

PROJECT MANUAL

California Department of Corrections and Rehabilitation

California State Prison – Corcoran (COR)

24-014 Facility III A Kitchen Repairs

September 20, 2024



GOVmotus Permit Application Number: 24-S-3165-C



CDCR Architecture & Engineering
24-014

California State Prison Corcoran
Kitchen III Facility Repairs

**SECTION 01 25 00
SUBSTITUTION PROCEDURES**

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Definitions.
 - 2. Substitution Submittal Procedures.
 - 3. Substitution Construction Procedures.
 - 4. Notice of Request for Substitution.
- B. Related Sections:
 - 1. Section 01 33 00 – Submittal Procedures.
 - 2. Section 01 33 23 – Shop Drawing, Product Data, Samples.
- C. SUBSTITUTION SUBMITTALS: Submit in writing,. Notice of Request for Substitution must include complete data substantiating compliance of proposed substitution with Contract.
- D. Substitution requires written concurrence by CDCR Representative prior to use in the Project.
- E. A Substitution request constitutes a representation that the Contractor:
 - 1. Has investigated proposed substitution and determined that it meets or exceeds the quality level required to achieve operating efficiency and effectiveness of the specified material, product, thing, or service, and is otherwise equal or superior in all respects, including aesthetics, to that specified or otherwise indicated in Contract Documents.
 - 2. Will provide the same warranty for the substitution as for the specified material, product, thing, or service.
 - 3. Will coordinate installation and make changes to other Work which may be required for the Work to be compatible with substrates and adjacent materials, and complete in all respects with no additional cost to the State.
 - 4. Waives claims for additional costs or time extension which may subsequently become apparent.
- F. Substitution requests must include a statement indicating the substitution's effect on the Construction Schedule. Indicate the effect of the proposed substitution on overall Contract Time and, as applicable, on completion of portions of the Work for use by CDCR or for work under separate contracts by CDCR.
- G. Substitution Submittal Procedure:
 - 1. Limit each request to one proposed substitution.
 - 2. Submit shop drawings, product data, and certified test results attesting to the proposed equivalence.
 - 3. CDCR Representative will notify Contractor, in writing, of decision to approve or reject request.
- H. If Notice of Request for Substitution is approved, submit required submittals under provisions of Sections 01 33 00 – Submittal Procedures and 01 33 23 – Shop Drawings, Product Data, and Samples.

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- I. If Notice of Request for Substitution is rejected or not approved, use item specified or otherwise indicated in Contract Documents. Submit required submittals under provisions of Sections 01 33 00 – Submittal Procedures and 01 33 23 – Shop Drawings, Product Data, and Samples.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.1 INSTALLATION PROCEDURES

- A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitution at no additional cost to the State.

END OF SECTION

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SECTION 01 25 00 – ATTACHMENT A

NOTICE OF REQUEST FOR SUBSTITUTION

Substitution Request No.: _____

In accordance with the Conditions of the Contract and the provisions of Section 01 25 00, we hereby submit for consideration, this Notice of Request for Substitution for the following material, product, thing, or service:

Section	Paragraph	Specified Item
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Proposed Substitution: _____

The following supporting information is attached:

- ☐ Product Data including model numbers and descriptions.
- ☐ Certified test results attesting to equivalence.
- ☐ Product/material samples.
- ☐ Other: _____

Reason for proposed substitution:

- ☐ Specified or indicated item is unavailable.
- ☐ Significant cost reduction. Actual dollar savings to the State if substitution is accepted: \$ _____
- ☐ Significant quality difference without cost change.
- ☐ Other: _____

Submitted and Certified By:

CONTRACTOR:

_____ Signature	_____ Date
_____ Name (Print)	_____ Title
_____ Firm Name	
_____ Address	_____ Phone
_____ City, State, Zip	_____ FAX

Received: _____
Date _____ CDCR Representative _____

☐ Recommended: _____
☐ Rejected: _____ Date _____ Architect of Record

☐ Approved: _____
☐ Rejected: _____ Date _____ CDCR Project Director

END OF SECTION 01 25 00 – ATTACHMENT A

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**SECTION 01 25 00
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 - 3. Will coordinate installation and make changes to other Work which may be required for the Work to be compatible with substrates and adjacent materials, and complete in all respects with no additional cost to the State.
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- I. If Notice of Request for Substitution is rejected or not approved, use item specified or otherwise indicated in Contract Documents. Submit required submittals under provisions of Sections 01 33 00 – Submittal Procedures and 01 33 23 – Shop Drawings, Product Data, and Samples.

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- ☐ Other: _____

Submitted and Certified By:

CONTRACTOR:

_____ Signature	_____ Date
_____ Name (Print)	_____ Title
_____ Firm Name	
_____ Address	_____ Phone
_____ City, State, Zip	_____ FAX

Received: _____
Date _____ CDCR Representative _____

☐ Recommended: _____
☐ Rejected: _____ Date _____ Architect of Record

☐ Approved: _____
☐ Rejected: _____ Date _____ CDCR Project Director

END OF SECTION 01 25 00 – ATTACHMENT A

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SECTION 01 33 00

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Submittal Log.
 - 2. Submittal Procedures.
 - 3. Submittal Contents.
 - 4. Submittal Quantities and Format.
 - 5. Manufacturer's Instructions.
- B. Related Sections and Documents:
 - 1. Section 01 33 23 – Shop Drawings, Product Data, and Samples.

1.2 SUBMITTAL LOG

- A. Within 10 days after Notice to Proceed, Contractor must furnish to CDCR Representative, an electronic version and four printed copies of the Submittal Log. The CDCR Representative will review and approve the Submittal Log or return it with comments for correction or revision.
- B. Submittal Log must include all submittals required by the Contract Documents and include the following information for each of the Contractor's submittal packages:
 - 1. Specification Section number and title.
 - 2. Submittal Title / description of the Work covered.
 - 3. Name of responsible entity (Contractor, CDCR, Subcontractor, etc.).
 - 4. Submittal category (action or informational).
 - 5. Provide written signatures of subcontractors indicating their review and approval of Submittal Log dates and information for their submittals.
 - 6. Identify deferred submittals which must be reviewed by State departments other than CDCR and/or local regulatory agencies.
 - 7. Identify critical and near critical submittals
 - 8. Following additional information must also be included in Submittal Log:
 - a. Corresponding Contract Schedule Activity ID/number.
 - b. Contractor's scheduled date for submission of initial submittal package to CDCR Representative.
 - c. Contractor's scheduled dates required for review, re-submittals, and review of re-submittals (when applicable).
 - d. Identify procurement time in days, to procure items.
 - e. Corresponding Contract Schedule activity(s) dependent on the submittal approval.
- C. The approved Submittal Log must be updated on a weekly basis by the Contractor to reflect the current status of the submittals.
 - 1. Contractor must provide a minimum of four copies of the updated Submittal Log to the CDCR Representative at Weekly Contractor meetings.

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2. Contractor and CDCR Representative must jointly revise submittal log information to reflect actual submittals and correct dates which are not accurate.

1.3 SUBMITTAL PROCEDURES

- A. Provide submittals as required in the individual Section.
- B. Electronic submittals may be utilized by Contractor subject to the approval of the CDCR Representative. Contractor must assume responsibility for:
 1. Confirming Electronic format compatibility with all required reviewers.
 2. Providing all software; security; access and instructions/training/support required for use of any proprietary applications.
 3. Compliance with all other applicable requirements of this Section.
- C. Submittals not required will not be reviewed.
- D. Submittals must be in the English language and numerical data must be in the system of units used as shown and specified.
- E. Neither the review nor lack of review of any submittal will waive any of the requirements of the Contract or relieve the Contractor of any obligations hereunder.
- F. Make submittals promptly in accordance with the approved submittal log, and in such sequence as to cause no delay in the Work or in the work of any other contractor.
- G. Number submittals sequentially, using alphabetic suffixes on resubmittals.
- H. Each submittal must contain data representing only one specification Section.
- I. CDCR Representative will review and return submittals within 20 days after receipt thereof, or within 20 days after receipt of all information necessary for such review, whichever is later.
 1. Review status will be marked "No Exception Taken", "Make Corrections Noted", "Revise and Resubmit", "Rejected", or "Not Reviewed".
 2. Revise and resubmit within 15 days of return submittals marked "Revise and Resubmit" or "Rejected".
- J. Except as otherwise specified for substitutions in the General Conditions of the Contract for Construction, and for certain other items in this Section 01 33 00, make submissions no later than the number of days outlined below after the Start Date of the Work.
 1. Items needed in initial stages of Work or requiring long lead-time for ordering: 20 calendar days.
 2. Deferred Approval submittals, for review and approval by agencies such as OSFM: 30 calendar days.
 3. All other items: 60 calendar days.
- K. Regulatory Agency Submittals: Contractor must allow additional time for required regulatory agency submittal reviews and processing as follows:
 1. CDCR Fire and Life Safety (FLS) Peer Reviewer of the Office of State Fire Marshal (OSFM) deferred submittal(s):
 - a. Prepare OSFM submittal(s) per published requirements:

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<https://osfm.fire.ca.gov/divisions/fire-and-life-safety-division/plan-review-submittal-requirements-information/>.

- 1) Fire Suppression systems to comply with NFPA 13 as adopted by the OSFM, including but not limited to, water flow test within 6 months of submittal submission and structural engineer letter of compliance.
- 2) Fire Alarm systems to comply with NFPA 72 as adopted by the OSFM.
- 3) All other listed deferred submittals as defined in their respective specifications.
- b. Provide submittal to CDCR FLS Peer Reviewer for CDCR internal “triage” review. Allow 3 weeks for triage review process to include:
 - 1) Allow 1 week for review of OSFM submittal(s) by CDCR FLS Peer Reviewer.
 - 2) Allow 1 week for Contractor incorporation of CDCR FLS Peer Reviewer comments.
 - 3) Allow 1 week for CDCR FLS Peer Reviewer back-check of Contractor revised submittal.
 - 4) Submittals that do not pass triage review will be sent back to Contractor for additional incorporation of CDCR FLS Peer Reviewer comments. Any delays to Contract Milestones caused by such resubmittals are the fault of the Contractor.
 - 5) Once submittal meets requirements for OSFM review, CDCR FLS Peer Reviewer will authorize for submission to the OSFM and be deemed a quality submission.
2. Office of the State Fire Marshal review time for deferred submittals as follows:
 - a. Allow 14 weeks for OSFM initial review.
 - b. Allow 2 weeks for Contractor incorporation of SFM comments.
 - c. Allow 1 week for CDCR FLS Peer Review backcheck.
 - d. Allow 4 weeks for OSFM back-check and approval.
 - e. Submittals that do not pass review will be sent back to Contractor for additional incorporation of OSFM comments. Any delays to Contract Milestones caused by such resubmittals are the fault of the Contractor.
- L. Distribute copies of the reviewed submittals to concerned parties. Instruct parties to promptly report inability to comply with provisions. Notify CDCR Representative of every such report.
- M. Do not begin Work covered by a submittal designated “Revise and Resubmit” or “Rejected”. Contractor may begin Work covered by submittals marked “No Exceptions Taken” or “Make Corrections Noted” in accordance with review notes and comments or as otherwise approved by a regulatory agency.

1.4 SUBMITTAL CONTENTS

- A. Submittals Must Contain:
 1. Date of submission and dates of any previous submissions.
 2. Project title and number.
 3. Contract Identification.
 4. Names of Contractor, supplier, and manufacturer.
 5. Identification of the product, with the Specification Section number and the applicable detail number(s) on the approved Project Drawings.
 6. Dimensions and values in units to match those indicated.
 7. Field dimensions, clearly identified as such.
 8. Relation to adjacent or critical features of the work or materials.

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9. Applicable standards, such as ASTM or Federal Specification numbers.
10. Identification of revisions on resubmittals.
11. An 8- x 3-inch space for review stamps in the lower right-hand corner of each page.
12. Contractor's stamp, initialed or signed, certifying to review of submittal, verification of products, field measurements and field construction criteria, and coordination of the information within the submittal with requirements of the Work and of the Contract.

1.5 SUBMITTAL QUANTITIES AND FORMAT

- A. Quantities:
 1. General: Submit electronically.
 2. Samples:
 - a. Submit the number of samples indicated in the specific technical Section.
 - b. Where no number is specified, submit four samples.
 - c. Two samples will be returned to Contractor.
 3. The number of submittals may be adjusted for specific submittals as approved by the CDCR Representative.
- B. Where Electronic submittal format is utilized, a PDF format file copy must be provided.
- C. Submittals must be organized in identical order in all copies.

1.6 MANUFACTURER'S INSTRUCTIONS

- A. Where any item of Work is required by the Contract to be delivered, stored, assembled, installed, started-up, adjusted, or finished in accordance with the Manufacturer's instructions, submit manufacturer's printed instructions.
- B. Identify conflicts between manufacturer's instructions and the Contract. Report conflicts to CDCR Representative.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

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SECTION 01 33 23

SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Definitions.
 - 2. Shop Drawings.
 - 3. Product Data.
 - 4. Samples.
- B. Related Sections
 - 1. Section 01 33 00 – Submittal Procedures.
 - 2. Section 01 33 23 – Shop Drawing, Product Data, Samples

1.2 DEFINITIONS

- A. Manufactured: Standard units, usually mass-produced.
- B. Fabricated: Specifically assembled or made out of selected materials to meet design requirements.
- C. Shop Drawings: Documents establishing the actual detail of manufactured or fabricated items, indicating relation to adjoining work, identifying what work is performed at the project site, and amplifying design details of mechanical and electrical equipment in proper relation to physical spaces in the structure.
- D. Product Data: Manufacturer's standard drawings, descriptive literature, catalogs, brochures, performance and test data, wiring and control diagrams, installation/application instructions, other drawings and descriptive data pertaining to specified products.

1.3 SHOP DRAWINGS

- A. Submit under provisions of Section 01 33 00.
- B. Reproductions of Contract Drawings, Specifications, or portions thereof must not be used for shop drawing submittals.
- C. Present information in clear and thorough manner.
- D. Identify details by reference to Drawing and detail, schedule, or room numbers shown and specified.

1.4 PRODUCT DATA

- A. Submit under provisions of Section 01 33 00.

SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

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- B. Clearly mark each copy to identify pertinent products and models.
 - 1. Modify to delete inapplicable information.
 - 2. Supplement standard information as required.
 - C. Indicate performance characteristics and capacities.
 - D. Show dimensions and clearances required.
 - E. Show wiring, piping diagrams, and controls.
- 1.5 SAMPLES
- A. Submit under provisions of Section 01 33 00.
 - B. Submit samples of sufficient size to illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
 - C. Submit samples of finishes from the full range of manufacturer's standard colors, custom colors when specified, textures and patterns for selection.
 - D. Include identification on each sample with full project information.
 - E. Reviewed samples which may be used in the Work are indicated in individual Sections.
 - 1. Only samples marked "No Exception Taken" may be incorporated into the Work.
 - 2. Samples that were intended to be incorporated into the Work will be returned, together with a written notice designating the sample with the appropriate review status and indicating errors discovered on review.
 - 3. Other samples will not be returned, but the same notice will be given, and such notice must be considered a return of the sample.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

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SECTION 01 42 00

REFERENCES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Industry standards.
 - 2. Abbreviations and acronyms.
- B. Related Sections:
 - 1. Refer to requirements of Division 0.

1.2 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference when specifically identified as a reference standard.
- B. Publication Dates: Comply with the Referenced Standards as listed in the applicable Title 24 Code. If not listed in the applicable Code, comply with the standard in effect as of the date of the Contract Documents.
- C. Copies of Standards: Copies of applicable standards are not bound with the Contract Documents.
 - 1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.3 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they mean the recognized name of the entities in the following list. Names and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents. Where abbreviations and acronyms are used in Specifications or other Contract Documents and are not included in the following list, they mean the recognized name of the entities indicated in Thomson Gale's "Encyclopedia of Associations" or in Columbia Books' "National Trade & Professional Associations of the U.S." Note: This is a general reference list and not all references will be used in all projects.

AA Aluminum Association, Inc. (The)
 www.aluminum.org

AAADM American Association of Automatic Door Manufacturers
 www.aaadm.com

REFERENCES

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AABC	Associated Air Balance Council www.aabchq.com
AAMA	American Architectural Manufacturers Association www.aamanet.org
AASHTO	American Association of State Highway and Transportation Officials www.transportation.org
AATCC	American Association of Textile Chemists and Colorists www.aatcc.org
ABAA	Air Barrier Association of America www.airbarrier.org
ABMA	American Bearing Manufacturers Association www.abma-dc.org
ACI	American Concrete Institute www.concrete.org
ACPA	American Concrete Pipe Association www.concrete-pipe.org
AEIC	Association of Edison Illuminating Companies, Inc. (The) www.aeic.org
AF&PA	American Forest & Paper Association www.afandpa.org
AGA	American Gas Association www.aga.org
AGC	Associated General Contractors of America (The) www.agc.org
AHAM	Association of Home Appliance Manufacturers www.aham.org
AHRI	Air-Conditioning, Heating, and Refrigeration Institute www.ahrinet.org
AI	Asphalt Institute www.asphaltinstitute.org
AIA	American Institute of Architects (The) www.aia.org

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AISC	American Institute of Steel Construction www.aisc.org
AISI	American Iron and Steel Institute www.steel.org
AITC	American Institute of Timber Construction www.aitc-glulam.org
ALSC	American Lumber Standard Committee, Incorporated www.alsc.org
AMCA	Air Movement and Control Association International, Inc. www.amca.org
ANSI	American National Standards Institute www.ansi.org
AOSA	Association of Official Seed Analysts, Inc. www.aosaseed.com
APA	Architectural Precast Association www.archprecast.org
APA	APA – The Engineered Wood Association www.apawood.org
API	American Petroleum Institute www.api.org
ARMA	Asphalt Roofing Manufacturers Association www.asphaltroofing.org
ASCE	American Society of Civil Engineers www.asce.org
ASHRAE	American Society of Heating, Refrigerating and Air- Conditioning Engineers www.ashrae.org
ASME	American Society of Mechanical Engineers – ASME International www.asme.org
ASSE	American Society of Sanitary Engineering www.asse-plumbing.org
ASTM	ASTM International www.astm.org

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AWCI	Association of the Wall and Ceiling Industry www.awci.org
AWI	Architectural Woodwork Institute www.awinet.org
AWPA	American Wood Protection Association www.awpa.com
AWS	American Welding Society www.aws.org
AWWA	American Water Works Association www.awwa.org
BHMA	Builders Hardware Manufacturers Association www.buildershardware.com
BIA	Brick Industry Association (The) www.bia.org or Building Industry Association www.bia.net
BICSI	BICSI, Inc. www.bicsi.org
BIFMA	Business and Institutional Furniture Manufacturer's Association (The) – BIFMA International www.bifma.com
BISSC	Baking Industry Sanitation Standards Committee www.bissc.org
CCC	Carpet Cushion Council www.carpetcushion.org
CDA	Copper Development Association www.copper.org
CEA	Consumer Electronics Association www.ce.org
CFFA	Chemical Fabrics & Film Association, Inc. www.chemicalfabricsandfilm.com
CGA	Compressed Gas Association www.cganet.com
CIMA	Cellulose Insulation Manufacturers Association

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www.cellulose.org

CISCA	Ceilings & Interior Systems Construction Association www.cisca.org
CISPI	Cast Iron Soil Pipe Institute www.cispi.org
CLFMI	Chain Link Fence Manufacturers Institute www.chainlinkinfo.org
CPA	Composite Panel Association www.pbmdf.com
CPPA	Corrugated Polyethylene Drainage Pipe Association (CPPA is a division of the PPI – Plastics Pipe Institute) plasticpipe.org/drainage/
CRI	Carpet and Rug Institute (The) www.carpet-rug.org
CRRC	Cool Roof Rating Council www.coolroofs.org
CRSI	Concrete Reinforcing Steel Institute www.crsi.org
CSA	CSA International www.csa-international.org
CSI	Cast Stone Institute www.caststone.org
CSI	Construction Specifications Institute (The) www.csinet.org
CTI	Cooling Technology Institute www.cti.org
DHI	Door and Hardware Institute www.dhi.org
EIMA	EIFS Industry Members Association www.eima.com
EJCDC	Engineers Joint Contract Documents Committee www.ejcdc.org
EJMA	Expansion Joint Manufacturers Association, Inc. www.ejma.org

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ESD	Electrostatic Discharge Association www.esda.org
FM Global	FM Global www.fmglobal.com
FRSA	Florida Roofing, Sheet Metal & Air Conditioning Contractors Association, Inc. www.floridarooft.com
FSA	Fluid Sealing Association www.fluidsealing.com
GA	Gypsum Association www.gypsum.org
GANA	Glass Association of North America www.glasswebsite.com
GS	Green Seal www.greenseal.org
GSI	Geosynthetic Institute www.geosynthetic-institute.org
HI	Hydraulic Institute www.pumps.org
HPVA	Hardwood Plywood & Veneer Association www.hpva.org
HPW	H. P. White Laboratory, Inc. www.hpwhite.com
ICEA	Insulated Cable Engineers Association, Inc. www.icea.net
ICRI	International Concrete Repair Institute, Inc. www.icri.org
IEC	International Electrotechnical Commission www.iec.ch
IEEE	Institute of Electrical and Electronics Engineers, Inc. www.ieee.org
IESNA	Illuminating Engineering Society of North America www.iesna.org

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IENT	Institute of Environmental Sciences and Technology www.ient.org
IGCC	Insulating Glass Certification Council www.igcc.org
IGMA	Insulating Glass Manufacturers Alliance www.igmaonline.org
ILI	Indiana Limestone Institute of America, Inc. www.iliai.com
ISFA	International Surface Fabricators Association www.isfanow.org
ISO	International Organization for Standardization www.iso.ch Available from ANSI www.ansi.org
KCMA	Kitchen Cabinet Manufacturers Association www.kcma.org
LPI	Lightning Protection Institute www.lightning.org
MBMA	Metal Building Manufacturers Association www.mbma.com
MFMA	Maple Flooring Manufacturers Association, Inc. www.maplefloor.org
MFMA	Metal Framing Manufacturers Association, Inc. www.metalframingmfg.org
MHIA	Material Handling Industry of America www.mhia.org
MIA	Marble Institute of America www.marble-institute.com
MPI	Master Painters Institute (The) www.paintinfo.com
MPPA	Moulding & Millwork Producers Association www.wmmpa.com
MSS	Manufacturers Standardization Society of the Valve and Fittings Industry Inc. www.mss-hq.com

