

General Info

Total:

\$6,763,000.00

Number	Description
24-S-14	Department of Public Health Basement Renovation
Deadline	The work to be done consists of, in general, the redesign and interior improvements of the basement of the Brix-Mercer Building that was previously damaged by flooding. Interior improvements to consist of the assembly of meeting rooms, offices, and storage occupancies including the construction of new walls, carpeting, and painting, with upgrades to the plumbing, mechanical, fire sprinklers, and electrical systems.
04/03/2025 02:00 PM PDT	
Vendor	
Better Enterprises, Inc.	
Submitted	
04/03/2025 01:39 PM PDT	No
Signed by	Allows zero unit prices and labor
Marc Kerkochian	No
Account Holder Susan Waid	Allows negative unit prices and labor
Opened	No
04/03/2025 02:02 PM PDT By jwongsing@fresnocountyca.gov	

Attachment List

County of Fresno - Project Website
RFC form, bid opening details, any Supplemental Information
including RFC responses, Pre-bid Conference information, etc.

Project Manual
Specifications

Plans - County approved (54 MB)
Drawings approved by Fresno County

Plans - Fire Department approved Part 1 (212 MB)
Drawings with notations and approved by Fire Department

Plans - Fire Department approved Part 2 (229 MB)
Drawings with notations and approved by Fire Department

Plans - Fire Department approved Part 3 (207 MB)
Drawings with notations and approved by Fire Department

Instructions to Bidders
Instructions for Completing the Bid Book within the Specifications

Addendum 1 (<http://www.fresnocountyca.gov/files/sharedassets/county/v/1/public-works-and-planning/design/construction-bidding-opportunities/24-s-14-dph-basement-renovation/00-91-15-addendum-1.pdf>)
Addendum 1

Addendum 2 (<http://www.fresnocountyca.gov/files/sharedassets/county/v/1/public-works-and-planning/design/construction-bidding-opportunities/24-s-14-dph-basement-renovation/00-91-15-addendum-2.pdf>)
Addendum 2

Plan Sheet P2.03 - Addendum 2 (<http://www.fresnocountyca.gov/files/sharedassets/county/v/1/public-works-and-planning/design/construction-bidding-opportunities/24-s-14-dph-basement-renovation/plan-sheet-p2.03-addendum-2.pdf>)
Plan Sheet P2.03 - Addendum 2

Proposal Section 004213 - 1

PROPOSAL TO THE COUNTY OF FRESNO

Contract Name: **DEPARTMENT OF PUBLIC HEALTH BASEMENT RENOVATION**

Contract No.: **24-S-14**

Fund / Subclass / Org / Account / Program or Memo No.: **5620 / 1500 / 08150 / 91760**

The work to be done consists of, in general, the redesign and interior improvements of the basement of the Brix-Mercer Buildings that was previously damaged by flooding. Interior improvements to consist of assembly of meeting rooms, office, and storage occupancies including the construction of new walls, carpeting, and painting, with upgrades to the plumbing, mechanical, fire sprinklers, and electrical systems.

The work to be done is shown on a set of Plans, entitled: "Fresno County Dept. of Public Health Basement Renovation"

Building No.: 611 and 612

Project Address:

1221 Fulton Street

Fresno, CA 93721

If this proposal shall be accepted and the undersigned shall fail to contract, as aforesaid, and to give the two bonds in the sums to be determined as aforesaid, each issued by a surety satisfactory to the Awarding Authority, within ten (10) days after the award of the contract, the Awarding Authority, at its option, may determine that the bidder has abandoned the contract, and thereupon this proposal and the acceptance thereof shall be null and void, and the forfeiture of such security accompanying this proposal shall operate and the same shall be the property of the County.

The undersigned, as bidder, declares that all addenda issued with respect to this bid have been received and incorporated into this Proposal. The bidder's signature on this Proposal also constitutes acknowledgement of all addenda.

The undersigned, as bidder, declares that the only persons, or parties interested in this proposal as principals are those named herein; that this proposal is made without collusion with any other person, firm or corporation; that the bidder has carefully examined the annexed proposed form of contract, and the plans therein referred to; and the bidder proposes and agrees if this proposal is accepted, that the bidder will contract with the County of Fresno to provide all necessary machinery, tools, apparatus and other means of construction, and to do all the work and furnish all the materials specified in the contract in the manner and time therein prescribed, and according to the requirements of the County as therein set forth, and that the bidder will take in full payment therefor the following lump sum price, to-wit:

Proposal Section 004213 - 2 Bid

\$6,763,000.00

Item No.	Item Description	Item Price	Extension
1	Base Bid	\$6,763,000.00	\$6,763,000.00
			Total: \$6,763,000.00

Proposal Section 004213 - 3 Acknowledgement of Addendum

Type N/A if no addenda were issued. Click "+" to add additional fields.

Addendum No. *

01

Dated *

03/24/2025

Type N/A if no addenda were issued. Click "+" to add additional fields. 1

Addendum No. *

02

Dated *

03/28/2025

Bid Security Form Section 004313 - 1

Accompanying this proposal is security (check one only) in an amount equal to at least ten percent (10%) of the total amount of the bid:

Bond Percentage

10.00%

Guarantee Method *

Paper Bid Bond, Certified
Check, Cashier's Check,
Cash, Scan of Paper Bid
Bond

Paper Bid Bond, Certified Check, Cashier's Check, Cash, Scan of Paper Bid Bond

Confirmation *

I have provided a Paper Bid Bond for 10.00% of the bid total amount, to the public works office, prior to the solicitation deadline.

If Cash Security, Enter Amount

You must either attach an electronic bid bond here or provide an original bid bond (or other form of bid security authorized by Public Contract Code Section 20129(a)), **prior to** the bid opening.

Bid Security Form Section 0014313 - 2

The names of all persons interested in the foregoing proposal as principals are as follows:

Business Name *

Better Enterprises, Inc.

Note: If bidder or other interested person is a corporation, state legal name of corporation. If bidder is a co-partnership, state true name of firm.

Type of Business *

Corporation

Business Owners and Officers Names *

Marc Kerkochian, President

Note: If bidder or other interested person is:

- a corporation, list names of the president, secretary, treasurer and manager thereof.*
- a partnership, list names of all individual co-partners composing firm.*
- an individual, state first and last name in full.*

Name of Owners and Key Employees *

Marc Kerkochian, President & Owner
Susan Waid, Secretary
Ben Emerzian, Treasurer

Note: List majority owners of your firm. If multiple owners, list all. Also include anyone, including key employees, who are actively promoting the contract. (SB1439)

Licensed in accordance with an act providing for the registration of Contractors:

Class *

B, C33, C-8

Contractor License *

1012660

Expires *

04/30/2026

DIR Registration Number *

1000565193

Business Address *

1148 N Cypress Ave, Fresno, CA 93727-6871

Zip Code *

93727

Mailing Address *

1148 N. Cypress Avenue, Fresno, CA

Zip Code *

93727

Business Phone *

(559) 233-2225 x1007

Fax Number

(559) 233-2850

Email Address *

marc@betterenterprisesinc.com

Signature of Bidder *

Better Enterprises, Inc., a California Corporation by Marc Kerkochian, President

Dated *

04/03/2025

NOTE: If bidder is a corporation, the legal name of the corporation shall be set forth above together with the signature of the officer or officers authorized to sign contracts on behalf of the corporation; if bidder is a co-partnership, the true name of the firm shall be set forth above together with the signature of the partner or partners authorized to sign contracts on behalf of the co-partnership; and if bidder is an individual, bidder signature shall be placed above. If signature is by an agent, other than an officer of a corporation or a member of a partnership, a Power of Attorney must be on file with the Owner prior to opening bids or submitted with the bid; otherwise, the bid will be disregarded as irregular and unauthorized.

Subcontractors List Section 004336 - 1

SUBCONTRACTORS

The following named subcontractor(s) will perform with labor, or otherwise render services to the general contractor in or about the construction of the work or improvement in an amount in excess of one-half of one percent of the total bid presented herewith. Please fill out as completely as possible when submitting your bid. Use subcontractor's business name style as registered with the License Board. Submission of subcontractor's name, location of business and description of work, California contractor's license number and public works contractor registration number issued pursuant to Section 1725.5 of the Labor Code, all are REQUIRED, by Section 4104 of the California Public Contract Code, to be submitted prior to bid opening. (The "location of business" must specify the city in which the subcontractor's business is located, and the state if other than California.) All other requested information shall be submitted, either with the bid or within 24 hours after bid opening.

Please fill out as completely as possible when submitting your bid. Use subcontractor's business name style as registered with the License Board.

FAILURE TO LIST SUBCONTRACTORS AS DIRECTED MAY RENDER THE BID NON-RESPONSIVE, OR MAY RESULT IN ASSESSMENT OF A PENALTY AGAINST THE BIDDER IN ACCORDANCE WITH SECTION 4110 OF THE CALIFORNIA PUBLIC CONTRACT CODE.

Subcontractor: To add more subcontractor listings, click the "+" to add additional fields.

Subcontractor: *
Better Flooring, Inc.

Business Address *
1148 N. Cypress Avenue, Fresno, CA 93727

Class
C15, C54

License No. *
820202

DIR Registration No. *
1000000130

Item No. or Description of Work *
Flooring, Ceramic Tile

Dollar Amount:

OR

Percentage of Total Bid:

Email Address:

marc@betterflooringinc.com

Subcontractor: To add more subcontractor listings, click the "+" to add additional fields. 1

Subcontractor: *

Best Fire Protection

Business Address *

1201 24th Street, Suite B110-334, Bakersfield, CA 93301

Class

C-16

License No. *

1054075

DIR Registration No. *

1000580773

Item No. or Description of Work *

Fire Sprinklers

Dollar Amount:

OR

Percentage of Total Bid:

Email Address:

chris@bestfire.us

Subcontractor: To add more subcontractor listings, click the "+" to add additional fields. 2

Subcontractor: *

Western Building Materials Co.

