personality codes) are available	
Address Requirements	Uses One Module Address		Uses Two Module Addresses	
Operating Current	Standby = 250µA; Activated = 400µA		Standby = 396µA; Activated = 680µA	
Operating Voltage	15.2 to 19.95 Vdc (19 Vdc nominal)			
Construction	High Impact Engineering Polymer			
Mounting	North American 2½ inch (64 mm) deep one-gang boxes and 1½ inch (38 mm) deep 4 inch square boxes with one-gang covers and SIGA-MP mounting plates			UIO2R/6R/6 Motherboard
Operating Environment	32°F to 158°F (0°C to 70°C)	32°F to 120°F (0°C to 49°C)		
Storage Environment	-4°F to 140°F (-20°C to 60°C); Humidity: 0 to 93% RH			
LED Operation	On-board Green LED - Flashes when polled; On-board Red LED - Flashes when in alarm/active. Both LEDs - Glow steady when in alarm (stand-alone)			
Compatibility	Use with Signature Loop Controller			
Agency Listings	UL, ULC, MEA, CSFM			

Ordering Information

Catalog Number	Description	Ship Wt. lbs (kg)
SIGA-CT1	Single Input Module — UL/ULC Listed	0.4 (0.15)
SIGA-CT1HT	Single Input Module High Temperature Operation UL/ULC Listed	0.4 (0.15)
SIGA-CT2	Dual Input Module — UL/ULC Listed	0.4 (0.15)
SIGA-MCT2	Dual Input Plug-in (UIO) Module — UL, ULC Listed	0.1 (0.05)

Related Equipment		
27193-11	Surface Mount Box - Red, 1-gang	1.0 (0.6)
27193-16	Surface Mount Box - White, 1-gang	1.0 (0.6)
SIGA-UIO2R	Universal Input-Output Module Board w/Riser Inputs — Two Module Positions	0.32 (0.15)
SIGA-UIO6R	Universal Input-Output Module Board w/Riser Inputs — Six Module Positions	0.62 (0.28)
SIGA-UIO6	Universal Input-Output Module Board — Six Module Positions	0.56 (0.25)
MFC-A	Multifunction Fire Cabinet — Red, supports Signature Module Mounting Plates	7.0 (3.1)
SIGA-MB4	Transponder Mounting Bracket (allows for mounting two 1-gang modules in a 2-gang box)	0.4 (0.15)
SIGA-MP1	Signature Module Mounting Plate, 1 footprint	1.5 (0.70)
SIGA-MP2	Signature Module Mounting Plate, 1/2 footprint	0.5 (0.23)
SIGA-MP2L	Signature Module Mounting Plate, 1/2 extended footprint	1.02 (0.46)

CALIFORNIA DEPARTMENT OF FORESTRY & FIRE PROTECTION
OFFICE OF THE STATE FIRE MARSHAL
FIRE ENGINEERING - BUILDING MATERIALS LISTING PROGRAM



LISTING SERVICE

LISTING No. 7300-1657:0121 Page 1 of 1

CATEGORY: 7300 -- FIRE ALARM CONTROL UNIT ACCESSORIES/MISC. DEVICES

LISTEE: EDWARDS, A Division of UTC Fire & Security Americas Corporation, Inc. 8985 Town Center Parkway, Bradenton, FL 34202
Contact: Jewell Conover (941) 739-4358 Fax (941) 308-8123
Email: rhonda.conover@fs.utc.com

DESIGN: Models SIGA-CC1, SIGA-CC2, SIGA-CT1, SIGA-CT1HT, SIGA-CT2, SIGA-CR, SIGA-CRR, SIGA-UM, SIGA-MM1, SIGA-WTM, SIGA-IM, SIGA-MDM, SIGA-MAB, SIGA-MCT2, SIGA-MCC1, SIGA-MCC2, SIGA-MCR and SIGA-MCRR remote transponders. Models SIGA-AA30 and SIGA-AA50 audio amplifiers. Models SIGA-APS and SIGA-APS-220 power supplies. Models SIGA-MB4, SIGA-MP1, SIGA-MP2 and SIGA-MP2L mounting plates. Models SIGA-UIO2R, SIGA-UIO6 and SIGA-UIO6R motherboards. Model CS-SIGA-CC1P releasing module. Models SIGA-CC1S and SIGA-MCC1S Auto-Sync Output Modules. Models MFC-A and MFC-AD Enclosures. Model SIGA-CR2 Control Relay Module. Model SIGA-CT1HT; Signature Series High Temperature Single Input Module. *SIGA-CRH High Power Control Relay Module.

Refer to listee's data sheet for additional detailed product description and operational consideration.

RATING: 15.2 - 19.95 VDC

INSTALLATION: In accordance with listee's printed installation instructions, applicable codes & ordinances and in a manner acceptable to the authority having jurisdiction.

MARKING: Listee's name, model number, electrical rating, and UL label.

APPROVAL: Listed as control unit accessories for use with separately listed compatible fire alarm control units. Refer to listee's Installation Instruction Manual for details.

NOTE: Formerly 7300-1591:121 and 7300-1388:178

*Rev 01-11-16 gt



This listing is based upon technical data submitted by the applicant. CSFM Fire Engineering staff has reviewed the test results and/or other data but does not make an independent verification of any claims. This listing is not an endorsement or recommendation of the item listed. This listing should not be used to verify correct operational requirements or installation criteria. Refer to listee's data sheet, installation instructions and/or other

Date Issued: **July 01, 2017**

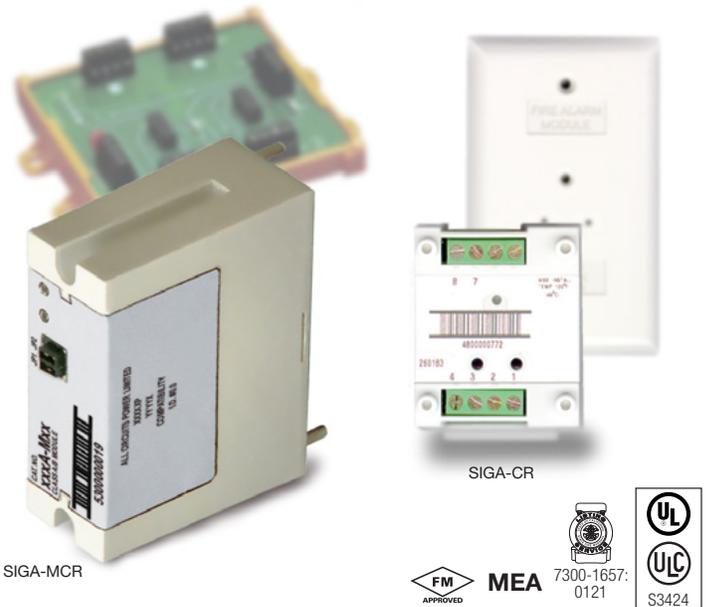
Listing Expires **June 30, 2018**

Authorized By: **DAVID CASTILLO, Program Coordinator**
Fire Engineering Division



Control Relay Modules

SIGA-CR, SIGA-MCR, SIGA-CRR, SIGA-MCRR



Overview

The Control Relay Module and the Polarity Reversal Relay Module are part of the Signature Series system. They are intelligent analog addressable devices available in either plug-in (UIO) versions, or standard 1-gang mount versions.

The SIGA-CR/MCR Control Relay Module provides a Form “C” dry relay contact to control external appliances such as door closers, fans, dampers etc. This device does not provide supervision of the state of the relay contact. Instead, the on-board microprocessor ensures that the relay is in the proper ON/OFF state. Upon command from the loop controller, the SIGA-CR/MCR relay activates the normally open or normally-closed contact.

The SIGA-CRR/MCRR Polarity Reversal Relay Module provides a Form “C” dry relay contact to power and activate a series of SIGA-AB4G Audible Sounder Bases. Upon command from the Signature loop controller, the SIGA-CRR reverses the polarity of its 24 Vdc output, thus activating all Sounder Bases on the data loop.

Standard-mount versions (SIGA-CR and SIGA-CRR) are installed to standard North American 1-gang electrical boxes, making them ideal for locations where only one module is required. Separate I/O and data loop connections are made to each module.

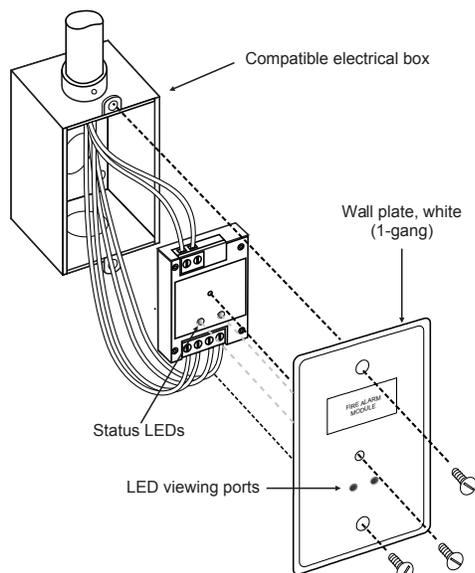
Plug-in UIO versions (SIGA-MCR and SIGA-MCRR) are part of the UIO family of plug-in Signature Series modules. They function identically to the standard mount versions, but take advantage of the modular flexibility and easy installation that characterizes all UIO modules. Two- and six-module UIO motherboards are available. All wiring connections are made to terminal blocks on the motherboard. UIO assemblies may be mounted in Edwards enclosures.

Standard Features

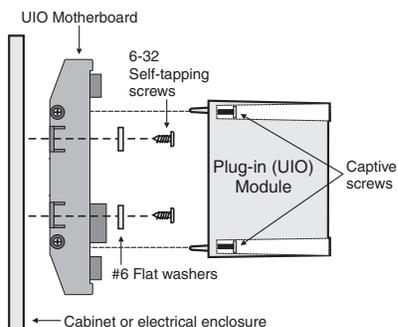
- Provides one no/nc contact (SIGA-CR/MCR)**
 Form “C” dry relay contact can be used to control external appliances such as door closers, fans, dampers etc.
- Allows group operation of sounder bases**
 The SIGA-CRR/MCRR reverses the polarity of its 24 Vdc output, thus activating all Sounder Bases on the data loop.
- Plug-in (UIO) or standard 1-gang mount**
 UIO versions allow quick installation where multiple modules are required. The 1-gang mount version is ideal for remote locations that require a single module.
- Automatic device mapping**
 Signature modules transmit information to the loop controller regarding their circuit locations with respect to other Signature devices on the wire loop.
- Electronic addressing**
 Programmable addresses are downloaded from the loop controller, a PC, or the SIGA-PRO Signature Program/Service Tool; there are no switches or dials to set.
- Intelligent device with microprocessor**
 All decisions are made at the module to allow lower communication speed with substantially improved control panel response time and less sensitivity to line noise and loop wiring properties; twisted or shielded wire is not required.
- Ground fault detection by address**
 Detects ground faults right down to the device level.

Installation

SIGA-CR and SIGA-CRR: modules mount to North American 2½ inch (64 mm) deep 1-gang boxes and 1½ inch (38 mm) deep 4 inch square boxes with 1-gang covers and SIGA-MP mounting plates. The terminals are suited for #12 to #18 AWG (2.5 mm² to 0.75 mm²) wire size.



SIGA-MCR and SIGA-MCRR: mount the UIO motherboard inside a suitable Edwards enclosure with screws and washers provided. Plug the module into any available position on the motherboard and secure the module to the motherboard with the captive screws. Wiring connections are made to the terminals on the motherboard (see wiring diagram). UIO motherboard terminals are suited for #12 to #18 AWG (2.5 mm² to 0.75 mm²) wire size.



Electronic Addressing - The loop controller electronically addresses each module, saving valuable time during system commissioning. Setting complicated switches or dials is not required. Each module has its own unique serial number stored in its on-board memory. The loop controller identifies each device on the loop and assigns a “soft” address to each serial number. If desired, the modules can be addressed using the SIGA-PRO Signature Program/Service Tool.

Edwards recommends that this module be installed according to latest recognized edition of national and local fire alarm codes.

Application

The operation of Signature Series control relays is determined by their sub-type code or “Personality Code.”

Personality Code 8: CONTROL RELAY (SIGA-CR/MCR) - Dry Contact Output. This setting configures the module to provide one Form “C” DRY RELAY CONTACT to control Door Closers, Fans, Dampers, etc. Contact rating is 2.0 amp @ 24 Vdc; 0.5 amp @ 120 Vac (or 0.25A @ 220 Vac for non-UL applications). Personality Code 8 is assigned at the factory. No user configuration is required.

Personality Code 8: POLARITY REVERSAL RELAY MODULE (SIGA-CRR/MCRR). This setting configures the module to reverse the polarity of its 24 Vdc output. Contact rating is 2.0 amp @ 24 Vdc (pilot duty). Personality Code 8 is assigned at the factory. No user configuration is required.

Compatibility

The Signature Series modules are compatible only with EST's Signature Loop Controller.

Warnings & Cautions

This module will not operate without electrical power. As fires frequently cause power interruption, we suggest you discuss further safeguards with your local fire protection specialist.

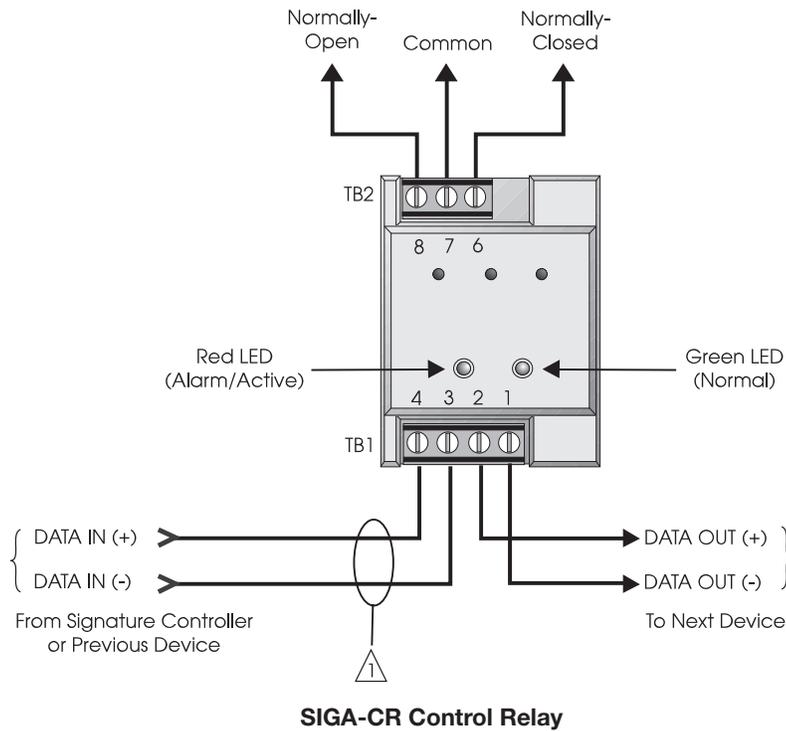
Testing & Maintenance

The module's automatic self-diagnosis identifies when it is defective and causes a trouble message. The user-friendly maintenance program shows the current state of each module and other pertinent messages. Single modules may be turned off (deactivated) temporarily, from the control panel. Availability of maintenance features is dependent on the fire alarm system used. Scheduled maintenance (Regular or Selected) for proper system operation should be planned to meet the requirements of the Authority Having Jurisdiction (AHJ). Refer to current NFPA 72 and ULC CAN/ULC 536 standards.

Typical Wiring

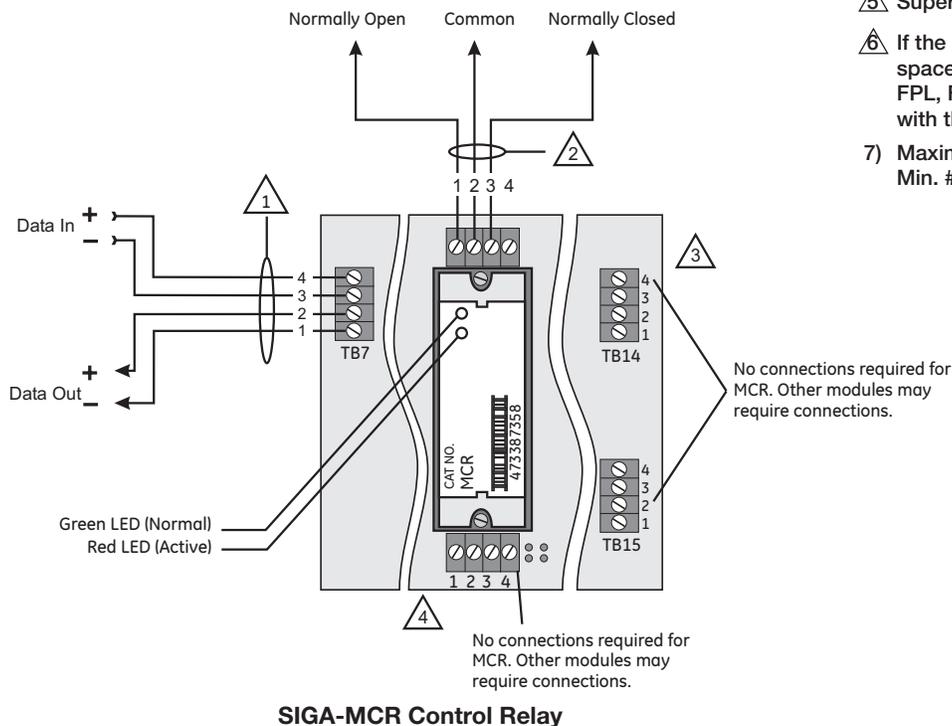
Modules will accept #18 AWG (0.75mm²), #16 (1.0mm²), #14 AWG (1.50mm²) and #12 AWG (2.5mm²) wire sizes.