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NAAMM	National Association of Architectural Metal Manufacturers www.naamm.org
NACE	National Association of Corrosion Engineers (The) – NACE International www.nace.org
NADCA	National Air Duct Cleaners Association/The HVAC Inspection, Maintenance and Restoration Association www.nadca.com
NAIMA	North American Insulation Manufacturers Association www.naima.org
NBGQA	National Building Granite Quarries Association, Inc. www.nbgqa.com
NCAA	National Collegiate Athletic Association www.ncaa.org
NCMA	National Concrete Masonry Association www.ncma.org
NCPI	National Clay Pipe Institute www.ncpi.org
NCTA	National Cable & Telecommunications Association www.ncta.com
NEBB	National Environmental Balancing Bureau www.nebb.org
NECA	National Electrical Contractors Association www.necanet.org
NeLMA	Northeastern Lumber Manufacturers Association www.nelma.org
NEMA	National Electrical Manufacturers Association/The Association of Electrical and Medical Imaging Equipment Manufacturers www.nema.org
NETA	InterNational Electrical Testing Association www.netaworld.org
NFHS	National Federation of State High School Associations www.nfhs.org

REFERENCES

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NFPA	National Fire Protection Association www.nfpa.org
NFRC	National Fenestration Rating Council (The) www.nfrc.org
NGA	National Glass Association www.glass.org
NHLA	National Hardwood Lumber Association www.natlhardwood.org
NLGA	National Lumber Grades Authority www.nlga.org
NOMMA	National Ornamental & Miscellaneous Metals Association www.nomma.org
NRCA	National Roofing Contractors Association www.nrca.net
NRMCA	National Ready Mixed Concrete Association www.nrmca.org
NSF	NSF International (National Sanitation Foundation International) www.nsf.org
NSSGA	National Stone, Sand & Gravel Association www.nssga.org
NTMA	National Terrazzo & Mosaic Association, Inc. (The) www.ntma.com
NWFA	National Wood Flooring Association www.nwfa.org
PCI	Precast/Prestressed Concrete Institute www.pci.org
PDCA	Painting & Decorating Contractors of America www.pdca.com
PDI	Plumbing & Drainage Institute www.pdionline.org
PLANET	Professional Landcare Network www.landcarenetwork.org

REFERENCES

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PTI	Post-Tensioning Institute www.post-tensioning.org
RCSC	Research Council on Structural Connections www.boltcouncil.org
RFCI	Resilient Floor Covering Institute www.rfci.com
RIS	Redwood Inspection Service www.redwoodinspection.com
SAE	SAE International (Society of Automotive Engineers) www.sae.org
SDI	Steel Deck Institute www.sdi.org
SDI	Steel Door Institute www.steeldoor.org
SEFA	Scientific Equipment and Furniture Association www.sefalabs.com
SGCC	Safety Glazing Certification Council www.sgcc.org
SIA	Security Industry Association www.siaonline.org
SJI	Steel Joist Institute www.steeljoist.org
SMA	Screen Manufacturers Association www.smainfo.org
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association www.smacna.org
SPFA	Spray Polyurethane Foam Alliance www.sprayfoam.org
SPIB	Southern Pine Inspection Bureau www.spib.org
SPRI	Single Ply Roofing Industry www.spri.org
SSINA	Specialty Steel Industry of North America

REFERENCES

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www.ssina.com

SSPC	SSPC: The Society for Protective Coatings www.sspc.org
STI	Steel Tank Institute/Steel Plate Fabricators Association www.steeltank.com
SWI	Steel Window Institute www.steelwindows.com
SWRI	Sealant, Waterproofing, & Restoration Institute www.swrionline.org
TCNA	Tile Council of North America, Inc. www.tileusa.com
TIA	Telecommunications Industry Association www.tiaonline.org
TMS	The Masonry Society www.masonrysociety.org
TPI	Truss Plate Institute, Inc. www.tpinst.org
TPI	Turfgrass Producers International www.turfgrassod.org
TRI	Tile Roofing Institute www.tilerroofing.org
UL	Underwriters Laboratories Inc. www.ul.com
UNI	Uni-Bell PVC Pipe Association www.uni-bell.org
USGBC	U.S. Green Building Council www.usgbc.org
WASTEC	Waste Equipment Technology Association www.wastec.org
WCLIB	West Coast Lumber Inspection Bureau www.wclib.org
WCMA	Window Covering Manufacturers Association www.wcmanet.org

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WCSC	Window Covering Safety Council www.windowcoverings.org
WDMA	Window & Door Manufacturers Association www.wdma.com
WI	Woodwork Institute www.wicnet.org
WSRCA	Western States Roofing Contractors Association www.wsrca.com
WWPA	Western Wood Products Association www.wwpa.org

- B. Code Agencies and Codes: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they mean the recognized name of the entities and/or codes in the following list. Names and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

CBSC	California Building Standards Commission www.bsc.ca.gov
CBC	California Building Code
CEC	California Electrical Code
CESCC	California Elevator Safety Construction Code
CFC	California Fire Code
CGBSC	California Green Building Standards Code
CMC	California Mechanical Code
CPC	California Plumbing Code
CCR	California Code of Regulations www.calregs.com
IAPMO	International Association of Plumbing and Mechanical Officials www.iapmo.org
ICC	International Code Council www.iccsafe.org
ICC-ES	ICC Evaluation Service, Inc. www.icc-es.org

- C. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they mean the recognized name of the entities in the following list. Names and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

CE	US Army Corps of Engineers
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	www.usace.army.mil
CPSC	Consumer Product Safety Commission www.cpsc.gov
DOC	Department of Commerce www.commerce.gov
DOD	Department of Defense www.defense.gov
DOE	Department of Energy www.energy.gov
EPA	Environmental Protection Agency www.epa.gov
FAA	Federal Aviation Administration www.faa.gov
FCC	Federal Communications Commission www.fcc.gov
FDA	Food and Drug Administration www.fda.gov
GSA	General Services Administration www.gsa.gov
HUD	Department of Housing and Urban Development www.hud.gov
LBL	Lawrence Berkeley National Laboratory www.lbl.gov
NCHRP	National Cooperative Highway Research Program (See TRB)
NIST	National Institute of Standards and Technology www.nist.gov
ODPHP	Office of Disease Prevention and Health Promotion odphp.osophs.dhhs.gov
OSHA	Occupational Safety & Health Administration www.osha.gov
PBS	Public Buildings Service (See GSA)

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RUS	Rural Utilities Service (See USDA)
SD	State Department www.state.gov
TRB	Transportation Research Board http://gulliver.trb.org
USDA	Department of Agriculture www.usda.gov
USPS	Postal Service www.usps.com

- D. Federal and State Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they mean the recognized name of the standards and regulations in the following list. Names and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

ADAAG	Americans with Disabilities Act (ADA) Architectural Barriers Act (ABA) Accessibility Guidelines for Buildings and Facilities Available from U.S. Access Board www.access-board.gov
CFR	Code of Federal Regulations Available from Government Printing Office www.gpoaccess.gov/cfr/index.html
DOD	Department of Defense Military Specifications and Standards Available from Department of Defense Single Stock Point http://dodssp.daps.dla.mil
DSCC	Defense Supply Center Columbus (See FS)
FED-STD	Federal Standard (See FS)
FS	Federal Specification Available from Department of Defense Single Stock Point http://dodssp.daps.dla.mil Available from Defense Standardization Program www.dsp.dla.mil Available from General Services Administration www.gsa.gov Available from National Institute of Building Sciences

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www.wbdg.org/ccb

FTMS	Federal Test Method Standard (See FS)
MIL	(See MILSPEC)
MIL-STD	(See MILSPEC)
MILSPEC	Military Specification and Standards Available from Department of Defense Single Stock Point http://dodssp.daps.dla.mil
UFAS	Uniform Federal Accessibility Standards Available from Access Board www.access-board.gov

- E. State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they mean the recognized name of the entities in the following list. Names and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

CALTRANS	California Department of Transportation www.dot.ca.gov
CBHF	State of California, Department of Consumer Affairs Bureau of Home Furnishings and Thermal Insulation www.dca.ca.gov/bhfti
CDCR	California Department of Corrections and Rehabilitation www.cdcr.ca.gov
CPUC	California Public Utilities Commission www.cpuc.ca.gov
DGS	California Department of General Services www.dgs.ca.gov
OSHPD	Office of Statewide Health Planning and Development www.oshpd.ca.gov
OSFM	State of California, Office of the State Fire Marshal http://osfm.fire.ca.gov/

- F. State Department of Corrections Institutions: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they mean the recognized name of the entities in the following list. Names and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

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ASP	Avenal State Prison www.cdcr.ca.gov/Facilities_Locator/ASP.html
CAL	Calipatria State Prison www.cdcr.ca.gov/Facilities_Locator/CAL.html
CCC	California Correctional Center www.cdcr.ca.gov/Facilities_Locator/CCC.html
CCI	California Correctional Institution www.cdcr.ca.gov/Facilities_Locator/CCI.html
CCWF	Central California Women's Facility www.cdcr.ca.gov/Facilities_Locator/CCWF.html
CEN	Centinela State Prison www.cdcr.ca.gov/Facilities_Locator/CEN.html
CIM	California Institution for Men www.cdcr.ca.gov/Facilities_Locator/CIM.html
CIW	California Institution for Women www.cdcr.ca.gov/Facilities_Locator/CIW.html
CMC	California Men's Colony www.cdcr.ca.gov/Facilities_Locator/CMC.html
CMF	California Medical Facility www.cdcr.ca.gov/Facilities_Locator/CMF.html
COR	California State Prison, Corcoran www.cdcr.ca.gov/Facilities_Locator/COR.html
CRC	California Rehabilitation Center www.cdcr.ca.gov/Facilities_Locator/CRC.html
CTF	Correctional Training Facility www.cdcr.ca.gov/Facilities_Locator/CTF.html
CVSP	Chuckawalla Valley State Prison www.cdcr.ca.gov/Facilities_Locator/CVSP.html
DVI	Deuel Vocational Institution www.cdcr.ca.gov/Facilities_Locator/DVI.html
FSP	Folsom State Prison www.cdcr.ca.gov/Facilities_Locator/FSP.html
HDSP	High Desert State Prison www.cdcr.ca.gov/Facilities_Locator/HDSP.html

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ISP	Ironwood State Prison www.cdcr.ca.gov/Facilities_Locator/ISP.html
KVSP	Kern Valley State Prison www.cdcr.ca.gov/Facilities_Locator/KVSP.html
LAC	California State Prison, Los Angeles County www.cdcr.ca.gov/Facilities_Locator/LAC.html
MCSP	Mule Creek State Prison www.cdcr.ca.gov/Facilities_Locator/MCSP.html
NCWF	Northern California Women's Facility
NKSP	North Kern State Prison www.cdcr.ca.gov/Facilities_Locator/NKSP.html
PBSP	Pelican Bay State Prison www.cdcr.ca.gov/Facilities_Locator/PBSP.html
PVSP	Pleasant Valley State Prison www.cdcr.ca.gov/Facilities_Locator/PVSP.html
RJD	R.J. Donovan Correctional Facility www.cdcr.ca.gov/Facilities_Locator/RJD.html
SAC	California State Prison, Sacramento www.cdcr.ca.gov/Facilities_Locator/SAC.html
SATF	California Substance Abuse Treatment Facility and State Prison, Corcoran www.cdcr.ca.gov/Facilities_Locator/SATF.html
SCC	Sierra Conservation Center www.cdcr.ca.gov/Facilities_Locator/SCC.html
SOL	California State Prison, Solano www.cdcr.ca.gov/Facilities_Locator/SOL.html
SQ	San Quentin State Prison www.cdcr.ca.gov/Facilities_Locator/SQ.html
SVSP	Salinas Valley State Prison www.cdcr.ca.gov/Facilities_Locator/SVSP.html
VSP	Valley State Prison www.cdcr.ca.gov/Facilities_Locator/VSP.html
WSP	Wasco State Prison

REFERENCES

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www.cdcr.ca.gov/Facilities_Locator/WSP.html

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

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SECTION 05 05 53

SECURITY METAL FASTENINGS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Removable and non-removable security (tamperproof) metal fastenings.
 - 2. Thread adhesive.
 - 3. Tools for installation and removal.
- B. Related Sections:
 - 1. Additional requirements for the installation of security metal fastenings may be in individual Sections.

1.2 REFERENCES

- A. American Welding Society (AWS): D1.1 – Structural Welding Code – Steel.

1.3 SUBMITTALS

- A. Submit in accordance with Sections 01 33 00 – Submittal Procedures and 01 33 23 – Shop Drawings, Product Data, and Samples.
- B. Product Data:
 - 1. Product data for each of products and materials indicated.
 - 2. Indicate finish, head design, strength, and corrosion resistance.
 - 3. Manufacturer's technical bulletins and installation/application instructions.
- C. Samples: Submit three samples of each type of security metal fastening proposed for use.
- D. Qualification Data: For manufacturer.

1.4 DEFINITIONS

- A. Inmate Accessible Areas: Security metal fastenings are required to be installed in all Inmate Accessible Areas.
- B. Security Metal Fastenings: Corrosion-resistant, hardened, high-strength, plated or stainless-steel metal fasteners of size and type best suited for intended application, having head design requiring special removal tool of controlled availability.
- C. Exposed Fasteners:
 - 1. Fasteners not completely concealed by earthwork, paving, or by the finish of a structure.
 - 2. Fasteners which may be accessed and removed, without the prior removal of other fasteners designated as tamperproof or security.

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1.5 QUALIFICATIONS

- A. Manufacturer: Company regularly and presently engaged in the manufacture of products of the type specified within minimum five years' experience.

1.6 COORDINATION

- A. Coordinate the required locations, finishes, delivery schedule, and installation of security metal fastenings with the Work of the Sections requiring the fastenings.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle packaged materials in the manufacturer's original, sealed containers, each clearly identified with the manufacturer's name, and name and type of product.
- B. Store materials subject to damage by dirt and moisture in a clean, dry location, off the ground, and suitably protected.
- C. Store, protect, and handle installation/removal tools to prevent unauthorized use or duplication.

1.8 EXTRA STOCK MATERIALS

- A. Security Metal Fastenings:
 - 1. Provide 100 of each type and size, sorted, to the CDCR Representative.
 - 2. Clearly identify contents of each package; indicate type, size, name, address, and phone number of California distributor where additional fasteners may be obtained.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Corrosion resistant, hardened, high strength, plated or stainless steel.
- B. Nonferrous metal where exposed to weather, moisture, or high humidity.
- C. Plating: Cadmium, zinc, nickel, phosphate, or chrome to match adjacent materials.

2.2 FASTENERS

- A. Non-Removable:
 - 1. Twist-off head type dressed smooth.
 - 2. Allen or similar recessed drive type, drilled to remove drive surfaces, filled with body putty.
- B. Removable:
 - 1. Allen head (hexagon) with center pin reject, button head, or flat head as required by application.
 - 2. Torx drive (star) with center pin reject, button head, or flat head as required by application.
 - 3. Spanner Head Screws or one-way removable screws: Not allowed.
 - 4. Removable only by tools produced by fastener manufacturer or other licensed fabricator specifically for individual tamperproof fastener.

SECURITY METAL FASTENINGS

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5. Limit size and shape variations such that no more than six different tools are required for each type of tamperproof fastener used on project.
 - C. Structural:
 1. Where security metal fastening is required in structural connections, unless otherwise indicated, fastening may be accomplished by either:
 - a. Installing high strength bolts with a torque wrench.
 - b. Tack welding nuts.
- 2.3 ACCESSORIES
- A. Tools: Provide ten complete sets of each manual drive tool required for installation and removal of removable tamperproof fasteners. Package each set in an individual kit and deliver to the CDCR Representative.
 - B. Screw-Thread Adhesive Sealant (Threadlocker):
 1. Acceptable Manufacturers/Products, as listed below and meeting the criteria and requirements specified herein, will be acceptable:
 - a. Henkel; Loctite No. 243 Thread locker – Blue.
 - b. Devcon; Permatex Medium Strength Thread locker – Blue.
 - c. 3M; Scotch-Weld Thread locker TL42 – Blue.
 - d. For manufacturers/products not listed, comply with substitution requirements in Section 01 25 00 – Substitution Procedures.
 - C. Expansion Shields, One-Way Sex Bolts, Toggle Bolts, Tamp-ins, and Miscellaneous Accessories: Size and type as indicated, best suited to intended application, and as required for complete installation.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive the Work. Notify the CDCR Representative, in writing, of any conditions requiring corrective action.
- B. If unsatisfactory conditions exist, do not commence the installation until such conditions have been corrected. Beginning of installation means acceptance of existing conditions.

3.2 PREPARATION

- A. Coordinate security metal fastening material, finish, size, type, and threads with requirements of other Sections.

3.3 INSTALLATION

- A. Install security metal fastenings in accordance with manufacturer's instructions, using tools designed for fastening installation and removal.
- B. Set removable security metal fastenings with screw thread adhesive sealant in accordance with manufacturer's instructions.

SECURITY METAL FASTENINGS

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3.4 SCHEDULE

- A. This schedule applies to the Work of all Sections unless specifically exempted in the individual Section(s).
- B. Provide removable type security metal fastenings as specified herein, as shown on Drawings, and as noted below:
 - 1. In accordance with the definitions set forth above, all exposed fasteners in Inmate Accessible Areas and in "No Man's Land".
 - 2. All exposed fasteners for all consoles, panels, and enclosures located in the following areas:
 - a. Central Control.
 - b. Complex Control.
 - c. Housing Unit Control Rooms.
 - d. Administrative Segregation Gun Posts.
 - e. Perimeter Guard Towers.
 - f. Yard Observation Posts.
 - g. Dining Room Gun Post.
 - h. Gym Gun Post.
 - i. Workchange Building.
 - j. Door Gate Intercom.
 - k. Public Address System.

END OF SECTION

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SECTION 21 23 00

WET-CHEMICAL FIRE-EXTINGUISHING SYSTEMS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Fire suppression system for kitchen hoods.
- B. Related Sections:
 - 1. Section 23 38 13 - Commercial - Kitchen Hoods.
 - 2. Section 28 31 00 - Fire Detection and Alarm

1.2 REFERENCES

- A. National Fire Protection Association (NFPA):
 - 1. 17A - Standard for Wet Chemical Extinguishing Systems.
 - 2. 96 - Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations.
- B. Underwriters Laboratories (UL):
 - 1. 300 - Standard for Fire Testing of Fire Extinguishing Systems for Protection of Commercial Cooking Equipment.

1.3 SYSTEM DESCRIPTION

- A. Automatic system to detect and suppress fire with or without someone present; capable of local and remote manual actuation.
- B. System: Conform to UL Standard 300.

1.4 DESIGN REQUIREMENTS

- A. Exposed fasteners must be tamperproof type in accordance with Section 05 05 53.

1.5 SUBMITTALS

- A. Submit in accordance with Section 01 33 00.
- B. Product Data:
 - 1. Submit product data for manufactured equipment.
 - 2. Indicate conformance to specified requirements.
- C. Shop Drawings: Indicate large-scale details of custom built equipment, sizes and locations of mechanical and electrical services and other information required to describe proposed installation. Shop drawings of this system must be submitted for final approval to all authorities having jurisdiction prior to fabrication and installation.
- D. Quality Control Submittals:

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1. Design Data:
 - a. Indicate piping layout, capacity, and calculations.
 2. Test Reports:
 - a. Indicate system operation and approval by California State Fire Marshal.
 3. Certificates:
 - a. Certify that products meet or exceed specified requirements.
 - b. Certify equipment and system layout.
 4. Manufacturer's Instructions:
 - a. Submit manufacturer's installation instructions.
- E. Contract Closeout Submittals:
1. Project Record Documents:
 - a. Accurately record exact location of heads, piping, layout, control and shut off valves and equipment (chemical tanks) location, sizes, etc.
 2. Operation and Maintenance Data:
 - a. Provide cleaning and stain removal methods and recommended cleaning materials, polishes, and waxes.
 - b. Submit in accordance with Section 01 33 00.
- 1.6 QUALITY ASSURANCE
- A. Perform work in accordance with NFPA.
 - B. Maintain one copy of each document on site.
- 1.7 QUALIFICATIONS
- A. Manufacturer: Company specializing in the manufacture of products specified in this Section with minimum three year's documented experience.
 - B. Installer: Company specializing in applying the work of this Section with minimum three year's documented experience; approved by manufacturer.
- 1.8 REGULATORY REQUIREMENTS
- A. Installation of fire suppression system must not be started until complete plans and specifications have been approved by the Office of the State Fire Marshal.
- 1.9 CERTIFICATIONS
- A. Provide certification of inspection confirming approval by authority having jurisdiction.
- 1.10 MAINTENANCE SERVICE
- A. Initial Maintenance Service: Beginning at Project completion, provide [two year's][] quarterly maintenance service by skilled employee of Wet-Chemical Agent System Installer. Include verification of proper operation of system, check extinguishant container weight and pressure, and provide a thorough check of controls, detection and alarm systems. Repair defects and replace extinguishant as necessary to conform to specified requirements.
 1. Submit documents, certifying satisfactory system conditions. Include manufacturer's certificate of acceptance of Inspector's qualifications.
 2. Include 24-hour-per-day, 7-day-per-week emergency callback service.

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- a. Response Time: 24 hours or less.

1.11 EXTRA STOCK MATERIALS

- A. Submit maintenance materials in accordance with Section 01 33 00.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable manufacturers are indicated with each item in Schedule at the end of this Section.

2.2 EQUIPMENT

- A. Individual equipment items are indicated in Schedule at the end of this Section.
- B. Trim and Accessories: Manufacturers' standard as required for complete installation.

2.3 COMPONENTS

- A. Fire Suppression Agent: Liquid chemical.
- B. Agent Tank: Deep drawn carbon steel; 100-psi working pressure, 300 psi test pressure, minimum 600-psi burst pressure; adapter/tube assembly with integral vent plug.
- C. Regulated Release Mechanism: Capable of providing expellant gas supply; visual indication of cocked or fired condition without having to open enclosure.
- D. Regulated Actuator: As required to provide expellant for the number of tanks provided.
- E. Tank Bracket: Chrome-plated steel.
- F. Discharge Nozzles: Manufacturer's standard, designed for specific application; protective blow-off caps.
- G. Detection System: Fusible link, with rating in compliance with NFPA and requirements of this project.

2.4 ACCESSORIES

- A. General: Sizes, types and quantity of all items must be in compliance with their function and service of the systems.
- B. Remote Manual Pull Station.
- C. Electric Switch.
- D. Pressure Switch.

PART 3 EXECUTION

3.1 EXAMINATION

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- A. Verify that surfaces and openings are ready to receive the Work.
- B. Verify that required utilities are available, in proper locations, and ready for use.
- C. Beginning installation means acceptance of existing conditions.