Business Address *

4620 E. Olive Avenue, Fresno, CA 93702

Class

C-2

License No. *

248608

DIR Registration No. *

1000003005

Item No. or Description of Work *

Suspended Acoustical Ceilings; Fiberglass Reinforced Panels; Acoustic Wall Panels

Dollar Amount:

OR

Percentage of Total Bid:

Email Address:

brian@wbmco.com

Subcontractor: To add more subcontractor listings, click the "+" to add additional fields. 3

Subcontractor: *

KC&S Construction Specialties, Inc.

Business Address *

432 Bitritto Way, Unit 3, Modesto, CA 95356

Class

C-61/D28, C-61/D34, C23

License No. *

1048604

DIR Registration No. *

1000063244

Item No. or Description of Work *

WD Doors, HM Frames and Finish Hardware

Dollar Amount:

OR

Percentage of Total Bid:

Email Address:

a.landingham@kcsconstructionspecialties.com

Subcontractor: To add more subcontractor listings, click the "+" to add additional fields. 4

Subcontractor: *

Fresno Roofing Co., Inc.

Business Address *

5950 E. Olive Avenue, Fresno, CA 93727

Class

C39

License No. *

302777

DIR Registration No. *

1000004536

Item No. or Description of Work *

Roofing

Dollar Amount:

OR

Percentage of Total Bid:

Email Address:

ed@fresnorroofingco.net

Subcontractor: To add more subcontractor listings, click the "+" to add additional fields. 5

Subcontractor: *

Shelco Industries

Business Address *

5425 E. Home Avenue, Suite 101, Fresno, CA 93727

Class

C-61/D34

License No. *

423565

DIR Registration No. *

1000007336

Item No. or Description of Work *

Toilet Partitions; Toilet Accessories; Lockers

Dollar Amount:

OR

Percentage of Total Bid:

Email Address:

bobs@shelcoindustries.com

Subcontractor: To add more subcontractor listings, click the "+" to add additional fields. 6

Subcontractor: *

Cencal Services, Inc.

Business Address *

3299 S. Cedar Avenue, Fresno, CA 93725

Class

C21, C22, C-8

License No. *

976935

DIR Registration No. *

1000002906

Item No. or Description of Work *

Demolition; Saw Cutting

Dollar Amount:

OR

Percentage of Total Bid:

Email Address:

Jamesd@cencaldemo.com

Subcontractor: To add more subcontractor listings, click the "+" to add additional fields. 7

Subcontractor: *

Alcal Specialty Contracting, Inc.

Business Address *

2647 N. Weber Avenue, Fresno, CA 93705

Class

C39, C-2, C-35

License No. *

815286

DIR Registration No. *

1000000315

Item No. or Description of Work *

Batt Insulation; Operable Partitions

Dollar Amount:

OR

Percentage of Total Bid:

Email Address:

mike.donahoo@alcal.com

Subcontractor: To add more subcontractor listings, click the "+" to add additional fields. 8

Subcontractor: *

Valley Air Conditioning & Repair, Inc.

Business Address *

825 S. Topeka Avenue, Fresno, CA 93721

Class

C36, C-4

License No. *

669606

DIR Registration No. *

1000009688

Item No. or Description of Work *

Plumbing

Dollar Amount:

OR

Percentage of Total Bid:

Email Address:

sjohnson@valleyairrepair.com

Subcontractor: To add more subcontractor listings, click the "+" to add additional fields. 9

Subcontractor: *

San Joaquin Glass

Business Address *

2150 E. McKinley Avenue, Fresno, CA 93703

Class

C-17

License No. *

248167

DIR Registration No. *

1000010471

Item No. or Description of Work *

Storefronts; Glazing

Dollar Amount:

OR

Percentage of Total Bid:

Email Address:

anthony@sjglass.com

Subcontractor: To add more subcontractor listings, click the "+" to add additional fields. 10

Subcontractor: *

Frontline Plastering, Inc.

Business Address *

2549 N. Bundy Drive, Fresno, CA 93727

Class

C35, C-9

License No. *

1017354

DIR Registration No. *

1000055393

Item No. or Description of Work *

Cold Formed Metal Framing; Gypsum Board; Firestopping; Joint Sealants

Dollar Amount: **OR** **Percentage of Total Bid:**

Email Address:

doug@frontlineplasteringinc.com

Subcontractors List Section 004336 - 2

Optional: Vendor is not required to complete.

SUBCONTRACTORS

Subcontractor: To add more subcontractor listings, click the "+" to add additional fields.

Subcontractor: *
Tarlton & Son, Inc.

Business Address *
3562 S. Elm Avenue, Fresno, CA 93706

Class
C33

License No. *
342341

DIR Registration No. *
1000004368

Item No. or Description of Work *
Painting

Dollar Amount:

OR

Percentage of Total Bid:

Email Address:
randyt@tarltonandson.com

Subcontractor: To add more subcontractor listings, click the "+" to add additional fields. 1

Subcontractor: *
EI Executive Interiors

Business Address *
1020 S 10th St Fresno Ca 93702

Class

C-6

License No. *

885715

DIR Registration No. *

1000013318

Item No. or Description of Work *

Cabinets/Countertops

Dollar Amount:

OR

Percentage of Total Bid:

Email Address:

pfachenda@executiveinteriorsinc.com

Subcontractor: To add more subcontractor listings, click the "+" to add additional fields. 2

Subcontractor: *

Strategic Mechanical, Inc.

Business Address *

4661 E. Commerce Avenue, Fresno, CA 93725

Class

C20, C38, C43

License No. *

834679

DIR Registration No. *

1000001726

Item No. or Description of Work *

Mechanical

Dollar Amount:

OR

Percentage of Total Bid:

Email Address:

AFornes@strategicmech.com

Subcontractor: To add more subcontractor listings, click the "+" to add additional fields. 3

Subcontractor: *

The Boelter Companies, Inc.

Business Address *

9960 Business Park Drive, #120, Sacramento, CA 95827

Class

B

License No. *

1109217

DIR Registration No. *

1001103677

Item No. or Description of Work *

Food Service Equipment

Dollar Amount:

OR

Percentage of Total Bid:

Email Address:

kedens@boelter.com

Subcontractor: To add more subcontractor listings, click the "+" to add additional fields. 4

Subcontractor: *

Meyers Constructors, Inc.

Business Address *

40488 Brickyard Dr., Madera, CA 93636

Class

B, C51

License No. *

1004811

DIR Registration No. *

1000034927

Item No. or Description of Work *

Rough Carpentry; Structural Steel

Dollar Amount:

OR

Percentage of Total Bid:

Email Address:

bryan@meyersconstructors.com

Subcontractor: To add more subcontractor listings, click the "+" to add additional fields. 5

Subcontractor: *

A-C Electric Company

Business Address *

P O BOX 81977, Bakersfield, CA 93380

Class

C10

License No. *

99849

DIR Registration No. *

1000000365

Item No. or Description of Work *

Electrical

Dollar Amount:

OR

Percentage of Total Bid:

Email Address:

jeff.waughtal@a-celectric.com

Non-Collusion Declaration Section 004519 - 1

CONTRACT: DEPARTMENT OF PUBLIC HEALTH BASEMENT RENOVATION
CONTRACT NO.: 24-S-14

To the Board of Supervisors, County of Fresno:

NON-COLLUSION DECLARATION TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID *

The undersigned declares:

I am the (Choose one of the following options): *

Corporate Officer

If Corporate Officer please list Title:

President

of (Business Name): *

Better Enterprises, Inc.

the party making the foregoing bid.

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

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

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration is executed on

Date: *

04/03/2025

at City, State: *

Fresno, California

Signature: *

Marc Kerkochian, President

(See Title 23 United States Code Section 112; Calif Public Contract Code Section 7106)

*NOTE: Completing, signing, and returning the Non-Collusion Declaration is a required part of the Proposal. Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

Equal Opportunity Clause - Section 004536 - 1

CERTIFICATION WITH REGARD TO THE PERFORMANCE OF PREVIOUS CONTRACTS OR SUBCONTRACTS SUBJECT TO THE EQUAL OPPORTUNITY CLAUSE AND THE FILING OF REQUIRED REPORTS

The bidder or proposed subcontractor hereby certifies that they

Please choose an option below *

have not participated

in a previous contract or subcontract subject to the equal opportunity clause, as required by Executive Orders 10925 or 11114, and that they

Please select an option below *

have not filed

with the Joint Reporting Committee, the Director of the Office of Federal Contract Compliance, a Federal Government contracting or administering agency, or the former President's Committee on Equal Employment Opportunity, all reports due under the applicable filing requirements.

Company *

Better Enterprises, Inc.

By: *

Marc Kerkochian

Title *

President

Date *

04/03/2025

NOTE: The above certification is required by the Equal Employment Opportunity Regulations of the Secretary of Labor (41 CFR 60-1.7(b) (1), and must be submitted by bidders and proposed subcontractors only in connection with contracts and subcontracts which are subject to the equal opportunity clause. Contracts and subcontracts which are exempt from the equal opportunity clause are set forth in 41 CFR 60-1.5. (Generally only contracts or subcontracts of \$10,000 or under are exempt.) Currently, Standard Form 100 (EEO-1) is the only report required by the Executive Orders or their implementing regulations.

Currently, Standard Form 100 (EEO-1) is the only report required by the Executive Orders or their implementing regulations.

Proposed prime contractors and subcontractors who have participated in a previous contract or subcontract subject to the Executive Orders and have not filed the required reports should note that 41 CFR 60-1.7(b) (1) prevents the award of contracts and subcontracts unless such contractor submits a report covering the delinquent period or such other period specified by the Director, Office of Federal Contract Compliance, U. S. Department of Labor.