Note: Sizes #16 AWG (1.0mm²) and #18 AWG (0.75mm²) are preferred for ease of installation. See Signature Loop Controller catalog sheet for detailed wiring requirement specifications.



Notes

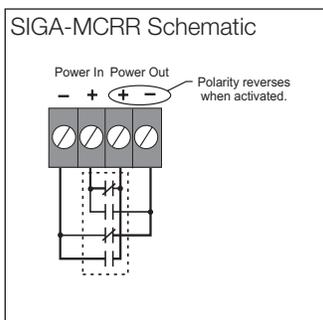
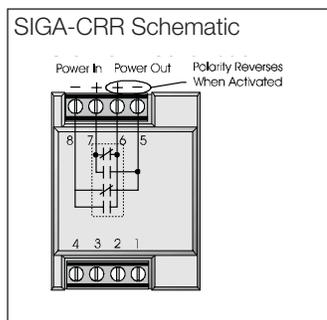
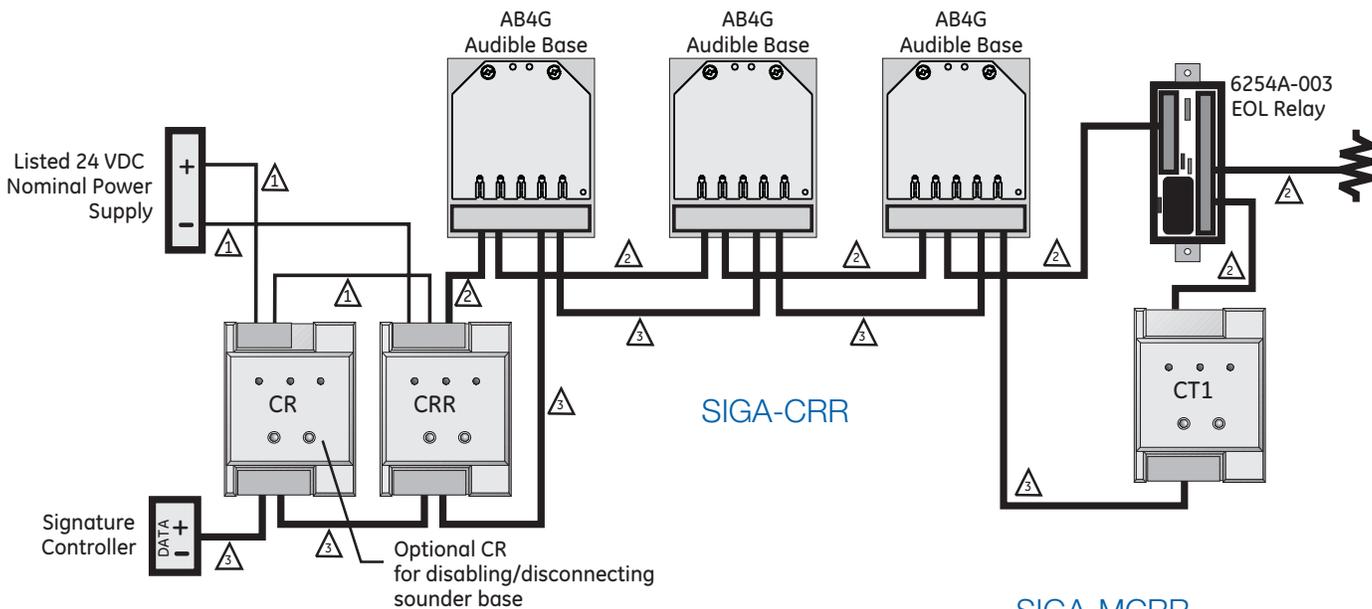
- 1 Refer to Signature Loop Controller Installation Sheet for wiring specifications.
- 2 NFPA 72 requires that the SIGA-CR/SIGA-MCR be installed in the same room as the device it is controlling. This requirement may not apply in all markets. Check with your local AHJ for details.
- 3 The SIGA-UIO6R and the SIGA-UIO2R do not come with TB14.
- 4 The SIGA-UIO6 does not come with TB8 through TB13.
- 5 Supervised and power-limited.
- 6 If the source is nonpower-limited, maintain a space of 1/4 inch from power-limited wiring or use FPL, FPLP, FPLR, or an equivalent in accordance with the National Electrical Code.
- 7) Maximum #12 AWG (2.5mm²) wire. Min. #18 (0.75mm²).



Typical Wiring

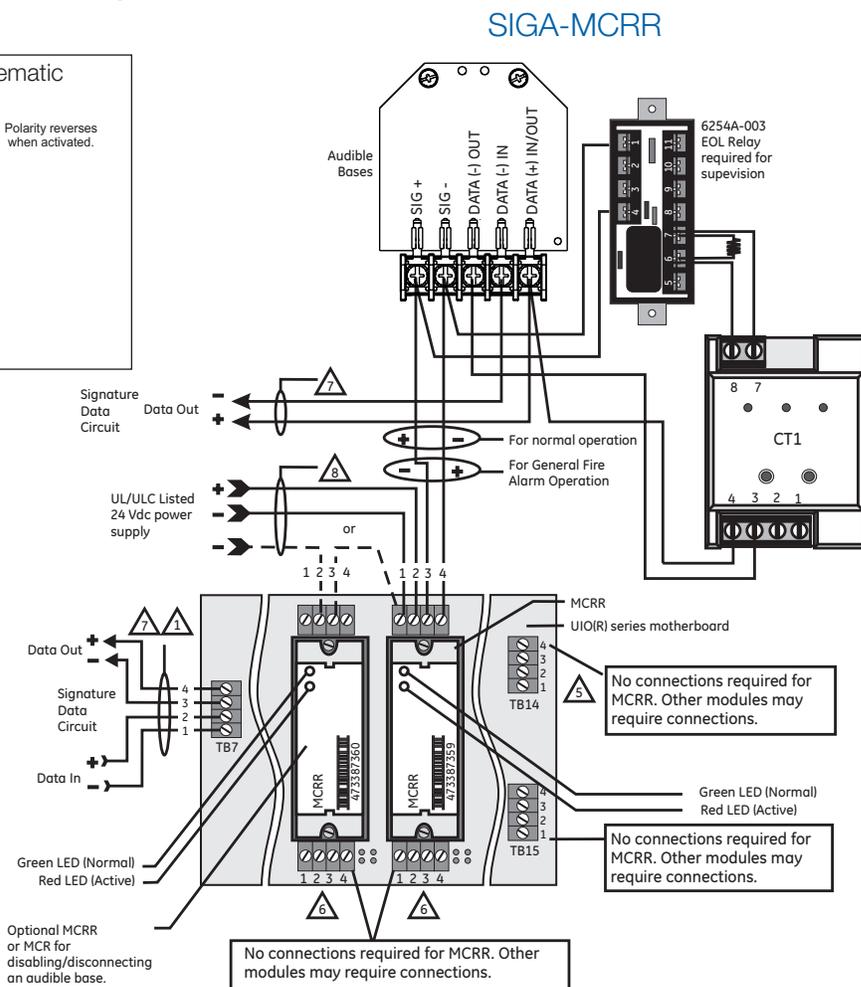
Modules will accept #18 AWG (0.75mm²), #16 (1.0mm²), #14 AWG (1.50mm²) and #12 AWG (2.50mm²) wire sizes.

Note: Sizes #16 AWG (1.0mm²) and #18 AWG (0.75mm²) are preferred for ease of installation. See Signature Loop Controller catalog sheet for detailed wiring requirement specifications.



Notes

- ⚠ Refer to the Signature controller installation sheet for wiring.
- ⚡ One Pair of Wires (24 Vdc power).
- ⚡ One Pair of Wires (Signature Data).
- ⚡ Single Wire (24 Vdc power).
- ⚠ The SIGA-UIO6R and the SIGA-UIO2R do not come with TB14.
- ⚠ The SIGA-UIO6 does not come with TB8 through TB13.
- ⚠ Supervised and power-limited.
- 8 If the source is nonpower-limited, maintain a space of 1/4 inch from power-limited wiring or use FPL, FPLP, FPLR, or an equivalent in accordance with the National Electrical Code.
- 9 Maximum #12 AWG (2.5 mm²) wire; Minimum #18 AWG (0.75 mm²).
- 10 End-of-Line Relay must monitor and report power supply trouble to control panel.
- 11 Class B Data wiring may be "T-tapped."



Specifications

Catalog Number	SIGA-CR	SIGA-MCR	SIGA-CRR	SIGA-MCRR
Description	Control Relay		Polarity Reversal Relay	
Type Code	Personality Code 8 (Factory Set)		Personality Code 8 (Factory Set)	
Address Requirements	Uses 1 Module Address			
Operating Current	Standby = 75 μ A Activated = 75 μ A			
Operating Voltage	15.2 to 19.95 Vdc (19 Vdc nominal)			
Relay Type and Rating	Form C, 2 Amps @ 24 Vdc (pilot duty), 0.5 Amps @ 120 Vac and 0.25 Amps @ 220 Vac (220 Vac is non-UL) Not rated for capacitive loads.			
Mounting	North American 2½ inch (64 mm) deep 1-gang boxes and 1½ inch (38 mm) deep 4 inch square boxes with 1-gang covers and SIGA-MP mounting plates	Plugs into UIO2R, UIO6R or UIO6 Motherboards	North American 2½ inch (64 mm) deep 1-gang boxes and 1½ inch (38 mm) deep 4 inch square boxes with 1-gang covers and SIGA-MP mounting plates	Plugs into UIO2R, UIO6R or UIO6 Motherboards
Construction & Finish	High Impact Engineering Polymer			
Storage and Operating Environment	Operating Temperature: 32°F to 120°F (0°C to 49°C) Storage Temperature: -4°F to 140°F (-20°C to 60°C) Humidity: 0 to 93% RH			
LED Operation	On-board Green LED - Flashes when polled On-board Red LED - Flashes when in alarm/active			
Compatibility	Use With: Signature Loop Controller			
Agency Listings	UL, ULC, CSFM, MEA			

Ordering Information

Catalog Number	Description	Ship Weight - lbs (kg)
SIGA-CR	Control Relay Module (Standard Mount)	0.4 (0.15)
SIGA-MCR	Control Relay Module (UIO Mount)	0.18 (0.08)
SIGA-CRR	Polarity Reversal Relay Module (Standard Mount)	0.4 (0.15)
SIGA-MCRR	Polarity Reversal Relay Module (UIO Mount)	0.18 (0.08)

Related Equipment

27193-11	Surface Mount Box - Red, 1-gang	1 (0.6)
27193-16	Surface Mount Box - White, 1-gang	1 (0.6)
SIGA-UIO2R	Universal Input-Output Module Board w/Riser Inputs - Two Module Positions	0.32 (0.15)
SIGA-UIO6R	Universal Input-Output Module Board w/Riser Inputs - Six Module Positions	0.62 (0.28)
SIGA-UIO6	Universal Input-Output Module Board - Six Module Positions	0.56 (0.25)
SIGA-AB4G	Audible (Sounder) Detector Base	0.3 (0.15)

Accessories

MFC-A	Multifunction Fire Cabinet - Red, supports Signature Module Mounting Plates	7.0 (3.1)
SIGA-MB4	Transponder Mounting Bracket (allows for mounting two 1-gang modules in a 2-gang box)	0.4 (0.15)
SIGA-MP1	Signature Module Mounting Plate, 1 footprint	1.5 (0.70)
SIGA-MP2	Signature Module Mounting Plate, 1/2 footprint	0.5 (0.23)
SIGA-MP2L	Signature Module Mounting Plate, 1/2 extended footprint	1.02 (0.46)



Contact us...

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Web: www.est-fire.com

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Email: inquiries@chubbedwards.com
Web: www.chubbedwards.com

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Signature Series Overview

The Signature Series intelligent analog-addressable system from Edwards is an entire family of multi-sensor detectors and mounting bases, multiple-function input and output modules, network and non-network control panels, and user-friendly maintenance and service tools. Analog information from equipment connected to Signature devices is gathered and converted into digital signals. An onboard microprocessor in each Signature device measures and analyzes the signal and decides whether or not to input an alarm. The microprocessor in each Signature device provides four additional benefits – Self-diagnostics and History Log, Automatic Device Mapping, Stand-alone Operation and Fast, Stable Communication.

Self-diagnostics and History Log – Each Signature Series device constantly runs self-checks to provide important maintenance information. The results of the self-check are automatically updated and permanently stored in its non-volatile memory. This information is accessible for review any time at the control panel, PC, or using the SIGA-PRO Signature Program/Service Tool. The information stored in device memory includes:

- Device serial number, address, and type
- Time and date of last alarm
- Most recent trouble code logged by the detector — 32 possible trouble codes may be used to diagnose faults.

Automatic Device Mapping –The Signature Data Controller (SDC) learns where each device's serial number address is installed relative to other devices on the circuit. The SDC keeps a map of all Signature Series devices connected to it. The Signature Series Data Entry Program also uses the mapping feature. With interactive menus and graphic support, the wired circuits between each device can be examined. Layout or “as-built” drawing information showing branch wiring (T-taps), device types and their address are stored on disk for printing hard copy. This takes the mystery out of the installation. The preparation of as-built drawings is fast and efficient.

Device mapping allows the Signature Data Controller to discover:

- Unexpected additional device addresses
- Missing device addresses
- Changes to the wiring in the circuit.

Most Signature modules use a personality code selected by the installer to determine their actual function. Personality codes are downloaded from the SDC during system configuration and are indicated during device mapping.

Standalone Operation – A decentralized alarm decision by the device is guaranteed. Onboard intelligence permits the device to operate in standalone (degrade) mode. If Signature loop controller CPU communications fail for more than four seconds, all devices on that circuit go into standalone mode. The circuit acts like a conventional alarm receiving circuit. Each Signature device on the circuit continues to collect and analyze information from its slave devices. When connected to a panel utilizing standalone operation, modules with their “personality” set as alarm devices (IDC) will alarm should their slave alarm-initiating device activate.

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OFFICE OF THE STATE FIRE MARSHAL
FIRE ENGINEERING - BUILDING MATERIALS LISTING PROGRAM



LISTING SERVICE

LISTING No. 7300-1657:0121 Page 1 of 1

CATEGORY: 7300 -- FIRE ALARM CONTROL UNIT ACCESSORIES/MISC. DEVICES

LISTEE: EDWARDS, A Division of UTC Fire & Security Americas Corporation, Inc. 8985 Town Center Parkway, Bradenton, FL 34202
Contact: Jewell Conover (941) 739-4358 Fax (941) 308-8123
Email: rhonda.conover@fs.utc.com

DESIGN: Models SIGA-CC1, SIGA-CC2, SIGA-CT1, SIGA-CT1HT, SIGA-CT2, SIGA-CR, SIGA-CRR, SIGA-UM, SIGA-MM1, SIGA-WTM, SIGA-IM, SIGA-MDM, SIGA-MAB, SIGA-MCT2, SIGA-MCC1, SIGA-MCC2, SIGA-MCR and SIGA-MCRR remote transponders. Models SIGA-AA30 and SIGA-AA50 audio amplifiers. Models SIGA-APS and SIGA-APS-220 power supplies. Models SIGA-MB4, SIGA-MP1, SIGA-MP2 and SIGA-MP2L mounting plates. Models SIGA-UIO2R, SIGA-UIO6 and SIGA-UIO6R motherboards. Model CS-SIGA-CC1P releasing module. Models SIGA-CC1S and SIGA-MCC1S Auto-Sync Output Modules. Models MFC-A and MFC-AD Enclosures. Model SIGA-CR2 Control Relay Module. Model SIGA-CT1HT; Signature Series High Temperature Single Input Module. *SIGA-CRH High Power Control Relay Module.

Refer to listee's data sheet for additional detailed product description and operational consideration.

RATING: 15.2 - 19.95 VDC

INSTALLATION: In accordance with listee's printed installation instructions, applicable codes & ordinances and in a manner acceptable to the authority having jurisdiction.

MARKING: Listee's name, model number, electrical rating, and UL label.

APPROVAL: Listed as control unit accessories for use with separately listed compatible fire alarm control units. Refer to listee's Installation Instruction Manual for details.