3.2 PREPARATION

- A. Protect elements surrounding the Work of this Section from damage or disfiguration.

3.3 INSTALLATION

- A. Install equipment in accordance with manufacturer's instructions.
- B. Install square, plumb and level, accurately aligned to position intended, and securely anchored in place.

3.4 FIELD QUALITY CONTROL

- A. Perform field inspection and testing in accordance with Section 01 45 00.
- B. Tests: per NFPA Requirements.
- C. Inspection: per State Fire Marshal Requirements.
- D. Manufacturer's Field Service:
 - 1. Manufacturer's representative must be on site and give instruction as necessary prior to and during tests and inspection.
 - 2. Prepare and start systems; place in operating condition.

3.5 ADJUSTING

- A. Test each assembly for proper operation.
- B. Adjust and service operating elements as necessary to operate smoothly, quietly, and free from binding.
- C. Adjust for complete coverage.

3.6 CLEANING

- A. Clean, leaving exposed surfaces free from damage, dents, tool marks, stains, discoloration, and other defects and damage.

3.7 DEMONSTRATION AND TRAINING

- A. Provide system demonstration and instruction of Department.
 - 1. Provide instruction for 2 people.
 - 2. Instruction period must last 4 hours.

3.8 SCHEDULE

- A. Fire Protection System:

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1. Description:
 - a. Wet chemical fire protection system to provide protection to hood ducts, plenums and equipment as indicated by requirements of NFPA 17A and 96, state, local codes, and CDCR; shop drawings of this system must be submitted for final approval to all authorities having jurisdiction prior to fabrication and installation.
 - b. System: stored pressure, wet chemical type with indicating gauges and fusible link actuation; ventilators must be pre-piped with the canopy bodies; exposed drop piping and nozzles chrome plated.
 - c. System must comply with California State Fire Marshal requirements for 100-percent floor coverage; provide necessary nozzles to cover floor area under hood.
 - d. Control mechanism, chemical tanks: located per plans; run all piping unexposed above the finished ceiling; furnish each unit with one (1) remote pull station to be located as directed.
 - e. Coordinate interconnection and supply all solenoid valves, contactors and interwiring, as required to complete the system; provide for power shut-off of all electrical items below hoods.
 - f. System must be interlocked with the fire alarm system; provide alarm and indicator that shows that the system has been operated.
 - g. Provide stainless steel cabinet with lockable access doors around system storage tank and components.
2. Acceptable Manufacturers/Products, as listed below and meeting the criteria and requirements specified herein, will be acceptable:
 - a. Basis of Design: Ansul; R-102.
 - b. Range Guard.
 - c. Badger Fire Protection.
 - d. For manufacturers/products not listed, comply with substitution requirements in Section 01 25 00.

END OF SECTION

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SECTION 23 38 13

COMMERCIAL-KITCHEN HOODS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Commercial Kitchen Hoods.
- B. Related Sections:
 - 1. Section 05 05 53 - Security Metal Fastenings.
 - 2. Section 07 92 00 - Joint Sealants.

1.2 REFERENCES

- A. ASTM A167-99 - Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip.
- B. ASTM A653/A653M-07 - Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- C. California Mechanical Code as U.L. Classified hood without damper.

1.3 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Product Data
 - 1. Submit manufacturers' equipment specifications, in the form of a book, assembled and bound.
 - 2. Indicate required accessories, utility requirements, standard colors and finishes, and other pertinent data.
- C. Seismic Restraint Data:
 - 1. Identify, in a separate column on the equipment schedule, each item requiring seismic restraint installation in accordance with CCR Title 24.
 - 2. Include floor-mounted items weighing more than 500-pounds and wall mounted or suspended items weighing more than 20-pounds.
- D. Shop Drawings
 - 1. Provide large scale details of equipment indicating fabrication, dimensions, construction methods, and materials, type, gage and finish of metal, hardware and fittings, methods of field joints, reinforcements, and anchorages. Show complicated parts of typical items in cut-away perspective.
 - 2. Indicate utility requirements as to types, sizes, and locations and include wiring diagram for electrically powered equipment.
 - 3. Show attachment details as required by SMACNA, "Guidelines for Seismic Restraints of Kitchen Equipment." Show on elevation and section shop drawings, referencing the SMACNA number for each attachment for each item.

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4. For items which cannot be adequately covered by standard SMACNA details, such as exhaust hoods and cold storage rooms, provide special drawings for installation.
 5. Conform to anchorage requirements of the Office of Statewide Health Planning and Development (OSHPD).
- E. Submit manufacturer's installation instructions.
- F. Operation and Maintenance Data:
1. Provide service parts manuals and maintenance manuals.
 2. Include cleaning instructions and data on care of finished surfaces.
 3. Provide list of service agencies authorized by the manufacturer to service equipment in the State of California. Include telephone number and name of contact person.
- G. Warranty:
1. Include coverage of scheduled equipment, including disconnection and removal of defective unit and installation and connection of replacement unit.
- 1.4 QUALITY ASSURANCE
- A. Fabricator: Companies specializing in manufacture of commercial food services equipment with minimum three years experience.
- 1.5 REGULATORY REQUIREMENTS
- A. Work must conform to the requirements of federal, state, and local laws, ordinances, and regulations.
1. Conform to applicable requirements of the following:
 - a. American Society of Mechanical Engineers (ASME)
 - b. Local Health Department.
 - c. National Board of Fire Underwriters.
 - d. National Fire Protection Association (NFPA)
 - e. National Sanitation Foundation (NSF).
 - f. Occupational Safety and Health Administration (OSHA)
 - g. Underwriters' Laboratories, Inc. (UL). UL-710 or equivalent.
 - h. U. S. Public Health Service.
 - i. National Electrical Manufacturer's Association (NEMA)
- 1.6 DELIVERY, STORAGE, AND HANDLING
- A. Provide factory wrapping, packaging and other means necessary to prevent damage or deterioration during shipment, handling, storage and installation.
- B. Follow any special handling instructions of the manufacturer.
- C. Coordinate accessibility conditions for equipment handling and installation.

PART 2 PRODUCTS

2.1 EQUIPMENT

- A. Individual items and acceptable manufacturers are indicated in the schedule.

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2.2 ACCESSORIES

- A. Provide rough-in hardware, supports and connections, attachment devices, closure trim, and other accessories for a complete installation.

2.3 MATERIALS

- A. Sheet Steel: ASTM A653/A653M; minimum 14-gage before coating, unless otherwise indicated; 1.25-oz/sq ft galvanized coating.
- B. Stainless Steel: ANSI/ASTM A167; Type 304 commercial grade, No. 4 finish; minimum 18-gage unless otherwise indicated.
- C. Finish Hardware: Manufacturer's standard.
- D. Service Outlet Covers and Escutcheons: Stainless steel.
- E. Sealants: Dow Corning No. 784.
- F. Fasteners:
 - 1. Tamper proof fasteners under provisions of Section 05 05 53.
 - 2. Fasteners not required to be tamper-proof under provisions of Section 05 05 53 may be of type specified below.
 - 3. Fasteners not otherwise specified may be manufacturer's standard for individual equipment item or type.

PART 3 EXECUTION

3.1 INSPECTION

- A. Verify existing conditions are suitable to receive the work of this Section.
- B. Verify ventilation outlets, service connections, and supports are correct and in required location.
- C. Verify site dimensions match dimensions indicated on shop drawings.
- D. Do not commence installation until unsatisfactory conditions have been corrected. Beginning of installation means acceptance of existing conditions.

3.2 INSTALLATION

- A. Use anchoring devices appropriate for equipment and expected usage.
- B. Completely assemble and install equipment in accordance with manufacturers' instructions. Mount equipment as indicated on the Drawings.
- C. Insulate to prevent electrolysis between dissimilar metals. Provide sealant to achieve clean joints without crevices.
- D. Sequence installation and erection to ensure mechanical and electrical connections are achieved in an orderly and expeditious manner.

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3.3 CUTTING AND FITTING

- A. No cutting, notching, drilling, or altering of any kind must be done to the building without first obtaining permission from the CDCR Representative.

3.4 MANUFACTURERS' FIELD SERVICE

- A. Provide operation and service inspections by authorized manufacturers' representatives every 90 days during the warranty period.
- B. Provide emergency repair service during the warranty period, as required, with 24 hours of the request.
- C. Provide final inspection 30 days prior to warranty expiration.

3.5 ADJUSTING AND CLEANING

- A. Start-up, test and adjust equipment to ensure proper working order and conditions.
- B. Clean all equipment surfaces in accordance with manufacturer's instructions.
- C. All equipment surfaces must be free from scratches, dents, tool marks, stains, discoloration or other defects or damage.

3.6 DEMONSTRATION AND INSTRUCTION

- A. Demonstrate equipment and instruct CDCR personnel in operation, repair and maintenance of the work specified in this Section.
- B. Provide instruction for [10] people.
- C. Perform demonstration in two phases: one for operation, one for maintenance personnel.
- D. Duration: 1 working day total demonstration and instruction time.

END OF SECTION

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SECTION 26 05 00

COMMON WORK RESULTS FOR ELECTRICAL

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Basic Electrical Requirements, materials and methods common to multiple electrical systems, specifically applicable to all Sections in Division 26.

B. Related Sections:

1. Section 05 05 53 - Security Metal Fastenings.

1.2 REFERENCES

- A. CEC - California Electrical Code, Part 3, CCR Title 24 and 2022 California Fire Code, Part 9, CCR Title 24.**
- B. NEMA ICS-6 - Industrial Control and Systems: Enclosures.**

1.3 DEFINITIONS

- A. The meaning of words must be as defined in the CEC Article 100, Definitions, unless defined otherwise in an individual section.**
- B. Inmate Accessible Areas:** All areas within State Prison Property are considered inmate accessible, except as specifically listed below:
- a) Interior of electrical, mechanical, and communications rooms or vaults.
 - b) All areas more than ten feet above finished floor or finished grade.
 - c) Areas above suspended ceilings, behind access panels, and within plumbing chases.
 - d) Roofs and equipment thereon.
 - e) Interior of control rooms.
- C. Within fences enclosing equipment pads; Areas greater than 4 feet from fence.**
- D. Exercise Yard:** The area surrounded by housing units and associated support buildings to the fence connecting the buildings including the exterior of these buildings.
- E. Exposed Fasteners:**
1. Fasteners not completely concealed within building construction.
 2. Fasteners which may be accessed and removed, without the prior removal of other fasteners designated as "tamper proof" or "security".
- F. Exposed Locations:** All locations are considered exposed, except the following:
1. Mechanical and electrical rooms.
 2. Areas above suspended ceilings, behind access panels, and within pipe and duct chases.
 3. Roofs.
 4. Control rooms, however control consoles are considered exposed.
 5. Within fences around equipment pads at distances greater than 4 feet from fence.

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- G. Security Screws/Fasteners: Tamper proof metal fasteners as specified in Section 05 05 53 - Security Metal Fastenings; removable or non-removable types as indicated.
- H. Secured Perimeter System: System comprised of double fencing, gates, towers, lighting, and electronic detection system.
- I. The following specification development organizations are referenced throughout the various specification sections of Division 26:
 - 1. AASHTO - American Association of State Highway and Transportation Officials.
 - 2. ADAAG - Americans with Disabilities Act Accessibility Guidelines
 - 3. Air Pollution Control District, Air Quality Management District
 - 4. ANSI - American National Standards Institute
 - 5. AQMD - Air Quality Management District
 - 6. APCD - Air Pollution Control District
 - 7. ASME - American Society of Mechanical Engineers
 - 8. ASTM - American Society for Testing and Materials
 - 9. CBC - California Building Code
 - 10. CCR - California Code of Regulations Title 24. State Chapters.
 - 11. CEC - California Electrical Code
 - 12. CFC - California Fire Code
 - 13. CMC - California Mechanical Code
 - 14. CSA - Canadian Standards Association
 - 15. EIA - Electronic Industries Association
 - 16. FCC - Federal Communications Commission.
 - 17. FM - Factory Mutual.
 - 18. FS - Federal Specifications
 - 19. ICEA - Insulated Cable Engineers Association
 - 20. IEC - International Electrotechnical Commission
 - 21. IEEE - Institute of Electrical and Electronic Engineers
 - 22. IETA - International Electrical Testing Association
 - 23. ISA - Instrument Society of America
 - 24. ISO - International Organization for Standardization
 - 25. MIL - Military Specifications
 - 26. NACE - National Association of Corrosion Engineers
 - 27. NECA - National Electrical Contractor's Association
 - 28. NEMA - National Electrical Manufacturing Association
 - 29. NETA - International Electrical Testing Association
 - 30. NFPA - National Fire Protection Association
 - 31. NIST - National Institute of Standards and Technology
 - 32. OSHA - Occupational Safety and Health Administration
 - 33. SMACNA - Sheet Metal and Air Conditioning Contractors National Association, Inc.
 - 34. UL - Underwriters Laboratories

1.4 SYSTEM DESCRIPTION

- A. Performance Requirements
 - 1. Furnish and install all materials to provide functioning systems in compliance with performance requirements specified, and any modifications required by reviewed shop drawings and field coordinated drawings.

1.5 SUBMITTALS

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- A. Submit under provisions of Section 01 33 00 - Submittal Procedures.
- B. Product Data
 - 1. Submit product data grouped to include complete submittals of related systems, products, and accessories in a single submittal.
 - 2. Quantity of Submittals Required
 - a. Submit six copies of product data.
 - b. Five copies will be returned.
 - c. If comments are required, comment sheet(s) will be returned with each copy.
 - d. One copy will be retained by the Engineer.
- C. Shop Drawings
 - 1. Submit shop drawings grouped to include complete submittals of related systems, products, and accessories in a single submittal.
 - 2. Submit a composite drawing for each cell chase, including the coordinated layout of all other trades' distinct components and detailing the intended electrical installation.
 - 3. Quantity of Submittals Required:
 - a. Submit one reproducible transparency and one print.
 - b. Upon review, transparency will be annotated and returned. Print will be retained by Engineer.
 - c. Copies of this transparency will serve as record copies for Architect and Engineer.
 - d. Additional prints will not be reviewed nor returned.
 - 4. Corrections or comments made on the shop drawings during review do not relieve the Contractor from compliance with requirements of the drawings and specifications. Shop drawing checking by the Engineer is only for review of general conformance with the design concept of the project and general compliance with the information given in the contract documents. The Contractor is responsible for:
 - a. Confirming and correlating all quantities and dimensions.
 - b. Selecting fabrication processes and techniques of construction.
 - c. Coordinating his work with all other trades.
 - d. Performing his work in a safe and satisfactory manner.
 - e. Provide equipment that can be installed in the available space with all code clearances. This must be coordinated prior to ordering any equipment.
- D. Samples
 - 1. Submit as directed by the architect and as required in each specification section.
- E. Quality Control/Control Submittals
 - 1. Submit material control record procedures for approval. Submit records during the project upon request by the CDCR Representative. Submit at the end of the project for record.

1.6 QUALITY ASSURANCE

- A. Regulatory Requirements
 - 1. Conform to CEC.
 - 2. Furnish products listed and classified by UL or other independent laboratory acceptable to CDCR Representative as suitable for purpose specified and shown when a listing is available for the type of product.

1.7 DELIVERY, STORAGE, AND HANDLING

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- A. Maintain material control records for all products for traceability to manufacturer and order number. Have records available for inspection by CDCR Representative.
- B. Store material and equipment in an environment similar to the final installation environment.
- C. Store and handle material and equipment in accordance with manufacturers' recommendations.

1.8 PROJECT CONDITIONS

- A. Electrical plan drawings show only general locations of equipment, devices, and raceway, unless specifically dimensioned.
- B. Install Work in locations shown on Drawings, unless prevented by Project conditions.
- C. Prepare and submit drawings showing proposed rearrangement of Work to meet Project conditions, including changes to Work specified in other Sections. Obtain permission of CDCR Representative before proceeding.

1.9 SHORT CIRCUIT AND PROTECTIVE DEVICE COORDINATION STUDY

- A. Provide a short circuit and protective device coordination study and arc flash study to the CDCR Representative for review and approval. Provide all short circuit characteristic information on electrical equipment. Provide time current curves for all circuit breakers in the submittal. Set and adjust all devices in accordance with the results of this study before energizing equipment.

1.10 MAINTENANCE AND SERVICE

- A. Maintenance and service must be provided as part of the Contract during the two year warranty period starting the day that Project Completion is awarded by the CDCR Representative.
 - 1. Contractor must be responsible for systems and system components as defined in these documents.
 - 2. Scheduled maintenance must be conducted on a weekly and quarterly basis. Responsibilities for scheduled maintenance are as follows:
 - a. Weekly - CDCR's personnel.
 - b. Quarterly - Contractor's personnel.
 - 3. All maintenance activity must be conducted on a schedule that is convenient to the CDCR Representative. All Contractors personnel must provide written notice of all visits.
- B. Daily operational inspections by CDCR must consist of inspections to determine the operational state of a system. It is not intended that the CDCR perform adjustments or modifications for system restoration.
- C. Non-scheduled maintenance will be initiated by staff personnel as a result of daily inspections or operational use of the systems. Categories of maintenance support and the response time for system restoration are defined as follows:
 - 1. Critical - Items which compromise the security of the facility or have an adverse effect on the operations of the facility. Items in this category must be returned to service within

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- eight (8) actual hours after receipt of a service call. Service must be available on a seven (7) day, twenty-four (24) hour basis.
2. Sensitive - Items which adversely impact the operations of the facility but are not considered "critical" as defined above. Items in this category must be returned to service within forty eight (48) actual hours after receipt of a service call. Service must be available on a normal eight (8) hour, five (5) day a week basis.
 3. Normal - Items which require maintenance support but are not "critical" or "sensitive" as defined above. These are typically items which staff personnel identify and accept that maintenance during the standard quarterly inspection.
- D. Contractor must provide scheduled maintenance in accordance with the description of services and maintenance schedule.
 - E. Contractor must maintain all documents and modify drawings, schedules, and other documents as required to effect documentation which reflects the current system or wiring configuration.
 - F. Upon termination of the service contract, Contractor must return all system documents to the CDCR Representative.
 - G. Contractor must develop maintenance reports, or logs, which identify maintenance activities on the system. If requested, the reports, or logs, must be provided to the CDCR Representative on a monthly basis.
 - H. In the event software is introduced which will enhance the system operation, Contractor must inform the CDCR Representative of the software, its features, and the cost to upgrade the existing software. If accepted by the CDCR Representative, Contractor must furnish and install the software and invoice CDCR in the amount approved by the CDCR Representative. Contractor to train the CDCR staff on new system features or software which may be provided to enhance the systems capability.
 - I. Insurance requirements must be maintained through the maintenance and service period.
- 1.11 SPARE PARTS
- A. Spare parts must be provided and maintained by Contractor to support the maintenance response requirements defined in this document.
 - B. The spare parts inventory may be comprised of Contractor furnished, Contractor maintained parts.
 - C. Contractor must maintain a spare parts inventory as he deems necessary to support the maintenance and service requirements of this section.
 - D. During the maintenance and service period, Contractor must maintain a log of all component failures and parts replaced.
 - E. Six months prior to the expiration of the maintenance and service period, Contractor must submit the replaced parts log to the CDCR Representative. The CDCR Representative will use the replaced parts log to evaluate the on-site spare parts inventory required for future maintenance by CDCR.

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- F. At a minimum, the following spare parts must be stored at the site in a location identified by the CDCR Representative. The spare parts must be property of CDCR. This requirement is not intended to include all spare parts required to meet the service response time limits. The contractor must replace any of these spare parts, if used for service work during the warrantee period within 10 days. The spare parts must be the same type submitted and installed in the facility.
1. Fuses.
 2. Fuse Pullers.

PART 2 PRODUCTS

2.1 EQUIPMENT

- A. Weather Proof Equipment
1. Where weatherproof (WP) equipment is indicated, use NEMA 3R or NEMA 4 cast metal or stainless steel enclosures where applicable unless otherwise specified or indicated.
- B. Outdoor Equipment
1. Equipment and devices to be installed outdoors or in unheated enclosures must be capable of continuous operation within an ambient temperature range of 20 degrees F. to 120 degrees F.

2.2 SOURCE QUALITY CONTROL

- A. CDCR Representative may elect to visit manufacturers'/suppliers' facilities prior to, or at any time during, fabrication of equipment. Manufacturers/suppliers must grant access to their facilities for the CDCR Representative visits.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install equipment to permit easy access for normal operation and maintenance to switches, motors, drives, pull boxes and receptacles in accordance with CEC Article 110, Requirements for Electrical Installation.
- B. Coordinate electrical work with CDCR Representative and work of other trades to avoid conflicts, errors, delays, and unnecessary interference with operation of the plant during construction.
- C. Check and coordinate the approximate locations of electrical stub-ins, light fixtures, electrical outlets, equipment, and other electrical system components shown on Drawings for conflicts with openings, structural members, and components of other systems and equipment having fixed locations. In the event of conflicts, notify the CDCR Representative in writing. The CDCR Representative's decision must govern. Make modifications and changes required to correct conflicts.

3.2 HOUSEKEEPING PADS AND FOUNDATIONS

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- A. Concrete work required for housekeeping pads and foundations must be provided by General Construction Work.
 - B. Furnish required dimensional drawings and specify locations. Minimum height of housekeeping pads must be 4 inches and must extend out 6 inches from the footprint of the equipment.
 - C. Furnish anchor bolts and sleeves, and verify accuracy of installation.
 - D. Provide for:
 - 1. Switchboards.
 - 2. Floor mounted ATS.
 - 3. Distribution panels.
 - 4. Floor mounted transformers.
 - 5. Other items as required.
- 3.3 FIELD QUALITY CONTROL
- 3.4 SITE TESTS
- A. Field test the following:
 - 1. At completion of installation, test for operation, panel load balance, short circuits, and ground.
 - 2. Each building service and separately derived system to have neutral bonding jumper opened and neutral and ground buses to be tested for infinite resistance. Test to be demonstrated to CDCR Representative. Where infinite resistance is not achieved, correct deficiencies and retest in the presence of CDCR personnel.
- 3.5 ADJUSTING
- A. Adjust work for intended functional operation.
 - B. Inspect all equipment and put in good working order.
- 3.6 CLEANING
- A. Clean all items.
- 3.7 PROTECTION
- A. Protect finished installation from environmental and mechanical damages.
 - B. Prior to installation, store items in clean, dry, indoor locations. Store in clean, dry, indoor, heated locations items subject to corrosion under damp conditions, and items containing electrical insulation, such as transformers, conductors, motors, and controls. Energize all space heaters furnished with equipment. Provide temporary heating, sufficient to prevent condensation, in transformers, switchgear, switchboards, motors, and motor control centers which do not have space heaters.
 - C. Following installation, protect materials and equipment from corrosion, physical damage, and the effects of moisture on insulation. When equipment intended for indoor installation is installed at the Contractor's convenience in areas where it is subject to dampness, moisture,

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dirt, or other adverse atmosphere until completion of construction, ensure that adequate protection from these atmospheres is provided that is acceptable to the CDCR Representative. Cap conduit runs during construction with manufactured seals. Keep openings in boxes or equipment closed during construction. Energize all space heaters furnished with equipment.