Debarment and Suspension Certification - Section 004546 - 1

TITLE 49, CODE OF FEDERAL REGULATIONS, PART 29

DEBARMENT AND SUSPENSION CERTIFICATION

The bidder or proposed subcontractor under penalty of perjury, certifies that, except as noted below, he/she or any person associated therewith in the capacity of owner, partner, director, officer, manager:

is not currently under suspension, debarment, voluntary exclusion, or determination of ineligibility by any federal agency;

has not been suspended, debarred, voluntarily excluded or determined ineligible by any federal agency within the past 3 years;

does not have a proposed debarment pending; and

has not been indicted, convicted, or had a civil judgment rendered against it by a court of competent jurisdiction in any matter involving fraud or official misconduct within the past 3 years.

If no exceptions enter "No Exceptions." If there are any exceptions to this certification, insert the exceptions in the following space: *

No Exceptions

Exceptions will not necessarily result in denial of award, but will be considered in determining bidder responsibility.

For any exception noted above, indicate below to whom it applies, initiating agency, and dates of action:

Note: Providing false information may result in criminal prosecution or administrative sanctions.

The above certification is part of the Proposal. Signing the Proposal on the signature portion thereof shall also constitute signature

of this Certification.

By my signature on this proposal, I certify, under penalty of perjury under the laws of the State of California and the United States of America, that the Title 23 United States Code, Section 112 Non-Collusion Declaration and the Title 49 Code of Federal Regulations, Part 29 Debarment and Suspension Certification are true and correct.

Company *

Better Enterprises, Inc.

By *

Marc Kerkochian

Date *

04/03/2025

Title *

President

Nonlobbying Certification For Federal-Aid Contracts - Section 004556

The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with awarding of any cooperative agreement, and the extension, continuation, renewal, amendment, or INSTALLATION of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, **the undersigned shall complete and submit Standard Form-LLL, "Disclosure of Lobbying Activities," in accordance with its instructions.**

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, Title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

The prospective participant also agrees by submitting his or her bid or proposal that he or she shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such subrecipients shall certify and disclose accordingly.

Bidder *

Better Enterprises, Inc.

By *

Marc Kerkochian

Date *

04/03/2025

Title *

President

Disclosure of Lobbying Activities - Section 004566

Disclosure of Lobbying Activities - Section 004566 (223 KB)
Disclosure of Lobbying Activities

Title 13 CARB Certification Section 004656 - 1

In conformance with Title 13 § 2449(i), bidders will be required to attach copies of valid Certificates of Reported Compliance for the fleet selected for the contract and their listed subcontractors.

Before May 15th of each year, the prime contractor must collect a new valid Certificate of Reported Compliance for the current compliance year, as defined in section 2449(n), from all fleets that have an ongoing contract with the prime contractor as of March 1 of that year. Prime contractors must not write contracts to evade this requirement. Annual renewals must be provided to the Resident Engineer at least one week prior to the expiration date of the current certificate.

<https://ww2.arb.ca.gov/resources/fact-sheets/fact-sheet-contracting-requirements>

Choose all that apply:

- ☐ Bidder’s Certificate of Reported Compliance has been attached to the bid.
- ☒ Bidder does not have a fleet subject to this regulation as outlined in Section 2449(i)(1)-(4).
- ☒ Listed subcontractors’ Certificate of Reported Compliance have been attached.
- ☐ The following subcontractors do not have a fleet subject to this regulation as outlined in Section 2449(i)(1)-(4):

Subcontractors

- ☒ Additional information regarding subcontractor fleets and/or certificates will be submitted within five (5) calendar days of the bid opening.

FAILURE TO PROVIDE THE CERTIFICATES OF REPORTED COMPLIANCE AS DIRECTED MAY RENDER THE BID NON-RESPONSIVE.

Guaranty Section 006536 - 1

Optional: Vendor is not required to complete.

CONTRACT NO: 24-S-14

This guaranty shall be executed by the successful bidder in accordance with Section 2.32 of the General Conditions. The bidder may execute the guaranty on this page at the time of submitting the bid or may, in the alternative, submit it with the insurance certificates and bonds within ten (10) days after award.

G U A R A N T Y

To the Owner: County of Fresno

The undersigned guarantees the construction and installation of the following work included in this project:

ALL WORK

Should any of the materials or equipment prove defective or should the work as a whole prove defective, due to faulty workmanship, material furnished or methods of installation, or should the work or any part thereof fail to operate properly as originally intended and in accordance with each individual Work Order Detailed Scope of Work and specifications, due to any of the above causes, all within 365 calendar days after the date on which the Work under this contract is accepted by the Owner, the undersigned agrees to reimburse the Owner, upon demand, for its expenses incurred in restoring said work to the condition contemplated in said project, including the cost of any such equipment or materials replaced and the cost of removing and replacing any other work necessary to make such replacement or repairs, or, upon demand by the Owner, to replace any such material and to repair said work completely without cost to the Owner so that said work will function successfully as originally contemplated.

The Owner shall have the unqualified option to make any needed replacement or repairs itself or to have such replacements or repairs done by the undersigned. In the event the Owner elects to have said work performed by the undersigned, the undersigned agrees that the repairs shall be made and such materials as are necessary shall be furnished and installed within a reasonable time after the receipt of demand from the Owner. If the undersigned shall fail or refuse to comply with his or her obligations under this guaranty, the Owner shall be entitled to all costs and expenses reasonably incurred by reason of said failure or refusal.

Date: *

04/03/2025

Name (Printed): *

Marc Kerkochian

Signature: *

Marc Kerkochian

Title: *

President

Contractor: *

Better Enterprises, Inc.

Required Documents

Name	Omission Terms	Submitted File
Electronic Bid Bond - Scan of Bid Bond Scan of Notarized Paper Bid Bond with original due by 4pm on the 5th calendar day after the bid opening.	I have already provided a bid bond, i.e. through an electronic Surety above or to the public works office prior to the deadline.	County of Fresno DPH Basem Bond.pdf
Disclosure of Lobbying Activities - Section 004566 Complete this form to disclose lobbying activities pursuant to 31 U.S.C. 1352	Submit disclosure if needed.	I am not enclosing this document omission terms have been met
CARB Certification of Reported Compliance - Bidder Valid CARB Certification of Reported Compliance - Bidder	Does not have a fleet subject to this regulation.	I am not enclosing this document omission terms have been met
CARB Certification(s) of Reported Compliance - Subcontractors Valid CARB Certification(s) of Reported Compliance - Subcontractors	Due by 4pm on the 5th calendar day after bid opening or no listed subcontractors have a fleet subject to this regulation.	BFI E149998_FleetwideCompliance
4 Required Documents		

Additional Documents (use if needed)

Name	Omission Terms	Submitted File
Not Required - Extra Space if needed Not Required - Extra Space if needed	Not Required - Extra Space if needed	I am not enclosing this document because the omission terms have been met.
Not Required - Extra Space if needed Not Required - Extra Space if needed	Not Required - Extra Space if needed	I am not enclosing this document because the omission terms have been met.
Not Required - Extra Space if needed Not Required - Extra Space if needed	Not Required - Extra Space if needed	I am not enclosing this document because the omission terms have been met.
3 Required Documents		



Nationwide Mutual Insurance Company

Home Office: Columbus, Ohio
Surety Administrative Office:
1100 Locust Street – Dept. 2006
Des Moines, IA 50391-2006

BID BOND

Nationwide Mutual Insurance Company vouches that this document conforms to
American Institute of Architects Document A310, 2010 Edition.

CONTRACTOR: (Name, legal status and address)

BETTER ENTERPRISES, INC.
1148 N. Cypress Avenue
Fresno, CA 93727

SURETY: (Name, legal status and principal place of business)

Nationwide Mutual Insurance Company
1100 Locust Street – Dept. 2006
Des Moines, IA 50391-2006

OWNER: (Name, legal status and address)

COUNTY OF FRESNO
2220 Tulare St., 7th Floor
Fresno, CA
93721

BOND AMOUNT: **TEN PERCENT (10%) OF AMOUNT BID**

PROJECT: (Name, location or address, and Project number, if any) Department of Public Health Basement
Renovation Contract Number: 24-S-14

The Contractor and Surety are bound to the Owner in the amount set forth above, for the payment of which the Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, as provided herein. The conditions of this Bond are such that if the Owner accepts the bid of the Contractor within the time specified in the bid documents, or within such time period as may be agreed to by the Owner and Contractor, and the Contractor either (1) enters into a contract with the Owner in accordance with the terms of such bid, and gives such bond or bonds as may be specified in the bidding or Contract Documents, with a surety admitted in the jurisdiction of the Project and otherwise acceptable to the Owner, for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof; or (2) pays to the Owner the difference, not to exceed the amount of this Bond, between the amount specified in said bid and such larger amount for which the Owner may in good faith contract with another party to perform the work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect. The Surety hereby waives any notice of an agreement between the Owner and Contractor to extend the time in which the Owner may accept the bid. Waiver of notice by the Surety shall not apply to any extension exceeding sixty (60) days in the aggregate beyond the time for acceptance of bids specified in the bid documents, and the Owner and Contractor shall obtain the Surety's consent for an extension beyond sixty (60) days.