NOTE: Formerly 7300-1591:121 and 7300-1388:178

*Rev 01-11-16 gt



This listing is based upon technical data submitted by the applicant. CSFM Fire Engineering staff has reviewed the test results and/or other data but does not make an independent verification of any claims. This listing is not an endorsement or recommendation of the item listed. This listing should not be used to verify correct operational requirements or installation criteria. Refer to listee's data sheet, installation instructions and/or other

Date Issued: **July 01, 2017**

Listing Expires **June 30, 2018**

Authorized By: **DAVID CASTILLO, Program Coordinator**
Fire Engineering Division



Synchronization Output Module

SIGA-CC1S, MCC1S



Patented



Overview

SIGA-CC1S and MCC1S Synchronization Output Modules are intelligent analog addressable devices that form part of EST's Signature line of products. The actual operation of the SIGA-CC1S and MCC1S is determined by the "personality code" selected by the installer, which is downloaded to the module from the Signature loop controller during system configuration.

Depending on their assigned personality, Synchronization Output Modules may be used as a signal power riser selector to provide synchronization of fire alarm signals across multiple zones, or for connecting, upon command from the loop controller, supervised Class B signal or telephone circuits to their respective power inputs. The power inputs may be polarized 24 Vdc to operate audible and visible signal appliances or 25 and 70 VRMS to operate audio evacuation speakers and firefighter's telephones.

Standard Features

- Provides UL 1971-compliant auto-sync output for visual signals**
 Use for connecting a supervised output circuit to a supervised 24 Vdc riser input and synchronizing multiple notification appliance circuits.
- Functions as an audible signal riser selector**
 Use as a synch module or for connecting supervised 24 Vdc Audible/Visible signal circuits, or 25 and 70 VRMS Audio Evacuation and Telephone circuits to their power inputs.
- Built-in ring-tone generator**
 When configured for telephone circuits, the SIGA-CC1S generates its own ring-tone signal, eliminating the need for a separate ring-tone circuit.
- Automatic device mapping**
 Signature modules transmit information to the loop controller regarding their circuit locations with respect to other Signature devices on the wire loop.
- Electronic addressing**
 Programmable addresses are downloaded from the loop controller, a PC, or the SIGA-PRO Signature Program/Service Tool; there are no switches or dials to set.
- Intelligent device with microprocessor**
 All decisions are made at the module to allow lower communication speed with substantially improved control panel response time and less sensitivity to line noise and loop wiring properties; twisted or shielded wire is not required.

Application

The SIGA-CC1S mounts to a standard North American two-gang electrical box, making it ideal for locations where only one module is required. Separate I/O and data loop connections are made to each module.

The SIGA-MCC1S is part of the UIO family of plug-in Signature Series modules. It functions identically to the SIGA-CC1S, but takes advantage of the modular flexibility and easy installation that characterize all UIO modules. Two- and six-module UIO motherboards are available. These can accommodate individual risers for each on-board module, or risers that are shared by any combination of its UIO modules. All wiring connections are made to terminal blocks on the motherboard. UIO assemblies may be mounted in Edwards enclosures.

Personality Codes

The operation of the SIGA-CC1S is determined by their sub-type code or “Personality Code”. The code is selected by the installer depending upon the desired application and is downloaded from the loop controller.

Personality Code 5: Signal Power or Audio Evacuation (single riser). Configures the module for use as a Class B Audible/Visible Signal power (24 Vdc polarized) or Audio Evacuation (25 or 70 VRMS) power selector. The ring-tone generator is disabled. The output circuit is monitored for open or shorted wiring. If a short exists, the control panel inhibits the activation of the audible/visible signal circuit to prevent connection to the power circuit.

Personality Code 6: Telephone with ring-tone (single riser). Configures the module for use as a Telephone power selector. When a telephone handset is plugged into its jack or lifted from its hook, the module generates its own Ring-Tone signal. A separate ring-tone circuit is not needed. The module sends this signal to the control panel to indicate that an off-hook condition is present. When the system operator responds to the call, the ring-tone signal is disabled.

Personality Code 25: Visual Signal Synchronization. This personality code configures the module to provide synchronization of fire alarm signals across multiple zones. It functions as a signal power (24 Vdc) riser selector. The output wiring is monitored for open circuits and short circuits. A short circuit will cause the fire alarm control panel to inhibit the activation of the audible/visual signal circuit so the riser is not connected to the wiring fault.

Warnings & Cautions

This module will not operate without electrical power. As fires frequently cause power interruption, we suggest you discuss further safeguards with your fire protection specialist.

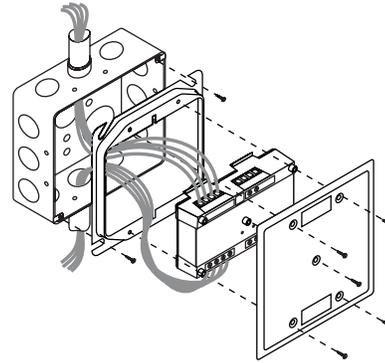
Edwards recommends that these modules be installed according to latest recognized edition of national and local fire alarm codes.

Compatibility

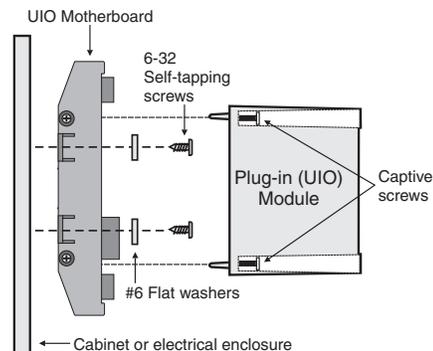
The Synchronization Output Module is compatible with EST's Signature Loop Controller operating under EST3 version 2.0 or higher, and QuickStart Signature Loop Intelligent Controller.

Installation

The SIGA-CC1S: mounts to North American 2-1/2 inch (64 mm) deep 2-gang boxes and 1-1/2 inch (38 mm) deep 4 inch square boxes with 2-gang covers and SIGA-MP mounting plates. The terminals are suited for #12 to #18 AWG (2.5 mm² to 0.75 mm²) wire size.



SIGA-MCC1S: mount the UIOxR motherboard inside a suitable Edwards enclosure with screws and washers provided. Plug the module into any available position on the motherboard and secure the module to the motherboard with the captive screws. Wiring connections are made to the terminals on the motherboard (see wiring diagram). UIOxR motherboard terminals are suited for #12 to #18 AWG (2.5 mm² to 0.75 mm²) wire size.



Electronic Addressing

The loop controller electronically addresses each module saving valuable time during system commissioning. Setting complicated switches or dials is not required. Each module has its own unique serial number stored in its “on-board memory”. The loop controller identifies each device on the loop and assigns a “soft” address to each serial number. If desired, the modules can be addressed using the SIGA-PRO Signature Program/Service Tool.

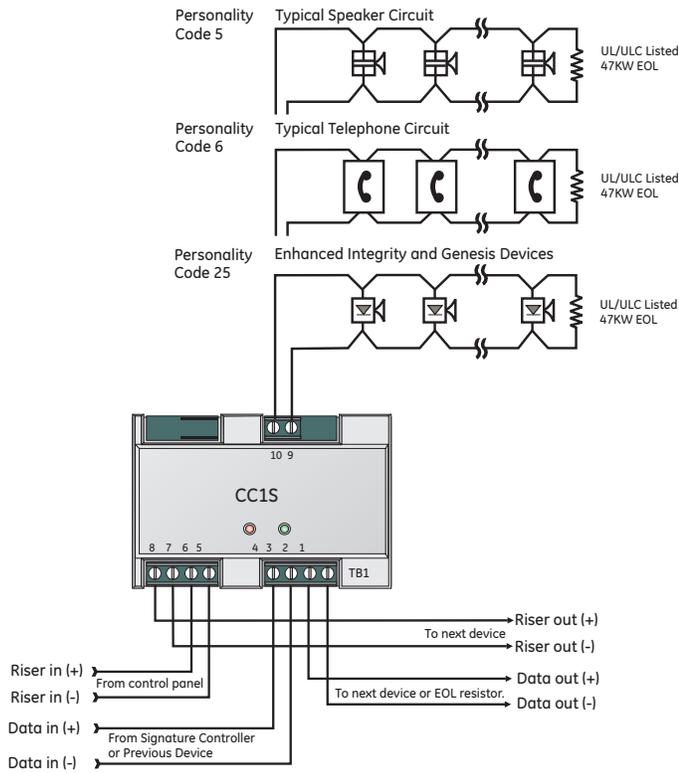
Testing & Maintenance

The module's automatic self-diagnosis identifies when it is defective and causes a trouble message. The user-friendly maintenance program shows the current state of each module and other pertinent messages. Single modules may be turned off (de-activated) temporarily, from the control panel.

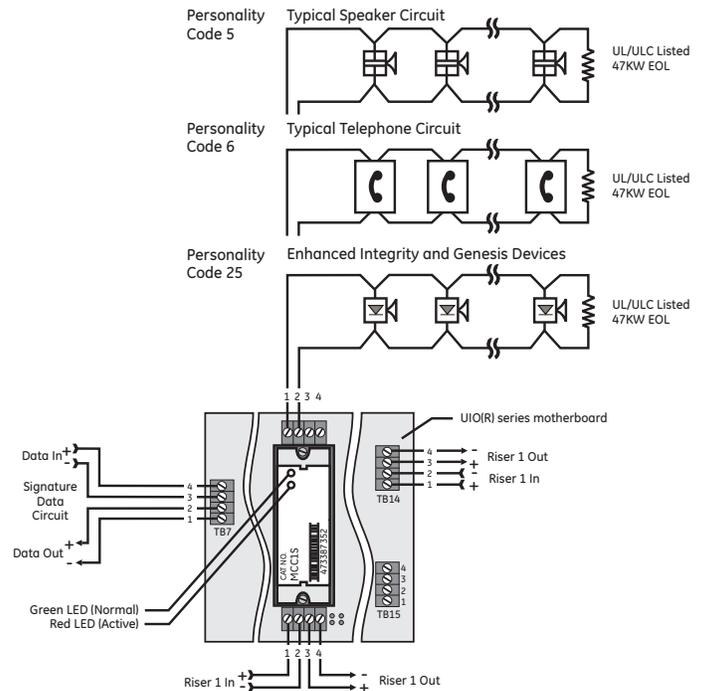
Scheduled maintenance (Regular or Selected) for proper system operation should be planned to meet the requirements of the Authority Having Jurisdiction (AHJ). Refer to current NFPA 72 and ULC CAN/ULC 536 standards.

Typical Wiring

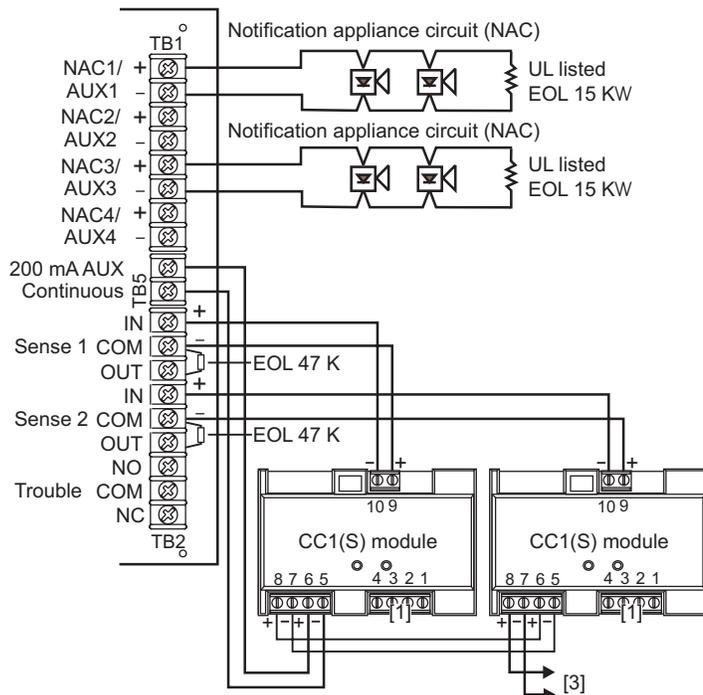
SIGA-CC1S (Standard Mount)



SIGA-MCC1S (UIO Mount)



Multiple CC1(S) modules using the BPS's sense inputs





Contact us...

Email: edwards.fire@fs.utc.com

Web: www.est-fire.com

EST is an **EDWARDS** brand.

1016 Corporate Park Drive
Mebane, NC 27302

In Canada, contact Chubb Edwards...

Email: inquiries@chubbedwards.com

Web: www.chubbedwards.com

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Specifications

Catalog Number	SIGA-CC1S	SIGA-MCC1S
Mounting	North American 2½ inch (64 mm) deep two-gang boxes and 1½ inch (38 mm) deep 4 inch square boxes with 2-gang covers and SIGA-MP mounting plates	Plugs into UIO2R, UIO6R or UIO6 Motherboards
Description	Synchronization Output Module	
Type Code	50 (factory set)	
Address Requirements	Uses one module address	
Wiring Terminations	Suitable for #12 to #18 AWG (2.5 mm ² to 0.75mm ²)	
Operating Current	Standby = 223µA Activated = 100µA	
Operating Voltage	15.2 to 19.95 Vdc (19 Vdc nominal)	
Output Rating	24 Vdc = 2 amps 25 V Audio = 50 watts 70 V Audio = 35 watts	
Construction	High Impact Engineering Polymer	
Storage and Operating Environment	Operating: 32°F to 120°F (0°C to 49°C) Storage: -4°F to 140°F (-20°C to 60°C) Humidity: 0 to 93% RH	
LED Operation	Green LED - Flashes when polled Red LED - Flashes when in alarm/active	
Compatibility	Use with: Signature Loop Controller under EST3 version 2.0 or higher	
Agency Listings	UL, ULC, CSFM, MEA	

Ordering Information



Catalog Number	Description	Shipping Wt. lbs (kg)
SIGA-CC1S	Synchronization Output Module (Standard Mount) - UL/ULC Listed	0.5 (0.23)
SIGA-MCC1S	Synchronization Output Module (UIO Mount) - UL/ULC Listed	0.18 (0.08)

Related Equipment		
27193-21	Surface Mount Box - Red, 2-gang	2 (1.2)
27193-26	Surface Mount Box - White, 2-gang	2 (1.2)
SIGA-UIO2R	Universal Input-Output Module Board w/Riser Inputs - Two Module Positions	0.32 (0.15)
SIGA-UIO6R	Universal Input-Output Module Board w/Riser Inputs - Six Module Positions	0.62 (0.28)
SIGA-UIO6	Universal Input-Output Module Board - Six Module Positions	0.56 (0.25)
235196P	Bi-polar Transient Protector	0.01 (0.05)
MFC-A	Multifunction Fire Cabinet - Red, supports Signature Module Mounting Plates	7.0 (3.1)
SIGA-MP1	Signature Module Mounting Plate, 1 footprint	1.5 (0.70)
SIGA-MP2	Signature Module Mounting Plate, 1/2 footprint	0.5 (0.23)
SIGA-MP2L	Signature Module Mounting Plate, 1/2 extended footprint	1.02 (0.46)

CALIFORNIA DEPARTMENT OF FORESTRY & FIRE PROTECTION
OFFICE OF THE STATE FIRE MARSHAL
FIRE ENGINEERING - BUILDING MATERIALS LISTING PROGRAM



LISTING SERVICE

LISTING No. 7300-1657:0121 Page 1 of 1

CATEGORY: 7300 -- FIRE ALARM CONTROL UNIT ACCESSORIES/MISC. DEVICES

LISTEE: EDWARDS, A Division of UTC Fire & Security Americas Corporation, Inc. 8985 Town Center Parkway, Bradenton, FL 34202
Contact: Jewell Conover (941) 739-4358 Fax (941) 308-8123
Email: rhonda.conover@fs.utc.com

DESIGN: Models SIGA-CC1, SIGA-CC2, SIGA-CT1, SIGA-CT1HT, SIGA-CT2, SIGA-CR, SIGA-CRR, SIGA-UM, SIGA-MM1, SIGA-WTM, SIGA-IM, SIGA-MDM, SIGA-MAB, SIGA-MCT2, SIGA-MCC1, SIGA-MCC2, SIGA-MCR and SIGA-MCRR remote transponders. Models SIGA-AA30 and SIGA-AA50 audio amplifiers. Models SIGA-APS and SIGA-APS-220 power supplies. Models SIGA-MB4, SIGA-MP1, SIGA-MP2 and SIGA-MP2L mounting plates. Models SIGA-UIO2R, SIGA-UIO6 and SIGA-UIO6R motherboards. Model CS-SIGA-CC1P releasing module. Models SIGA-CC1S and SIGA-MCC1S Auto-Sync Output Modules. Models MFC-A and MFC-AD Enclosures. Model SIGA-CR2 Control Relay Module. Model SIGA-CT1HT; Signature Series High Temperature Single Input Module. *SIGA-CRH High Power Control Relay Module.

Refer to listee's data sheet for additional detailed product description and operational consideration.

RATING: 15.2 - 19.95 VDC

INSTALLATION: In accordance with listee's printed installation instructions, applicable codes & ordinances and in a manner acceptable to the authority having jurisdiction.

MARKING: Listee's name, model number, electrical rating, and UL label.

APPROVAL: Listed as control unit accessories for use with separately listed compatible fire alarm control units. Refer to listee's Installation Instruction Manual for details.