3.8 FINAL CONNECTION

- A. Make final connection to the power distribution system at the building service point.

3.9 PUTTING SYSTEMS IN OPERATION - START UP

- A. Operate all systems in good working order for a period of 5 consecutive days, at time period agreed to by CDCR Representative, prior to inspection.

END OF SECTION

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SECTION 26 05 35

RACEWAY FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Rigid metal conduit.
 - 2. Intermediate metal conduit.
 - 3. PVC coated rigid metal conduit.
 - 4. Flexible metal conduit.
 - 5. Liquid tight flexible metal conduit.
 - 6. Electrical metallic tubing.
 - 7. Rigid nonmetallic conduit.
 - 8. Fittings.
 - 9. Warning tape.
 - 10. Cable/conduit locator.
- B. Related Documents and Sections:
 - 1. Section 07 60 00 - Flashing and Sheet Metal.
 - 2. Section 07 84 00 - Firestopping.
 - 3. Section 26 05 00 - Common Work Results for Electrical.
 - 4. Section 26 05 34 - Outlet and Junction Boxes for Electrical Systems.
 - 5. Section 26 05 53 - Identification for Electrical Systems.

1.2 REFERENCES

- A. ANSI C80.1 - Electrical Rigid Steel Conduit (ERSC).
- B. ANSI C80.3 - Steel Electrical Metallic Tubing (EMT).
- C. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable.
- D. NEMA RN 1 - Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.
- E. NEMA TC 2 - Electrical Polyvinyl Chloride (PVC) Tubing and Conduit.
- F. NEMA TC 3 - Polyvinyl Chloride (PVC) Fittings for Use with Rigid PVC Conduit and Tubing.
- G. UL 1 - Flexible Metal Conduit.
- H. UL 6 - Electrical Rigid Metal Conduit - Steel.
- I. UL 360 - Liquid-tight Flexible Steel Conduit.
- J. UL 514B - Conduit, Tubing, and Cable Fittings.

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- K. UL 651 - Schedule 40 and 80 Rigid PVC Conduit and Fittings.
- L. UL 797 - Electrical Metallic Tubing - Steel.
- M. UL 1242 - Electrical Intermediate Metal Conduit - Steel.
- N. FS-A-A-55810 - Conduit, Metal, Flexible.
- O. FS-A-A-50552 - Fittings, For Cable, Power, Electrical and Conduit, Metal, Flexible.
- P. FS-A-A-50553A - Fittings for Conduit, Metal Rigid (Thick-wall and Thin-wall).

1.3 DEFINITIONS

- A. Inmate Accessible Areas: All areas within State Prison Property are considered inmate accessible, except as specifically listed below:
 - a) Interior of electrical, mechanical, and communications rooms or vaults.
 - b) All areas more than ten feet above finished floor or finished grade.
 - c) Areas above suspended ceilings, behind access panels, and within plumbing chases.
 - d) Roofs and equipment thereon.
 - e) Interior of control rooms.
 - f) Within fences enclosing equipment pads; Areas greater than 4 feet from fence.

B.

1.4 DESIGN REQUIREMENTS

- A. Conduit Size: As indicated. When not indicated or when equipment has been substituted, size per CEC except no smaller than 3/4-inch.

1.5 SUBMITTALS

- A. Submit under provisions of Division 01 33 00 - Submittal Procedures.
- B. Certify compliance with CEC Article 110 - Requirements for Electrical Installation.

1.6 AS-BUILT DOCUMENTS

- A. Accurately record actual routing of conduits larger than 2 inches in diameter.

1.7 PROJECT CONDITIONS

- A. Verify that field measurements are as shown on Drawings.
- B. Verify routing and termination locations of conduit prior to roughin-.
- C. Conduit routing is shown on Drawings in approximate locations unless dimensioned. Route as required to complete wiring system.

PART 2 PRODUCTS

2.1 RIGID METAL CONDUIT

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- A. Rigid Steel Conduit: ANSI C80.1, UL 6.
 - 1. Stamp each length with manufacturer's name or trademark and U/L label.
- 2.2 INTERMEDIATE METAL CONDUIT
 - A. Material: Rigid steel; hot-dip galvanized.
 - 1. UL 1242 and UL 514B.
- 2.3 PVC COATED RIGID METAL CONDUIT
 - A. Rigid steel conduit with external PVC coating, 40 mil thick: Requirements for rigid steel conduit and NEMA RN 1.
 - B. Fittings and Conduit Bodies: Steel fittings with external PVC coating to match conduit.
 - C. Tape for Joints: As recommended by conduit manufacturer.
 - D. PVC Coating on conduit and fittings must have no sags, blisters or other surface defects and must be free of holes.
 - E. At Contractor's option, rigid steel conduit may be field wrapped. Use Scotch 51 system, or substitute accepted under provisions of Division 0, with minimum 50 percent overlap.
- 2.4 FLEXIBLE METAL CONDUIT
 - A. Interlocked Steel Construction: UL 1, FS-A-A-55810.
- 2.5 LIQUIDTIGHT FLEXIBLE METAL CONDUIT
 - A. Interlocked steel construction with PVC jacket: UL 1 and UL 360.
- 2.6 ELECTRICAL METALLIC TUBING (EMT)
 - A. Galvanized Steel Tubing: ANSI C80.3, UL 797 and UL 797.
 - B. Maximum size must be 2 inches.
- 2.7 NONMETALLIC CONDUIT
 - A. Schedule 40 PVC: NEMA TC 2 and UL 651.
 - 1. Mark each length clearly and durably with size type of material and U/L label.
 - B. Solvent and Cement: In accordance with manufacturers' recommendations.
- 2.8 FITTINGS
 - A. Acceptable Manufacturer
 - 1. Thomas and Betts, (T&B).
 - a. For reference, Thomas & Betts series numbers are listed below.
 - 2. Appleton.
 - 3. Crouse-Hinds.
 - 4. O.Z. Gedney.

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- B. Standards
 - 1. Metallic: NEMA FB1 and UL 514B ferrous.
 - a. Flexible: FS-A-A-50553A.
 - 2. Non-metallic: NEMA TC3.
- C. Locknuts:
 - 1. Hardened Steel or malleable iron construction, electro zinc plated, capable of insuring positive bond to enclosure.
 - a. Non-bonding: T & B Series 142.
 - b. Bonding: T & B Series 107.
 - c. Crouse-Hinds.
 - d. Appleton.
- D. Bushings:
 - 1. Insulated: T & B Series 223.
 - 2. Insulated Metallic Bushing: T & B Series 1223.
 - 3. Insulated Grounding and Bonding Bushing: T & B Series 3871.
 - 4. Crouse-Hinds.
 - 5. Appleton.
- E. Couplings:
 - 1. Non-metallic Conduit Coupling: By non-metallic conduit manufacturer for the purpose.
 - 2. Threaded Rigid Metal Conduit Couplings: By conduit manufacturer for the purpose.
 - 3. Threadless Coupling: "Erickson" Type; T & B Series 676.
 - 4. EMT Coupling, Raintight: T & B Series 5220.
 - 5. Expansion Type: permit 3/4 inch movement any direction.
 - a. Exposed: Weatherproof with external bonding jumper.
 - b. Embedded: Watertight with internal bonding jumper.
 - 6. Crouse-Hinds.
 - 7. Appleton.
- F. Connectors:
 - 1. Non-Metallic Conduit Connector: By conduit manufacturer for the purpose.
 - 2. Threaded Hubs: Electro zinc coated with nylon insulated throat and oil/moisture resistant recessed sealing ring, raintight.
 - a. Non-bonding: T & B series 371.
 - b. Bonding: T & B Series 371 with 107 series bonding locknut.
 - 3. EMT Connectors, Raintight: T & B Series 5223.
 - 4. EMT to Rigid Metal Conduit Connector: Raintight - T & B Series 531.
 - 5. Flexible metal conduit connector - Insulated throat, suitable as grounding means. T & B Series 3115.
 - 6. Liquid-tight flexible metal conduit connector FS-A-A-50552, electro zinc plated inside and outside, with nylon insulating throat and taper threaded hub.
 - a. Non-External Bonding - T & B Series 5333.
 - b. External Bonding - T & B Series 5333GR.
 - 7. Crouse-Hinds.
 - 8. Appleton.
- G. Nipple: "Chase" Type, Insulated; T & B Series 1943.
- H. Sealing Gaskets: Oil and moisture resistant rubber bonded to metallic retainer.

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1. With rigid conduit - T & B Series 5303.
2. With liquid tight flexible conduit - T & B Series 5263.
3. Fittings not specifically listed but required must be of similar style and quality.

2.9 CONDUIT BODIES

- A. Standards - NEMA FB-1 and FS-A-A-50553A.
- B. Ferrous with threaded hubs and gasketed cover.

2.10 SEALANT

- A. Internal to fittings.
 1. Approved by manufacturer for application.
 2. Manufacturer:
 - a. Crouse Hinds Chico A-P and Chico X Fiber.
 - b. O.Z. Gedney.

2.11 WARNING TAPE

- A. Tape: Heavy-gauge, yellow plastic; minimum 6inch width for use in trenches containing electric circuits; material resistant to corrosive soil and containing a metallic tracer wire for use with cable locators; printed warning that electric circuit is located below the tape.
 1. Manufacturers and Types:
 - a. 3M.
 - b. Calpico.
 - c. Plymouth, Vinyl Tape.
 - d. Griffolyn Co, Terra Tape.
 - e. ITT Blackburn, Type YT or RT.

2.12 CABLE/CONDUIT LOCATOR

- A. Locator: Hand-held, self contained, cable/conduit locator capable of inducing a signal on a cable and detecting a 60 Hz power signal.

PART 3 EXECUTION

3.1 INSTALLATION - GENERAL

- A. Installation Standards:
 1. Install conduit in accordance with NECA "Standard of Installation."
 2. Ground and bond conduits.
 3. Identify conduit under provisions of Section 26 05 53.
 4. Where conduit systems penetrate or parallel fire and/or smoke rated walls, ceilings, roofs or floors, maintain the fire rating integrity. Comply with Section 07 84 00 - Firestopping.
 5. Install nonmetallic conduit in accordance with manufacturer's instructions.
 6. Provide heavy nylon cord pull string in each empty conduit except sleeves and nipples. Pull line to have a minimum of 200 pound pull strength. Tag each end of string with destination. Leave a minimum of 24 inches of slack and tie-off at each end.
 7. Within finished areas of building. Install all conduits concealed.

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8. Exposed overhead conduit may be used in areas with exposed metal structure, Switchgear Rooms, Mechanical Equipment Rooms, Electric Closets, and Equipment Rooms only.
 9. Do not use setscrew type couplings, bushings, elbows, nipples, or other fittings for Intermediate Metal Conduit unless specifically approved by the CDCR Representative.
- B. Supports:
1. Arrange supports to prevent misalignment during wiring installation.
 2. Support conduit using coated steel or malleable iron straps, layin- adjustable hangers, clevis hangers, and split hangers.
 3. Group related conduits; support using conduit rack. Construct rack using steel channel; provide space on each for 25 percent additional conduits.
 4. Fasten conduit supports to building structure and surfaces.
 5. Do not attach conduit to ceiling support wires.
 6. Conduit Installation:
 - a. Support all conduit systems from building structure or walls with approved hangers.
 - 1) Do not support from piping, ducts or support system for piping or ducts.
 - 2) Do not install to prevent ready removal of piping, ducts or ceiling tiles.
 - 3) Do not support from ceiling or ceiling support systems.
- C. Routing:
1. Arrange conduit to maintain headroom and present neat appearance.
 2. Route conduit in and under slab from point-to-point.
 3. Route other conduit parallel and perpendicular to walls.
 4. Unless otherwise indicated or specifically approved by CDCR Representative, route conduit below metal decks without concrete toppings.
 5. Maintain adequate clearance between conduit and piping.
 6. Maintain 12-inch clearance between conduit and surfaces with temperatures exceeding 104 degrees F (40 degrees C).
 7. In outdoor, underground, or wet locations, use watertight couplings and connections in raceways.
 8. Thoroughly clean threads of oil, tailings and paint threads of galvanized conduits that are installed in exposed or damp locations with zinc-rich paint or liquid galvanizing compound before assembling.
 9. Do not notch or penetrate structural members for passage of raceways except with prior approval of the CDCR Representative.
 10. Do not run raceways in equipment foundation pads.
 11. Install concealed, embedded, and buried raceways so that they emerge at right angles to the surface and have none of the curved portion of the bend exposed.
- D. Fitting:
1. Cut conduit square using saw or pipe cutter; de-burr cut ends.
 2. Bring conduit to shoulder of fittings; fasten securely.
 3. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure for 20 minutes, minimum.
 4. Use conduit hubs or sealing locknuts to fasten conduit to sheet metal boxes in damp and wet locations and to cast boxes.
 5. Install no more than equivalent of four 90 degree bends between boxes. Use conduit bodies to make sharp changes in direction, as around beams. Use hydraulic oneshot-bender to fabricate bends in metal conduit larger than 2 inch size.

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6. Avoid moisture traps; provide junction box with drain fitting at low points in conduit system.
 7. Provide suitable fittings to accommodate expansion and deflection where conduit crosses seismic control and expansion joints.
 8. Use suitable caps to protect installed conduit against entrance of dirt and moisture.
 9. Make joints in threaded conduit watertight with white nonlead compound applied to male threads only.
 - a. Cut square, ream smooth, and properly thread filed joints to receive couplings.
 - b. Do not use running threads. Fit all conduit ends at switch and outlet boxes with approved lock nuts and bushing forming approved tight bond with box when screwed tightly in place.
 10. Remove moisture and debris from conduit before wire is drawn into place. Tightly plug ends of conduit with plastic inserts until wire is pulled.
 11. Neatly seal openings around conduits, etc., where they pass through fire rated construction or exterior walls or roof in accordance with Section 07 84 00.
 12. Install conduit to roof exhaust fans through fan housing with no conduit exposed.
 13. Route conduit through roof openings for piping and ductwork or through suitable roof jack with pitch pocket. Coordinate location with roofing installation specified under Section 07 60 00.
 14. Provide escutcheon plates at exposed wall, ceiling and floor conduit penetrations.
- E. Bends:
1. Make changes in direction of runs with symmetrical bends or cast metal fittings. Make bends and offsets of the longest practical radius. Avoid fieldmade- bends and offsets where possible, but where necessary, make with an acceptable hickey or conduit bending machine. Do not heat metal raceways to facilitate bending.
 2. Make bends in parallel or banked runs of raceways from the same center or centerline so that bends are parallel and of neat appearance. Factory elbows may be used in parallel or banked raceways if there is a change in the plane of the run and the raceways are of the same size. Otherwise, make field bends in parallel runs.
 3. For PVC conduits, use factory made elbows for all bends 30 degrees or larger. Use acceptable heating methods for forming smaller bends.
 4. For duct bank runs for site electrical distribution including signal/communications ducts, use only utility type large radius sweeps, (12 times trade size).
 5. Make no bends in flexible conduit that exceed allowable bending radius of the cable to be installed or that significantly restricts the conduit's flexibility.
- F. Bushing and Insulating Sleeves:
1. Where metallic conduit enters metal equipment enclosures through conduit openings, install a bonding bushing on the end of each conduit. Install a bonding jumper from the bushing to any equipment ground bus or ground pad.
 2. If neither exists, connect the jumper to a lag-bolt connection to the metallic enclosure.
 3. Use manufacturer's standard insulating sleeves in all metallic conduits terminating at an enclosure.
- G. Penetrations:
1. Seal the interior of all raceways entering structures including manholes, handholes, and pullboxes at the first box or outlet with oakum or suitable plastic expandable compound to prevent the entrance into the structure of gases, liquids, or rodents.

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2. Dry pack with nonshrink grout around raceways that penetrate concrete walls, manholes, handholes, pullboxes, or floors, or use one of the methods specified for underground penetrations. The seal must prevent water seepage around the raceways.
3. Where an underground raceway enters a structure through a non-waterproofed wall, install a sleeve made of Schedule 40 galvanized pipe. Fill the space between the conduit and sleeve with a suitable plastic expandable compound, or oakum and lead joint, on each side of the wall in such a manner as to prevent entrance of moisture. A watertight entrance sealing device may be used in lieu of the sleeve.
4. Where raceways penetrate fire-rated walls, floors, or ceilings, fire stop openings around electrical penetrations to maintain the -fire-resistance- rating.

3.2 INSTALLATION REQUIREMENTS FOR UNDERGROUND DIRECT BURIAL RACEWAYS

A. General:

1. Coordinate installation of underground raceways with other outside and building construction work.
2. Remove entirely and properly reinstall all raceway installations not in compliance with these requirements.
3. Do not use union type fittings underground.
4. Provide a minimum cover of 30 inches over all low voltage and communication underground raceways unless otherwise indicated. Provide a minimum cover of 36 inches over all high voltage underground raceways unless otherwise indicated.
5. Do not backfill underground direct burial raceways until they have been inspected by the CDCR Representative.
6. Warning Tapes: Bury warning tapes approximately 12 inches above all underground conduit runs or duct banks. Align parallel to and within 12 inches of the centerline of runs.

B. Separation and Support:

1. Separate parallel runs of two or more raceways in a single trench with preformed, nonmetallic spacers designed for the purpose. Install spacers at intervals not greater than that specified in the CEC for support of the type raceways used, and in no case greater than 10 feet.
2. Support raceways installed in fill areas to prevent accidental bending until backfilling is complete. Tie raceways to supports, and raceways and supports to the ground, so that raceways will not be displaced when concrete encasement or earth backfill is placed.

C. Arrangement and Routing:

1. Arrange multiple conduit runs substantially in accordance with any details shown on the Drawings and as required in Figure 310-60 of the California Electric Code. Locate underground conduits where indicated on the Drawings.
2. Make minor changes in location or cross-section- as necessary to avoid obstructions or conflicts. Where raceway runs cannot be installed substantially as shown because of conditions not discoverable prior to digging of trenches, refer the condition to the CDCR Representative for instructions before further work is done.
3. Where other utility piping systems are encountered or being installed along a raceway route, maintain a 12 inch minimum vertical separation between raceways and other systems at crossings. Maintain a 12 inch minimum separation between raceways and other systems in parallel runs unless otherwise noted. Do not place raceways over valves

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or couplings in other piping systems. Refer conflicts with these requirements to the CDCR Representative for instructions before further work is done.

4. Provide bellends- flush with manhole walls on all nonmetallic raceways entering manholes.
5. In multiple conduit runs, stagger raceway coupling locations so that couplings in adjacent raceways are not in the same transverse line.
6. All communications conduits must enter communications manholes and pull boxes from the ends only.

3.3 PRODUCT APPLICATION - RACEWAY - GENERAL LOCATIONS

A. Underground

1. Conduit:
 - a. PVC Coated Rigid Metal Conduit.
 - 1) Wrap connection point of fitting and conduit to maintain integrity of coating system.
 - b. Rigid Nonmetallic conduit.
2. Encase underground conduits to 5 feet of building concrete where passing under roadways.
3. Install underground conduit 30 inches minimum below grade unless otherwise noted. Do not backfill before observation by CDCR Representative. Field coordinate elevation of conduits provided by Site Work/Utilities Contractor.
4. Separate conduit from face to face by 3 inches.
5. Make transition from underground rigid non-metallic conduit to rigid metal conduit after entering but prior to exiting the concrete slab. If during this transition the metal conduit comes in contact with the earth, then PVC coated rigid metal conduit must be installed.

B. Outdoors, Above Grade:

1. Do not install in exercise yards unless specifically indicated.
2. Liquid-tight Flexible Conduit:
 - a. Where greater than 12 feet above grade in exercise yard where allowed.
 - b. Other locations where protected from physical damage.
 - c. Maximum 3 foot lengths.
3. Electrical Metallic Tubing:
 - a. Do not use in exercise yards.
 - b. Where protected from weather and physical damage.
4. Rigid Metallic Conduit:
 - a. Use in exercise yard where allowed.
 - b. Other locations not otherwise indicated.

C. In Slabs and Masonry:

1. Rigid metal conduit.
2. Rigid nonmetallic conduit.
3. PVC coated rigid conduit.
4. Conduits to be installed in precast concrete during casting and through extruded concrete planks.
5. Install no conduit larger than 1 inch in floor slabs on grade.
 - a. Where installed in composite floors, conduit runs must have no crossovers.
 - b. Do not install conduit under pads for fans, pumps, boilers, or other machinery.

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6. Install expansion joint fittings on conduit in slab at all building expansion joints. Allow for the high rate of thermal expansion and contraction of PVC conduit by providing PVC expansion joints as recommended by the manufacturer and as required.
 7. In concrete floor slabs, not on grade:
 - a. Install conduits so that the structural strength of the slab is not impaired.
 - b. Install conduit in the middle one-third of the slab except as necessary to avoid structural reinforcement material and maintain at least 1 inch of cover.
 - c. Provide minimum spacing of 3 diameters except at cabinet and panel locations.
 - d. Do not cross conduits.
 - e. Place conduit larger than 1 inch parallel with or at right angles to reinforcement.
- D. Dry Locations - Concealed:
1. Rigid metal conduit.
 2. Flexible metal conduit.
 3. Liquidtight flexible metal conduit.
 4. Electrical metallic tubing.
 5. Connections and Fittings:
 - a. Above lay-in tile ceilings, make connections to lay-in type fixtures with 1/2-inch flexible metal conduit.
 - 1) Include No. 12 branch and grounding conductors.
 - 2) Arrange conduit and box systems for easy removal of lay-in ceiling.
- E. Dry Locations - Exposed.
1. Rigid metal conduit.
 2. Flexible metal conduit - 6 feet maximum length.
 3. Liquidtight flexible metal conduit - 6 feet maximum length.
 4. Electrical metallic tubing.
 5. Inmate Accessible Areas: Rigid metal conduit only.