If this Bond is issued in connection with a subcontractor's bid to a Contractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

When this Bond has been furnished to comply with a statutory or other legal requirement in the location of the Project, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

Signed, and sealed this 27th day of March, 2025

(Witness to Principal)

(Principal's Signature)

(Seal)

(Title)

Nationwide Mutual Insurance Company

(Surety)

(Seal)

By:

Karen Amin, Attorney-in-Fact

ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California

County of Fresno)

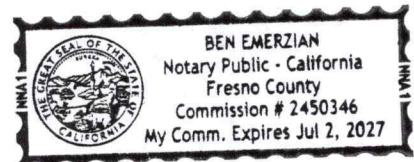
On 03-28-2025 before me, Ben Emerzian
(insert name and title of the officer)

personally appeared Marc Kerkochian,
who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature Ben Emerzian (Seal)



ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California

County of San Joaquin)

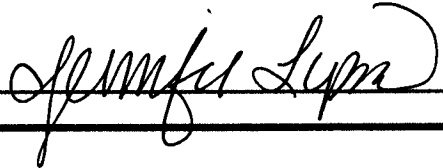
On March 27, 2025 before me, Jennifer Loper, Notary Public
(insert name and title of the officer)

personally appeared Karen Amin
who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/~~are~~
subscribed to the within instrument and acknowledged to me that he/~~she/they~~ executed the same in
his/~~her/their~~ authorized capacity(~~ies~~), and that by his/~~her/their~~ signature(s) on the instrument the
person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

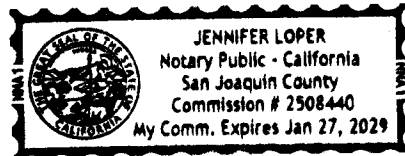
I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature



(Seal)



Power of Attorney

KNOW ALL MEN BY THESE PRESENTS THAT:

Nationwide Mutual Insurance Company, an Ohio corporation

hereinafter referred to severally as the "Company" and collectively as "the Companies" does hereby make, constitute and appoint:

DANIEL M CONNOLLY; JENNIFER LOPER; KAREN AMIN;

each in their individual capacity, its true and lawful attorney-in-fact, with full power and authority to sign, seal, and execute on its behalf any and all bonds and undertakings, and other obligatory instruments of similar nature, in penalties not exceeding the sum of

UNLIMITED

and to bind the Company thereby, as fully and to the same extent as if such instruments were signed by the duly authorized officers of the Company; and all acts of said Attorney pursuant to the authority given are hereby ratified and confirmed.

This power of attorney is made and executed pursuant to and by authority of the following resolution duly adopted by the board of directors of the Company:

"RESOLVED, that the president, or any vice president be, and each hereby is, authorized and empowered to appoint attorneys-in-fact of the Company, and to authorize them to execute and deliver on behalf of the Company any and all bonds, forms, applications, memorandums, undertakings, recognizances, transfers, contracts of indemnity, policies, contracts guaranteeing the fidelity of persons holding positions of public or private trust, and other writings obligatory in nature that the business of the Company may require; and to modify or revoke, with or without cause, any such appointment or authority; provided, however, that the authority granted hereby shall in no way limit the authority of other duly authorized agents to sign and countersign any of said documents on behalf of the Company."

"RESOLVED FURTHER, that such attorneys-in-fact shall have full power and authority to execute and deliver any and all such documents and to bind the Company subject to the terms and limitations of the power of attorney issued to them, and to affix the seal of the Company thereto; provided, however, that said seal shall not be necessary for the validity of any such documents."

This power of attorney is signed and sealed under and by the following bylaws duly adopted by the board of directors of the Company.

Execution of Instruments. Any vice president, any assistant secretary or any assistant treasurer shall have the power and authority to sign or attest all approved documents, instruments, contracts, or other papers in connection with the operation of the business of the company in addition to the chairman of the board, the chief executive officer, president, treasurer or secretary; provided, however, the signature of any of them may be printed, engraved, or stamped on any approved document, contract, instrument, or other papers of the Company.

IN WITNESS WHEREOF, the Company has caused this instrument to be sealed and duly attested by the signature of its officer the 20th day of August, 2021.



Antonio C. Albanese, **Vice President** of Nationwide Mutual Insurance Company

ACKNOWLEDGMENT

STATE OF NEW YORK COUNTY OF NEW YORK: ss

On this 20th day of August, 2021, before me came the above-named officer for the Company aforesaid, to me personally known to be the officer described in and who executed the preceding instrument, and he acknowledged the execution of the same, and being by me duly sworn, deposes and says, that he is the officer of the Company aforesaid, that the seal affixed hereto is the corporate seal of said Company, and the said corporate seal and his signature were duly affixed and subscribed to said instrument by the authority and direction of said Company.



Stephanie Rubino McArthur
Notary Public, State of New York
No. 02MC6270117
Qualified in New York County
Commission Expires October 19, 2024

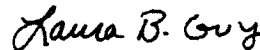


Notary Public
My Commission Expires
October 19, 2024

CERTIFICATE

I, Laura B. Guy, Assistant Secretary of the Company, do hereby certify that the foregoing is a full, true and correct copy of the original power of attorney issued by the Company; that the resolution included therein is a true and correct transcript from the minutes of the meetings of the boards of directors and the same has not been revoked or amended in any manner; that said Antonio C. Albanese was on the date of the execution of the foregoing power of attorney the duly elected officer of the Company, and the corporate seal and his signature as officer were duly affixed and subscribed to the said instrument by the authority of said board of directors; and the foregoing power of attorney is still in full force and effect.

IN WITNESS WHEREOF, I have hereunto subscribed my name as Assistant Secretary, and affixed the corporate seal of said Company this 27th day of March, 2025.



Assistant Secretary



Affirmation of Fleet Wide Compliance

Certification ID: 167154

This certificate affirms that

Entity ID: E149998
Better Flooring, Inc.
1148 N Cypress Ave
Fresno, CA 93727

has attested in the Clean Truck Check electronic reporting system to report a complete list of vehicles subject to Heavy-Duty Inspection and Maintenance (HD I/M) Regulation and the California Air Resources Board (CARB) hereby verifies that as of 3/27/2025, all of the attested vehicles are compliant with the Clean Truck Check.*

A complete list of the attested vehicles is listed in the following page(s).

*This Affirmation of Fleet Wide Compliance shall be used for the fleet's purposes of proving their fleet compliance status with their freight contractors and brokers. This Affirmation of Fleet Wide Compliance shall not constitute proof of a vehicle compliance with the Clean Truck Check beyond the issued date.

S.No	VIN Numbers
1	1FVHCYCY8FHGH4419
2	1FDUF4HTXFEC98358

DEPARTMENT OF PUBLIC HEALTH BASEMENT RENOVATION

1000 10th Street
Fresno, CA 93703

Contract # 24-S-14

The County of Fresno Department of Public Works and Planning

1000 Tenth St., 10th Floor
Fresno, California 93703

PROJECT M000000

Prebid Conference

Wednesday, March 27, 2024, 10:00 A.M.

Bid Date:

Thursday, April 3, 2025
2:00 P.M. (1400 hours and 00 seconds)

Bidlet Packet – 1000 10th Street 10th Floor



Development Services & Capital Projects Division

Department of Public Works and Planning

CONTRACT # 24-S-14

ADDENDUM 01

Contract \$

Dated

The herein documents are ended in the respects as herein set forth. This addendum and the amendments herein supplement the said documents and herein contract entered into pursuant to said documents.

PLEASE ACKNOWLEDGE THIS ADDENDUM ON YOUR PROPOSAL. IF YOU HAVE GIVEN THE CONTRACT DOCUMENTS TO SOMEONE ELSE, PLEASE FORWARD THIS ADDENDUM.

3-24-2025
Date Signed



Architect of Record: _____
Matthew B. Lopez, Lic. C

RESN COT
Department of Public Works and Planning
Development Services and Capital Projects Division
11111 T Street, Elt
resn, C
[ttpe](#) [resncntc](#)

CONTRACT \$

A. BID FORMS: Bid Express Solicitation

00 c00n0es

B. BID FORMS: Paper

00 c00n0es

C. SPECIFICATIONS / PROCUREMENT CONTRACTING REQUIREMENTS – DIVISION 00

a. Section 00 01 10 – Table of Contents

00 c00n0es

b. Section 00 11 13 – Notice to Bidders

00 c00n0es

c. Section 00 52 13 – Agreement

00 c00n0es

d. Section 00 72 00 – General Conditions

00 c00n0es

D. SPECIFICATIONS / SPECIAL PROVISIONS – DIVISION 01

00 c00n0es

E. DRAWINGS

a. Roof Plan & Details - Sheet A4.41

i. DELETE:

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REPLACE with:

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ii. DELETE:

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SPECI0ED.

REPLACE with:

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M00T000ED 0S 0RI000000 SPECI0ED.

F. GENERAL CLARIFICATIONS:

00 c00n0es

G. REQUEST FOR CLARIFICATION RESPONSES

- a. **Question #S14-2:** In Paragraph 1.1.1.1, it states that the "owner" shall be the one who repairs sewer lines. The owner is the architect or client approved alternate." Questions Requested: In this project, the sewer line is the responsibility of the owner and approved for repairs.

Response: Clarified above.

END OF SECTION

ADDENDUM 02

Contract # 24-S-14

Dated: 03/28/2025

The foregoing documents are amended in the respects as herein set forth. This addendum and the amendments herein shall become part of said documents and of any contract entered into pursuant to said documents.

PLEASE ACKNOWLEDGE THIS ADDENDUM ON YOUR PROPOSAL. IF YOU HAVE GIVEN THE CONTRACT DOCUMENTS TO SOMEONE ELSE, PLEASE FORWARD THIS ADDENDUM.

3-28-25

Date Signed



Architect of Record: _____ Matthew B. Lopez, Lic.# C-26483

FRESNO COUNTY
Department of Public Works and Planning
Development Services and Capital Projects Division
m/a 2220 Tulare Street, Eighth Floor
Fresno, CA 93721 (559) 600-4536
mattlopez@fresnocountyca.gov

A. BID FORMS: Bid Express Solicitation

No changes

B. BID FORMS: Paper

No changes

C. SPECIFICATIONS / PROCUREMENT CONTRACTING REQUIREMENTS – DIVISION 00

a. Section 00 01 10 – Table of Contents

No changes

b. Section 00 11 13 – Notice to Bidders

No changes

c. Section 00 52 13 – Agreement

No changes

d. Section 00 72 00 – General Conditions

i. Section 2.40 INSURANCE

DELETE: Automobile Liability: Insurance Services Office (ISO) Form CA 0001 covering Code 1 (any auto), with limits no less than five million dollars (\$5,000,000) per accident for bodily injury and property damage. Coverage should include owned and non-owned vehicles used in connection with this Agreement and all applicable endorsements.