NOTE: Formerly 7300-1591:121 and 7300-1388:178

*Rev 01-11-16 gt



This listing is based upon technical data submitted by the applicant. CSFM Fire Engineering staff has reviewed the test results and/or other data but does not make an independent verification of any claims. This listing is not an endorsement or recommendation of the item listed. This listing should not be used to verify correct operational requirements or installation criteria. Refer to listee's data sheet, installation instructions and/or other

Date Issued: **July 01, 2017**

Listing Expires **June 30, 2018**

Authorized By: **DAVID CASTILLO, Program Coordinator**
Fire Engineering Division

Field Configurable Horns and Strobes

Genesis Series



ECS/MNS appliances available
with clear or amber lenses.



Overview

The Genesis line of fire alarm and mass notification/emergency communications (ECS/MNS) signals are among the smallest, most compact audible-visible life safety signaling devices in the world. About the size of a deck of playing cards, these devices are designed to blend with any decor.

Thanks to patented breakthrough technology, Edwards Genesis strobes do not require bulky specular reflectors and lenses. Instead, an exclusive cavity design conditions light to produce a highly controlled distribution pattern. Significant development efforts employing this new technology have given rise to a new benchmark in strobe performance – FullLight technology.

FullLight strobe technology produces a smooth light distribution pattern without the spikes and voids characteristic of specular reflectors. This ensures the entire coverage area receives consistent illumination from the strobe flash. As a result, Genesis strobes with FullLight technology go well beyond the UL-1971 and ULC-S526 light distribution requirements.

Genesis strobes and horn-strobes offer selectable candela output by means of a conveniently-located switch on the side of the device. Models are also available that offer fixed 15/75 cd output. The candela output setting remains clearly visible even after final installation, yet it stays locked in place to prevent unauthorized tampering.

Genesis ECS/MNS appliances offer emergency signaling with clear or amber lenses and with optional ALERT housing labels. They are ideal for applications that require differentiation between fire alarm and mass notification alerts.

Standard Features

- **Unique low-profile design**
 - The most compact UL-1971/ULC-S526 listed strobe available
 - Ultra-slim – protrudes less than one inch
 - Attractive appearance
 - No visible mounting screws
- **Four field-configurable options in one device**
 - Select 15, 30, 75, or 110 cd strobe output
 - Select high (default) or low dB horn output
 - Select temporal (default) or steady horn output
 - Select public mode flash rate (default) or private mode temporal flash
- **Fixed 15/75 cd model available**
- **ECS/MNS models available**
- **Easy to install**
 - Fits standard 1-gang electrical boxes – no trim plate needed
 - Optional trim plate accommodates oversized openings
 - Pre-assembled with captive hardware
 - #12 AWG terminals – ideal for long runs or existing wiring
- **Unparalleled performance**
 - Industry's most even light distribution
 - Meets tough synchronizing standards for strobes
 - Single microprocessor controls both horn and strobe
 - Independent horn control over a single pair of wires
 - Highly regulated in-rush current
 - Multiple frequency tone improves sound penetration
 - Field-programmable temporal strobe output option

Application

Genesis strobes are UL 1971-listed for use indoors as wall-mounted public-mode notification appliances for the hearing impaired. Prevailing codes require strobes to be used where ambient noise conditions exceed 105 dBA (87dBA in Canada), where occupants use hearing protection, and in areas of public accommodation as defined in the *Americans with Disabilities Act* (see *application notes – USA*).

Combination horn-strobe signals must be installed in accordance with guidelines established for strobe devices. Consult with your Authority Having Jurisdiction for details.

All Genesis strobes exceed UL synchronization requirements (within 10 milliseconds over a two-hour period) when used with a synchronization source. Synchronization is important in order to avoid epileptic sensitivity.

WARNING: These devices will not operate without electrical power. As fires frequently cause power interruptions, further safeguards such as backup power supplies may be required.

Horns

Genesis horn output reaches as high as 99 dB and features a unique multiple frequency tone that results in excellent sound penetration and an unmistakable warning of danger. Horns may be configured for either coded or non-coded signal circuits. They can also be set for low dB output with a jumper cut that reduces horn output by about 5 dB. Horn-only models may be ceiling-mounted or wall-mounted.

The suggested sound pressure level for each signaling zone used with alarm signals is at least 15 dB above the average ambient sound level, or 5 dB above the maximum sound level having a duration of at least 60 seconds, whichever is greater, measured 5 feet (1.5 m) above the floor. The average ambient sound level is, A-weighted sound pressure measured over a 24-hour period.

Doubling the distance from the signal to the ear will theoretically result in a 6 dB reduction of the received sound pressure level. The actual effect depends on the acoustic properties of materials in the space. A 3 dBA difference represents a barely noticeable change in volume.

ECS/MNS Applications

Genesis ECS/MNS strobe appliances bring the same high-performance fire alarm features and unobtrusive design to mass notification applications. Available with amber lenses and optional ALERT housing labels, they are ideal for applications that require differentiation between fire alarm and mass notification alerts.

Installation

Genesis horns and strobes mount to any standard one-gang surface or flush electrical box. Matching optional trim plates are used to cover oversized openings and can accommodate one-gang, two-gang, four-inch square, or octagonal boxes, and European 100 mm square.



Genesis Horn/Strobe with optional trim plate

All Genesis signals come pre-assembled with captive mounting screws for easy installation. Two tabs at the top of the signal unlock the cover to reveal the mounting hardware. The shallow depth of Genesis devices leaves ample room behind the signal for extra wiring. Once installed with the cover in place, no mounting screws are visible.

Field Configuration

Temporal horn and horn-strobe models are factory set to sound in a **three-pulse temporal pattern**. Units may be configured for use with coded systems by cutting a jumper on the circuit board. This results in a **steady output** that can be turned on and off (coded) as the system applies and removes power to the signal circuit. A Genesis Signal Master is required when horn-strobe models are configured for coded systems. Non-temporal, horn-only models sound a steady tone.

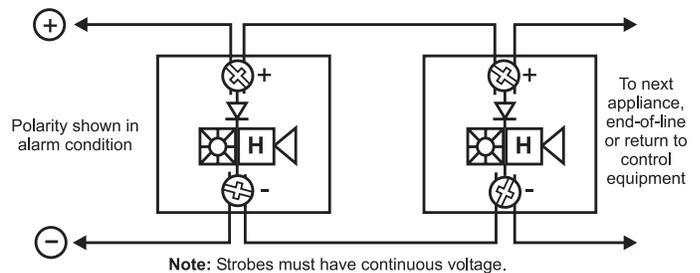
Genesis clear strobes and horn-strobes are shipped from the factory ready for use as **UL 1971 compliant** signals for public mode operation. These signals may be configured for **temporal flash** by cutting a jumper on the circuit board. This battery-saving feature is intended for private mode signaling only.

Genesis clear strobes and horn-strobes may be set for **15, 30, 75, or 110 candela output**. The output setting is changed by simply opening the device and sliding the switch to the desired setting. The device does not have to be removed to change the output setting. The setting remains visible through a small window on the side of the device after the cover is closed.

Horns and horn-strobes are factory set for **high dB output**. **Low dB output** may be selected by cutting a jumper on the circuit board. This reduces the output by about 5 dB.

Wiring

Field wiring terminals accommodate #18 to #12 AWG (0.75 mm² to 2.5 mm²) wiring. Horns, strobes, and combination horn-strobes are interconnected with a single pair of wires as shown below.



Current Draw

Strobes, Horn-Strobes

Multi-cd Wall Strobes (G1-VM)

UL Rating	15 cd* RMS	30 cd* RMS	15/75 cd** RMS	75 cd* RMS	110 cd* RMS
16 Vdc	103	141	152	255	311
16 Vfwr	125	179	224	346	392

*G1-VM multi-cd; **G1F-V1575 fixed 15/75 cd

Typical Current	15 cd RMS	30 cd RMS	15/75 RMS	75 cd RMS	110 cd RMS
16 Vdc	85	127	150	245	285
20 Vdc	71	98	123	188	240
24 Vdc	59	82	104	152	191
33 Vdc	46	64	84	112	137
16 Vfwr	119	169	223	332	376
20 Vfwr	103	143	189	253	331
24 Vfwr	94	129	169	218	262
33 Vfwr	87	112	148	179	205

Wall Temporal Horn-strobes – High dB Setting

UL Rating	15 cd* RMS	30 cd* RMS	15/75 cd** RMS	75 cd* RMS	110 cd* RMS
16 Vdc	129	167	172	281	337
16 Vfwr	176	230	269	397	443

*G1-HDVM multi-cd
**G1F-HDV1575 fixed 15/75 cd

Typical Current	15 cd RMS	30 cd RMS	15/75 RMS	75 cd RMS	110 cd RMS
16 Vdc	102	135	160	246	309
20 Vdc	88	109	137	193	248
24 Vdc	81	94	122	161	203
33 Vdc	74	72	106	124	154
16 Vfwr	144	182	247	352	393
20 Vfwr	141	162	220	274	362
24 Vfwr	136	152	203	235	282
33 Vfwr	125	144	196	201	232

Wall Temporal Horn-strobes – Low dB Setting

UL Rating	15 cd* RMS	30 cd* RMS	15/75 cd** RMS	75 cd* RMS	110 cd* RMS
16 Vdc	122	160	146	274	330
16 Vfwr	162	216	231	383	429

*G1-HDVM multi-cd
**G1F-HDV1575 fixed 15/75 cd

Typical Current	15 cd RMS	30 cd RMS	15/75 RMS	75 cd RMS	110 cd RMS
16 Vdc	96	130	158	243	302
20 Vdc	79	104	133	189	241
24 Vdc	68	88	119	156	197
33 Vdc	56	71	100	118	146
16 Vfwr	128	180	241	344	389
20 Vfwr	118	157	213	266	343
24 Vfwr	113	144	195	230	279
33 Vfwr	112	137	182	197	226

Horns

Wall or Ceiling Mounted Temporal Horns (G1-HD)

UL Rating	High dB (RMS)	Low dB (RMS)
16 Vdc	26	19
24 Vdc	36	27
33 Vdc	41	33
16 Vfwr	51	37
24 Vfwr	69	52
33 Vfwr	76	70

Typical Current	High dB RMS	Low dB RMS
16 Vdc	22	17
20 Vdc	24	19
24 Vdc	27	22
33 Vdc	32	26
16 Vfwr	34	30
20 Vfwr	40	34
24 Vfwr	45	38
33 Vfwr	52	47

Wall or Ceiling Mounted Horns (G1-P)

UL Designation	Voltage Range	Max. Current, RMS
Regulated 24 Vdc	16 - 33 Vdc	13 mA
24 fwr	16 - 33 Vfwr	11 mA

Typical Current	RMS
24 Vdc	10
24 Vdc	11
31 Vdc	12
20 Vfwr	9
24 Vfwr	10

Current values are shown in mA.

dBA output

Temporal Horns, Horn-strobes (G1-HD, G1-HDVM series)

High dB Setting	UL464		Average	Peak
	Temporal	Steady	Temporal/Steady	Temporal/Steady
16 Vdc	81.4	85.5	91.4	94.2
24 Vdc	84.4	88.6	94.5	97.6
33 Vdc	86.3	90.4	96.9	99.5

Low dB Setting	UL464		Average	Peak
	Temporal	Steady	Temporal/Steady	Temporal/Steady
16 Vdc	76.0	80.1	86.3	89.2
24 Vdc	79.4	83.5	89.8	92.5
33 Vdc	82.1	86.5	92.5	95.3

Steady Tone Horns (G1-P series)

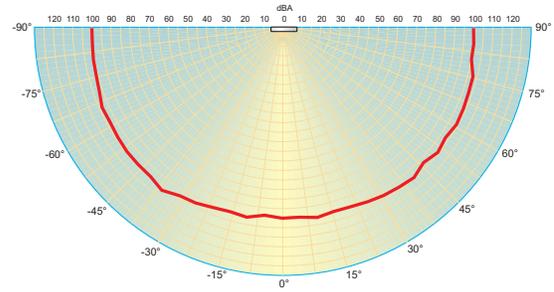
	UL464	Average	Peak
16 Vdc	77 dBA, min	85 dBA	91 dBA
16 Vfwr	77 dBA, min	85 dBA	91 dBA

Notes

1. All values shown are dBA measured at 10 feet (3.01m).
2. UL464 values measured in reverberant room.
3. Average and Peak values are measured in anechoic chamber.

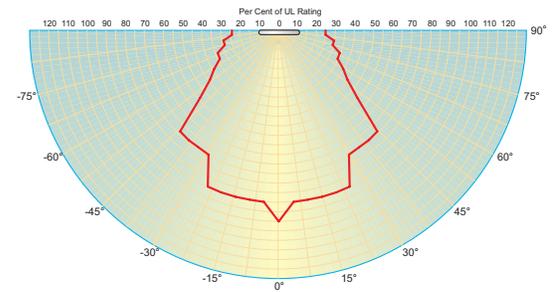
Average Sound Output (dBA)

(High dB setting, anechoic, 24V, measured at 10ft)



Light output - (effective cd)

Percent of UL rating versus angle



Specifications

Housing	Red or white textured UV stabilized, color impregnated engineered plastic. Exceeds 94V-0 UL flammability rating.
Lens	Optical grade polycarbonate (clear)
Mounting (indoor only)	Strobes and horn-strobes are for wall-mount installation only. Horn-only models may be ceiling- or wall-mounted. Flush mount: 2½ inch (64 mm) deep one-gang box Surface mount: Model 27193 surface mount box, wiremold box, or equivalent surface-mount box With optional trim plate: One-gang, two-gang, four-inch square, octagonal, or European single-gang box
Wire connections	Screw terminals: single input for both horn and strobe. #18 to #12 AWG (0.75 mm ² to 2.5 mm ²) wire size
Operating environment	Indoor only: 32-120°F (0-49°C) ambient temperature. 93% relative humidity
Agency listings/approvals	UL 1971 (S218), UL 1638 (S218), UL 464 (S218), ULC S525, ULC S526, CSFM, CE, FCC, MEA. (All models comply with ADA Code of Federal Regulation Chapter 28 Part 36 Final Rule.)
Dimensions (HxWxD)	Signal: 4-1/2" x 2-3/4" x 13/16" (113 mm x 68 mm x 21 mm) Trimplate: 5" (127 mm); Height – 5-7/8" (149 mm); Depth – ½" (13 mm)
Operating voltage	G1-HD series temporal-tone horns: non-coded, filtered 16-33 Vdc or unfiltered 16-33 Vdc FWR (or coded when horn set to steady tone) G1-HDVM series temporal-tone horn-strobes: non-coded, filtered 16-33 Vdc or unfiltered 16-33 Vdc FWR (or coded (audible NAC only) when used with optional G1M Genesis Signal Master) G1-VM series strobes: non-coded, filtered 16 - 33 Vdc or unfiltered 16-33 Vdc FWR G1-P series steady-tone horns: coded or non-coded, filtered 20-31 Vdc or unfiltered 20-27 Vfwr
Strobe output rating	UL 1971, UL 1638, ULC S526: selectable 15 cd, 30 cd, 75 cd, or 110 cd output UL 1971: 15 cd (fixed 15/75 cd models) UL 1638, ULCS526: 75 cd (fixed 15/75 cd models)
Strobe flash rate	G1-VM strobes and G1-HDVM series temporal-tone horn-strobes: one flash per second synchronized with optional G1M Genesis Signal Master indefinitely within 10 milliseconds. Temporal setting (private mode only): synchronized to temporal output of horns on same circuit
Synchronization Sources	SIGA-CC1S, SIGA-MCC1S, SIGA-CC2A, SIGA-MCC2A, G1M-RM BPS6A, BPS10A, APS6A, APS10A, iO64, iO500, Firesield Plus 3, 5 and 10 zone. Add G1M for G1-CVM & G1-HDVM devices only.
Horn pulse rate	G1-HD temporal-tone horns and G1-HDVM series temporal-tone horn-strobes: temporal rate synchronized with optional G1M Genesis Signal Master indefinitely within 10 milliseconds. G1-P steady-tone horns: continuous, steady tone only
Temporal audible pattern	½ sec ON, ½ sec OFF, ½ sec ON, ½ sec OFF, ½ sec ON, 1½ sec OFF, then repeat cycle

Candela Output

Lens Color	Rating	Switch Position A	Switch Position B	Switch Position C	Switch Position D
Amber	UL 1638	110 cd	75 cd	30 cd	15 cd
Amber	UL 1971*	88 cd	60 cd	24 cd	12 cd
Clear	UL 1971	110 cd	75 cd	30 cd	15 cd

* Equivalent Rating

Fire appliances available with white or red housings.



ECS/MNS appliances available with clear or amber lenses.