3.4 PRODUCT APPLICATION - RACEWAY - SPECIAL LOCATIONS

- A. The following requirements modify the general location requirements listed above.
- B. Hazardous Locations:
1. Rigid Metal Conduit.
 2. Flexible Metallic Conduit: As limited by CEC.
 3. Liquidtight flexible metallic conduit: As limited by CEC.
 4. Use sealing fittings. Fill with sealant in accordance with manufacturers instructions. Install in accord with CEC.
- C. Corrosive Areas:
1. PVC coated rigid metal conduit.
 2. Liquidtight flexible metal conduit.
- D. Motor Connections:
1. Make motor and equipment connections with flexible metal conduit not exceeding 24 inches in length.
 - a. Use liquidtight metal conduit in damp and wet locations.
 - b. Damp locations include but are not limited to: Dietary production, dishwashing, decontamination sterilizers and pumps.

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- E. Freezer and Refrigeration Rooms:
 - 1. Rigid metal conduit.
 - 2. Use sealing fittings on refrigeration and freezer room conduit runs in accord with CEC 300-7(a).
- F. Hospitals, Clinics and Health Facilities
 - 1. The use of rigid non-metallic conduit is to be restricted to areas only indicated on the Non-metallic Conduit Guideline as detailed on the Drawings. Do not use rigid non-metallic conduit without a Non-metallic Conduit Guideline Detail.

3.5 PRODUCT APPLICATIONS - CONNECTIONS

- A. Rigid Metal Conduit:
 - 1. At building expansion joints, use expansion type fittings.
 - 2. Where an expansion type fitting is not required, use a threaded rigid metal conduit coupling or "Erickson" type coupling as appropriate.
 - 3. Make connections to NEMA 12 boxes with a threaded hub.
 - 4. Make connections to a threadless opening with locknuts on the inside and outside of the box. The conduit end must be fitted with an insulating bushing. In wet locations, a sealing gasket must be provided between the outside locknut and the box.
 - 5. Bonding type locknuts must be used where the raceway and associated fittings are part of the equipment grounding system.
 - 6. Insulated grounding and bonding bushings must be used to terminate service conduits, rigid metal conduit used as the grounding electrode conductor enclosure, where assurance of electrical continuity between isolated sections of raceways is required in accordance with CEC and where a bonding jumper around unpunched knockouts is required in accordance with CEC.
 - 7. Terminate in sealing type fittings when leaving refrigerator and freezer boxes and when leaving hazardous areas.
 - 8. Repair any marred galvanized finish to maintain the same level of corrosion protection.
- B. PVC Coated Rigid Metal Conduit:
 - 1. Tape over all connections below grade to maintain the continuity of the corrosion protection.
 - 2. Repair any damaged PVC covering of the conduit or fittings.
 - 3. The requirements for rigid metal conduit also apply.
- C. Flexible Metal Conduit:
 - 1. Terminate with a flexible metal conduit connector. Use a locknut in unthreaded boxes.
- D. Liquidtight Flexible Metal Conduit:
 - 1. Terminate with a liquidtight flexible metal conduit connector. Use external bonding type with equipment bonding jumper in hazardous locations (where allowed). Fasten bonding jumper to conduit with cable ties every foot.
 - 2. In wet locations, use a sealing gasket.
- E. Electrical Metallic Tubing:
 - 1. At building expansion joints, use expansion type fittings.
 - 2. Where an expansion type fitting is not required, use an EMT coupling to connect EMT sections.
 - 3. Make connections with EMT connectors.

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- F. Rigid non-metallic conduit:
 - 1. Make connections in accordance with the manufacturers published instructions.
 - G. System-to-System Connections:
 - 1. Make EMT to rigid metal conduit connections with an EMT to rigid metal conduit connector.
 - 2. Make a box-to-box connection with a “chase” type nipple and locknut.
- 3.6 PREPARATION FOR PULLING IN CONDUCTORS
- A. Do not install crushed or deformed raceways. Avoid traps in raceways where possible. Take care to prevent the lodging of plaster, concrete, dirt, or trash in raceways, boxes, fittings, and equipment during the course of construction. Make raceways entirely free of obstructions. Raceways that are not usable because of being crashed or obstructions must be replaced. Ream all raceways, remove burrs, and clean raceway interior before introducing conductors or pull wires.
 - B. Immediately after installation, plug or cap all raceway ends with watertight and dusttight-seals until the time for pulling in conductors. Provide a permanent removable cap over each end of each empty raceway.
- 3.7 EMPTY RACEWAYS
- A. Certain raceways will have no conductors pulled in as part of this Contract. Identify with tags at each end the origin and destination of each such empty raceway. Provide a permanent cap over each end of each empty raceway. Provide a nylon pull wire in each empty raceway, tie-off at both ends.
- 3.8 TESTING & INSPECTION
- A. Do not cover up conduit work until inspected. Notify CDCR representative at least 3 days before inspection is desired.

END OF SECTION

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SECTION 28 31 00

FIRE DETECTION AND ALARM

PART 1 GENERAL

1.1 SUMMARY

- A. This Section covers the fire alarm system as shown on the Drawings or as required to support the systems defined in these Specifications. The Work under this Section consists of furnishing materials and equipment, performing labor and services necessary for the installation of the fire alarm system required for the security electronics and communications system.
- B. Related Work Specified Elsewhere: Refer to all other Division 26, 27 and 28 Specification sections and Drawings, and to the Specifications and Drawings under the General Construction Contract to ascertain the extent of Work included.

1.2 SUBMITTALS

- A. Submit in accordance with Sections 01 33 00 – Submittal Procedures and 01 33 23 – Shop Drawings, Product Data, and Samples.
- B. Fire Alarm Product Data:
 - 1. Submit technical information consisting of marked-up catalog sheets of each specified device inserted in a 3-ring binder in the same order as the devices appear in these Specifications.
 - a. Mark the appropriate specification reference number in the upper right-hand corner of each catalog sheet.
 - b. For devices that may not be specified in these Specifications but are required to provide the system functions specified, include those catalog sheets and shop drawings at the end of the submittal binder.
 - 2. Provide California State Fire Marshal listing numbers for each piece of equipment submitted.
 - 3. Submit manufacturer's certification that the submitted equipment will meet or exceed the site-specific system network performance requirements.
- C. Submit qualifications of individuals responsible for overseeing the installation of the Fire Alarm System.
- D. Deferred Submittal Approval:
 - 1. Systems shown in these design documents establish design intent, are schematic, and are included for reference only. Contractor must provide complete design submittals with justification of life safety elements and/or system.
 - a. Specialty (State of California Licensed) Engineer or NICET Level III, minimum must Stamp and wet-sign drawings including supporting calculations.
- E. California State Fire Marshal (CSFM) Submittal:

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1. CDCR Representative will provide electronic files of reviewed fire alarm Shop Drawings. Incorporate all addenda and bulletins issued to Contractor into electronic files.
2. Submit complete California State Fire Marshal (CSFM) submittal based on Contractor's Contract Drawings (including addenda and bulletins); and the reviewed Fire Alarm Product Data Submittal. Submit, as indicated in the Project milestone schedule, the following:
 - a. All drawings and diagrams; which must include Contractor's title block, complete with drawing title, Contractor's name and address, date including revisions, and preparer's and reviewer's initials.
 - b. Reviewed set of Fire Alarm Product Data that includes stamp of Engineer of Record.
 - c. Complete system bill of material with peripheral device back box size information, part numbers, and device mounting height information.
 - d. Complete equipment fabrication descriptions and dimensions of equipment cabinets. For each building, indicate the equipment cabinet size(s) required to accommodate the specific equipment required to perform the specified functions.
 - e. Detailed system operational description, with all specification differences and deviations clearly noted and marked.
 - f. Riser diagram that individually depicts all control panels, annunciators, addressable devices and notification appliances. Field addressable devices and notification appliances may be grouped together by specific circuit.
 - g. FACP point-to-point wiring diagrams, specific for each building. Show all interconnecting wiring of components within the FACP and the termination of all initiating and signaling circuits.
 - h. Complete 1/8" = 1'-0" scale floor plan drawing locating all system devices, and elevation drawing of all equipment at Fire Control Station.
 - 1) Floor plans must indicate accurate locations for all control and peripheral devices as well as raceway size and routing, junction boxes, and conductor size and quantity in each raceway.
 - 2) All notification appliances must be provided with a candela rating and circuit address that corresponds to that depicted on Riser Diagram.
 - 3) If individual floors need to be segmented to accommodate 1/8" scale requirements, Key Plans and break lines must be provided on plans in an orderly and professional manner.
 - 4) End-of-line resistors (and values) must be depicted.
 - i. Control panel wiring and interconnection schematics.
 - 1) Drawings must depict internal component placement and all internal and field termination points.
 - 2) Drawings must provide detail indicating where conduit penetrations must be made to avoid conflicts with internally mounted batteries.
 - 3) For each additional data-gathering panel, provide separate control panel drawing which clearly indicates designation, service and location of control enclosure.
 - j. Battery calculations: Battery calculations must include the specified spare capacity. Final battery sizes, based on calculations, must be indicated.
 - k. Complete voltage drop calculations that clearly indicate quantity of devices, device part numbers, supervisory current draw, alarm current draw, voltage drop, and totals for all categories.

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- l. System (Load and Battery) calculations for each system power supply and control panel, providing power for notification appliance circuits, auxiliary control circuits, and all circuits that draw power from any system power supply.
 - 1) Battery calculations must reflect all control panel components, remote annunciator, and auxiliary relay current draws.
 - m. Wiring connection diagrams for each device to be installed or connected by Contractor.
 - n. Site-wide network configuration:
 - 1) Submit drawings indicating network design for each network proposed.
 - 2) Drawings must indicate quantity and designation (building number and device type) of each node on each network.
 - 3) Design must not exceed 80 percent of manufacturer's recommendations for total network length and total nodes per network.
 - 4) Drawings must also indicate the conduit length, as indicated on the Contract Documents, between each node.
 3. Incorporate CDCR Representative review comments and submit package to CSFM.
 4. Indicate on CSFM approved drawings all comments provided by CDCR Representative and CSFM which were not indicated on original Contract Drawings.
 5. After CSFM approval, transmit two electronic media sets, seven bond copies of shop drawings, each bearing the CSFM stamp of approval, to CDCR Representative.
 6. System to be installed and inspected utilizing CSFM approved drawings, not original Contract Drawings.
 7. In addition to the to the requirements above, submittal packages shall comply with the requirements listed in the Fire Sprinkler, Standpipe System, Fire Pump and Water Tank Submittal Guideline as well as the CalFire Plan Review Triage List published by CSFM. Provide the CalFire Plan Review Triage List as part of the submittal package, with all items checked off to indicate their inclusion in the submittal package.
 - a. The required Triage List is available online at the following address:
http://osfm.fire.ca.gov/firelifesafety/pdf/Calfire_Triage.pdf.
 - b. The fire protection submittal guidelines are located at:
<http://osfm.fire.ca.gov/firelifesafety/pdf/20141012RequirementsforFireSprinklerPlanReview.pdf>.
- F. Fire Alarm Device Nomenclature Submittal:
1. Submit list of all fire alarm devices by Building name, Building number and device number indicated on approved CSFM drawings to the CDCR Representative. Include system nomenclature restrictions.

1.3 REFERENCES

- A. FM – Factory Mutual Approval Guide, Current Edition.
- B. National Fire Protection Association (NFPA):
 1. 72 – 2022 National Fire Alarm Code, as amended by CA code.
 2. 101 – 2021 Life Safety Code, as amended by CA code.
- C. Underwriters Laboratories Inc. (UL):
 1. 38 – Manual Signaling Boxes for Fire Alarm Systems.
 2. 217 – Single and Multiple Station Smoke Alarms.
 3. 268 – Smoke Detectors for Fire Alarm Signaling.
 4. 268A – Smoke Detectors for Duct application.

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5. 464 – Audible Signal Devices.
6. 521 – Heat Detectors for Fire Protective Signaling Systems.
7. 632 – Electrically-Actuated Transmitters.
8. 864 – (9th Edition) Control Units for Fire-Protective Signaling Systems (UOJZ), and Smoke Control Service (UUKL).
9. 1711 – Amplifiers for Fire Protective Signaling Systems.
10. 1971 – Signaling Devices for the Hearing Impaired.
11. 2572 Control and Communication Units for Mass Notification Systems.
12. UL Certifications Directory, Current Edition.

D. ADAAG – Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities.

E. California Building Code.

F. California Electrical Code.

G. California Mechanical Code.

H. California Fire Code.

1.4 DELINEATION OF RESPONSIBILITY

A. Products furnished and installed under this section:

1. Central Fire Alarm Monitoring Systems Equipment which must include but not be limited to:
 - a. Existing FACP network Central Fire Alarm Monitoring System, CPU, visual display, workstation, and printer to be in Building 306.
 - b. Central Monitoring system at the existing Building 202, Fire House.

B. Products furnished and installed under this section:

1. Local Building Fire Alarm System Equipment which must include but not be limited to:
 - a. Fire Alarm Control Panels including power supplies.
 - b. Signal Initiating Devices (smoke detectors, heat detectors, duct smoke detectors, pull stations, etc.).
 - c. Alarm Signal Notification Appliances (audible devices, visual devices, etc.).
 - d. System Interface Hardware.
 - e. Remote Annunciator Panels.
 - f. Input/Output Modules.
 - g. Fan Control Relays.
 - h. Special backboxes.
 - i. Fire Alarm Control Panel batteries.
 - j. Air Sampling Smoke Detectors.
 - k. Standard backboxes for fire alarm devices.
 - l. Conductors and cable for local building fire alarm system.
 - m. Conduit system.
 - n. Annunciators on housing door control panels.
 - o. Power from emergency power panel (where applicable) to FACP and central fire alarm monitoring equipment.
 - p. Remote Power Supplies.
 - q. Graphic Interface Monitor.

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- C. Contractor must provide a complete and functional system, including proper functionality of the existing system.

1.5 SYSTEM DESCRIPTION

A. Central Fire Alarm Monitoring Systems:

1. Central Monitoring at Building 306 (security electronics systems control panel):
 - a. The central fire alarm monitoring system monitors initiation of any fire alarm and combined trouble/supervisory condition at the local building FACP. Alarms and combined trouble/supervisory conditions are displayed on a per building basis in all buildings.
 - b. Display alarms and combined trouble/supervisory conditions on the security electronics systems control panel.
 - 1) Addressable output modules must be provided to interface with security system to annunciate the alarm and trouble/supervisory conditions.
 - 2) Addressable output modules must "latch" upon initiation of the alarm and trouble/supervisory conditions and must not reset until the local FACP is reset.
 - c. System must be configured such that the worst case response time (under all phasing conditions) between the initiation of an alarm or input at a local building FACP and the annunciation of that alarm or input at the Central Control security electronics systems control panel does not exceed ten (10) seconds.
2. Central Monitoring at Building 306 (FACP network monitoring):
 - a. Fire alarm signals shall report Central Control in building 306 where they are monitored 24/7 by qualified personnel.
 - b. The contractor shall field verify the existing central monitoring system in building 306 for the existing system make, model and functionality.
 - c. The FACP network Central Fire Alarm Monitoring System is referred on the drawings as the Data Logger/CRT and printer.
 - d. The FACP network Central Fire Alarm Monitoring System monitors all fire alarm, trouble and supervisory conditions at each local building FACP. Alarm, trouble and supervisory conditions are logged and displayed on a per device/event basis and archived and printed out on a per device/event basis.
 - e. The FACP network Central Fire Alarm Monitoring System must be connected to the FACP network through an NFPA 72, Class A signaling line circuit and comply with NFPA 72 as a Proprietary Supervising Station System.
 - f. System must be configured such that the worst case response time (under all phasing conditions) between the initiation of an alarm or input at a local building FACP and the annunciation of that alarm or input at the FACP network Central Fire Alarm Monitoring System and printer does not exceed ten (10) seconds.
3. Central Monitoring at existing building 202, Fire House:
 - a. The contractor shall field verify the existing central monitoring system in building 202, Fire House, for the existing system make, model and functionality.
 - b. Each Building FACP panel must include a stand-alone digital alarm communicator transmitter (DACT) with dual telephone line connections (primary and secondary), or a dedicated fiber optic line, configured to automatically report alarm, trouble and supervisory events to the Fire Station on a general per FACP/building basis. Contractor shall field verify the availability of telephone lines and/or fiber optic connection.
 - 1) Each DACT must be configured and programmed in accordance with NFPA 72.

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- c. Existing building 202, Fire House, must be equipped with a digital alarm communicator receiver (DACR) to monitor initiation of any fire alarm, trouble or supervisory events at each local building FACP. Events are displayed on a per building basis and archived and printed out on a per building/FACP basis.
 - d. DACR at the Fire Station must receive alarm, trouble or supervisory events from each the local building FACP through telephone line connections routed through the CDCR-provided Telephone PABX in Building.
 - 1) Telephone connections at each Building FACP:
 - a) CDCR must provide two telephone station cables and jacks, or a dedicated fiber optic connection, at each FACP to serve as the primary and secondary telephone connections to the DACT at each Building FACP.
 - b) Each building FACP's DACT must be programmed by Contractor to report events to the Fire Station in accordance with NFPA 72.
 - 2) Telephone/fiber optic connections between the PABX and the Fire Station:
 - a) CDCR must provide two telephone lines, or a dedicated fiber optic connection, between the PABX and the Fire Station that are dedicated for Building Fire Alarm event reporting from the Building FACP panels. The two telephone lines must be programmed by CDCR for line selection using a hunt group configuration based on NFPA 72.
 - b) DACR provided at the Fire Station by Contractor must be configured and programmed to communicate with FACP panels through the two PABX telephone lines assigned by CDCR.
 - e. Receiving, logging, annunciating and displaying of alarm, trouble and supervisory conditions must be provided in accordance with NFPA 72, Proprietary Supervising Station Systems.
 - f. Each FACP's DACT must be configured to initiate a communications integrity test of all channels between the DACT and the DACR automatically at a frequency that is no greater than 24 hours.
- B. Local Building Fire Alarm System:
- 1. Except in housing units, activation of any manual or automatic fire alarm initiating device activates building general alarm audible and visual devices through the FACP. The FACP indicates device or devices in alarm and activates the central fire alarm monitoring system as specified.
 - 2. System trouble and supervisory activates common audible signals at the FACP. The FACP indicates device or devices in trouble or supervisory condition and activates the central fire alarm monitoring system.
 - 3. Alarm, trouble, and supervisory signals operate until the condition is corrected and the FACP is manually reset at the FACP itself by key or code (remote reset is not allowed).
 - 4. An FACP front panel switch silences audible trouble signals. Visual trouble indication remains on the FACP LCD display until trouble condition is corrected and system is restored to normal by the reset function at the FACP.
 - a. The following conditions initiate a trouble signal:
 - 1) Ground or open fault on a circuit.
 - 2) Loss of 120 volt operating power to FACP.
 - 3) Low battery.
 - 4) Loss of communication.
 - 5) Fire pump trouble signal.
 - 6) Clean agent system trouble signal.
 - b. The following conditions initiate a supervisory signal:

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- 1) Main sprinkler valve is closed.
 - 2) PIV is closed.
 - 3) Any sprinkler or standpipe O, S & Y valve is closed.
 - 4) Fire pump supervisory signal.
 - 5) Clean agent system low gas pressure.
 - 6) Clean agent system abort switch activated.
 - 7) Dry sprinkler system low air pressure.
5. Alarms annunciate as specified until the initiating device returns to normal and the system is reset at the FACP.
 - a. The FACP may silence audible alarms without resetting the system.
 - b. System continues to monitor all initiating points as specified after alarm signal silencing.
 - c. Additional alarms initiate the audible tone until silenced again.
 6. FACP automatically transmits trouble and alarm indications on a per device basis to the central fire alarm monitoring system.
 7. Activation of fire rated counter shutters or hold-open fire doors must be initiated by an addressable output module located adjacent to the counter shutter or fire door based on alarm by local smoke detectors on either side of the shutter or fire door unless otherwise noted on the drawings. Power to operate the counter shutters will be provided by the building contractor and will be switched through the contact of the associated addressable output module.
 8. For buildings with smoke dampers:
 - a. For Buildings with smoke dampers, activation of the dampers must be initiated via detector mounted relays except where addressable output modules are either noted to be provided on the Fire Alarm Drawings or where addressable output modules are required to operate the dampers in accordance with Mechanical Control sequences (per Building HVAC Drawings).
 - b. Damper control relays must be activated based on alarm by room smoke sensors or duct smoke sensors as shown on the drawings.
 - c. Smoke dampers are shown on the fire alarm plan drawings.
 - d. Control power to operate the damper will be provided by Contractor and will be switched through the damper control relays.
 - e. Auxiliary control relays must be provided as required to supplement input/output modules or detector mounted relays for auxiliary control of equipment provided under other bid package contracts where the voltage and current requirements of the equipment to be controlled exceed the contact ratings of the input/output modules or detector mounted relays.
 9. Individual designated non-fire alarm monitoring points must not cause the FACP to enter the "alarm" state. The FACP monitors the status of the relay contact and automatically clears or resets when the relay contact returns to its normal state. Manual reset of the FACP is not required. Alarm verification feature must not be implemented for non-fire alarm monitoring points.
 10. Each local FACP must be an addressable NFPA 72 Class A fire/smoke detection and alarm system that is compatible with the central fire alarm monitoring system and complies with NFPA 72 as a Protected Premises Fire Alarm System.
 - a. Automatic detector circuits: Addressable Class A signaling line circuits with remote sensitivity monitoring and adjustment.
 - b. Notification appliance circuits: Class A circuits.
 11. Each local FACP provides the functions specified for that building if the communication link between the local FACP and central fire alarm monitoring system is lost. This includes monitoring detection devices, annunciating audible and visual signaling

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- devices, providing remote annunciation where specified, providing TROUBLE indications and operate in the TEST mode.
12. Each Building Fire Suppression/Agent Panel System must be monitored by either the local or adjacent building FACP (as indicated on the fire alarm plan drawings).
 - a. The FACP must monitor and report both alarm and trouble conditions associated with each system.
 - b. Activation of a Building Fire Suppression/Agent Panel System must activate the building general fire alarm.
 - c. For sub-fed buildings, both the alarm and trouble conditions must be reported to the Central Fire Alarm Monitoring System separate from the alarm and trouble conditions for the building with the FACP.
 13. Auxiliary contacts on duct smoke sensors will be used to activate/deactivate the associated mechanical equipment unless otherwise noted in these specifications or on the fire alarm plan drawings. Building contractor will extend control circuits to the duct smoke sensor auxiliary contact and affect the required control sequence.
 14. Each FACP includes a power supply with battery back-up. Both the power supply and battery back-up must be sized to independently provide power for the fire alarm system as specified plus 20 percent spare capacity for future system expansion.
 15. There must be no exterior audible or visual fire alarm signal devices inside the secure perimeter of the facility. Flow detection must be indicated via graphic control panel in Central Control and via printer in Central Control.
 16. Each Kitchen Hood Extinguishing System must be monitored by the local building FACP. Activation of a Kitchen Hood Extinguishing System must activate the building general fire alarm.
- C. Housing Unit Special Requirements:
1. The FACP must be configured with a pre-alarm function.
 - a. Activation of any specified pre-alarm manual or automatic fire alarm initiation device initiates a pre-alarm audible tone via the audible device(s) in the control room(s), illuminates LED(s) on the "Reset" switch(es) on the door control panel(s) and initiates the pre-alarm timer in the FACP.
 - b. The pre-alarm timer must be software programmable from 15 to 120 seconds. Initial setting must be 120 seconds.
 - c. The pre-alarm audible tone must sound until the "Fire Alarm Silence" switch on the door control panel is depressed. When the "Fire Alarm Silence" switch is depressed, the LED(s) on the switch(es) must illuminate steady and until the "Silence" function is completed.
 - d. The pre-alarm timer must continue until one of the following occurs:
 - 1) The "Fire Alarm Reset" switch on the door control panel is depressed. Action: FACP and pre-alarm timer to reset and the LED's on the "Reset" switch(es) must extinguish.
 - 2) The pre-set pre-alarm time elapses. Action: FACP transmits alarm conditions to the Central Fire Alarm Monitoring System, the system must initiate the appropriate smoke control mode (where required) and the LED's on the "Reset" switch(es) must extinguish.
 - 3) The pull station in the control room is activated. Action: pre-alarm timer is bypassed, FACP transmits alarm conditions to the Central Fire Alarm Monitoring System, the system must initiate the appropriate smoke control mode (where required) and the LED's on the "Reset" switch(es) must extinguish.