REPLACE with: Automobile Liability: Automobile liability insurance with limits of not less than five million dollars (\$5,000,000) per accident for bodily injury and for property damages. Coverage must include any auto used in connection with this Agreement.

D. SPECIFICATIONS / SPECIAL PROVISIONS – DIVISION 01

No changes

E. DRAWINGS

a. DELETE: Plan Sheet P2.03

REPLACE with: Plan Sheet P2.03 – Addendum 2

F. GENERAL CLARIFICATIONS:

No changes

G. REQUEST FOR CLARIFICATION RESPONSES:

- a. **Question S14-13:** Issue: The scope of work related to the telecom and speaker system needs to be clarified. including conduit requirements and termination locations. Request: 1. Please confirm the scope of work for the telecom and speaker system, including any specific requirements for installation. 2. Clarify whether we are responsible for providing conduit only up to the accessible ceiling or if we must route it back to the source.
Response: Contractor to omit this scope of work because a County vendor will be performing the work.
- b. **Question #S14-15:** In enlarged drawing labeled A/P2.03 & B/P2.03, the plans call out for WF-2 but have an arrow with detailed description saying the fixture is WF-1. Can you please clarify if it is WF-1 or if a WF-2 needs to be added to the fixture schedule?
Response: Clarified in Sheet P2.03 – Addendum 2. Plan Sheet P2.03 provided with Addendum 2 includes a new schedule for WF-2 and relabeling of WF-1 and WF-2 on Details A/P2.03 and B/P2.03.
- c. **Question #S14-16:** In the enlarged drawing labeled A/P2.03, the plans show a domestic cold water line going from S-1 to SB-1 but there is no source of where the water is coming from. Can you please clarify where the point of connection is to the main line?
Response: Clarified in Sheet P2.03 – Addendum 2. Cold water supply piping added to drawing. A 3/4" cold water supply shall tee from the 1" cold water supply to water filter WF-1, and tee into the supply line between sink S-1 and supply box SB-1.
- d. **Question #S14-19:** Can we remove the requirement of a symbol 1 on auto as we carry two specific auto policies? These two policies are Non-owned and Hired auto policy as well as a commercial auto policy with symbol 7 which is named vehicles.
Response: Clarified above.

END OF SECTION

SECTION 000107 - COUNTY ADOPTION AND ACKNOWLEDGEMENT & SEALS

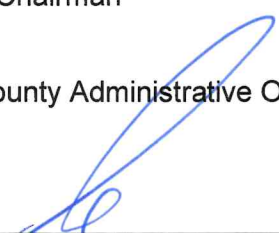
DEPARTMENT OF PUBLIC HEALTH BASEMENT RENOVATION

Contract # 24-S-14

Brian Pacheco
Garry Bredefeld, Vice Chairman
Luis Chavez
Buddy Mendes, Chairman
Nathan Magsig

1st District
2nd District
3rd District
4th District
5th District

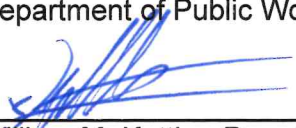
Paul Nerland, County Administrative Officer



Steven E. White, Director
Department of Public Works and Planning

2/26/25

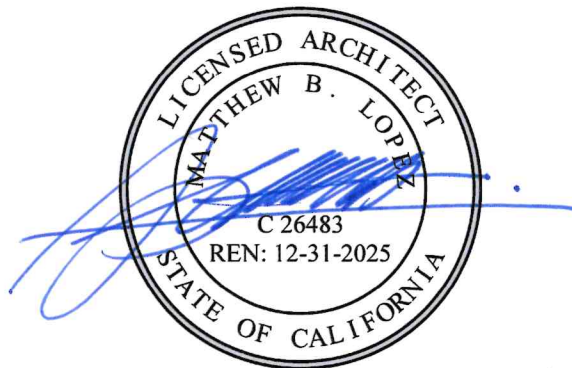
Date Signed



William M. Kettler, Deputy Director of Planning
Department of Public Works and Planning

2/26/25

Date Signed



2/26/25

Date Signed

Architect: _____

Matthew B. Lopez, Lic.# C-26483

FRESNO COUNTY
Department of Public Works and Planning
Development Services and Capital Projects Division
m/a 2220 Tulare Street, Eighth Floor
Fresno, CA 93721 (559) 600-4536
mattlopez@fresnocountyca.gov

CONTRACT # 24-S-14

SECTION 000108 – GENERAL

The work is done in accordance with the technical specifications, accepted and titled "Specifications Fresno County Dept. of Public Health Brix/Mercer Building Basement Renovations" and the General Provisions and the General Provisions. Where these provisions indicate to replace, add to, delete, delete, or otherwise modify "section," or a portion thereof, the section or portion thereof to be so modified is to be applied is the section or portion thereof in the corresponding number in the General Technical Specifications. In case of conflict between the General Technical Specifications and these Special Provisions, the Special Provisions shall take precedence over and be used in the construction portions.

Replace DIVISION 00 – INTRODUCTORY INFORMATION

GENERAL CONDITIONS with Division 00 – General Provisions and Contract Requirements

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INDEX TO TECHNICAL SPECIFICATIONS AND BID DOCUMENTS

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DIVISION 12 – FURNISHINGS

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DIVISION 20 – GENERAL MECHANICAL

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DIVISION 22 – PLUMBING

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DIVISION 23 – MECHANICAL

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END OF SECTION

DEPT OF PUBLIC HEALTH BASEMENT RENOVATION
FRESNO, CA

NOTICE TO BIDDERS
SECTION 00000000

COUNTY OF FRESNO

STATE OF CALIFORNIA

NOTICE TO BIDDERS

Contract Name

DEPARTMENT OF PUBLIC HEALTH BASEMENT RENOVATION

Project Address Location

1221 FULTON STREET
FRESNO, CA 93721

Contract Number

24-S-14

Bid Opening Date & Time

Thursday, April, 2014
1:00 P.M. 0000 0000 and 00 seconds

Sealed Proposals Bids Received at EITHER of the following locations

<https://www.fidepress.com/businesses>
or

Department of Public Works and Planning
Office of the Design Engineer
1221 Fulton St., 4th Floor
Fresno, CA 93721

The project to be done consists, in general, of the redesign and interior improvements of the basement of the Briar Mercer Building that was previously demolished and replaced. Interior improvements to consist of the installation of meeting rooms, offices, and storage occupancies including the construction of new walls, carpeting, and painting, and to provide to the project, mechanical, fire sprinklers, and electrical systems.

Prebid Conference

Monday
1:00 P.M. on Wednesday, March 20, 2014
1221 Fulton Street
Fresno, CA 93721

Proposers Website

"Contractor Bidding Opportunities"
<http://www.fresnocountycalifornia.gov/propn>

Requests for Clarification R/C Deadline is for

<http://www.fresnocountycalifornia.gov/DepartmentsPublicWorksandPlanningConstructionBiddingopportunities>
<http://www.fresnocountycalifornia.gov/DepartmentsPublicHealthBaseamentRenovationRequestforClarification>
no later than 4:00 p.m. on the tenth day of the calendar month before bid opening

Bid Submission Questions

DesignServices@fresnocountycalifornia.gov
or 559.444.4444

Contract Number

Request to be added to Planholders list <https://www.resncontent.com/Departments/Public%20WorksandPlanning/Construction/Bidding%20opportunities/RequesttoBeAddedtothePlanholderslist>

Architect's Estimate Range
\$0,000,000 to \$0,000,000
Approximate Section 00000000 \$000,000 to three hundred ten \$000,000

Required Valid California Contractor's License
Class B General Building Contractor

Basis of Bid: Bids are required for the entire work described herein. Bids will be compared on the basis of the lowest price bid.

Project Details: Electronic copies, in ".pdf" file format, of the official project plans and specifications, bid sheets and proposals sheets, and such additional applicable information as may be provided, are available to view, download, and print on the Planholders website.

This project is funded by the San Francisco Rescued Plan Act (RPAA)

Bid Opening: Proposals submitted in the course of the bidding process submitted bids will be publicly opened and the lowest bid will be the one for which the lowest price is posted for construction in accordance with the project specifications therein. A bid shall be the bids received will be posted to the project's website, General Information to the project website and the bid opening.

The apparent lowest bidder shall submit a Cost Distribution of the bid, otherwise known as a "Schedule of Values," (refer to Section 002113 Instructions to Bidders 1.16 Post-Bid Pre-award Information and Requirements) within eight working days of the bid opening.

Planholders: Bidders may submit a Request to be added to Planholders list at the link listed above. Requesters will then be listed as a planholder for the project on the website and receive notifications and addenda issued for the project. Prospective bidders may also select the project on www.BidExpress.com. Those that demonstrate interest in the project will be added to the planholders list, and receive notifications and addenda issued for the project. Planholder and electronic publication notices will be obtained from the Content Management Planholders website listed above.

Requests for Clarification (RFC) & Addenda: Requests for substitutions refer to Section 000, Substitution Materials in the General Conditions and questions regarding this project shall be in writing and received by the Department of Public Works and Planning, Design Division, no later than 4:00 P.M. on the tenth working day prior to bid opening. Substitution requests and questions received after this deadline will not receive a response unless the Department of Public Works and Planning elects to issue an addendum to revise the bid opening date. In the event that the bid opening date is revised, the deadline for questions will be extended to no later than 4:00 P.M. on the tenth working day prior to the revised bid opening date.

Any changes to, or correction of, the project plans and specifications shall be in the form of written addendum issued to purchasers of record. Questions that prompt a change or correction shall be included in the addendum at the subsequent answer.

Any representation or interpretations given to this project are not binding.

Bid Submission Instructions: Each bidder is asked to submit a bid to Bid Express, Bid Books, which contain bid proposal sheets necessary to submit a bid, to be obtained within the Specifications documents posted on the County website.

Electronic bids shall be submitted to the Bid Express website.