Ordering Information

Model	Housing	Marking	Lens	Strobe	Horn	Ship Wt. lbs (kg)
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Fire Alarm Appliances (c/w running man icon screen printed on housing)



G1-VM	White	None	Clear	Selectable 15, 30, 75, or 110 cd	Strobe only	0.25 (0.11)
G1F-HD	White	FIRE	Clear	Horn only	Selectable high/low dB	0.25 (0.11)
G1F-HDV1575	White	FIRE	Clear	15/75 cd ¹	Temporal hi/lo dB-24V	0.25 (0.11)
G1F-HDVM	White	FIRE	Clear	Selectable 15, 30, 75, or 110 cd	Selectable high/low dB	0.25 (0.11)
G1F-P	White	FIRE	Clear	Steady Horn (not compatible with Genesis Signal Master)		0.25 (0.11)
G1F-V1575	White	FIRE	Clear	15/75 cd ¹	Strobe only	0.25 (0.11)
G1F-VM	White	FIRE	Clear	Selectable 15, 30, 75, or 110 cd	Strobe only	0.25 (0.11)
G1-HD	White	None	Clear	Horn only	Selectable high/low dB	0.25 (0.11)
G1-HDVM	White	None	Clear	Selectable 15, 30, 75, or 110 cd	Selectable high/low dB	0.25 (0.11)
G1-P	White	None	Clear	Steady Horn (not compatible with Genesis Signal Master)		0.25 (0.11)
G1RF-HD	Red	FIRE	Clear	Horn only	Selectable high/low dB	0.25 (0.11)
G1RF-HDV1575	Red	FIRE	Clear	15/75 cd ¹	Temporal hi/lo dB-24V	0.25 (0.11)
G1RF-HDVM	Red	FIRE	Clear	Selectable 15, 30, 75, or 110 cd	Selectable high/low dB	0.25 (0.11)
G1RF-P	Red	FIRE	Clear	Steady Horn (not compatible with Genesis Signal Master)		0.25 (0.11)
G1RF-V1575	Red	FIRE	Clear	15/75 cd ¹	Strobe only	0.25 (0.11)
G1RF-VM	Red	FIRE	Clear	Selectable 15, 30, 75, or 110 cd	Strobe only	0.25 (0.11)
G1R-HD	Red	None	Clear	Horn only	Selectable high/low dB	0.25 (0.11)
G1R-HDVM	Red	None	Clear	Selectable 15, 30, 75, or 110 cd	Selectable high/low dB	0.25 (0.11)
G1R-P	Red	None	Clear	Steady Horn (not compatible with Genesis Signal Master)		0.25 (0.11)
G1R-VM	Red	None	Clear	Selectable 15, 30, 75, or 110 cd	Strobe only	0.25 (0.11)

ECS/MNS Appliances (no running man icon on housing)

G1WA-VMA	White	ALERT	Amber	Selectable A, B, C or D	Strobe only	0.25 (0.11)
G1WA-VMC	White	ALERT	Clear	Selectable 15, 30, 75, or 110 cd	Strobe only	0.25 (0.11)
G1WN-VMA	White	None	Amber	Selectable A, B, C or D	Strobe only	0.25 (0.11)
G1WN-VMC	White	None	Clear	Selectable 15, 30, 75, or 110 cd	Strobe only	0.25 (0.11)

Trim Plates

G1T	White	None	Genesis Trim Plate (for two-gang or 4" square boxes)			0.15 (0.7)
G1RT	Red	None	Genesis Trim Plate (for two-gang or 4" square boxes)			0.15 (0.7)
G1T-FIRE	White	FIRE	Genesis Trim Plate (for two-gang or 4" square boxes)			0.15 (0.7)
G1RT-FIRE	Red	FIRE	Genesis Trim Plate (for two-gang or 4" square boxes)			0.15 (0.7)
G1WT-ALERT	White	ALERT	Genesis Trim Plate (for two-gang or 4" square boxes)			0.15 (0.7)

Surface Boxes

27193-16	White	N/A	One-gang surface mount box			1 (0.4)
27193-11	Red	N/A	One-gang surface mount box			1 (0.4)

¹ These 15/75 cd models provide fixed output and are not multi-candela devices. The 15 cd output component complies with UL1971, while the 75 cd output component complies with UL 1638.



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EST is an **EDWARDS** brand.

1016 Corporate Park Drive
Mebane, NC 27302

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Email: inquiries@chubbedwards.com

Web: www.chubbedwards.com

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FIRE ENGINEERING - BUILDING MATERIALS LISTING PROGRAM



LISTING SERVICE

LISTING No. 7125-1657:0202

Page 1 of 1

CATEGORY: 7125 -- FIRE ALARM DEVICES FOR THE HEARING IMPAIRED

LISTEE: EDWARDS, A Division of UTC Fire & Security Americas Corporation, Inc. 8985 Town Center Parkway, Bradenton, FL 34202
Contact: Jewell Conover (941) 739-4358 Fax (941) 308-8123
Email: rhonda.conover@fs.utc.com

DESIGN: Models "EST" G1-HV15, -HV30, -HV60, -HV-75, G1-HOV15, -HOV30, -HOV60, -HOV75, -HOV110, GIF-HOV15, -HOV30, -HOV60, -HOV75, -HOV110, GIRF-HOV15, -HOV30, -HOV60, -HOV75, -HOV110, G1-HDVM, G1R-HDVM, G1F-HDVM, G1RF-HDVM, GC-HDVM, GC-HDVMH, GCF-HDVM, GCFR-HDVM, GCF-HDVMH, G1-HDV1575, G1R-HDV1575, G1F-HDV1575, and G1RF-HDV1575 horn/strobes with or without suffixes -R and -F. Models with HO as part of the model number are a high audible output version of the standard output model. Refer to listee's data sheet for additional detailed product description and operational considerations.

RATING: Electrical: 24-30 Vdc
16-33 Vdc/Vfwr - Models G1-HDVM, G1R-HDVM, G1F-HDVM, G1RF-HDVM, GC-HDVM, GC-HDVMH, GCF-HDVM, GCFR-HDVM, GCF-HDVMH, G1-HDV1575, G1R-HDV1575, G1F-HDV1575, G1RF-HDV1575

Candela: 15cd, 30cd, 60cd, 75cd, 110cd
15 - 95 multi-cd - Models GC-HDVM, GCF-HDVM, GCFR-HDVM
95-177 multi-cd-Models GC-HDVMH, GCF-HDVMH
15/75cd -Models G1-HDV1575, G1R-HDV1575, G1F-HDV1575, G1RF-HDV1575

INSTALLATION: In accordance with listee's printed installation instructions, applicable codes & ordinances and in a manner acceptable to the authority having jurisdiction.

MARKING: Listee's name, model number, electrical/candela rating, and UL label.

APPROVAL: Listed as horns and horn/strobe lights for use with separately listed compatible fire alarm control units. Suitable for use with Audible Signal Appliances (CSFM Listing No. 7135-1657:230). For indoor use and wall mount only. Models GC-HDVM, *GC-HDVMH, GCFR-HDVM, GCF-HDVM and *GCF-HDVMH for ceiling or wall mount. Refer to listee's Installation Instruction Manual for details.

These units can generate a distinctive three-pulse Temporal Pattern Fire Alarm Evacuation Signal (for total evacuation) in accordance with NFPA 72, 2002 Edition.

NOTE: Formerly 7125-1591:202

*REV 08-20-13 gt



This listing is based upon technical data submitted by the applicant. CSFM Fire Engineering staff has reviewed the test results and/or other data but does not make an independent verification of any claims. This listing is not an endorsement or recommendation of the item listed. This listing should not be used to verify correct operational requirements or installation criteria. Refer to listee's data sheet, installation instructions and/or other

Date Issued: **July 01, 2017**

Listing Expires **June 30, 2018**

Authorized By: **DAVID CASTILLO, Program Coordinator**
Fire Engineering Division



Remote Booster Power Supplies

BPS6A, BPS10A



ME A
476-91-E
Vol.13



ULC
S3424



7300-1657:
0229

Overview

The Booster Power Supply (BPS) is a UL 864, 9th Edition listed power supply. It is a 24 Vdc filtered-regulated, and supervised unit that can easily be configured to provide additional notification appliance circuits (NACs) or auxiliary power for Mass Notification/Emergency Communication (MNEC), as well as life safety, security, and access control applications.

The BPS contains the circuitry to monitor and charge internal or external batteries. Its steel enclosure has room for up to two 10 ampere-hour batteries. For access control-only applications, the BPS can support batteries totaling up to 65 ampere-hours in an external enclosure. The BPS has four Class B (convertible to two Class A) NACs. These can be activated in one or two groups from the BPS's unique dual input circuits.

The BPS is available in 6.5 or 10 ampere models. Each output circuit has a capacity of three amperes; total current draw cannot exceed the unit's rating.

The BPS meets current UL requirements and is listed under the following standards:

Standard (CCN)	Description
UL864 9th ed.ition (UOXX)	Fire Alarm Systems
UL636 (ANET, UEHX7)	Holdup Alarm Units and Systems
UL609 (AOTX, AOTX7)	Local Burglar Alarm Units and Systems
UL294 (ALVY, UEHX7)	Access Control Systems
UL365 (APAW, APAW7)	Police Station Connected Burglar Alarm Units and Systems
UL1076 (APOU, APOU7)	Proprietary Burglar Alarm System Units
UL1610 (AMCX)	Central Station Alarm Unit
ULC-S527 (UOXXC)	Control Units, Fire Alarm (Canada)
ULC-S303 (AOTX7)	Local Burglar Alarm Units and Systems (Canada)
C22.2 No. 205	Signaling Equipment (Canada)

Standard Features

- Allows for reliable filtered and regulated power to be installed where needed
- Cost effective system expansion
- Provides for Genesis and Enhanced Integrity notification appliance synchronization
- Supports coded output operation
- Self-restoring overcurrent protection
- Multiple signal rates
- Can be cascaded or controlled independently
- Easy field configuration
- On-board diagnostic LEDs identify wiring or internal faults
- Standard Edwards keyed lockable steel cabinet with removable door
- 110 and 230 Vac models available
- Accommodates 18 to 12 AWG wire sizes
- Optional tamper switch
- Dual battery charging rates
- Optional earthquake hardening; OSHPD seismic pre-approval for component Importance Factor 1.5

Application

The BPS provides additional power and circuits for notification appliances and other 24 Vdc loads. It is listed for indoor dry locations and can easily be installed where needed.

Fault conditions are indicated on the on-board diagnostic LEDs, opening the BPS input sense circuit and the trouble relay (if programmed). While this provides indication to the host system, the BPS can still be activated upon command. A separate AC Fail contact is available on the BPS circuit board, which can be programmed for trouble or AC Fail. There are seven on-board diagnostic LEDs: one for each NAC fault, one for battery fault, one for ground fault, and one for AC power.

The unique dual-input activation circuits of the BPS can be activated by any voltage from 6 to 45 VDC (filtered-regulated) or 11 to 33 Vdc (full-wave rectified, unfiltered). The first input circuit can be configured to activate 1-4 of the four possible outputs. The second input circuit can be configured to control circuits 3 and 4. When outputs are configured for auxiliary operation, these circuits can be configured to stay on or automatically deactivate 30 seconds after AC power is lost. This feature makes these circuits ideal for door holder applications. The BPS also has a separate 200 mA 24 Vdc output that can be used to power internal activation modules.

BPS NACs can be configured for a 3-3-3 temporal or continuous output. California temporal rate outputs are also available on certain models. This makes the BPS ideal for applications requiring signaling rates that are not available from the main system.

In addition to the internally generated signal rates, the BPS can also be configured to follow the coded signal rate of the main system NACs. This allows for the seamless expansion of existing NACs.

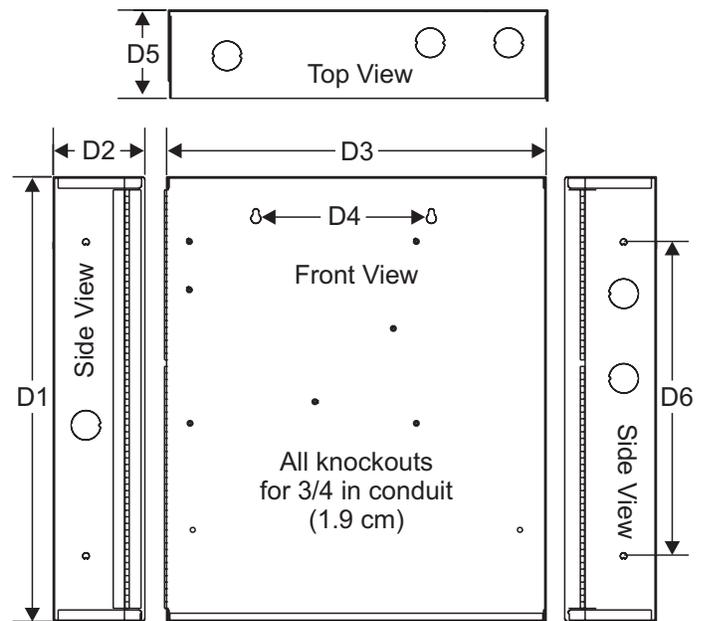
The BPS enclosure has mounting brackets for up to three Signature modules to the right of the circuit board.

Engineering Specification

Supply, where needed, Edwards BPS Series Booster Power Supplies (BPS) that are interconnected to and supervised by the main system. The BPS shall function as a stand-alone auxiliary power supply with its own fully-supervised battery compliment. The BPS battery compliment shall be sized to match the requirements of the main system. The BPS shall be capable of supervising and charging batteries having the capacity of 24 ampere-hours for Mass Notification/Emergency Communication (MNEC), life safety and security applications, and the capacity of 65 ampere-hours for access control applications.

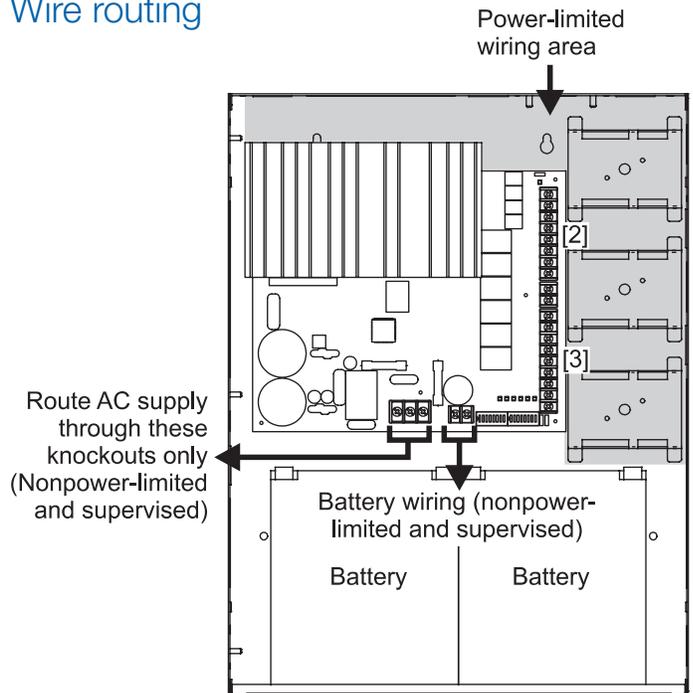
<<The BPS shall be capable of installation for a seismic component Importance Factor of 1.5.>> The BPS shall provide a minimum of four independent, fully supervised Class B circuits that can be field configurable for notification appliance circuits or auxiliary 24 Vdc power circuits. BPS NACs shall be convertible to a minimum of two Class A NACs. Each BPS output circuit shall be rated at 3 amperes at 24 Vdc. Each output circuit shall be provided with automatically restoring overcurrent protection. The BPS shall be operable from the main system NAC and/or Edwards Signature Series control modules. BPS NACs shall be configurable for continuous, 3-3-3 temporal or optionally, California rate. Fault conditions on the BPS shall not impede operation of main system NAC. The BPS shall be provided with ground fault detection circuitry and a separate AC fail relay.

Dimensions



D1	D2	D3	D4	D5	D6
17.0 in (43.2 cm)	3.5 in (8.9 cm)	13.0 in (33.0 cm)	6.5 in (16.5 cm)	3.375 in (8.6 cm)	12.0 in (30.4 cm)

Wire routing



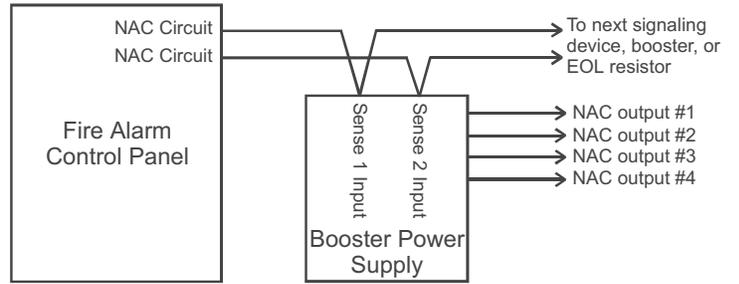
Notes

- Maintain 1/4-inch (6 mm) spacing between power-limited and nonpower-limited wiring or use type FPL, FPLR, or FPLP cable per NEC.
- Power-limited and supervised when not configured as auxiliary power. Non-supervised when configured as auxiliary power.
- Source must be power-limited. Source determines supervision.
- When using larger batteries, make sure to position the battery terminals towards the door.