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2. Devices not specified as pre-alarm devices must report to the Central Fire Alarm Monitoring System as soon as they are in an alarm condition.
 3. The "Reset" switch on the door control panel(s) must reset the FACP only during the period that the pre-set pre-alarm timer is active. After the pre-set pre-alarm timer has elapsed, and for all zones that are not specified as pre-alarm zones, the FACP must be reset via the "Reset" switch on the FACP.
- D. Building Fire Alarm Control Panel (FACP) Special Features:
1. Each FACP must accommodate the initiation device signal circuits, notification device circuits and auxiliary circuits and must accommodate the initiation devices shown and noted on the building fire alarm systems drawings.
 2. Special input/output fire alarm system functions must be provided in accordance with the following: 1) Air handler, exhaust fan and fire/smoke damper control sequences shown or noted on HVAC drawings; 2) As shown or noted in fire alarm drawings and fire alarm specifications.
 3. Special LED annunciation and control switch functions must be provided on control panels through fire alarm graphic interface panels. These functions must be provided as shown or noted in fire alarm drawings and specifications.

1.6 QUALITY ASSURANCE

- A. Work of this Section must be carefully performed by workmen skilled in fire detection and alarm systems, using appropriate tools and equipment; under supervision of competent foremen at all times.
- B. Submit qualifications of individuals responsible for overseeing installation of Fire Alarm System. Provide the following:
1. Authorization Letters: Letters from fire alarm equipment manufacturer stating that fire alarm contractor is a Factory Authorized Distributor, and is trained and certified for equipment proposed for this Project, and is licensed to purchase and install software required to provide specified functions.
 2. Copy of National Institute for Certification in Technologies (NICET) Technician Level III Certificate for employee actively involved in this Project.
 3. Documentation that fire alarm contractor has on staff personnel factory-trained and certified for equipment proposed for this Project.
 4. Contractor must be licensed by the State of California Contractors' License Board and hold a valid fire protection contractor license (C-16) and an electrical contractor license (C-10).
 5. Contractor's License: Copy of Contractor's valid State of California License. Contractor must be licensed in the State of California and have been incorporated in business in that State for a minimum of 5 years.
 6. Proof of Experience: Proof (minimum of three examples) that fire alarm contractor has successfully installed similar system fire detection, evacuation voice and visual signaling control components on a previous project of comparable size and complexity.
- C. Service Capability: Fire alarm contractor must have in- Station engineering, installation and service personnel with adequate spare parts stock and a maintenance office within 50 miles of Project location.
- D. U.L. Requirements:

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1. All fire alarm equipment must be UL listed and bear the “UL” label. Partial listing is unacceptable.
 2. Central fire alarm monitoring system must have UL listed transient protection which complies with UL864 requirements.
 3. All fire alarm circuits that leave the building must have UL listed transient protection.
 4. System controls must be UL listed for Power Limited Applications.
- E. Fire alarm systems and components must be California State Fire Marshal approved and listed in accordance with California Code of Regulations, Title 19, Division 1.
- F. Certifications:
1. Provide certification of inspection confirming approval of Fire Alarm System by California State Fire Marshal.
 2. Provide certification that replacement parts for installed equipment will be available for seven (7) years after date of final acceptance.
- 1.7 PREINSTALLATION MEETING
- A. Preinstallation Conference: Conduct conference at Project Site.
1. Review requirements for sequencing work with other trades for work occurring above, below and adjacent to, or otherwise affected by, the Work of this Section.
 2. Review procedures for subsequent construction activities and access for work above, below or adjacent to the Work of this Section.
 3. Review procedures and scheduling for completion, inspections and certifications.
- 1.8 SEQUENCING AND SCHEDULING
- A. Coordinate Work effort with other Contractors installing building fire alarm systems.
- B. Furnish and install the Central Fire Alarm Monitoring System in Building 306, as necessary, as well as furnish and install the required fiber optic cable between the local fire alarm control panels and the Central Fire Alarm Monitoring System, including terminating the cable in each fire alarm control panel.
- 1.9 WARRANTY
- A. Special Warranty: provide warranty for complete fire detection and alarm system including all components, wiring, equipment, devices, etc.
1. Warranty must include that manufacturer and installer agree to repair or replace fire detection and alarm devices and equipment that fail in materials, workmanship, or proper function within specified warranty period.
 2. Warranty Period: Manufacturer’s maximum.

PART 2 PRODUCTS

2.1 EQUIPMENT

- A. Fire Alarm Control Panel (FACP) – Local Building:
1. Control panels: Perform operations as described in system description and must support the following operations in each installed cabinet or node of the system:
 - a. Up to 10 Intelligent Device loops.

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- b. Up to 125 Intelligent Smoke Detectors and 125 Intelligent Modules per device loop.
 - 1) Up to 120 Hardwired input/output Circuits.
 - 2) Up to 342 Manual Control (Input) Switches.
 - 3) Up to 456 LED Annunciation Points.
- c. Fiber Optic, multi-Priority, token passing, peer-to-peer network connection of up to 64 system nodes wired as Class A. The light loss budget between network nodes must be large enough to support the physical distances between nodes in accordance with manufacturer's recommendations.
- d. Ground fault detection by panel, by Data Circuit, and by device module.
- e. Ability to download all system applications programs and "firmware" from a computer through a single point in the system.
- f. True Distributed Intelligence, including microprocessor-based Detectors and Modules.
- g. AC Power Trouble Delay adjustable from 4 Hours to 10 Hours.
- h. Removable, Interlocked terminal blocks for the connection of the field wiring to the Fire Alarm Control Panel.
 - 1) Electronic Addressing of Field Devices.
 - 2) Advanced Power Management.
 - 3) Dead Front Construction.
- 2. Each Fire Alarm Control Panel must include an Operators' Interface Panel that must include the following system annunciation and control functions:
 - a. Hands Free Emergency Operation: The first and last highest priority event on the system must be displayed automatically and simultaneously.
 - b. Control Panel Internal Audible Signal must have four programmable signal patterns, to allow for the easy differentiation between Alarm, Supervisory, Trouble, and Monitor conditions within the installed system.
 - c. Discreet "System Status" LEDs:
 - 1) Power Status LED – LED must illuminate when AC power is present.
 - 2) Test Status LED – LED must illuminate when any portion of the system is in the test mode. A programmable timer must cause the system to automatically exit the test mode after a period of system inactivity. This Test LED must function in a local or in a group mode.
 - 3) CPU Fail Status LED – LED must illuminate when the panel controller has an internal failure.
 - 4) Ground Fault Status LED – LED must illuminate when ungrounded wiring connected to the cabinets' power supply has continuity to ground. This feature must function in either a local or group mode.
 - 5) Disable Status LED – LED must illuminate whenever any point or zone in the installed system is manually disabled.
 - d. Discreet Common Control Switches with Associated Status LEDs:
 - 1) Reset: Depression of the Reset Switch starts the system reset operation.
 - a) The associated LED must have three flash rates during this operation to inform the user of the progress status of the reset cycle.
 - b) The LED must flash fast during the smoke detector power down sequence, then it must flash slowly during the restart phase, and must illuminate steadily for the restoral phase.
 - c) The LED must go out completely when system is back to normal mode.
 - d) Each phase, as well the overall reset cycle must be programmable to perform other functions.
 - 2) Alarm Silence:

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- a) Depression of Alarm Silence Switch must silence all audible Notification Appliances without extinguishing visual Notification Appliances (provided separate visual appliance circuits as required to comply with this requirement).
- b) The associated LED illuminates when the Alarm Silence function is active, whether by Alarm Silence Switch, or by an integral software timer.
- c) Subsequent activation of Alarm Silence Switch must resound the signals.
- d) Activation of Alarm Silence switch must be programmable to perform other functions.
- 3) Panel Silence:
 - a) Depression of the Panel Silence Switch must turn off the systems' internal audible signal when configured as a 'local' system.
 - b) The associated LED illuminates when panel silence feature is activated.
- 4) Drill Switch / LED:
 - a) Depressing the DRILL switch activates the fire drill function.
 - b) LED indicates that the fire drill function is active.
 - c) The Drill Switch must also be programmable to perform system functions other than the Drill Function.
- e. Other Operator Control Switches:
 - 1) Previous Message Switch:
 - a) Pressing the Previous Message Switch must scroll the display to show the preceding message in the selected queue.
 - b) Holding the Previous Message Switch and pressing any queue select switch moves to the top of the respective queue event list.
 - c) Scrolling through event messages may be done by the operator at any time.
 - 2) Next Message Switch:
 - a) Pressing the Next Message Switch must scroll the display to show the following message in the selected queue.
 - b) Holding the Previous Message Switch and pressing any queue select switch moves to the bottom of the respective queue event list.
 - c) Scrolling through event messages may be done by the operator at any time.
 - 3) More Details Switch:
 - a) Pressing the More Details Switch must show the address and 42 character location message of the active device on display.
 - b) If a zone is active, pressing the switch displays the address and message of active devices within the zone.
 - c) When multiple devices are active, the "Previous/Next" message switch may be used to scroll through the messages.
- f. The System Main Liquid Crystal Display:
 - 1) The Liquid Crystal display must provide the means to inform the System Operator with detailed information about the off-normal status of the installed Fire Alarm System.
 - 2) The Main Display must automatically respond to the status of the system, and must display that status on an 8 line by 21 character backlit alpha-numeric Graphical Liquid Crystal Display.
 - 3) The following status functions must be annunciated by the Main Liquid Crystal Display:
 - a) When the Fire Alarm System is in the "Normal" Mode, the LCD displays:
 - i. The current Date and Time.

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- ii. A Custom System Title (2 lines X 21 characters).
 - iii. A summary total of the Alarm History of the system.
- b) With the Fire Alarm System in the Alarm Mode, the LCD must automatically reconfigure into four logical windows.
 - i. Systems Status Window: The LCD must show the system time, and the number of active points and disabled points in the system in this section of the LCD Display.
 - ii. Current Event Window: The LCD must show the first active event of the highest priority in reverse text to highlight the condition to the Emergency Operator. The top line of the reversed text must show the sequence number in which the displayed event was received, as well as its event type. The second and third lines of reversed text must display an identification message related to the displayed event.
 - iii. Last Event Window: The LCD must show the most recent, highest priority event received by the system.
 - iv. Type Status Window: The LCD must show the total number of active events in the system, by event type. There must be four different System Event Types that must be displayed, "Alarm Events", "Supervisory Events", "Active Trouble Events", and "Active Monitor Events".
- 4) Maintenance Menu: The Main LCD must also allow the System Operator to access system maintenance functions through a four-level password system. The authorized System Operator must be able to access the following functions:
 - a) System Status: The system must allow the operator to determine the status of individual system components, including active points, disabled points, and active points by panel.
 - b) Enable: The system must allow the operator to restore a disabled point (device) in the system, allowing that point (device) to operate as originally intended by the application program of the system. Additionally, the system must allow the operator to restore any group function, guard patrol function, Panel, system module, "software-defined zone", operator control, or time control function.
 - c) Disable: The system must allow the operator to disable any point (device) in the system, inhibiting that point (device) from operating as originally intended by the application program of the system. Additionally, the system must allow the operator to disable any group function, guard patrol function, Panel, system module, "software-defined zone", operator control, or time control function within the system.
 - d) Activate: The system must allow the operator to manually turn on any system output point, or system function. Alternate Smoke Detector sensitivity, message routing within the system, guard patrol timing, and check-in group timings must be modifiable with this simple command from the control panel.
 - e) Restore: The system must allow the operator to restore the primary (application program defined) operation to the Smoke Detector sensitivity and the message routing functions with this simple command from the control panel.
 - f) Control Output: The system must allow the operator to manually command and control relays and LEDs. Relays must be able to be

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- commanded to “Latch”, to energize as a “High Priority”, or as a “Low Priority”, to “Energize”, or to “De-Energize”. LEDs must be able to be commanded to “Latch”, to energize as a “High Priority”, or as a “Low Priority”, to turn “On”, to turn “Off”, to “Slow Blink”, or to “Fast Blink”.
- g) Reports: The system must provide the operator with system reports that give detailed description of the status of certain system parameters for corrective action, or for preventative maintenance programs. The system must provide these reports via the Main LCD, and must be capable of being printed on any of the connected system printers.
- i. The system must provide a report that gives a sensitivity listing of all detectors that have less than 75 percent environmental compensation remaining.
 - ii. The system must provide a report that provides a sensitivity listing of any particular detector.
 - iii. The system must provide a report that gives a listing of the sensitivity of all of the detectors on any given panel in the system, or any given SDC loop within any given panel.
 - iv. The system must provide a report that gives a chronological listing of up to the last 1740 system events.
 - v. The system must provide a listing of all of the firmware revision listings for all of the installed network components in the system.
3. Each Fire Alarm Control Panel must include a standalone digital alarm communicator transmitter (DACT) with dual telephone line (primary and secondary), or a dedicated fiber optic connections configured for remote reporting of alarm, trouble and supervisory events on a per FACP/Building basis.
- a. Silent Knight Model 5104 or approved equal. Field verify existing central station system for compatibility.
4. Install all control panel components in surface mounted, 16 gauge steel cabinet with transparent viewing door and key lock. Provide flush-mounted backboxes where indicated.
- a. Finish: Baked enamel.
5. Provide control panel with equipment required for all initiating circuits, signaling circuits and monitor points shown on drawings and described in these specifications plus forty percent additional initiating circuits, signaling circuits and monitor points (not less than one of each type) to be used by the contractor during construction and another twenty percent additional “spare” initiating circuits, signaling circuits and monitor points (not less than one of each type) to be reserved for future use.
- a. See the building fire alarm systems drawings for all fire alarm circuit and input/output point requirements.
6. Provide control panels where shown on the Drawings.
7. Provide approved sealed type battery with automatic battery charger capable of operating maximum normal load of system for twenty four hours and then capable of operating system for five minutes in the alarm condition. Power supply/battery back-up system must be sized for 20% spare capacity at each building. All batteries must be monitored for integrity.
8. Control panels must be equipped to support addressable type devices.
9. Fire Alarm Control Panel Operational Descriptions:
- a. Each fire alarm control panel must have all hardware, software, batteries and power supplies required to accommodate all initiation devices, notification appliances and circuits, input/output devices, signaling circuits, devices requiring direct 24VDC power, remote annunciators, remote power supplies, LED drivers and control

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interfaces with door control consoles (for silence/reset functions and secondary annunciation of initiation devices), and all auxiliary features required for proper system operation. All specified spare capacity requirements must be accommodated.

10. Graphic Interface Panel:
 - a. Custom configured Graphics Interface Panels as required to provide LED point annunciation and control switch functions on the door control panels as shown in the following bid documents:
 - 1) Fire alarm drawings and/or fire alarm specification in each building.
 - b. Graphics Interface Panels must be furnished complete and must include but must not be limited to the following key elements to perform the required functions:
 - 1) Microprocessor based CPU.
 - 2) LED drivers.
 - 3) Power supplies.
 - 4) Terminal strips to facilitate field wiring to remote LED's and switches provided in the control panel.
 - 5) Tone generator.
 - 6) Steel electronics enclosure with piano hinge door and keyed lock and backboard sized to accommodate all components.
 - c. Lamp test function must not be provided.
 - d. Graphics Interface Panels must be compatible with existing equipment panels.
 11. Control panel per-to-peer network cards must be compatible with the specified fiber optic cable.
- B. Central Fire Alarm Monitoring System (FACP network monitoring):
1. The Central Fire Alarm Monitoring System is referred to as the Data Logger/CRT and printer on fire alarm drawings.
 2. The Central Fire Alarm Monitoring System must be a desktop computer with these additional features:
 - a. Must be desktop mounted in the Central Control Room in Building 306.
 - b. The requirements defined here – Computers must be considered a minimum. The Central Fire Alarm Monitoring System must have all of the required hardware and software as recommended by the Manufacturer of the fire alarm system.
 3. Monitor:
 - a. One video monitor, 23 inches, must be provided.
 4. Printer:
 - a. The Printer must be a dot matrix printer.
 5. Acceptable Software Manufacturers/Products: As listed below and meeting the criteria and requirements specified herein:
 - a. Basis of Design: EST Fireworks or compactible approved equal.
 - b. For manufacturers/products not listed, comply with substitution requirements in Section 01 25 00 – Substitution Procedures.
 6. The Central Fire Alarm Monitoring System must be powered by a UPS backed power receptacle provided at the data logger/CRT in the Central Control Room.
- C. Central Fire Alarm Monitoring System (graphic control panel):
1. General building alarm and combined trouble/supervisory conditions must be annunciated on a custom graphic control panel.
- D. Fire Alarm Monitoring System:

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1. Desktop modular style receiver designed to receive, display, route and data received from two telephone lines, fiber optics. Major components:
 - a. Master CPU with two telephone line cards:
 - 1) Acceptable Manufacturers/Products: As listed below and meeting the criteria and requirements specified herein:
 - a) Basis of Design: Silent Knight Model 9500.
 - b) For manufacturers/products not listed, comply with substitution requirements in Section 01 25 00 – Substitution Procedures.
 - 2) UL listed for Proprietary Receiving Station use.
 - 3) Two telephone line cards.
 - 4) CPU Software.
 - b. Serial printer:
 - 1) Minimum of 465 characters per second.
 - 2) Serial and Parallel interfaces.
 - 3) Minimum 4 KB buffer.
 - 4) Tractor feed.
 - c. Supplemental Desktop computer for custom programmed display of system events.
 - 1) The requirements defined here must be considered a minimum.
 - 2) The Fire Alarm Monitoring System must have all of the required hardware and software as recommended by the Manufacturer of the fire alarm system.
 - 3) Provide additional features as follows:
 - a) Desktop computer, with these additional features:
 - i. 8 USB 2.0 ports.
 - ii. Integral multi-format digital media manager interface.
 - iii. 2 RS-232 serial ports for printer and interface with fire alarm receiving equipment.
 - iv. Keyboard.
 - v. Optical 2-button wheel mouse.
 - vi. The most current desktop computer software available at time of equipment order with customized programming for all FACP's/Buildings monitored.
 2. Battery Back-up: Provide a 120V UPS system capable of operating Data Logger/CRT, graphic panel and printer in Central Control for 20 minutes during power outage.
- E. Signal Initiating Devices:
1. Manual Fire Alarm Box: Intelligent double action, single stage fire alarm stations. The fire alarm station must be of polycarbonate construction with an internal toggle switch. Provide a key locked test feature. Finish the station in red with white "PULL IN CASE OF FIRE" lettering.
 - a. Flush mounted stations designed to fit standard single-gang backbox.
 - b. Provide red backbox for surface mounted stations.
 - c. Provide weatherproof cover for weatherproof stations.
 2. Manual Fire Alarm Box, Key Operated: Non-coded, general alarm institutional, key operated, normally open contacts with screw terminals, constructed of die cast metal alloy, red housing with white letter operating instructions.
 - a. Flush mounted stations designed to fit standard single gang backbox.
 - b. Provide red backbox for surface mounted stations.
 - c. Provide weatherproof cover for weatherproof stations.
 - d. Provide two keys per station.
 - e. Key all stations alike.

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- f. Provide an intelligent addressable module for each station. Module to be located at detector.
- 3. Heat Sensing Fire Detectors – combination rate-of-rise and fixed temperature type:
 - a. Provide intelligent combination fixed temperature/rate-of-rise heat detectors.
 - b. The heat detector must have a low mass thermistor heat sensor and operate at a fixed temperature and at a temperature rate-of-rise.
 - c. It must continually monitor the temperature of the air in its surroundings to minimize thermal lag to the time required to process an alarm.
 - d. The integral microprocessor must determine if an alarm condition exists and initiate an alarm based on the analysis of the data.
 - e. Systems using central intelligence for alarm decisions must not be acceptable.
 - f. The intelligent heat detector must have a nominal fixed temperature alarm point rating of 135 degrees F. (57 degrees C.) and a rate-of-rise alarm point of 15 degrees F. (9 degrees C.) per minute.
 - g. The heat detector must be rated for ceiling installation at a minimum of 70 foot (21.3 meter) centers and be suitable for wall mount applications.
 - h. Each detector must include a separate detector mounting base equipped with terminal screws for all wiring connections, designed for mounting on any standard 4 inches square outlet box with 4/0 round mounting ring for flush mounted devices, or special box for surface mounted devices.
 - i. Furnished with backbox and decorative skirt for surface mounting.
 - j. Provide an intelligent addressable output module with SPDT contacts rated for 10 amps at 115 VAC minimum for each device requiring an auxiliary contact for activating local equipment, where indicated. Module must be located in a separate backbox adjacent to the device.
- 4. Heat Sensing Fire Detectors – fixed temperature type: 135 degrees F. fixed temperature type or 190 degrees F. fixed temperature type as indicated on the fire alarm plan drawings.
 - a. Detectors using non-restoring elements:
 - b. Low voltage, 2-wire solid state design incorporating tamperproof, plug-in head assembly.
 - c. Magnetically activated test switch.
 - d. Tamper-resistant design.
 - e. Provide intelligent, addressable module for each detector. Module to be located at detector.
 - f. Each detector must include a separate detector mounting base equipped with terminal screws for all wiring connections, designed for mounting on any standard 4 inches square outlet box with 4/0 round mounting ring for flush mounted devices, or special box for surface mounted devices.
 - g. Design to produce TROUBLE signal if detector head is removed from its mounting base and ALARM signal if detection chamber is removed.
 - h. Furnished with backbox and decorative skirt for surface mounting.
 - i. Provide an intelligent addressable output module with SPDT contacts rated for 10 amps at 115 VAC minimum for each device requiring an auxiliary contact for activating local equipment, where indicated. Module must be located in a separate backbox adjacent to the device.
- 5. Heat Sensing Fire Detectors – Explosion Proof: 135 degrees F. combination rate-of-rise and fixed temperature type or 190 degrees F. fixed temperature type as indicated.
 - a. Furnished with backbox for surface mounting.
 - b. Provide intelligent, addressable module for each detector. Module to be located at detector.