Hardcopy bids shall be submitted in a sealed envelope addressed to the "Department of Public Works and Planning, Office of the Design Engineer" and mailed to the name of the bidder, contract number, name of the project, and the statement "Do Not Open Until The Time Of Bid Opening."

Bid Security: Bid security in the amount of ten percent shall be submitted with the bid, and in the form of bid bond issued by an admitted surety insurer licensed by the California Department of Insurance, cash, cashier's check or certified check payable to the bid. Each bid shall either attach an electronic bid bond or provide an original bond and either the bid security authorized by Public Contract Code section 26100, prior to the bid opening. Bid security shall be made in accordance with **the County of Fresno**.

Hardcopy bid bonds shall be submitted in a sealed envelope addressed to "Department of Public Works and Planning, Office of the Design Engineer" and mailed to the name of the bidder, contract number, name of the project, and the statement "Do Not Open Until The Time Of Bid Opening – BID BOND."

Each bond specified in this notice shall be issued by a surety company designated as an admitted surety insurer in good standing with and authorized to transact business in this state by the California Department of Insurance, and acceptable to the County. Bidders are cautioned that representations made by surety companies will be verified with the California Department of Insurance. Additionally, the County, in its discretion, may determine the sufficiency of a proposed surety company, and may require the surety company to provide additional information supported by documentation. The County Engineer requires such information and documentation whenever the proposed surety company has either a Best's Key Rating Guide of less than A and a financial size designation less than VIII. Provided, however, that the County expressly reserves its right to require information and documentation to which the County is lawfully entitled from any proposed surety company.

Additional Information and Requirements: Each contract will be awarded to a contractor who has not been licensed in accordance with the provisions of the Contractors State License Law, California Business and Professions Code, Division 3, Chapter 3, as amended, or whose bid is not on the proposal form included in the contract documents.

This project is subject to the contracting requirements and interpretation provisions as set forth in Title 23, Section 0000 General Requirements for In-house Construction. These include the fact that the Contractor Code of Regulations and CCR of the Department of Bidders must submit a valid Certificate of Reported Compliance (CRC) issued by the Contractor Air Resources Construction Board at the time of bidding. Bidders are responsible for submitting their listed subcontractors' CRCs and any supporting documentation within the tender documents and the bid opening. Failure to submit the required CRCs will render a bid non-responsive.

Asbestos certification from the Contractors State License Board and registration with the Division of Occupational Safety and Health is not required of the prime contractor to bid on this project, however the contractor performing asbestos abatement must hold the proper licenses and certifications to perform the work. Method and Safety Code apply.

Prime and non-prime asbestos containing materials (CM) are to be removed as part of this project, and it is anticipated that removal of CM will result in release of airborne asbestos fibers and lead into the atmosphere. Refer to the asbestos report under Supplemental Information on the project website for more information regarding locations and quantities of identified asbestos containing materials as well as locations of identified lead-based paint and lead-containing paint to be impacted as part of the scope of work.

The Contractor and their subcontractors shall comply with applicable statutes and regulations, and provisions of Sections 1.00, 2.00 and 3.00 of the General Conditions, regarding payment of fees, taxes and other cost compliance issues.

Pursuant to Section 0000 of the Contractor Code, the General Pricing Code rates in the county or counties, in which the work is to be done have been determined by the Director of the California Department of Industrial Relations. These rates are set forth in the General Pricing Code Rates for this project, which are at County of Fresno, Department of Public Works and Planning, 1000 Tower Street, Suite 1000, Fresno, CA 93701 and which are from the California Department of Industrial Relations' Internet web site at <http://www.dir.ca.gov/DCSR/PD>. Where effective General Pricing Code rates, which have been predetermined and are on file with the California Department of Industrial Relations are referenced but not printed in the General Pricing Code rates.

The Board of Supervisors hereby specifies that portions of the work can and be performed outside the regular working hours as defined in the applicable collective bargaining agreement filed with the Director of Industrial Relations in accordance with Contractor Code section 0000.0, and that the overtime requirements for Standards, and which are hereby specified for these portions of the work, as are particularly described in the specifications. However, this exception shall not negate the overtime provisions specified in Contractor Code section 0000.

This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations.

The contractor or subcontractor shall be listed on a bid proposal or public works project unless registered with the Department of Industrial Relations pursuant to Contractor Code section 0000.0 with limited exceptions from this requirement for bid purposes under Contractor Code section 0000.0000.

Contractor or subcontractor shall be bonded contract for public work on public works project unless registered with the Department of Industrial Relations pursuant to Public Code section 15B:1.

This contract is subject to state contract nondiscrimination and compliance requirements pursuant to Commonwealth Code section 8B:1.

The successful bidder shall furnish a performance bond in the amount of one hundred percent of the contract amount and a payment bond in the amount of one hundred percent of the contract amount. Each bond specified in this notice and bond, with performance bond and payment bond shall meet the requirements of applicable statutes, including but not limited to those specified in Public Contract Code section 15B:1 and Civil Code section 15B:1.

Pursuant to Public Contract Code section 15B:1, substitution of securities for cash bonds is allowed if the County agrees to ensure performance under the contract shall be permitted.

The Board of Supervisors reserves the right to reject any or all bids.

Board of Supervisors, County of Essex

Power and, County Administrative Officer

Bernice E. Seide, Clerk of the Board

Issue Date March 1, 2000

INSTRUCTIONS TO BIDDERS

1.00 EMPLOYMENT TO BIDDERS

An explanation desired by bidders regarding the meaning or interpretation of the bid documents must be requested in writing no later than 10 days prior to the bid opening.

Representations given before the award of the contract shall not be binding. Any interpretation made while in the two week addendum to the bid documents, said addendum which shall be issued by the County's Director of Public Works and Planning ("Director"). Any addendum or supplement in any form shall be posted on the Resno County website at <https://www.resnocountycolorado.gov/bidders> and the bidders shall record while notified.

1.00 EMPLOYMENT TO BIDDERS, SPECIFICATIONS, SPECIAL PROVISIONS AND SITE VISIT

The bidder is required to examine the proposals, plans, specifications, special provisions, and contract terms and conditions of the proposal. It is understood that the successful bidder's proposal shall be considered prior to the evidence that the bidder has made satisfactory and is satisfied with the conditions to be encountered in performing the work and as to the requirements of the plans, specifications, and special provisions of the contract documents.

1.00 PROPOSAL REQUIREMENTS

The bidder shall submit a proposal, consisting of bid bond, cash, certified check, or cashier's check, for ten percent of the total bid amount, including additives.

Insurance is provided in the two week certified check or cashier's check, the County shall have sole disposition of the same as it may deem proper for the purpose of the bid. Checks deposited on successful bidders shall be returned as soon as practicable after the bid opening.

1.00 PREPARATION OF PROPOSALS

The bidder shall prepare a proposal on the form provided by the County.

The bidder's proposal shall be executed by the individual, or one or more partners of the partnership, or one or more officers of the corporation submitting it. The proposal is made by an individual, or one and post office address must be shown. In the case of a partnership, the name of each partner of the partnership must be shown. In the case of a corporation, the proposal must show the name of the state under which the corporation is chartered and the name of the president, vice president, secretary and treasurer.

1.00 SUBCONTRACTORS

Each person submitting a bid to perform the work covered by in the bid request shall set forth in this bid

DEPT OF PUBLIC WORKS BOSEMONT REGIONAL INSTRUCTIONS TO BIDDERS
RESOLUTION, C SECTION

1. The name and the location of the place of business, and the Commercial contractor's license number, and the public works contractor registration number issued pursuant to Section of the Code, of each subcontractor who will perform work or render service to the general contractor in or about the construction of the project is to be included in an amount in excess of one percent of the general contractor's total bid.

- B. The portion of the project to be done by each subcontractor.

The attention of bidders is directed to the provisions of Public Contract Code Section and set forth the consequences and possible penalties which may result if failure to comply with the requirements for distinguished subcontractors.

1. SUBMISSION OF PROPOSAL

1. Electronic Bid Submission

The bidder has the option to submit the bid for this Project electronically. The bidder must either attach an electronic bid and or provide an original bond and or other required security required by Public Contract Code Section prior to the bid opening.

Bidders submitting online must

- 1. Use one of the accepted electronic signatures (Digital Signature or Signature)
- 2. Attach to the online bid a scan of notarized paper bid bond, attached to the original paper notarized bidder's bond by the admitted surety insurer so that it is received by Design Services no later than 4:00 PM on the day of the bid opening.
- 3. submit cash, cashier's check, certified check, or a bidder bond so that it is received by Design Services prior to the bid opening.

Ordinary bid bonds should

- submitted in sealed envelope
- addressed to "Department of Public Works and Planning, Office of the Design Engineer" and
- include:
 - o the name of the bidder,
 - o contract number,
 - o name of the project, and
 - o the statement "Do Not Open Until The Time Of Bid Opening – BID BOND."

The address for bond delivery is listed in the Office of Bidders for the bid opening. Send bond to: Resonant Contract Bonding, 1000 Tenth Street, Resonant, CO 80501. The address for delivery of bid is: Bid Site Office, Resonant Contract Bonding, 1000 Tenth Street, Resonant, CO 80501.

- B. Bid Submission by Personal Delivery or Mail

The bidder has the option to submit the bid by personal delivery or by mail. The bidder specifies, in the Bid Proposal, a proposed price in dollars and cents for each bid item, including alternates, additions and supplementary items. The bid is not submitted electronically, then the bids

DEPT OF PUBLIC WORKS BOWSEMAN RECONSTRUCTION INSTRUCTIONS TO BIDDERS
RESNO, CO SECTION 00000000

and figures shall be written on the Proposals in ink. In the case of discrepancy between the prices written in words and those written in figures, the written words shall govern. The bidder's proposals shall be signed in ink by the individual executing the bid on the official bidder.

The required Proposal guarantee must accompany the proposal.