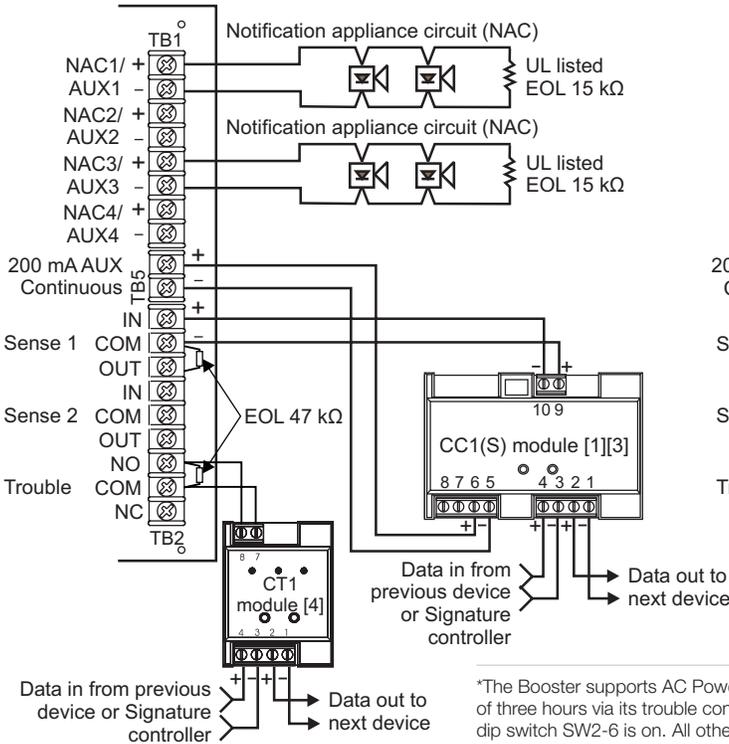
Typical Wiring

Single or cascaded booster anywhere on a notification appliance circuit

Existing NAC end-of-line resistors are not required to be installed at the booster's terminals. This allows multiple boosters to be driven from a single NAC circuit without the need for special configurations.

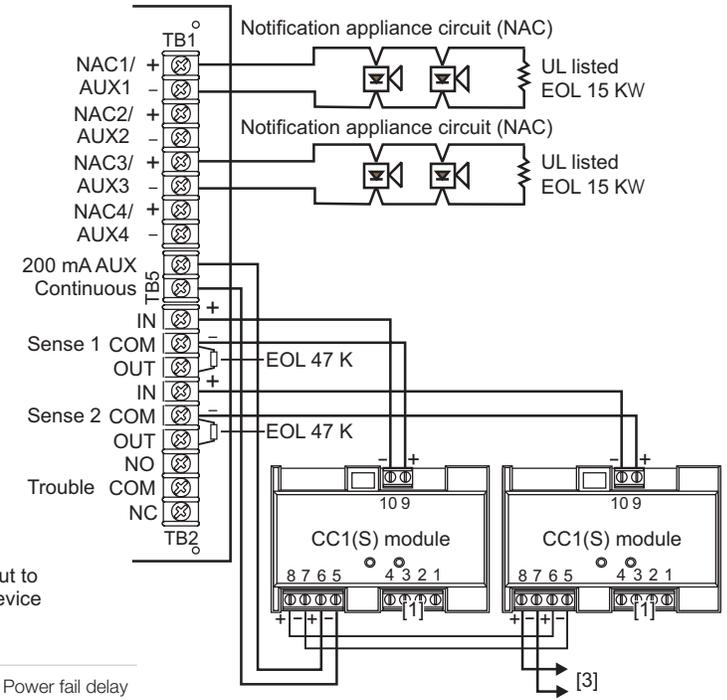


Configuring the Booster for AC Power Fail delay operation*

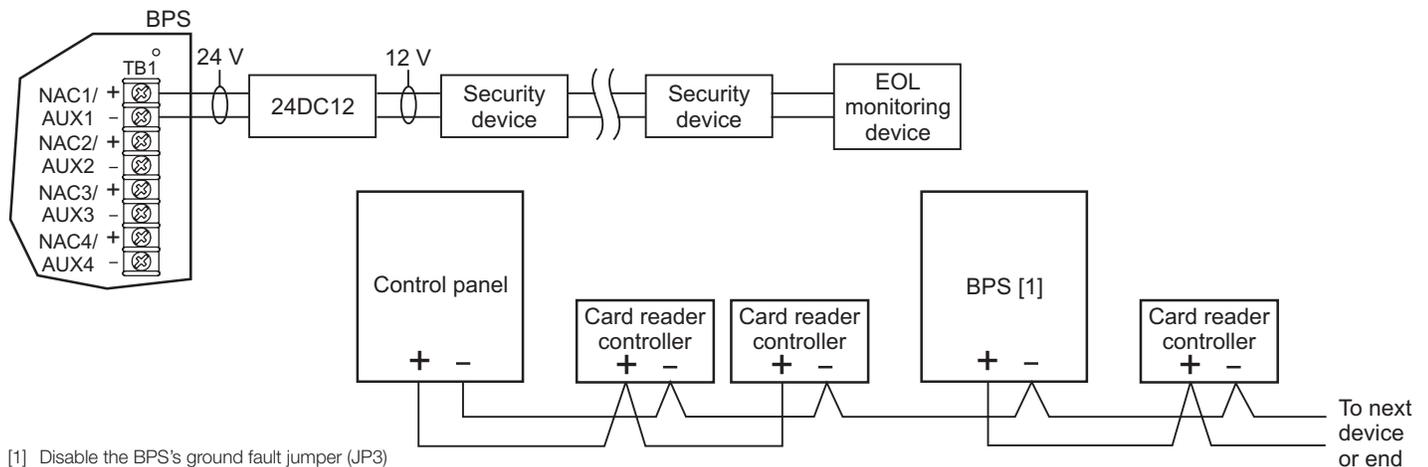


*The Booster supports AC Power fail delay of three hours via its trouble contact when dip switch SW2-6 is on. All other troubles are reported to supervising module or panel without delay via Sense inputs.

Multiple CC1(S) modules using the BPS's sense inputs



Security and access



[1] Disable the BPS's ground fault jumper (JP3)



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Specifications

Model	6.5 amp Booster	10 amp Booster
AC Line Voltage	120VAC or 220-240VAC 50/60Hz 390 watts	120VAC or 220-240VAC 50/60Hz 580 watts
Notification Appliance Circuit Ratings	3.0A max. per circuit @ 24Vdc nominal 6.5A max total all NACs	3.0A max. per circuit @ 24Vdc nominal 10A max total all NACs
Trouble Relay	2 Amps @ 30Vdc	
Auxiliary Outputs	Four configurable outputs replace NACs 1, 2, 3 or 4. as auxiliary outputs and 200 mA dedicated auxiliary. (See note 2.)	
Input Current (from an existing NAC)	3mA @ 12Vdc, 6mA @ 24Vdc	
Booster Internal Supervisory Current	70mA + 35 mA for each circuit set to AUX	
Booster Internal Alarm Current	270mA	
Signature Mounting Space	Accommodates three two-gang modules.	
Maximum Battery Size	10 Amp Hours (2 of 12V10A) in cabinet up to 24 Amp hours with external battery cabinet for fire and security applications; up to 65 Amp hours for access control applications in external battery box.	
Terminal Wire Gauge	18-12 AWG	
Relative Humidity	0 to 93% non condensing @ 32°C	
Temperature Rating	32° to 120°F (0° to 49°C)	
NAC Wiring Styles	Class A or Class B	
Output Signal Rates	Continuous, California rate, 3-3-3 temporal, or follow installed panel's NAC. (See note 1.)	
Ground Fault Detection	Enable or Disable via jumper	
Agency Listings	UL, ULC, CSFM	

1. Model BPS*CAA provides selection for California rate, in place of temporal.
2. Maximum of 8 Amps can be used for auxiliary output.

Ordering Information

Catalog Number	Description	Shipping Wt. lb (kg)
BPS6A	6.5 Amp Booster Power Supply	13 (5.9)
BPS6AC	6.5 Amp Booster Power Supply (ULC)	13 (5.9)
BPS6A/230	6.5 Amp Booster Power Supply (220V)	13 (5.9)
BPS6CAA	6.5 Amp Booster Power Supply with California rate	13 (5.9)
BPS10A	10 Amp Booster Power Supply	13 (5.9)
BPS10AC	10 Amp Booster Power Supply (ULC)	13 (5.9)
BPS10A/230	10 Amp Booster Power Supply (220V)	13 (5.9)
BPS10CAA	10 Amp Booster Power Supply with California rate	13 (5.9)

Related Equipment

12V6A5	7.2 Amp Hour Battery, two required	3.4 (1.6)
12V10A	10 Amp Hour Battery, two required	9.5 (4.3)
3-TAMP	Tamper switch	
BC-1EQ	Seismic Kit for BC-1. Order BC-1 separately. See note 3.	
BPSEQ	Seismic kit for BPS6A or BPS10 Booster Power Supplies. See note 3	
BC-1	Battery Cabinet (up to 2 - 40 Amp Hour Batteries)	58 (26.4)
BC-2	Battery Cabinet (up to 2 - 17 Amp Hour Batteries)	19 (8.6)
12V17A	18 Amp Hour Battery, two required (see note 1)	13 (5.9)
12V24A	24 Amp Hour Battery, two required (see note 1)	20 (9.07)
12V40A	40 Amp Hour Battery, two required (see notes 1, 2)	32 (14.5)
12V50A	50 Amp Hour Battery, two required (see notes 1, 2)	40 (18.14)
12V65A	65 Amp Hour Battery, two required (see notes 1, 2)	49 (22.2)

1. Requires installation of separate battery cabinet.
2. BPS supports batteries greater than 24 Amp hours for access control applications only.
3. For earthquake anchorage, including detailed mounting weights and center of gravity detail, refer to Seismic Application Guide 3101676. Approval of panel anchorage to site structure may require local AHJ, structural or civil engineer review.

CALIFORNIA DEPARTMENT OF FORESTRY & FIRE PROTECTION
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FIRE ENGINEERING - BUILDING MATERIALS LISTING PROGRAM



LISTING SERVICE

LISTING No. 7300-1657:0229 Page 1 of 1

CATEGORY: 7300 -- FIRE ALARM CONTROL UNIT ACCESSORIES/MISC. DEVICES

LISTEE: EDWARDS, A Division of UTC Fire & Security Americas Corporation, Inc. 8985 Town Center Parkway, Bradenton, FL 34202
Contact: Jewell Conover (941) 739-4358 Fax (941) 308-8123
Email: rhonda.conover@fs.utc.com

DESIGN: Models BPS6A, BPS10A, BPS6A/230, BPS10A/230, BPS6CAA, and BPS10CAA remote booster power supplies.

*Models APS6A, APS6A/230, APS6CAA, APS10A, and APS10A/230 Auxiliary Power Supply.

Refer to listee's data sheet for detailed product description and operational considerations.

RATING: 120 V/240 V, 60 Hz, 50 Hz

INSTALLATION: In accordance with listee's printed installation instruction, applicable codes and ordinances and in a manner acceptable to the authority having jurisdiction.

MARKING: Listee's name, model number, rating, and UL label.

APPROVAL: Listed as remote booster power supplies for use with listee's separately listed compatible fire alarm control units to extend the notification appliance circuit. Refer to listee's Installation Instruction Manual for details.

NOTE: Formerly 7300-1591:229

7-29-10 ma



This listing is based upon technical data submitted by the applicant. CSFM Fire Engineering staff has reviewed the test results and/or other data but does not make an independent verification of any claims. This listing is not an endorsement or recommendation of the item listed. This listing should not be used to verify correct operational requirements or installation criteria. Refer to listee's data sheet, installation instructions and/or other

Date Issued: **July 01, 2017**

Listing Expires **June 30, 2018**

Authorized By: **DAVID CASTILLO**, Program Coordinator
Fire Engineering Division

Intelligent Duct Smoke Detector

SIGA-SD



Overview

The Edwards *SuperDuct* Signature Series smoke detector is the most advanced and most reliable device in its class. Designed for easy installation and superb reliability, *SuperDuct* represents the perfect balance of practical design and advanced technology.

SuperDuct detectors feature a unique design that speeds installation and simplifies maintenance. Removable dust filters, conformally coated circuit boards, and optional water-resistant gaskets keep contaminants away from components, ensuring years of trouble-free service. When cleaning is required, the assemblies come apart easily and snap back together in seconds.

A Signature Series photoelectric sensor is incorporated into the design of each SIGA-SD duct smoke detector. This sensor inherits the power and benefits of this exceptional line of intelligent devices.

Signature Series sensors gather analog information from their smoke sensing elements and convert it into digital signals. The sensor measures and analyses these signals and compares the information to historical readings and time patterns to make an alarm decision. Digital filters remove signal patterns that are not typical of fires, which virtually eliminates unwanted alarms.

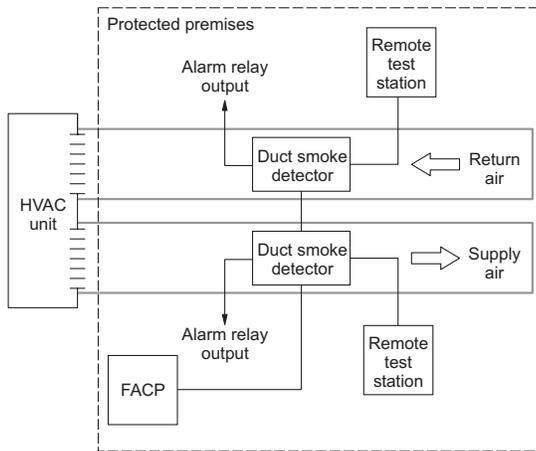
WARNING: Duct detectors have specific limitations. Duct detectors are not a substitute for an open area smoke detector. Duct detectors are not a substitute for early warning detection or a replacement for a building's regular fire detection system. Smoke detectors are not designed to detect toxic gases which can build up to hazardous levels in some fires. These devices will not operate without electrical power. As fires frequently cause power interruptions, Edwards suggests you discuss further safeguards with your local fire protection specialist.

Standard Features

- Less than 2" deep for easy installation and applications where space is tight
- -4°F to 158°F (-20°C to 70°C) operating range with 100 ft/min. to 4,000 ft/min air velocity rating assures reliability under harsh environmental conditions
- Status LEDs remain visible through clear assembly cover
- Cover monitor switch for added security
- Standard sampling tube spacing for easy drop-in migration from other detectors
- Sampling tube can be installed with or without the cover in place and can be rotated in 45-degree increments to ensure proper alignment with duct airflow
- 15.2 to 19.95 Vdc operation
- Magnet-activated test switch
- One Form C auxiliary alarm relay for controlling ancillary equipment (e.g., HVAC controls)
- No special tools required for easy access to field connections
- Signature Series intelligence
- Environmental compensation with differential sensing for reliable, stable, and drift-free sensitivity
- Wide 0.79% to 2.46% obscuration/ft. smoke sensitivity
- Identification of dirty or defective detectors

Application

SuperDuct detectors are ideally suited to duct smoke detection applications where early indication of combustion is required within the confined space of ventilation ductwork. Its primary purpose is to provide early warning of an impending fire and to prevent smoke from circulating throughout the building. It is typically used to detect smoke in the supply side of the HVAC system but can provide supervision of the return side as well.



SuperDuct detectors continually sample air flow in the HVAC duct and initiate an alarm condition whenever smoke is detected. An alarm is activated when the quantity (percent obscuration) of combustion products in that air sample exceeds the detector's sensitivity setting.

Signature Series Intelligence

Like all Signature detectors, the SIGA-SD features electronic addressing and issues a dirty sensor warning when it reaches its preset limit. The dirty sensor warning indicates the sensor is operating within its specified limits but is in need of servicing. When the detector's ability to compensate for environmental changes has reached its limit, the duct smoke detector signals a trouble condition.

The SIGA-SD also uses differential sensing to prevent gradual environmental changes from triggering unwanted alarms. A rapid change in environmental conditions, such as smoke from a fire, causes the detector to signal an alarm state, but dust and debris accumulated over time does not change alarm sensitivity.

Each Signature Series *SuperDuct* detector contains a microprocessor that performs comprehensive self-diagnostics and stores the results in nonvolatile memory. Stored results include details such as hours of operation, last maintenance date, and number of alarms and troubles. This information can be retrieved and reviewed when desired.

Detector Configuration

The detector assembly cover provides easy access to the smoke sensor, its wiring connections, sample and exhaust tubes, and the smoke chamber itself.

Air enters the detector's sensing chamber through a sampling tube (ordered separately) that extends into the duct and is directed back into the ventilation system through an exhaust tube (included). The difference in air pressure between the two tubes pulls the sampled air through the sensing chamber. When a sufficient amount of smoke is detected in the sensing chamber, the detector initiates an alarm.

The sampling tube may be installed from either the duct side of the assembly or from inside the sensor compartment, as preferred by the installer. (The exhaust tube must be installed from the duct side.) Sampling tubes may be rotated in 45-degree increments so that air-holes can be aligned to allow the unit to be mounted at virtually any angle relative to the air flow.

In installations where the duct smoke detector's controls and indicators are hidden from view, a remote test station or an LED indicator can be connected to the detector to provide these functions.