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6. Smoke Sensing Fire Detectors:
 - a. Provide intelligent multisensor smoke detectors.
 - 1) The multisensor analog detector must use a light scattering type photoelectric smoke sensor, a unipolar ionization smoke sensor and an ambient temperature sensor to sense changes in air samples from its surroundings.
 - 2) The integral microprocessor must employ time based algorithms to dynamically examine values from the three sensors simultaneously and initiate an alarm based on that data.
 - 3) The multisensor must be capable of adapting to ambient environmental conditions. The temperature sensor must self-adjust to the ambient temperature of the surrounding air and input an alarm when there is a change of 65 degrees F. (35 degrees C.) in ambient temperature.
 - 4) Systems using central intelligence for alarm decisions are not acceptable.
 - 5) The detector must continually monitor any changes in sensitivity due to the environmental effects of dirt, smoke, temperature, age and humidity.
 - 6) The information must be stored in the integral processor and transferred to the analog loop controller for retrieval using a laptop PC or the Program/Service Tool.
 - 7) The multisensor smoke detector must be rated for ceiling installation at a minimum of 30 foot (9.1 meter) centers and suitable for wall mount applications.
 - 8) The percent smoke obscuration per foot alarm set point must be field selectable to any of five sensitivity settings ranging from 1.0 to 3.5 percent.
 - 9) The integral heat sensor must cause an alarm when it senses a change in ambient temperature of 65 degrees F. or reaches it fixed temperature alarm set point of 135 degrees F. nominal.
 - 10) Each detector must include a separate detector mounting base equipped with terminal screws for all wiring connections, designed for mounting on any standard 4 inch square outlet box with 4/0 round mounting ring for flush mounted devices, or special box for surface mounted devices.
 - b. Provide remote alarm indicator for mounting on standard single-gang box where indicated.
 - c. Provide an intelligent addressable output module with SPDT contacts rated for 10 amps at 115 VAC minimum for each device requiring an auxiliary contact for activating local equipment, where indicated. Module must be located in a separate backbox adjacent to the device.
 - d. Provide decorative skirt for surface mounted installations.
7. Detector Security Guards: Guards must be installed in all areas occupiable by inmates, regardless of distance from walking surface.
 - a. Designed to fit devices supplied.
 - b. OSFM Listed. Guards for detectors shall be listed with the model of detector they are to protect.
 - c. Construction Types:
 - 1) 9 gauge steel wire with corrosion-resistant polyester coating, or 9 gauge stainless steel (required in wet areas and exterior installations). Tamperproof fasteners.
 - 2) 16 gauge die formed steel with 3/16" diameter perforations on 1/4-inch staggered centers and baked enamel finish, and 14 gauge solid steel frame. Tamperproof fasteners.
 - d. Acceptable Manufacturers/Products: As listed below and meeting the criteria and requirements specified herein:

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- 1) Manufacturers listed in this section, paragraph 2.2.
 - 2) Safety Technology International, Inc.; STI Steel Web Stoppers.
 - 3) For manufacturers/products not listed, comply with substitution requirements in Section 01 25 00 – Substitution Procedures.
 8. Smoke Sensing Fire Detector – Duct mounted: Furnished with appropriate air duct installation accessories and characteristics and features as follows:
 - a. The analog photoelectric detector must utilize a light scattering type photoelectric smoke sensor to sense changes in air samples from its surroundings.
 - 1) The integral microprocessor must dynamically examine values from the sensor and initiate an alarm based on the analysis of data.
 - 2) Systems using central intelligence for alarm decisions must not be acceptable. The detector must continually monitor any changes in sensitivity due to the environmental effects of dirt, smoke, temperature, aging and humidity.
 - 3) The information must be stored in the integral processor and transferred to the analog loop controller for retrieval using a laptop PC or Program/Service Tool.
 - b. The percent smoke obscuration per foot alarm set point must be field selectable to any of five sensitivity settings ranging from 1.0 to 3.5 percent.
 - c. Duct accessories: Cast metal construction, with pre-cut keyed air sampling tubes custom sized for each duct width based on Ductwork provided under Division 23 (uniform width sampling tubes cut in the field to fit ductwork are not acceptable), suitable for mounting detector either perpendicular or parallel to ducts.
 - d. Provide recessed adjustable screw to permit regulation of air flow, designed to allow easy detector removal for cleaning or service without removing entire unit from duct.
 - e. Provide a remote test station with red LED alarm lamp for each duct smoke detector. Wire each test/alarm station to its respective detector.
 - f. Permanently label each station with the respective air handler designation and “Supply Air Duct Smoke Detector” or “Return Air Duct Smoke Detector”.
 - g. Auxiliary Contact: For shut down of mechanical unit.
 - h. Remote Indicator: Red Alarm Type.
 9. Sprinkler flow Alarm and OS&Y Valve Monitor Switches: Monitor as indicated on drawings.
 10. Furnish a protective dust cover for each smoke and heat sensing fire detector.
- F. Alarm Signal Devices:
1. Visible Appliance, Flashing Light – Interior: White parabolic polycarbonate lens with “fire” in red letters, dual lamps, semi-flush, 24 volt DC.
 - a. Flush mounted devices, designed to fit standard single gang backbox.
 - b. Provide backbox for surface mounted stations.
 - c. Meets ADAAG and UL 1971 Requirements.
 2. Audible Appliance, Chime – Interior: Electronic chime, red housing, high impact polycarbonate construction with polarized 24 volt DC supervised wiring connections.
 - a. Flush mounted devices designed to fit standard 4 inch square electrical box. Furnish with flush trim plate.
 - b. Provide red backbox for surface mounted stations.
 - c. Chime equipped with volume control.
 - d. Meets ADAAG and UL 1971 Requirements.
 3. Combination Audible/Visible Appliance, Chime – Interior: Electronic chime/low-intensity xenon flasher, red bezel, white polycarbonate visual device lens with “fire” in red letters and polarized 24 volt DC supervised wiring.

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- a. Flush mounted devices, designed to fit standard 4 inch square electrical box. Furnish with flush trim plate.
 - b. Provide red backbox for surface mounted stations.
 - c. Chime equipped with volume control.
 - d. Meets ADAAG and UL 1971 Requirements.
- G. System Interface Hardware:
- 1. Input/Output Modules: Required to interface non-addressable devices with addressable initiating and signaling circuits.
 - a. It must be possible to address each intelligent addressable module without the use of DIP or rotary switches.
 - b. The personality of multifunction modules must be programmable at site to suit conditions and may be changed at any time using a personality code downloaded from the Analog Loop Controller.
 - c. The modules must have a minimum of two diagnostic LEDs mounted behind a finished cover plate. A green LED must flash to confirm communication with the loop controller. A red LED must flash to display alarm status.
 - d. The module must be capable of storing up to 24 diagnostic codes that can be retrieved for troubleshooting assistance.
 - e. Input and output circuit wiring must be supervised for open and ground faults.
 - f. Modules must be located with interface device as indicated elsewhere in these specifications.
 - g. Enclosure must be surface mounted in mechanical equipment rooms and flush mounted in all other areas.
 - h. White, polycarbonate cover plate.
 - i. Contacts must be form "C", rated as required to interface with specified equipment.
 - j. Where higher contact current ratings than provided by the standard manufacturer modules are required for the controlled device, provide heavy duty relays with proper Form "C" contact ratings slaved directly off of a control module through a supervised control circuit.
 - 2. Auxiliary Control Relays:
 - a. 24 VDC control relays equipped with an LED to indicate coil is energized. SPDT contacts rated for 10 amps at 115 VAC minimum. Supervise circuit to relay.
- H. Air Sampling Smoke Detection:
- a. General Description:
 - 1) Air-sampling smoke detector must be laser based using a piping system and a fan to transport the particles of combustion to the detector.
 - 2) Provide one level of alarm from each zone covered by the detector and one supervisory level of alarm from each detector.
 - 3) The air being sampled must pass through filters to remove dust particulates greater than 20 microns before entering the detection chamber.
 - 4) Detectors must have the capability via RS 485 to connect up to 100 detectors in a network.
 - 5) Detectors must communicate with the fire-alarm control unit via addressable, monitored dry contact closures, RS 485, and interface modules. Provide a minimum of 19 relays per detector, individually programmable remotely for any function.
 - 6) Pipe airflow balancing calculations must be performed using approved calculation software.
 - b. Detector:

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- 1) Detector, Filter, Aspirator, and Relays: Station in a mounting box and arranged in such a way that air is drawn from the detection area and a sample passed through the dual-stage filter and detector by the aspirator.
 - 2) Obscuration Sensitivity Range: 0.005 – 6 percent obs/ft.
 - a) Actual hole sensitivity setting must be such that inmates smoking and minor non-emergency sources of smoke in cells do not cause an alarm signal. Recommended settings are as follows:
 - i. Alert: 0.75 percent obs/ft
 - ii. Action: 1.25 percent obs/ft
 - iii. Fire 1: 2.5 percent obs/ft
 - 3) Power Supply:
 - a) Regulated 24 VDC, monitored by the fire-alarm control unit, with battery backup.
 - b) Battery backup must provide 24 hours' standby, followed by 30 minutes at maximum connected load.
 - 4) Detector must also transmit the following faults:
 - a) Detector.
 - b) Airflow.
 - c) Filter.
 - d) System.
 - e) Zone.
 - f) Network.
 - g) Power.
 - 5) Provide 15 in-line sample tube inlets that contain a flow sensor for each tube inlet. The detector must be capable of identifying the tube from which smoke was detected.
 - 6) Aspirator: Air pump capable of allowing for multiple sampling tube runs up to 150 feet, (15 tube runs per detector) with a transport time of less than 120 seconds from the farthest sample port.
 - 7) Air-Sampling Flow Rates Outside Manufacturer's Specified Range: Result in a trouble alarm.
 - 8) Provide software-programmable relays rated at 2 A at 30-V dc for alarm and fault conditions.
 - 9) Provide built-in event and smoke logging. Store smoke levels, alarm conditions, operator actions, and faults with date and time of each event. Each detector (zone) must be capable of storing up to 18,000 events.
 - 10) Urgent and Minor Faults: Minor faults must be designated as trouble alarms. Urgent faults, which indicate the unit may not be able to detect smoke, must be designated as supervisory alarms.
- c. Displays:
- 1) Include display module within each detector.
 - 2) Each display must provide the following features at a minimum:
 - a) A bar-graph display.
 - b) Two independent, high-intensity alarm indicators (Alert and Fire 1), corresponding to the two alarm thresholds of the indicated sector.
 - c) Alarm threshold indicators for Alert and Fire 1.
 - d) LED indication that the first alarm sector is established.
 - e) Detector fault and airflow fault indicators.
 - f) LED indicators must be provided for faults originating in the particular zone (Zone Fault), faults produced by the overall smoke-detection system, and faults resulting from network wiring errors (Network Fault).

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g) Minor and urgent LED fault indicators.

- I. Fire Alarm Cable: Comply with the requirements in Section 28 05 13 – Conductors and Cables for Electronic Safety and Security.
- J. Remote Annunciation Panel: Furnish where noted on the drawings:
 - 1. Enclosure: Custom fabricated, key-locking, 14 gauge flush mounted steel enclosure and flange trim with a 10 gauge cold rolled steel (one piece) piano hinged door with shatterproof polycarbonate window (sized to match the dimensions of the panel faceplate) that will allow unrestricted viewing of all controls and indicators, sized to accommodate the fire alarm manufacturer's panel dimensions.
 - 2. Networked panels must be fully equipped with all hardware and software necessary for peer-to-peer network communications.
 - 3. Annunciator panels must have the following features:
 - a. Microprocessor based with EPROM memory buffer.
 - b. Trouble buzzer.
 - c. Back-Lit, 80 character liquid crystal display (LCD) screen (alpha/numeric).
 - d. Indicator LED's:
 - 1) Normal.
 - 2) Alarm.
 - 3) Supervisory.
 - 4) Trouble.
 - e. Password enabled control of all panel control functions.
 - 4. Annunciator panels must display all events that report to its host FACP panel.
 - 5. Each annunciator panel must reside on a communications circuit common with the local FACP panel.
 - 6. Each annunciator panel must have an auto acknowledge software feature whereby inactive messages are automatically purged from the memory buffer and the internal tone generator is disabled when the auto acknowledge feature is enabled.
 - 7. Provide supervised 24 VDC power to all panels from the host FACP panel.

2.2 MANUFACTURERS

- A. Fire Alarm System Components must meet the required features and level of quality of products listed within this section.
- B. Acceptable Manufacturers, as listed below and meeting the criteria and requirements specified herein, will be acceptable:
 - 1. Edwards Systems Technology.
 - 2. Simplex Grinnell.
 - 3. Notifier by Honeywell.
 - 4. Siemens Building Technologies.
 - 5. Silent Knight.
 - 6. For manufacturers not listed, comply with substitution requirements in Section 01 25 00 – Substitution Procedures.

2.3 EQUIPMENT SUMMARY

- A. See individual building fire alarm plan drawings included in the Drawings for device types and typical configuration for each local building fire alarm system.

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2.4 SYSTEM NETWORK DESIGN REQUIREMENTS

- A. Design of the site fire alarm system network must comply with the specific manufacturers requirements for systems of the type described on the Drawings and in these Specifications.
- B. To allow for future system expansion, each site fire alarm system network must not exceed 80 percent of the manufacturer's recommendations for cable length and total nodes per network.
- C. Each network design must take into account and allow for the facilities phased occupancy. Networks must be configured to allow building systems included in early phases to be controlled and monitored as specified prior to the completion of later phases.

2.5 BUILDING FIRE ALARM SYSTEM CABLING

- A. Contractor will furnish and install fire alarm system cabling within each building. Minimum wiring size will be 16 AWG for SLC Circuits and 14 AWG for notification appliance circuits.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install components in accordance with manufacturer's instructions.
- B. Site network cable must be continuous from equipment terminal to equipment terminal.
- C. Input building and device nomenclature into central fire alarm monitoring system for fire alarm devices as provided by the CDCR Representative. If information is not received, the Contractor must input device and zone numbers as indicated on the approved CSFM drawings.
- D. Prior to Contractor's System Tests, provide all final programming of all fire alarm system equipment furnished under this specification.
 - 1. Correct programming in the fire alarm control panels not meeting required test results.
 - 2. Equipment for which programming must be provided must include, but must not be limited to, the following:
 - a. Each local building Control panel.
 - b. Each local building Remote Annunciation Panel.
 - c. Each local building digital alarm communicator transmitter (DACT).
 - d. Central Fire Alarm Monitoring System (FACP network computer).
 - e. Fire Station Fire Alarm Monitoring System.
- E. Provide complete customized installation, programming, testing and training for the CDCR Representative in accordance with NFPA 72 and the receiving equipment manufacturer's instructions.
- F. All fire alarm devices must be accessible for periodic maintenance.
 - 1. Should a device location indicated on Contract Drawings not meet this requirement, it must be the responsibility of installing contractor to bring the issue in writing to the attention of Project Engineer.

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2. Failure to bring such issues to the attention of Project Engineer shall be exclusive liability of installing Electrical Contractor.
- G. System cable and devices to be installed and inspected utilizing Fire Marshal approved drawings and not the original Contract Drawings. Comply with the installation requirements of Section 28 05 00 – Common Work Results for Electronic Safety and Security and Section 28 05 13 – Conductors and Cables for Electronic Safety and Security.
- H. Power Wiring:
 1. Install power wiring from emergency power panel (where applicable) to fire alarm control panel and other system devices requiring 120 volt power or low voltage power.
- I. Location and Mounting:
 1. Control panels must be surface mounted unless otherwise indicated. Install control panel and backbox.
 2. Install components in accordance with the manufacturer's instructions.
 3. Identify device boxes with device designation as indicated on the Contract Drawings.
 4. Install devices at heights indicated or where not indicated, at the following heights:
 - a. Pull station: 48 inches above finish floor to center.
 - b. FACP: 72 inches above finish floor to top.
 5. All new audio/visual devices must be mounted at a minimum of 80 inches and no more than 96 inches above the finished floor, as measured on strobe center. Devices must be mounted no less than 6 inches from ceiling.
 - a. 8'-0" or 6" below ceiling whichever is less: Signaling Devices including:
 - 1) Audible device.
 - 2) Audible/Visible Signal Station.
 - 3) Visible Device.
 6. Install protective dust covers on all smoke and heat sensing fire detectors immediately upon installing the detector.
 7. Where indicated, install detector security guards over detectors utilizing tamperproof metal fasteners securely attached to ceiling material with proper anchor devices. Provide backing plates as required to ensure adequate support for security guards. CDCR Representative to review and approve Contractor proposed detector security guard mounting for each ceiling type. Detector Guards shall be listed with the device they are protecting.
 8. All addressable modules must be mounted within 36 inches of monitored or controlled point of termination. This must include, but is not necessarily limited to, fan shutdown, elevator recall, shunt trip, sprinkler status points, or door release. Label all addressable modules as to their function.
- J. Signal Initiating and Alarm Signaling Circuit Wiring:
 1. Provide wiring in accordance with Division 26.
 2. Install wiring in accordance with the CEC, the NFPA 72, and wiring and termination diagrams provided by the manufacturer.
 3. Make fire alarm wiring continuous from terminal to terminal or from terminal to device pigtail lead.
 4. Circuit splices are not permitted.
 5. T-tapping is not permitted.
 6. Wiring joints, only when required at device pigtail leads must utilize spring wire connectors.
 7. Ground shielded cable at one end only.

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8. Unless otherwise approved, splices, including terminal boards, terminal blocks or terminal strips, will not be allowed.
- K. Main Standpipe Waterflow Detector: Provide alarm wiring circuit and make connections from switch terminals to fire alarm system.
- L. Sprinkler and Standpipe Flow Alarm Switches: Provide alarm wiring circuit and connections from switch terminals to fire alarm system.
- M. Main Sprinkler Water Valve and PIV Tamper Switches: Provide supervision wiring circuit and connections from switch terminals to fire alarm system.
- N. O, S & Y Valve Tamper Switches for Sprinkler and Stand Pipe Valves: Provide supervision wiring circuit and connections from switch terminals to fire alarm system.
- O. Make wiring connections to all duct units with flex conduit to standard 4 inch octagonal outlet box mounted on base of detector. Provide conduit and wiring from each duct smoke detector auxiliary contact or programmable remote relay to the mechanical control panel at the mechanical unit for unit shutdown.
- P. Furnish and install a weather-proof enclosure for devices which are exposed to weather. Furnish and install solar shield for devices, such as duct detectors, mounted in the direct sun when shield is required for proper operation. Unless mounting is not possible in any other way, mount duct detectors so they are not exposed to direct sunlight.
- Q. Furnish 6 inch x 6 inch surface metal raceway with screw cover in accordance with Section 26 05 34 – Outlet and Junction Boxes or Electrical System above and below each FACP.
 1. Minimum width must be 24 inches and raceways must be separated a minimum of 60 inches from the bottom of the top raceway to the top of the bottom raceway.
 2. Power wiring must not be installed in the raceway.
 3. Properly sized conduits must be installed from the surface raceway to the FACP.
 4. Where fire alarm panels are flush mounted to wall, provide flush mount 6 inch x 6 inch metal raceway with screw cover.
- R. Make wiring connections to specified systems being installed by other building contractors to fire alarm system. Provide conduit and wiring as required.
- S. All junction box covers must be painted red.
- T. Power-Limited/Non-Power-Limited NEC wiring standards must be observed.
- U. Auxiliary relays must be appropriately labeled on exterior to indicate “FIRE ALARM SYSTEM” and their specific function (i.e. FAN S-1 SHUTDOWN).
- V. All AC power connections must connect to the building’s designated emergency electrical power circuit and must meet requirements of NFPA 72.
 1. AC power circuit must be installed in conduit raceway.
 2. Power circuit disconnect means must be clearly labeled FIRE ALARM CIRCUIT CONTROL and must have red marking.
 3. Location of circuit disconnect must be labeled permanently inside each control panel that the disconnect serves.

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3.2 QUALITY CONTROL AND TESTING

- A. General Testing requirements:
1. The CDCR Representative reserves the right to observe all testing.
 2. Provide trained and certified manufacturer's representatives to provide technical assistance during all testing.
 3. Document all testing using approved test procedure forms and checklists.
 4. Test complete site Fire Alarm System FACP network, Central Fire Alarm Monitoring Systems, and existing Fire Station Fire Alarm Monitoring System for the purpose of remote reporting of Building Fire Alarm System alarm, trouble and supervisory conditions.
 - a. During any test performed under this specification, when a tested system fails to operate as specified, trouble shoot the problem(s) to determine the source of the problem(s).
 - b. Document all known system problems and submit a complete report of all known system problems to the CDCR Representative.
 - c. After Contractor corrects the problem re-test the system and repeat this process until all problems are corrected and the system operates as specified.
 5. Fire Alarm Systems for which Contractor is responsible for testing under this Specification are as follows:
 - a. Central Fire Alarm Monitoring System (FACP Network Data Logger, CRT and printer in the Central Control Room in Building 306).
 - b. Central Fire Alarm Monitoring System (PLC-Driven graphic control panel in the Central Control Room in Building 306).
 - c. Fire Station Fire Alarm Monitoring System (located in building 202, Fire House).
 6. All Site Fire Alarm System Testing to be performed in the presence of the CDCR Representative and the Authority Having Jurisdiction (AHJ).
 7. Site Fire Alarm System Final Acceptance Testing scheduling, witnessing, documentation and acceptance:
 - a. Submit a copy of the NFPA 72 Fire Alarm Record(s) of Completion and any supplemental testing documentation resulting from the Site Fire Alarm System Test to CDCR and the AHJ at least five days in advance of scheduled Site Fire Alarm System Final Acceptance Testing as evidence that testing has been satisfactorily completed.
 - 1) CDCR Representative may inspect the work to determine readiness to commence Site Fire Alarm System Final Acceptance Testing.
 - 2) Site Fire Alarm System Final Acceptance Testing must not commence until signed and dated Fire Alarm Record(s) of Completion are submitted for the system(s) scheduled for Final Acceptance Testing.
 - b. Site Fire Alarm System Final Acceptance Testing must be witnessed by the CDCR representative and the AHJ.
 - 1) CDCR or the AHJ may direct additional tests and procedures.
 - 2) Contractor must comply with CDCR or AHJ test direction at no additional cost to CDCR.
 - c. CDCR or AHJ may fail the Site Fire Alarm System Final Acceptance Testing and schedule re-testing if systematic failure rates during testing are sufficiently high that, in the CDCR Representative's or AHJ's judgment, the outcome of completing the test will be to fail.
 - 1) Subsequent testing must start as a new Site Fire Alarm System Final Acceptance Test.
 - 2) In event of any system re-testing, Contractor must incur all associated costs.