When sent by registered proposal must be addressed to the Resno County Department of Public Works and Planning, Office of the Design Engineer, Sixth Floor, Resno County Public Building, 1000 Tenth Street, Resno, CO 80001. Proposals shall be filed prior to the time and at the place specified in the NOTICE TO BIDDERS. Proposals received after the time for opening the proposals shall be returned to the bidder unopened.

000 IRREGULAR PROPOSALS

Proposals that do not conform to bid requirements shall be rejected as nonresponsive. Proposals shall be considered irregular and shall be rejected for various reasons, including but not limited to the following:

- A. The proposals are furnished to the County are not used or are altered.
- B. There are noticeable additions, conditions, alternate proposals or irregularities which tend to make the proposal incomplete or indefinite.
- C. The bidder adds no provision reserving the right to accept or reject an order, or to enter into a contract pursuant to an order.
- D. The bid fails to contain a price for each bid component.

000 DISQUALIFICATION OF BIDDERS

One or more of the following shall be considered to constitute sufficient cause for disqualification of a bidder and rejection of that bidder's proposal:

- A. More than one proposal by the same person, partnership or corporation.
- B. Evidence of collusion of bidders. Participants in such collusion shall receive no recognition as bidders for any future or future County anticipated participant shall have been reinstated as a qualified bidder.
- C. Lack of competence or inadequate experience, plant or other equipment as considered necessary to perform this project, as shall be required by financial statement required.
- D. Insatisfactory performance once record is shown as past work for the County, added to the standpoint of the company and progress.
- E. Prior convictions or violations of law in the judgment of the County or in order to prevent the proper completion of the work.

DEPT OF PUBLIC WORKS BOSEMENT REQUESTS FOR INSTRUCTIONS TO BIDDERS
RESOL, C SECTION

1. Bidder to pay, or satisfactory settlement, shall be for work or materials which are in pending order on order contracts at the time of submission of bid for this project.
2. Bidder to complete on prequalification requirements of the Contract.
3. Bidder to furnish written contract proposal guarantee to bid or more to sign bid bond.

1.1.1. IT DRUGS AND REQUISITE PROPOSALS

A bidder may, without prejudice, withdraw a proposal after it has been deposited, provided the request for such withdrawal is received in writing before the time set for opening proposals. The request shall be executed by the bidder or the bidder's duly authorized representative and shall include the name of the individual authorized to receive the withdrawn proposal. Said individual shall be required to present proper identification prior to withdrawing the proposal. The bidder may then submit a revised proposal provided it is received prior to the time set for opening proposals.

1.1.2. PUBLIC OPENING OF PROPOSALS

Proposals will be opened and read publicly at the time and place indicated in the notice to Bidders. Bidders or their authorized agents are invited to be present.

1.1.3. BID PROTEST PROCEDURE APPLICABLE TO BIDDER

1. BID PROTEST PROCEDURE

An bid protest must be submitted in writing and delivered to the Bidder either on the morning of the opening of bids to DesignServices@resncc.com or by certified mail, return receipt requested to the mailing address: Design Division, Department of Public Works and Planning, 1000 Towne Street, Suite 1000, Resn, CA 94588.

The bid protest must be received no later than 5:00 p.m. of the second day of calendar day following the deadline for submission of the specific bid documents placed at issue of the protest. An Bidder who protests is encouraged to submit it to the bid protest by email, because the deadline is based on the Department's receipt of the bid protest. A bid protest according to the rules of the protest is not received after the deadline, regardless of the date on which it is postmarked. The Bidder's compliance with the mailing address and procedures is also a condition.

The initial protest documents shall contain a complete statement of the grounds for the protest, including a detailed statement of the facts and supporting evidence.

The protest shall identify and address the specific portion of the documents in the protest.

The protest shall include the name, address and telephone number of the person representing the protesting party.

DEPT OF PUBLIC WORKS BUREAU OF SEWAGE TREATMENT AND WASTE MANAGEMENT INSTRUCTIONS TO BIDDERS
RESOLUTION, CONTRACT SECTION 100.00

The Department will provide a copy of the initial protest document and an attached document to either Bidders or proposers who appear to have a reasonable prospect of receiving an award depending upon the outcome of the protest.

The Board of Supervisors will make a decision on the protest. If the Board of Supervisors determines that a protest is frivolous, the party originating the protest will be determined to be irresponsible and that party will be determined to be ineligible for future contract awards.

The procedure and time in its set forth herein are mandatory and are the Bidder's sole and exclusive remedy in the event of a bid protest. No other Bidder to comply with these procedures shall constitute a waiver or an irrevocable bid protest, including the subsequent filing of a Complaint Code Case or related proceedings.

B. REVIEW OF BIDDER

A bidder who complains of a mistake in their bid must follow the procedures in Public Contract Code Section 100.00 et seq in seeking relief of their bid.

100.00 AWARD OF CONTRACT

The award of the contract, if it is awarded, will be to the most responsive bidder whose proposal complies with the prescribed requirements. The award, if made, will be within 60 days after the opening of proposals.

If the County finds that it will be unable to award the contract within 60 calendar days after the opening of proposals, the Director may request one or more bidders to extend further to their proposals to a specified date. It is possible that additional extensions may be requested. If a bidder does not elect to extend the terms of their proposal beyond the 60 calendar days within opening of proposals, or does not respond within 60 days to a request for an extension, that bidder's proposal will be deemed as having expired 60 calendar days within opening of the proposals, and that bidder's proposal will not be considered for award of the contract.

The successful bidder will be notified in writing, by letter addressed to the address shown on their proposal, that their bid has been accepted and that the award has been awarded the contract.

The right is reserved by the County to reject one or more proposals, to waive technicalities, to accept or reject proposals, to advertise for new proposals, or to proceed to do this or otherwise, in the judgment of the governing authorities the best interests of the County will be promoted thereby.

100.00 CANCELLATION OF AWARD

The governing authority reserves the right to cancel the award of a contract at any time before the execution of said contract or properties thereof and to file a Complaint Code Case.

000 CONTRACT BONDS

The bidder to whom the award is made shall, within ten days, enter into a written contract with the County. The bidder shall forfeit the Proposal Guarantee in case the bidder does not submit to the County a written contract within ten days after the contract is awarded.

The successful bidder shall furnish a bid bond in the amount of ten percent of the contract amount and a performance bond in the amount of ten percent of the contract amount, and one year of current bond in the amount of ten percent of the contract amount. Said bonds shall be submitted in triplicate.

The performance and subcontractor provisions shall be the Contractor or their subcontractors shall be responsible for the payment of all amounts due under the one percent Insurance Code with respect to the performance bond under the contract, or amounts due required to be deducted, withheld and paid over to the Employment Development Department and to the Finance Tax Board from the wages of the employees of the Contractor and subcontractors pursuant to Section 00000 of the one percent Insurance Code with respect to subcontractors and shall, then the surety shall pay these amounts. In case suit is brought upon the performance bond, the surety shall pay the reasonable attorneys fee to be filed with the court.

The contract shall be attached hereto by the Contractor's introduction and Execution of the contract of the successful bidder which be required within ten days of the bid award is made. Bidder and its orders Compensation Insurance requirements shall be as set forth in the Resolution.

000 BIDDERS RISK INSURANCE

The Contractor shall obtain and maintain in force Builder's Risk Insurance against loss or damage from perils. The policy shall cover the entire structure on which the contract is to be done, up to the completion of the structure except that in the contract is for re-erecting, alteration, repair, or maintenance, then the policy shall cover the entire of the contract thereunder including items on the site and materials connected therewith on the site, materials in place or to be used as part of the permanent construction including materials stored and partially paid for by the County as provided in Division 00000 General Conditions, surplus materials, supplies, protective fences, bridges, or temporary structures, miscellaneous materials and supplies incident to the work, and subcontractors, stations, towers, cranes and equipment as are not owned or rented by the Contractor, the cost of which is included in the cost of the work. EXCLUDED is insurance does not cover any tools owned or mechanics, cranes, equipment, subcontractors, stations, towers, and cranes owned or rented by the Contractor, the capital equipment is not included in the cost of the work, or any structures erected for the Contractor's administration of the project.

Subcontractors shall be insured to the extent of their portion of the work under the Contractor. The Contractor shall request, and is responsible to confirm with its insurer, that the County and subcontractors are named, and as additional insured and as additional loss payees, on the Builder's Risk insurance policy. The County, Contractor, and all subcontractors shall be insured, except against the others, for damages arising from perils covered by the insurance required under the terms of this article, except such rights as they may have to the proceeds of the Builder's Risk insurance obtained and maintained by the Contractor. The Contractor shall provide a certificate of subcontract insurance to the County upon issuance of the policy, and with subcontractors upon its request.

DEPT OF PUBLIC WORKS BUREAU OF SEWAGE TREATMENT AND WASTE MANAGEMENT INSTRUCTIONS TO BIDDERS
RESOURCES, C SECTION

POSTBID PREPARATION INFORMATION

It is in the interest of the bidder to open the bid, the apparent low bidder should submit the bid in accordance with the [Design Services Resource Contract](#).

- The cost distribution of the bid, with costs shown for the items as defined in either the project specification index, the unit Construction Index (CI), or other method as appropriate for the project and approved by the Engineer.
- The cost distribution should distinguish between materials to be done by the bidder's own forces and materials to be subcontracted including those to be provided by the bidder or equipment provided to the subcontractors. Subcontractors should be named, regardless of the degree of subcontracting. Bidders' attention is directed to the Construction Project Contract Code Section set forth regarding subcontracting.

The County reserves the right to reject any proposed subcontractor, installer, or supplier who cannot show satisfactory evidence of meeting the qualifications required by the specification documents. In the event of a rejection, the apparent low bidder should submit the bid in accordance with the name and qualifications of the replacement subcontractor, installer, or supplier satisfactory to the County. Such replacement should be submitted in accordance with the specification requirements.

The bid should show prices for the materials in the event of a replacement.

This information should be used in the evaluation of bids. If the project is awarded, the cost distribution will be used in determining the amounts payable on progress payments and final payment.