Remote Test Stations

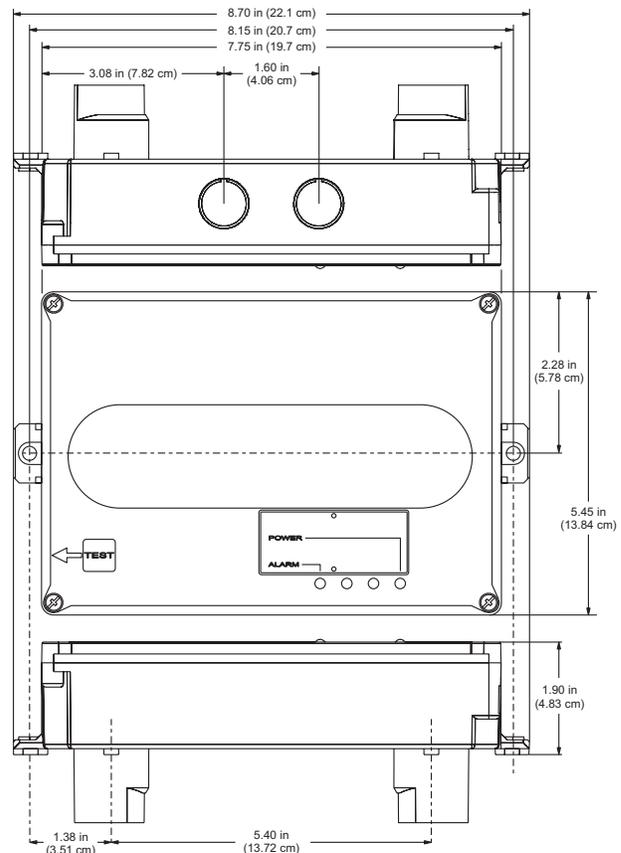


Labor-saving Remote Test/Reset stations provide alarm testing from the convenience of a remote location. Tests can be performed quickly and safely – without having to climb to the roof. Magnetically-operated and key-operated one-gang models are available. Signature *SuperDuct* detectors are also compatible with SIGA-LED remote alarm LED.

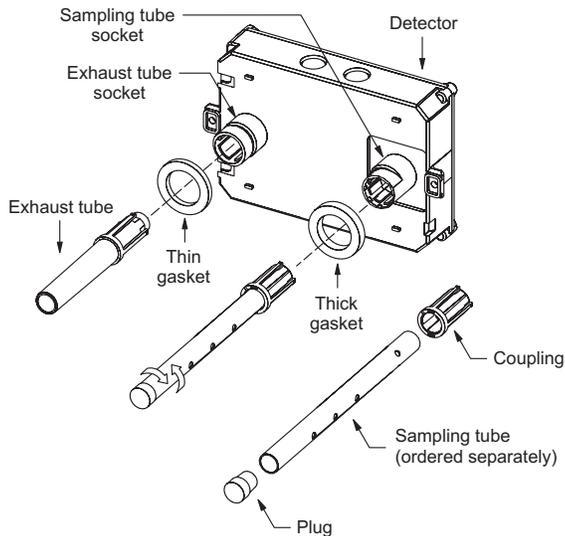
Air velocity in the duct as low as 100 ft/min. maintains adequate air flow into the sensor smoke chamber through air holes in the air sampling tube and discharges through the exhaust tube. *SuperDuct* air sampling tubes must be installed with the inlet holes facing the airstream. Sampling tubes may be rotated in 45-degree increments so that air-holes can be aligned to allow the unit to be mounted in virtually any angle relative to the airflow.

SuperDuct sensors are engineered to operate optimally under the harsh environmental conditions frequently found in HVAC ductwork. Nonetheless, before installing the detector, test the duct air velocity, temperature, and humidity to verify that it is within the operating range of the *SuperDuct* detector. Consult the *SuperDuct* installation sheet for details.

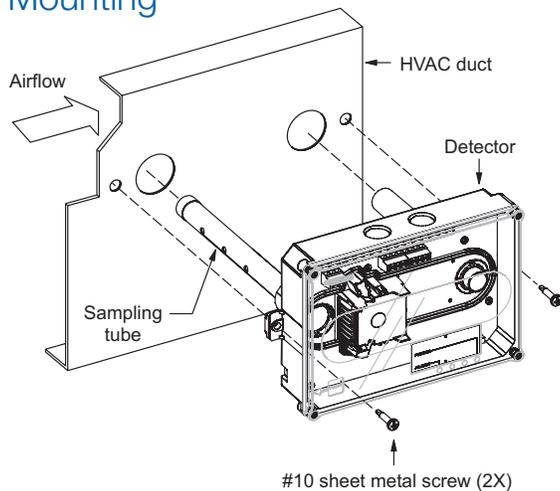
Dimensions



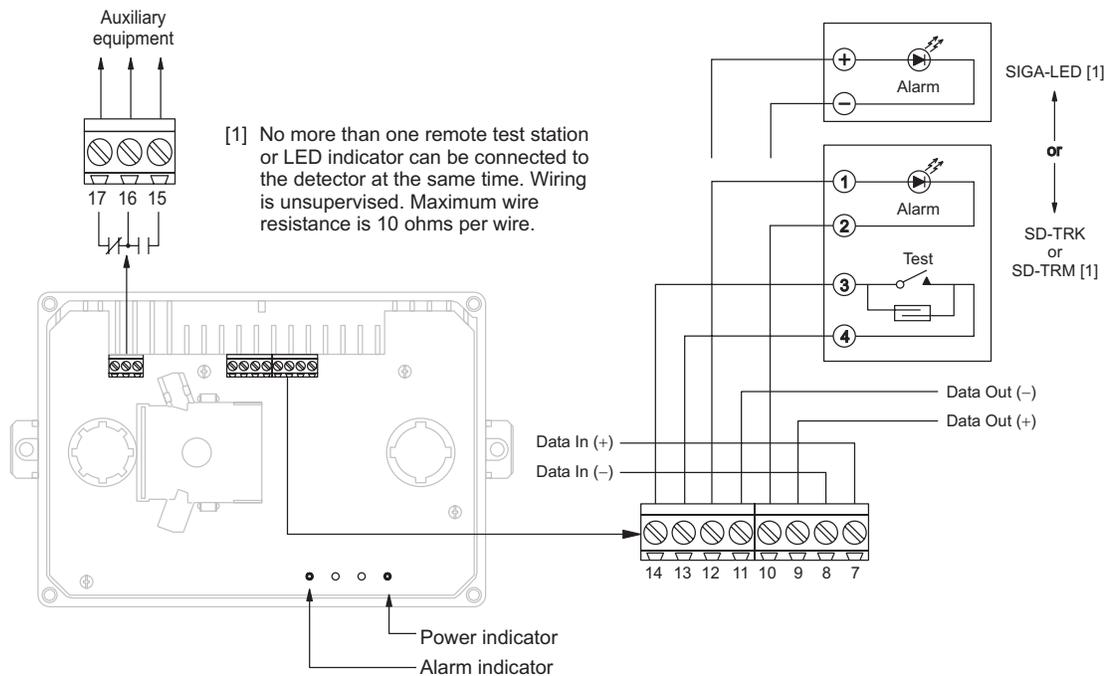
Assembly



Mounting

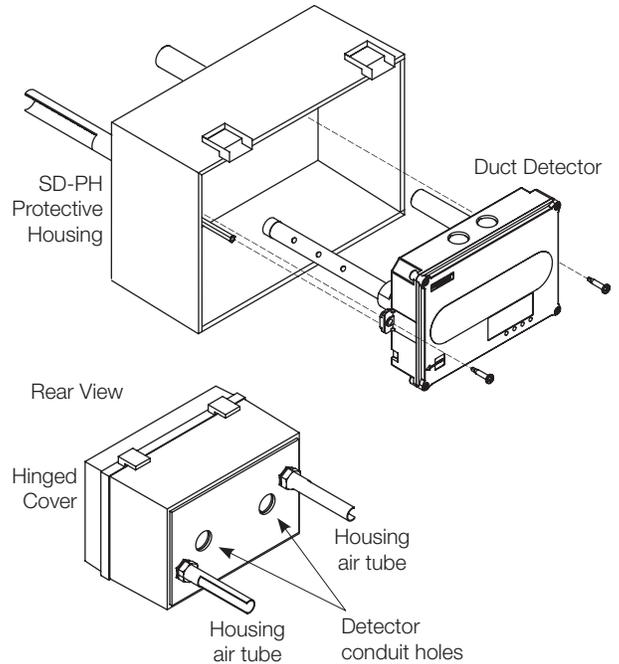


Wiring



High-humidity environments

Use the SD-PH Protective Housing when installing SuperDuct detectors in high-humidity environments. The SD-PH is a weatherized housing that prevents condensation on the device by insulating the detectors and providing circulated air from the monitored HVAC duct. The SD-PH also adds a layer of protection against physical damage to the unit.



The SD-PH is easy to install and service. The hinged and transparent cover provides ready access to the detector, while keeping its status indicators visible at all times.

Note: The SD-PH Protective Housing is weatherized against outdoor air, but it is not intended for direct outdoor exposure.



Contact us...

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 Web: www.est-fire.com

EST is an **EDWARDS** brand.
 1016 Corporate Park Drive
 Mebane, NC 27302

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 Email: inquiries@chubbedwards.com
 Web: www.chubbedwards.com

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Specifications, detector

Dimensions	8.70 x 5.45 x 1.90 inches (221 x 138 x 48 mm)
Wire size	14 to 22 AWG
Detection method	Photoelectric (light scattering principle)
Air velocity rating	100 to 4,000 ft/min and meets the required minimum air pressure differential
Air pressure differential	0.005 to 1.00 inches of water
Sensitivity	0.79 to 2.46 %/ft obscuration
Alarm test response time	5 seconds
LED indicators	Alarm (red), Power (green)
Common alarm relay	Unsupervised and power-limited Quantity: 1 Type: Form C Ratings: 2.0 A at 30 Vdc (resistive)
Operating voltage	15.2 to 19.95 Vdc
Operating current	Standby: 45 µA Alarm: 45 µA Inrush: 1 mA Standalone alarm: 18 mA
Operating environment	Temperature (UL): -4 to 158 °F (-29 to 70 °C). Temperature (ULC): -4 to 120 °F (-29 to 49 °C) Relative humidity: 10 to 93%, noncondensing
Agency listings	UL, ULC, CSFM, FM, MEA

Specifications, test stations

Remote Test/Reset Stations provide alarm test, trouble indication, and reset capability from a remote location. They include a one-gang plate, momentary SPST switch, red alarm LED, and terminal block. Magnetically-operated models (TRM) or key-operated models (TRK) are available.

Compatible electrical boxes	North American 1-gang box Standard 4-in square box, 1-1/2 inches deep, with 1-gang cover
LED indicators	Alarm (red)
LED type	Clear lens
Wire size	14 to 22 AWG
Resistance per wire	10 Ohms, max.
Current requirements	See controller specifications
LED circuit ratings	Voltage: 3 Vdc, max. Current: 30 mA, max.
Switch ratings (SD-TRK)	Voltage: 125 Vdc, max. Current: 4 A, max.
Switch ratings (SD-TRM)	Voltage: 200 Vdc, max. Current: 0.5 A, max.
Compatible detectors	SuperDuct conventional two-wire and Signature duct smoke detectors
Operating environment	-4°F to 158°F (-20°C to 70°C) Humidity: 93% RH, noncondensing
Storage temperature	-4 to 140 °F (-20 to 60 °C)
Agency listings	UL, ULC, MEA, CSFM

Ordering Information

Catalog Number	Description	Ship Wt., lb. (kg)
SIGA-SD	Intelligent SuperDuct Detector	2.4 (1.1)
Accessories		
SD-T8	8-inch sampling tube	0.5 (0.2)
SD-T18	18-inch sampling tube	1.5 (0.7)
SD-T24	24-inch sampling tube	2.7 (1.2)
SD-T36	36-inch sampling tube	3.0 (1.4)
SD-T42	42-inch sampling tube	3.5 (1.6)
SD-T60	60-inch sampling tube	5.8 (2.6)
SD-T78	78-inch sampling tube	7.5 (3.4)
SD-T120	120-inch sampling tube	11.5 (5.2)
SD-PH	Protective housing for high humidity environments	5.5 (2.5)
SIGA-LED	Remote alarm LED	1.0 (0.5)
SD-TRM	Remote test station, magnetic	1.0 (0.5)
SD-TRK	Remote test station, keyed	1.0 (0.5)
SD-VTK	Air velocity test kit (stoppers only, etc)	1.0 (0.5)
SD-GSK	Cover gasket kit	0.5 (0.2)
SD-MAG	Test magnet kit	0.5 (0.2)
SIGA-SDPCB	Replacement PCB/Signature sensor kit	1.0 (0.5)

CALIFORNIA DEPARTMENT OF FORESTRY & FIRE PROTECTION
OFFICE OF THE STATE FIRE MARSHAL
FIRE ENGINEERING - BUILDING MATERIALS LISTING PROGRAM



LISTING SERVICE

LISTING No. 3242-1657:0223 Page 1 of 1

CATEGORY: 3242 -- DUCT SMOKE DETECTOR, PHOTO. (W/ OR W/O BASE)

LISTEE: EDWARDS, A Division of UTC Fire & Security Americas Corporation, Inc. 8985 Town Center Parkway, Bradenton, FL 34202
Contact: Jewell Conover (941) 739-4358 Fax (941) 308-8123
Email: rhonda.conover@fs.utc.com

DESIGN: Models ESD-SJ, ESD-ST, TSD-SJ, TSD-ST, TSD-SJG, TSD-SJCO2, TSD-STCO2, SIGA-SD, SD-2W, ESD-2W, E-PDD, and FX-PDD photoelectric type duct smoke detectors. The duct detector consists of a thermoplastic enclosure, recognized component printed wiring board, a listed duct detector subassembly, and an inlet coupling tube and an exhaust tube along with gaskets. Refer to listee's data sheet for additional detailed product description and operational considerations.

RATING: 15.2-19.95 VDC
16-30 VDC: SD-2W, ESD-2W

INSTALLATION: In accordance with listee's printed installation instructions and applicable codes and ordinances and in a manner acceptable to the authority having jurisdiction.

MARKING: Listee's name, model number, electrical rating, and UL label.

APPROVAL: Listed as photoelectric type, duct smoke detectors for use with separately listed compatible fire alarm control units in conjunction with Models ESD-CJ, -CT or TSD-CJ, -CT series duct smoke detector controller (CSFM Listing No. 3240-1657:225). Models SIGA-SD, E-PDD, FX-PDD, SD-2W or ESD-2W does not require a listed duct smoke detector controller. Suitable for use in ducts where air velocity is between 100 and 4000 ft/min.

*Models ESD-SJ, ESD-ST, TSD-SJ, TSD-SJG, TSD-SJCO2, SIGA-SD, SD-2W and ESD-2W are suitable for use in ambient temperatures of -4°F to 158°F.

Refer to listee's Installation Instruction Manual for details.

NOTE:

1. CO2 sensing features were not examined.
2. Formerly 3242-1591:223

*Corrected 3-22-13 BH



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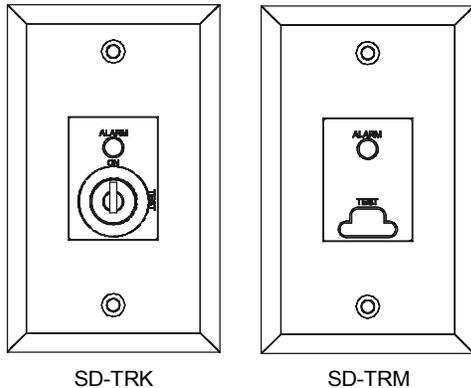
Date Issued: **July 01, 2017**

Listing Expires **June 30, 2018**

Authorized By: **DAVID CASTILLO, Program Coordinator**
Fire Engineering Division

SD-TRK, SD-TRM Remote Test Stations

Product description



The SD-TRK and SD-TRM remote test stations are used with SuperDuct series of conventional two-wire and Signature duct smoke detectors. Each remote test station provides a red LED to indicate alarms. The SD-TRK requires a key to activate the test function while the SD-TRM requires the SD-MAG magnetic test tool (ordered separately).

For operating instructions, refer to the following documentation:

- *SuperDuct Conventional Two-Wire Duct Smoke Detector Technical Reference (P/N 3100737)*
- *SuperDuct Signature Duct Smoke Detector Technical Reference (P/N 3100738)*

Specifications

Compatible electrical boxes
 North American 1-gang box
 Standard 4-in square box, 1-1/2 inches deep, with 1-gang cover

LED indicators: Alarm (red)

LED type: Clear lens

Wire size: 12 to 22 AWG

Resistance per wire: 10 Ω , max.

Current requirements: Included in controller specification

LED circuit ratings

Voltage: 3 Vdc, max.

Current: 30 mA, max.

Switch ratings (SD-TRK)

Voltage: 125 Vdc, max.

Current: 4 A, max.

Switch ratings (SD-TRM)

Voltage: 200 Vdc, max.

Current: 0.5 A, max.

Compatible detectors: SuperDuct conventional two-wire and Signature duct smoke detectors

Operating environment

Temperature: 0 to 55 °C (32 to 131 °F)

Humidity: 93% RH, noncondensing

Storage temperature: -20 to 60 °C (-4 to 140 °F)

Installation instructions

Mount the remote test/reset station on a single gang box as shown in Figure 1.