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- B. Site Fire Alarm System Testing methods and procedures for the Central Fire Alarm Monitoring System (FACP Network Data Logger, CRT and printer).
1. General:
 - a. Document all Site Fire Alarm System Testing using NFPA 72 Fire Alarm System Record of Completion form, or other form as approved by CDCR and Authority Having Jurisdiction.
 - b. In addition to Fire Alarm System Record of Completion form(s), submit supplemental documentation, on approved forms or checklists, as required to demonstrate proper functioning of the systems tested.
 2. Test the Central Fire Alarm Monitoring System (FACP Network Data Logger, CRT and printer) in accordance with the test methods outlined in NFPA 72 Test Methods.
 - a. Tests must be performed on all applicable equipment and circuits as detailed in NFPA 72.
 - b. Items tested must include, but not be limited to, the following:
 - 1) Control panels.
 - 2) Batteries.
 - 3) Power supplies.
 - 4) Network PC, monitor, keyboard, mouse, and system printer.
 - 5) Related system signal circuits.
 3. Additional Site Fire Alarm System Testing methods and procedures:
 - a. Observe on network computer monitor in Central Control Room in Building 306 that the fire alarm system is in normal condition with no trouble, alarm, and/or supervisory alarms.
 - 1) Contractor must restore the fire alarm system to normal operating mode before any tests commences.
 - 2) Observe fire alarm system test results on the network computer monitor. Document test results through hard copy printouts on the fire alarm printer and on approved forms or checklists.
 - b. Select local building to test and perform the following minimum tests for the fire alarm systems:
 - 1) For each of the following trouble conditions, the network computer displays the fire alarm visual and audible trouble condition for the building. Verify the hard copy message printout for the trouble condition. Document results.
 - a) Test battery supervision by disconnecting battery in local fire alarm panel.
 - b) Test AC power supervision by turning off dedicated AC circuit breaker to local fire alarm control panel.
 - c) Disconnect network communication of the local fire alarm control panel.
 - d) Test 10 percent of the smoke detectors, randomly selected by the Contractor, for trouble condition by removing the detector from their associated bases.
 - 2) For each of the following alarm conditions, verify the network computer displays the fire alarm visual and audible alarm condition for the building. Verify the hard copy message printout for the alarm condition. Measure the elapsed time from the moment of alarm initiation to the activation of the associated visual display and audible signal on the network computer. Any measured test result exceeding 10 seconds must constitute a system failure. Document results.
 - a) Test each manual pull station for alarm activation by activating device.
 - b) Test each area smoke detector with listed aerosols acceptable to the manufacturer or other such testing methods, which are approved by the

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- AHJ. Verify and document time to activation for smoke detectors with pre-alarm time requirements.
- c) Test each waterflow switch by approved test method. Document time and date of start of test. Document time and date of start of test. Document time and date of fire alarm condition received at the network computer.
 - d) Test each duct detector by AHJ-approved smoke generation device(s).
 - e) Test each kitchen hood fire suppression system (where applicable).
 - f) Test all other alarm inputs using the same methods.
- 3) For each of the following supervisory conditions, verify that the network computer displays the fire alarm visual and audible supervisory condition for the building. Verify the hard copy message printout for the supervisory condition. Measure the elapsed time from the moment of supervisory signal initiation to the activation of the associated visual display and audible signal on the network computer. Any measured test result exceeding 10 seconds must constitute a system failure. Document results.
- a) Test each Fire Protection Sprinkler valve supervisory switch by approved test method. Document time and date of start of test. Document time and date of supervisory condition received at the network computer.
 - b) Test all other supervisory inputs using approved methods.
4. Repeat the tests above for each Building Fire Alarm System (FACP).
- C. Site Fire Alarm System Testing methods and procedures for the Central Fire Alarm Monitoring System (PLC-Driven graphic control panel).
- 1. General:
 - a. Document all Site Fire Alarm System Testing for the graphic control panel Central Fire Alarm Monitoring System using forms or checklists as approved by CDCR to demonstrate proper functioning of the systems tested.
 - 2. Site Fire Alarm System Testing methods and procedures:
 - a. Observe on the graphic control panel in the Central Control Room in Building 306 that the fire alarm system is in normal condition with no trouble, alarm, and/or supervisory alarms.
 - 1) Contractor must restore the fire alarm system to normal operating mode before any tests commences.
 - 2) Observe fire alarm system test results on the graphic control panel.
 - 3) Document test results on approved forms or checklists.
 - b. Select local building to test and perform the following minimum tests for the fire alarm systems:
 - 1) For each of the following trouble conditions, verify that the graphic control panel displays the fire alarm visual and audible trouble condition for the building. Document test results on approved forms or checklists.
 - a) Test battery supervision by disconnecting battery in local fire alarm panel.
 - b) Test AC power supervision by turning off dedicated AC circuit breaker to local fire alarm control panel.
 - c) Disconnect network communication of the local fire alarm control panel.
 - d) Test 10 percent of the smoke detectors, randomly selected by the Contractor, for trouble condition by removing the detector from their associated bases.
 - 2) For each of the following alarm conditions, verify the graphic control panel displays the fire alarm visual and audible alarm condition for the building. Measure the elapsed time from the moment of alarm initiation to the activation of the associated visual display and audible signal on the graphic control panel.

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Any measured test result exceeding 10 seconds must constitute a system failure. Document results.

- a) Test each manual pull station for alarm activation by activating device.
 - b) Test each area smoke detector with listed aerosols acceptable to the manufacturer or other such testing methods, which are approved by the AHJ. Verify and document time to activation for smoke detectors with pre-alarm time requirements.
 - c) Test each waterflow switch by approved test method. Document time and date of start of test. Document time and date of fire alarm condition received at the graphic control panel.
 - d) Test each duct detector by AHJ-approved smoke generation device(s).
 - e) Test each kitchen hood fire suppression system (where applicable).
 - f) Test all other alarm inputs using the same methods.
- 3) For each of the following supervisory conditions, verify the graphic control panel displays the fire alarm visual and audible supervisory condition for the building. Measure the elapsed time from the moment of supervisory signal initiation to the activation of the associated visual display and audible signal on the graphic control panel. Any measured test result exceeding 10 seconds must constitute a system failure. Document results.
- a) Test each Fire Protection Sprinkler valve supervisory switch by approved test method. Document time and date of start of test. Document time and date of supervisory condition received at the graphic control panel.
 - b) Test all other supervisory inputs using approved methods.
3. Repeat the tests above for each Building Fire Alarm System (FACP).
- D. Site Fire Alarm System Testing methods and procedures for existing Fire Station Fire Alarm Monitoring System.
1. General:
 - a. Document all Site Fire Alarm System Testing using NFPA 72 Fire Alarm System Record of Completion form, or other form as approved by CDCR and the Authority Having Jurisdiction.
 - b. In addition to Fire Alarm System Record of Completion form(s), submit supplemental documentation, on approved forms or checklists, as required to demonstrate proper functioning of the systems tested.
 - c. At least 15 days before Site Fire Alarm System Testing begins, Contractor must obtain, from the AHJ, the maximum acceptable elapsed time between a building alarm initiation and the activation of the associated visual display and audible signal on the monitoring system. Record this time duration in the Site Fire Alarm System Testing documents.
 2. Test existing Fire Station Fire Alarm Monitoring System in accordance with the test methods outlined in NFPA 72 Test Methods.
 - a. Tests must be performed on all applicable equipment and circuits as detailed in NFPA 72.
 - b. Items tested must include but must not be limited to the following:
 - 1) Receiver/Master CPU.
 - 2) Power supplies.
 - 3) UPS system.
 - 4) Desktop computer monitor, keyboard, mouse.
 - 5) System printer.
 - 6) Related system signal circuits.
 3. Additional Site Fire Alarm System Testing methods and procedures:

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- a. Observe on the Receiver/CPU and system desktop computer that the fire alarm system is in normal condition with no trouble, alarm, and/or supervisory alarms.
 - 1) Contractor must restore the monitoring system to normal operating mode before any tests commence.
 - 2) Observe fire alarm system test results on both the Receiver/CPU and the system desktop computer simultaneously with each observation location staffed independently.
 - 3) Document test results through hard copy printouts on the monitoring system printer and on approved forms or checklists from annunciation on the desktop computer.
- b. Select local building to test and perform the following minimum tests for the fire alarm systems:
 - 1) For each of the following trouble conditions, verify that the monitoring system displays the fire alarm visual and audible trouble condition for the building. Verify the hard copy message printout for the trouble condition. Document results.
 - a) Test battery supervision by disconnecting battery in local fire alarm panel.
 - b) Test AC power supervision by turning off dedicated AC circuit breaker to local fire alarm control panel.
 - c) Disconnect network communication of the local fire alarm control panel.
 - d) Test 10 percent of the smoke detectors, randomly selected by the Contractor, for trouble condition by removing the detector from their associated bases.
 - 2) For each of the following alarm conditions, verify that the monitoring system displays the fire alarm visual and audible alarm condition for the building. Verify the hard copy message printout for the alarm condition. Measure the elapsed time from the moment of alarm initiation to the activation of the associated visual display and audible signal on the monitoring system. Any measured test result exceeding the time duration set forth by the AHJ must constitute a system failure. Document results.
 - a) Test each manual pull station for alarm activation by activating device.
 - b) Test each area smoke detector with listed aerosols acceptable to the manufacturer or other such testing methods, which are approved by the AHJ. Verify and document time to activation for smoke detectors with pre-alarm time requirements.
 - c) Test each waterflow switch by approved test method. Document time and date of start of test. Document time and date of start of test. Document time and date of fire alarm condition received at the monitoring system.
 - d) Test each duct detector by AHJ-approved smoke generation device(s).
 - e) Test each kitchen hood fire suppression system (where applicable).
 - f) Test all other alarm inputs using the same methods.
 - 3) For each of the following supervisory conditions, verify that the monitoring system displays the fire alarm visual and audible supervisory condition for the building. Verify the hard copy message printout for the supervisory condition. Measure the elapsed time from the moment of supervisory signal initiation to the activation of the associated visual display and audible signal on the monitoring system. Any measured test result exceeding the time duration set forth by the AHJ must constitute a system failure. Document results.
 - a) Test each Fire Protection Sprinkler valve supervisory switch by approved test method. Document time and date of start of test. Document time and date of supervisory condition received at the monitoring system.

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- b) Test all other supervisory inputs using approved methods.
 - 4. Repeat the tests above for each Building Fire Alarm System (FACP).
- E. Site Fire Alarm System Final Acceptance Testing methods and procedures for the Central Fire Alarm Monitoring System (FACP Network Data Logger, CRT and printer).
 - 1. Observe on the network computer monitor in the Central Control Room in Building 306 that the fire alarm system is in normal condition with no trouble, alarm, and/or supervisory alarms.
 - a. Contractor must restore the fire alarm system to normal operating mode before any tests commences.
 - b. Observe fire alarm system test results on the network computer monitor.
 - c. Document test results through hard copy printouts on the fire alarm printer and on approved forms or checklists.
 - 2. Select local building to test and perform the following minimum tests for the fire alarm systems:
 - a. For each of the following trouble conditions, the network computer displays the fire alarm visual and audible trouble condition for the building. Verify the hard copy message printout for the trouble condition. Document results.
 - 1) Test battery supervision by disconnecting battery in local fire alarm panel.
 - 2) Test AC power supervision by turning off dedicated AC circuit breaker to local fire alarm control panel.
 - 3) Disconnect network communication of the local fire alarm control panel.
 - 4) Test smoke detectors selected by the AHJ for trouble condition by removing the detector from their associated bases.
 - b. For each of the following alarm conditions, verify the network computer displays the fire alarm visual and audible alarm condition for the building. Verify the hard copy message printout for the alarm condition. Measure the elapsed time from the moment of alarm initiation to the activation of the associated visual display and audible signal on the network computer. Any measured test result exceeding 10 seconds must constitute a system failure. Document results.
 - 1) Test each manual pull station for alarm activation by activating device.
 - 2) Test each area smoke detector with listed aerosols acceptable to the manufacturer or other such testing methods, which are approved by the AHJ. Verify and document time to activation for smoke detectors with pre-alarm time requirements.
 - 3) Test each waterflow switch by approved test method or AHJ direction. Document time and date of start of test. Document time and date of fire alarm condition received at the network computer.
 - 4) Test each duct detector by AHJ-approved smoke generation device(s). Obtain AHJ approval for test method and smoke generation equipment used at least 10 days in advance of scheduled Site Fire Alarm Final Acceptance Testing.
 - 5) Test each kitchen hood fire suppression system (where applicable).
 - 6) Test all other alarm inputs using the same methods.
 - c. For each of the following supervisory conditions, verify the network computer displays the fire alarm visual and audible supervisory condition for the building. Verify the hard copy message printout for the supervisory condition. Measure the elapsed time from the moment of supervisory signal initiation to the activation of the associated visual display and audible signal on the network computer. Any measured test result exceeding 10 seconds must constitute a system failure. Document results.

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- 1) Test each Fire Protection Sprinkler valve supervisory switch by approved test method. Document time and date of start of test. Document time and date of supervisory condition received at the network computer.
 - 2) Test all other supervisory inputs using approved methods.
 3. Repeat the tests above for each Building Fire Alarm System (FACP).
- F. Site Fire Alarm System Final Acceptance Testing methods and procedures for the Central Fire Alarm Monitoring System (PLC-Driven graphic control panel).
 1. Observe on the graphic control panel in the Central Control Room in Building 306 that the fire alarm system is in normal condition with no trouble, alarm, and/or supervisory alarms.
 - a. Contractor must restore the fire alarm system to normal operating mode before any tests commence.
 - b. Observe fire alarm system test results on the graphic control panel.
 - c. Document test results on approved forms or checklists.
 2. Select local building to test and perform the following minimum tests for the fire alarm systems:
 - a. For each of the following trouble conditions, verify that the graphic control panel displays the fire alarm visual and audible trouble condition for the building. Document test results on approved forms or checklists.
 - 1) Test battery supervision by disconnecting battery in local fire alarm panel.
 - 2) Test AC power supervision by turning off dedicated AC circuit breaker to local fire alarm control panel.
 - 3) Disconnect network communication of the local fire alarm control panel.
 - 4) Test smoke detectors, as directed by AHJ, for trouble condition by removing the detector from their associated bases.
 - b. For each of the following alarm conditions, verify the graphic control panel displays the fire alarm visual and audible alarm condition for the building. Measure the elapsed time from the moment of alarm initiation to the activation of the associated visual display and audible signal on the graphic control panel. Any measured test result exceeding 10 seconds must constitute a system failure. Document results.
 - 1) Test each manual pull station for alarm activation by activating device.
 - 2) Test each area smoke detector with listed aerosols acceptable to the manufacturer or other such testing methods, which are approved by the AHJ. Verify and document time to activation for smoke detectors with pre-alarm time requirements.
 - 3) Test each waterflow switch by approved test method or AHJ direction. Document time and date of start of test. Document time and date of fire alarm condition received at the graphic control panel.
 - 4) Test each duct detector by AHJ-approved smoke generation device(s). Obtain AHJ approval for test method and smoke generation equipment used at least 10 days in advance of scheduled Site Fire Alarm Final Acceptance Testing.
 - 5) Test each kitchen hood fire suppression system (where applicable).
 - 6) Test all other alarm inputs using the same methods.
 - c. For each of the following supervisory conditions, verify the graphic control panel displays the fire alarm visual and audible supervisory condition for the building. Measure the elapsed time from the moment of supervisory signal initiation to the activation of the associated visual display and audible signal on the graphic control panel. Any measured test result exceeding 10 seconds must constitute a system failure. Document results.

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- 1) Test each Fire Protection Sprinkler valve supervisory switch by approved test method. Document time and date of start of test. Document time and date of supervisory condition received at the graphic control panel.
 - 2) Test all other supervisory inputs using approved methods.
 3. Repeat the tests above for each Building Fire Alarm System (FACP).
- G. Site Fire Alarm System Final Acceptance Testing methods and procedures for the Fire Station Fire Alarm Monitoring System.
 1. Observe on the Receiver/CPU and system desktop computer that the fire alarm system is in normal condition with no trouble, alarm, and/or supervisory alarms.
 - a. Contractor must restore the monitoring system to normal operating mode before any tests commences.
 - b. Observe fire alarm system test results on both the Receiver/CPU and the system desktop computer simultaneously with each observation location staffed independently.
 - c. Document test results through hard copy printouts on the monitoring system printer and on approved forms or checklists from annunciation on the desktop computer.
 2. Select local building to test and perform the following minimum tests for the fire alarm systems:
 - a. For each of the following trouble conditions, verify that the monitoring system displays the fire alarm visual and audible trouble condition for the building. Verify the hard copy message printout for the trouble condition. Document results.
 - 1) For each of the following trouble conditions, verify that the monitoring system displays the fire alarm visual and audible trouble condition for the building. Verify the hard copy message printout for the trouble condition. Document results.
 - a) Test battery supervision by disconnecting battery in local fire alarm panel.
 - b) Test AC power supervision by turning off dedicated AC circuit breaker to local fire alarm control panel.
 - c) Disconnect network communication of the local fire alarm control panel.
 - d) Test smoke detectors selected by the AHJ, for trouble condition by removing the detector from their associated bases.
 - b. For each of the following alarm conditions, verify that the monitoring system displays the fire alarm visual and audible alarm condition for the building. Verify the hard copy message printout for the alarm condition. Measure the elapsed time from the moment of alarm initiation to the activation of the associated visual display and audible signal on the monitoring system. Any measured test result exceeding the time duration set forth by the AHJ must constitute a system failure. Document results.
 - 1) Test each manual pull station for alarm activation by activating device.
 - 2) Test each area smoke detector with listed aerosols acceptable to the manufacturer or other such testing methods, which are approved by the AHJ. Verify and document time to activation for smoke detectors with pre-alarm time requirements.
 - 3) Test each waterflow switch by approved test method or AHJ direction. Document time and date of start of test. Document time and date of start of test. Document time and date of fire alarm condition received at the monitoring system.
 - 4) Test each duct detector by AHJ-approved smoke generation device(s). Obtain AHJ approval for test method and smoke generation equipment used at least 10 days in advance of scheduled Site Fire Alarm Final Acceptance Testing.

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- 5) Test each kitchen hood fire suppression system (where applicable).
 - 6) Test all other alarm inputs using the same methods.
 - c. For each of the following supervisory conditions, verify that the monitoring system displays the fire alarm visual and audible supervisory condition for the building. Verify the hard copy message printout for the supervisory condition. Measure the elapsed time from the moment of supervisory signal initiation to the activation of the associated visual display and audible signal on the monitoring system. Any measured test result exceeding the time duration set forth by the AHJ must constitute a system failure. Document results.
 - 1) Test each Fire Protection Sprinkler valve supervisory switch by approved test method. Document time and date of start of test. Document time and date of supervisory condition received at the monitoring system.
 - 2) Test all other supervisory inputs using approved methods.
 3. Repeat the tests above for each Building Fire Alarm System (FACP).
- H. Fire Alarm System Continuous Testing:
1. As the last step in Site Fire Alarm Final Acceptance Testing, CDCR Representative will annotate on the network fire alarm printer hard copy printout date and time of testing completion.
 - a. Contractor must perform no work on any fire alarm systems for 48 hours.
 - b. At the end of the 48-hour period, CDCR Representative will annotate on the fire alarm system network printer hard copy printout the date and time, which must constitute the completion of the 48-hour test.
 2. Contractor must have three days to identify all troubles, alarms, supervisory conditions and errors on the entire Fire Alarm System network (encompassing all FACP panels) that registered during the 48-hour test period and the Contractor responsible for each of the troubles, alarms, supervisory conditions and errors.
 - a. At the end of the three-day period following Fire Alarm System Continuous Testing.
 - b. Contractor must submit a comprehensive written report to the CDCR Representative documenting each trouble, alarm, supervisory condition and error.
 3. When Contractor is responsible for the troubles, alarms, supervisory conditions and errors documented in CDCR Continuous Testing Report, Contractor must complete corrective work at no additional cost to CDCR after obtaining written approval from CDCR Representative.
 4. This process must repeat until all corrective work has been completed and a Fire Alarm System Continuous Test is conducted with no resultant troubles, alarms, supervisory conditions or errors on the entire Fire Alarm System and the CDCR Representative has approved the Fire Alarm System Continuous Testing.
- I. Contractor will maintain cleanliness of smoke and heat sensing fire detectors from time that devices are installed to time that each building system is tested and turned over.
1. The sensitivity listing of all detectors at the time that the system is turned over will not exceed 35 percent of the total environmental compensation as determined by reviewing the maintenance report at the local building FACP.
 2. If any detector exceeds the specified 35 percent level, then that detector will be removed, cleaned, replaced and re-tested.
- J. Contractor must replace the protective dust covers on smoke and heat detectors after the building system has been tested and accepted by CDCR Representative and California State Fire Marshal.

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- K. Remove the protective dust covers from the smoke and heat detectors prior to site-wide system testing for each building unless otherwise instructed by the CDCR Representative.
 - 1. If the CDCR Representative provides specific written instructions to leave the protective dust covers on the smoke and heat detectors, then the CDCR Representative assumes the responsibility of removing the dust covers at a later date.

3.3 COMPLETION

- A. General: Upon completion of the Work, remove excess debris, materials, equipment, apparatus, tools and the like and leave the premises clean, neat and orderly.
- B. Testing: The completed system must be tested by the Contractor prior to the Final Acceptance test.

END OF SECTION