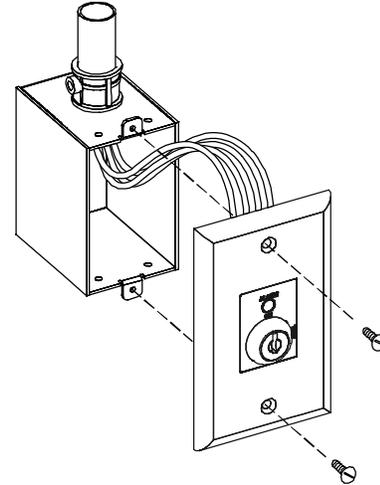


Figure 1: Installation diagram

Wiring diagram

Wire the remote test station to the duct smoke detector as shown in Figure 2.

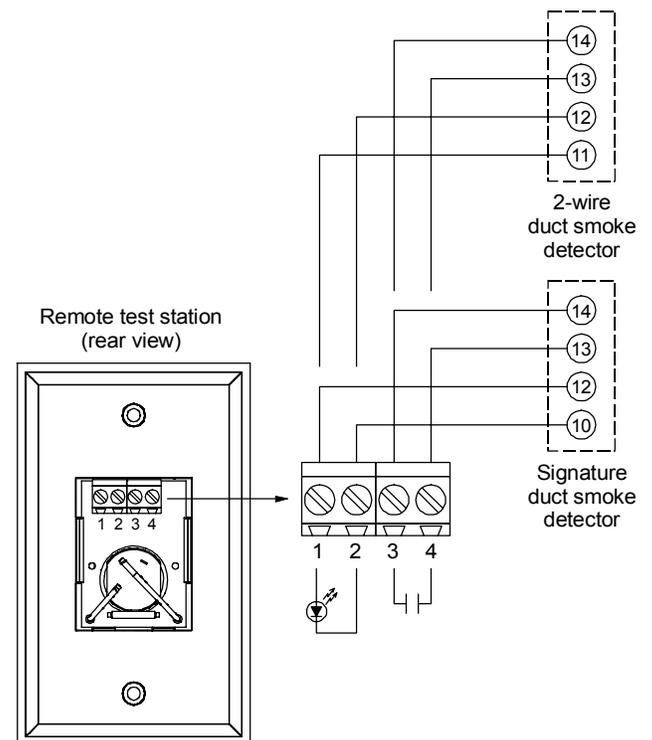


Figure 2: Wiring diagram

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FIRE ENGINEERING - BUILDING MATERIALS LISTING PROGRAM



LISTING SERVICE

LISTING No. 7300-1657:0226 Page 1 of 1

CATEGORY: 7300 -- FIRE ALARM CONTROL UNIT ACCESSORIES/MISC. DEVICES

LISTEE: EDWARDS, A Division of UTC Fire & Security Americas Corporation, Inc. 8985 Town Center Parkway, Bradenton, FL 34202
Contact: Jewell Conover (941) 739-4358 Fax (941) 308-8123
Email: rhonda.conover@fs.utc.com

DESIGN: Models SD-TRK, SD-TRM, SD-TRK4 and SD-TRM4 remote test/retest station. Refer to listee's data sheet for additional detailed product description and operational considerations.

INSTALLATION: In accordance with listee's printed installation instructions, applicable codes & ordinances and in manner acceptable to the authority having jurisdiction.

MARKING: Listee's name or Telaire, model number, electrical rating, and UL label.

APPROVAL: Listed as remote test/retest station for use with listee's separately listed duct smoke detector controller subassemblies (CSFM Listing No. 3240-1657:225). Models SD-TRK4 and SD-TRM4 are for use with Models ESD-CJ, -CT or TSD-CJ, -CT series: Models Models SD-TRK and SD-TRM are for use only with Models SIGA-SD, *ESD-2W and *SD-2W. For indoor use only. Refer to listee's Installation Instruction Manual for details.

NOTE: Formerly 7300-1591:226

7-29-10 ma



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Date Issued: **July 01, 2017**

Listing Expires **June 30, 2018**

Authorized By: **DAVID CASTILLO, Program Coordinator**
Fire Engineering Division

**NO
EXCUSES!**

SIGNALING



FIRE ALARM DOCUMENTS

The FAD is the perfect fit to meet the demanding code requirements today. SAE's number one goal is to manufacture code compliant solutions and this product allows you to do just that. NFPA 72 2007 section 6.2.2.1 states, "A record of installed software and firmware version numbers shall be maintained at the location of the fire alarm control unit."

This durable 16 gauge steel enclosure with a solid piano hinge and key lock will keep all of your code required documents in one safe place. With a 4GB USB flash drive it stores your fire alarm software safe and secure eliminating the occurrences of the software not being on site when technicians arrive to service the system. Along with your fire alarm software you can store your test & inspection documents, service records, manuals & AS built drawings for the system. Using a standard USB B connector it allows you to plug in with any standard SB printer cable to upload or download information.

The FDB is designed to hold critical manuals and documents with a durable steel retainer. It has designated hooks to organize key rings and hold important business cards for easy access and reference. Inside the cover it has a organized note table that allows for documentation for passwords and other critical system information.

Standard Features:

- Installed with a 4 gig digital flash drive with USB B connector
- 2 Key ring hooks to hold system keys
- Business card holder for key contacts
- Overall Dimensions are 12" x 13" tall and 2 ¼ deep
- 16 gauge steel box and cover for security
- Durable powercoat baked on finish other colors available
- Standard ¾" cat 30 key lock other lock assemblies available
- Solid stainless steel piano hinge
- Permanently screened white ink 1" high "Fire Alarm Documents"
- Legend sheet for passwords and system information



**ISO 9001
REGISTERED
COMPANY**

ACEBOX

Space Age Electronics, Inc.
www.1sae.com
800.486.1723 Toll Free
508.485.0966 Local
508.485.4740 Fax

Specifications:

The fire alarm documents box (FAD) shall be UL Listed, constructed of 18 gauge cold rolled steel. It shall have a red powder coat epoxy finish. The cover shall be permanently screened with 1" high lettering "FIRE ALARM DOCUMENTS" with white indelible ink. The access door shall be locked with a 3/4" barrel lock and the hinge shall be a solid width 12" stainless steel piano hinge. The enclosure will supply 4 mounting holes. Inside the enclosure will accommodate standard 8 1/2 x 11 manuals and loose document records that will be protected within the enclosure. A legend sheet will be permanently attached to the door for system required documentation, key contacts and system information. The FAD will have securely mounted inside a minimum of 4 Gigabyte digital flash memory drive with a standard USB B connector for uploading and downloading information. The drive shall not be accessible without tools to any person whom gains access to the records. The enclosure shall also provide 2 key ring holders with a location to mount standard business type cards for key contact personnel.



USB Storage Interface
Requires Standard USB-B
Connector

Key Ring
Hooks

Business
Card Holder

For replacement forms order PIN: EA0316 (Qty. 10)

Property Information	Minimum Required Documentation (SIG-FUN) (Reference NFPA-72 2013 Section 7.2.1)
Name of property: _____	1 Written narrative providing intent and system description □ NA □ Enclosed □ All Location
Address: _____	2 Riser diagram □ NA □ Enclosed □ All Location
Description of property: _____	3 Floor plan layout showing location of all devices and control equipment □ NA □ Enclosed □ All Location
Occupancy type: _____	4 Sequence of operation in either an input/output matrix or narrative form □ NA □ Enclosed □ All Location
Certifications and Approvals	
16.1 System Installation Contractor: This system, as specified herein, has been installed and tested according to all NFPA standards cited herein.	
Signed: _____	5 Equipment technical data sheets □ NA □ Enclosed □ All Location
Date: ____/____/____	6 Manufacturers published instructions, including operation and maintenance instruction □ NA □ Enclosed □ All Location
Organization: _____	7 Battery calculations (where batteries are provided) □ NA □ Enclosed □ All Location
Title: _____	8 Voltage drop calculations for notification appliance circuits □ NA □ Enclosed □ All Location
Phone: _____	9 Completed record of inspection and testing in accordance with 7.6.6 and 7.8.2 □ NA □ Enclosed □ All Location
16.5 Authority Having Jurisdiction: I have witnessed a satisfactory acceptance test of this system and find it to be installed and operating properly in accordance with its approved plans and specifications, with its approved sequence of operations, and with all NFPA standards cited herein.	
Signed: _____	10 Completed record of completion in accordance with 7.5.6 and 7.8.2 □ NA □ Enclosed □ All Location
Date: ____/____/____	11 Copy of site specific software, where applicable □ NA □ Enclosed □ All Location
Organization: _____	12 Record (as built) drawings □ NA □ Enclosed □ All Location
Title: _____	13 Periodic inspection, testing, and maintenance documentation in accordance with Section 7.6 □ NA □ Enclosed □ All Location
Phone: _____	14 Records, record retention, and record maintenance in accordance with 7.7 □ NA □ Enclosed □ All Location
Equipment Information	
ID No 1: _____	Signed: _____ Date: ____/____/____
Serial: _____	
Access code: _____	
ID No 2: _____	
Serial: _____	
Access code: _____	

Space Age Electronics, Inc. 58 Chocksett Road Sterling, MA 01564 800-486-1723 www.1sae.com LT10644 Rev. 1

Legend sheet for storing system information including contacts, sign-off, maintenance & test information, and alternate locations of additional records.

Ordering Information:

Part # Description

➔ **SSU00685 Fire Alarm Storage Cabinet RED**

SSU00686 Custom screening with your Logo

Check out our Infinity line eFAD single gang 2 Gig digital storage solutions (IAMEFAD)



Space Age Electronics, Inc.
www.1sae.com
800.486.1723 Toll Free
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508.485.4740 Fax

No Excuses, Just Solutions!

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CALIFORNIA DEPARTMENT OF FORESTRY & FIRE PROTECTION
OFFICE OF THE STATE FIRE MARSHAL
FIRE ENGINEERING - BUILDING MATERIALS LISTING PROGRAM



LISTING SERVICE

LISTING No. 7300-0553:0110 Page 1 of 1

CATEGORY: 7300 -- FIRE ALARM CONTROL UNIT ACCESSORIES/MISC. DEVICES

LISTEE: SPACE AGE ELECTRONICS 58 Chockett Road, Sterling, MA 01564
Contact: Robert Scholl (508) 485-0966 Fax (508) 485-4740
Email: bobs@1sae.com

DESIGN: Models TC2-32, TC1-18, TCX/A 64, TCX/D 128, ACE/A, AC2, ACE/D, IF-2, IF1, IFX/A and IFX/D enclosures. Models ACE-11, ACE-12 and ACE-13, *ACE2424, *ACE 3036, *ACE 2436, *ACE 3048 document cabinets. Refer to listee's data sheet for detailed product description and operational considerations.

INSTALLATION: In accordance with listee's printed installation instructions, applicable codes and ordinances and in a manner acceptable to the authority having jurisdiction.

MARKING: Listee's name, model number and UL label.

APPROVAL: Listed as fire alarm equipment enclosures and document cabinets for use with listee's fire alarm equipment. Refer to listee's Installation Instruction Manual for details.

02-09-16 dc



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Date Issued: **July 01, 2017**

Listing Expires **June 30, 2018**

Authorized By: **DAVID CASTILLO**, Program Coordinator
Fire Engineering Division

SECTION 321216 ASPHALT PAVING

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Submittals: Product Data and hot-mix asphalt design mixes.
- B. Regulatory Requirements: Comply with requirements of Section 39 of the State Standard Specifications.
- C. Asphalt-Paving Publication: Comply with AI MS-22, "Construction of Hot Mix Asphalt Pavements," unless more stringent requirements are indicated.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Hot-Mix Asphalt: Dense, hot-laid, Type A hot-mix asphalt plant mixes conforming to the provisions of Section 39 of the State Standard Specifications.
 - 1. Base and Surface Course: ½" maximum medium aggregate.
- B. Tack Coat: **ASTM D 977** emulsified asphalt, or **ASTM D 2397** cationic emulsified asphalt, slow setting, diluted in water, of suitable grade and consistency for application.
- C. Pavement-Marking Paint: MPI #32 alkyd traffic marking paint.
 - 1. Color: As indicated.
- D. Pavement-Marking Paint: MPI #97 latex traffic marking paint.
 - 1. Color: As indicated.
- E. Wheel Stops: Precast, air-entrained concrete, 2500-psi (17.2-MPa) minimum compressive strength, **4-1/2 inches (115 mm) high by 9 inches (225 mm) wide by 48 inches (1200 mm) long**. Provide chamfered corners and drainage slots on underside and holes for anchoring to substrate.

PART 3 - EXECUTION

3.1 PAVING

- A. Tack coat existing asphalt or concrete surfaces and allow tack coat to cure undisturbed.
- B. Place hot-mix asphalt to required grade, cross section, and thickness. Promptly correct surface irregularities in paving course.
 - 1. Spread mix at minimum temperature of 250 deg F (121 deg C).
- C. Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or vibratory-plate compactors in areas inaccessible to rollers. Complete compaction before mix temperature cools to 185 deg F (85 deg C).
- D. Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness.
- E. Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to 92 percent of reference maximum theoretical density according to ASTM D 2041.
- F. Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.
- G. While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.
- H. Remove and restore paved areas that are defective or contaminated.
- I. Allow paving to age for 30 days before starting pavement marking.
- J. Apply pavement-marking paint with mechanical equipment to a minimum wet film thickness of 15 mils (0.4 mm).
- K. Install wheel stops in bed of adhesive as recommended by manufacturer.
- L. Securely attach wheel stops into pavement with two galvanized-steel dowels.

END OF SECTION _____

SECTION 321723 PAVEMENT MARKING

PART 1 - GENERAL

1.1 SUMMARY:

- A. Provide requirements for materials, fabrications, and installation of traffic control and pavement markings.

1.2 SUBMITTALS

- A. Submit manufacturers product data describing application of products and compliance with the VOC requirements.
- B. Shop drawings: Show complete layout and location of pavement markings prior to demolition or obliteration of the existing markings.
- C. Submit samples as follows:
 - 1. Traffic paint
 - 2. Pavement markers and adhesives
 - 3. Reflectorized markers and posts

1.3 DELIVERY, STORAGE AND HANDLING

- A. Comply with Division 1 requirements, specifications, and the construction manager.
- B. Deliver in-store package products in original containers with seals unbroken in labels intact until time of installation.
- C. Provide proper facilities for handling and storage of products to prevent damage. Where necessary, stack products off ground on global platform, fully protected from weather.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Traffic marking and symbol paint: Waterborne, fast dry, traffic paint distributed by Fuller- O'Brien Corporation DJ Simpson (#108-273, white); (#108-280, blue); or approved equal.
- B. Handicapped Symbol background paint: Blue color. Glidden Company, "Glid-Guard Lifemaster finish no. 5200/series, color 1/M 79" or approved equal.

- C. Thermoplastic stripes and markings:
 - 1. Thermoplastic stripes and markings shall be hot applied conforming to CSS Section 84 and shall be Cataphote-Catatherm brand, Pavemark thermoplastic brand, or equal.
 - 2. Thermoplastic stripes and markings shall have a minimum skin friction value of BPN 35.
- D. Pavement markers and adhesives:
 - 1. Pavement markers shall be two-way reflective "blue" markers and shall conform to applicable requirements of CSS section 85.
 - 2. Adhesive for pavement markers shall be standard set epoxy adhesive conforming to the requirements of CSS section 95–2.05.

PART 3 - EXECUTION

3.1 INSPECTION:

- A. Examine receiving surfaces and verify that surfaces are clean and proper for installation.
- B. Do not start work until unsatisfactory conditions have been corrected.

3.2 APPLICATION

- A. Preparation:
 - 1. Clean and prepare surfaces to receive traffic paint in accordance with CSS section 84–3.05 in the special provisions. Where required, remove existing striping and markings by wet blasting or equivalent method. Do not use dry sandblasting or other dust producing methods.
- B. Traffic Paint:
 - 1. Traffic paint shall be machine applied in accordance with CSS section 84–3.04. Two coats of traffic paint shall be applied for all painted traffic stripes and markings.
- C. Striping Layout:
 - 1. Traffic stripe shall be a single and double, solid and broken, and of the color to match existing conditions.
 - 2. Traffic stripe shall be placed in patterns to match existing conditions, contractor shall document.
- D. Thermoplastic Stripes and Markings:
 - 1. Thermoplastic stripes and markings shall be applied hot in conformance with manufacturer's recommended instructions and the application requirements of CSS section 84–2.06.

- E. Pavement Markers:
 - 1. Pavement markers shall be installed to delineate the location of fire hydrants where indicated on the drawings. No marker shall be installed until the surface has been approved by the architect and engineer and at least 10 days after the slurry seal on asphalt concrete has been placed. Place markers in accordance with CSS section 85–1.06.
- F. Apply marking paint in accordance with approved manufacturer's recommendations.
- G. Density of paint coverage shall hide color and texture of substrate.
- H. Parking Stripes: Paint four inch wide unless otherwise noted.
- I. Symbol Marking: Paint to match existing conditions.

3.3 CLEANING AND PROTECTION

- A. Comply with requirements of Division one of these specifications.
- B. Upon completion of work, remove surplus materials and rubbish and clean off spilled words splattered paint resulting from this work.
- C. Prohibit traffic until all pavement markings and symbols have thoroughly dried.

END OF SECTION _____