The County may request that bidders other than the apparent low bidder submit a bid with cost distribution or qualification information, for the purpose of evaluation of bids.

Upon completion of the bid evaluation process, cost distributions or qualification information should be submitted by other than the apparent low bidder will be returned upon request.

END OF SECTION

BIDDERS' CHECKLIST (BUILDING CONTRACTS)

Because of the various technical irregularities resulting in rejected proposals for projects, the following checklist is offered for the bidders' information and use in preparing the proposal. This checklist is not to be considered as part of the contract documents. Bidders are cautioned that deletion or not submitting items supplied in the bid documents when it is not required signifies acceptance in an irregular bid.

PROPOSAL/BID SHEET (Section 00000000)

Bidder name on envelope. Price schedule including all additions, deductions, supplementary alternate items. Make no additions such as "plus tax", "plus freight", or conditions such as "less 2% if paid by 15th". Use ink or typewriter. Acknowledge addenda.

BID SECURITY FORM - Read the notices and notes (Section 00000000)

Indicate type of bid security provided.
Provide contract license information.

State business name and if business is

Corporation list officers

Partnership list partners

Joint venture list members

Joint venture members are corporations or partnerships, list their officers or partners.

Individually list Owner's name and firm name style

Signature of Bidder – BID MUST BE SIGNED!

Corporation name officer

Partnership name partner

Joint venture name member

Individually list the owner

Signature is of Branch Manager, Estimator, Agent, etc., the bid must be

accompanied by proper attorney's certification the individual is authorized, otherwise the bid will be rejected.

Business address (Firm's Street Address)

Main address (P.O. Box or Street address)

BID SECURITY (PROPOSAL GUARANTEE)

Ten percent of the bid amount bid to include supplementary alternate items

Type of Bid Security

Cash or certified check is deposited in clearing account and is returned to bidders on Contract Award. This process is the same for all bidders.

Cashier's or Certified Checks of the bid amount is not in consideration. Issued by potential orderer, the cashier is returned when the contract bonds are submitted and approved.

Bid Bonds Must be signed by the bidder and the attorney-in-fact or the bonding company. Signature of attorney-in-fact should be notarized and the bond should be accompanied by bonding company's affidavit authorizing attorney-in-fact to execute bonds. An unsigned bid bond will cause for rejection. If the bid is submitted electronically, then the bidder must either attach an electronic bid bond or provide an original bid bond and either an original or certified copy of the Public Contract Code Section 10000, prior to the bid opening, as are otherwise specified in the Instructions to Bidders, Section 1.04.A ("Electronic Bid Submittal").

SUBCONTRACTOR LIST Section 10000

One for each type subcontract to be subcontracted. Must be completed as possible. Give name and location of place of business, California contractor's license number, public works contractor registration number issued pursuant to Section 10000 of the Public Code, and description of work to be performed are required to be listed for each subcontractor in accordance with Public Contract Code section 10000.

NON-COLLUSION DECLARATION Section 10000

Must be completed, signed, and returned with bid.

EQUAL OPPORTUNITY CLAUSE Section 10000

Must be completed, signed, and returned with bid.

DEBARMENT AND SUSPENSION CERTIFICATION Section 10000

Must be completed, signed, and returned with bid.

NONLOBBYING CERTIFICATION Section 10000

Must be completed, signed, and returned with bid.

DISCLOSURE OF LOBBYING ACTIVITIES Section 10000

Must be completed, signed, and returned with bid.

TITLE 13 CARB CERTIFICATION Section 10000

Contractors, applicable, must submit Title 13 Certificates of Reported Compliance with their bid. Subcontractor certificates must be no later than 5 PM on the day of the bid opening or no later than the bid opening if not submitted with the bid.

GUARANTY OF WORK Section 10000

Does not need to be submitted with the bid. Must be signed and submitted by the successful bidder together with the executed contract and requisite bonds and insurance certificates, within ten days after award of the Project.

OTHER

If the bid is to be sealed, then the specifications must be sealed, stamped the pages together.

Make sure the bid envelope is sealed and shows the project name, bid package and contract number.

DEPT 00 PUBLIC 0E00T0 B0SEME0T RE00000TI00
0RES00, C0

BIDDERS C0EC00ST
SECTI00 000000 00

If the bid is 0 filed, 0000 sufficient time 0r post00del0er0 prior to the bid c0sin0 time. Bids
received 0fter the sc0ed0ed time 0i000e ret0rned 0n0pened. Be s0re the st0te0ent "DO
NOT OPEN UNTIL TIME OF BID OPENING" is 0n the en0e0pe.

END OF SECTION

C00TR0CT 0 00S000

General Info

Total:

\$6,763,000.00

Number	Description
24-S-14	Department of Public Health Basement Renovation
Deadline	The work to be done consists of, in general, the redesign and interior improvements of the basement of the Brix-Mercer Building that was previously damaged by flooding. Interior improvements to consist of the assembly of meeting rooms, offices, and storage occupancies including the construction of new walls, carpeting, and painting, with upgrades to the plumbing, mechanical, fire sprinklers, and electrical systems.
04/03/2025 02:00 PM PDT	
Vendor	
Better Enterprises, Inc.	
Submitted	
04/03/2025 01:39 PM PDT	No
Signed by	Allows zero unit prices and labor
Marc Kerkochian	No
Account Holder Susan Waid	Allows negative unit prices and labor
Opened	No
04/03/2025 02:02 PM PDT By jwongsing@fresnocountyca.gov	

Attachment List

County of Fresno - Project Website
RFC form, bid opening details, any Supplemental Information
including RFC responses, Pre-bid Conference information, etc.

Project Manual
Specifications

Plans - County approved (54 MB)
Drawings approved by Fresno County

Plans - Fire Department approved Part 1 (212 MB)
Drawings with notations and approved by Fire Department

Plans - Fire Department approved Part 2 (229 MB)
Drawings with notations and approved by Fire Department

Plans - Fire Department approved Part 3 (207 MB)
Drawings with notations and approved by Fire Department

Instructions to Bidders
Instructions for Completing the Bid Book within the Specifications

Addendum 1 (<http://www.fresnocountyca.gov/files/sharedassets/county/v/1/public-works-and-planning/design/construction-bidding-opportunities/24-s-14-dph-basement-renovation/00-91-15-addendum-1.pdf>)
Addendum 1

Addendum 2 (<http://www.fresnocountyca.gov/files/sharedassets/county/v/1/public-works-and-planning/design/construction-bidding-opportunities/24-s-14-dph-basement-renovation/00-91-15-addendum-2.pdf>)
Addendum 2

Plan Sheet P2.03 - Addendum 2 (<http://www.fresnocountyca.gov/files/sharedassets/county/v/1/public-works-and-planning/design/construction-bidding-opportunities/24-s-14-dph-basement-renovation/plan-sheet-p2.03-addendum-2.pdf>)
Plan Sheet P2.03 - Addendum 2

Proposal Section 004213 - 1

PROPOSAL TO THE COUNTY OF FRESNO

Contract Name: **DEPARTMENT OF PUBLIC HEALTH BASEMENT RENOVATION**

Contract No.: **24-S-14**

Fund / Subclass / Org / Account / Program or Memo No.: **5620 / 1500 / 08150 / 91760**

The work to be done consists of, in general, the redesign and interior improvements of the basement of the Brix-Mercer Buildings that was previously damaged by flooding. Interior improvements to consist of assembly of meeting rooms, office, and storage occupancies including the construction of new walls, carpeting, and painting, with upgrades to the plumbing, mechanical, fire sprinklers, and electrical systems.

The work to be done is shown on a set of Plans, entitled: "Fresno County Dept. of Public Health Basement Renovation"

Building No.: 611 and 612

Project Address:

1221 Fulton Street

Fresno, CA 93721

If this proposal shall be accepted and the undersigned shall fail to contract, as aforesaid, and to give the two bonds in the sums to be determined as aforesaid, each issued by a surety satisfactory to the Awarding Authority, within ten (10) days after the award of the contract, the Awarding Authority, at its option, may determine that the bidder has abandoned the contract, and thereupon this proposal and the acceptance thereof shall be null and void, and the forfeiture of such security accompanying this proposal shall operate and the same shall be the property of the County.

The undersigned, as bidder, declares that all addenda issued with respect to this bid have been received and incorporated into this Proposal. The bidder's signature on this Proposal also constitutes acknowledgement of all addenda.

The undersigned, as bidder, declares that the only persons, or parties interested in this proposal as principals are those named herein; that this proposal is made without collusion with any other person, firm or corporation; that the bidder has carefully examined the annexed proposed form of contract, and the plans therein referred to; and the bidder proposes and agrees if this proposal is accepted, that the bidder will contract with the County of Fresno to provide all necessary machinery, tools, apparatus and other means of construction, and to do all the work and furnish all the materials specified in the contract in the manner and time therein prescribed, and according to the requirements of the County as therein set forth, and that the bidder will take in full payment therefor the following lump sum price, to-wit:

Proposal Section 004213 - 2 Bid

\$6,763,000.00

Item No.	Item Description	Item Price	Extension
1	Base Bid	\$6,763,000.00	\$6,763,000.00
			Total: \$6,763,000.00

Proposal Section 004213 - 3 Acknowledgement of Addendum

Type N/A if no addenda were issued. Click "+" to add additional fields.

Addendum No. *

01

Dated *

03/24/2025

Type N/A if no addenda were issued. Click "+" to add additional fields. 1

Addendum No. *

02

Dated *

03/28/2025

Bid Security Form Section 004313 - 1

Accompanying this proposal is security (check one only) in an amount equal to at least ten percent (10%) of the total amount of the bid:

Bond Percentage

10.00%

Guarantee Method *

Paper Bid Bond, Certified
Check, Cashier's Check,
Cash, Scan of Paper Bid
Bond

Paper Bid Bond, Certified Check, Cashier's Check, Cash, Scan of Paper Bid Bond

Confirmation *

I have provided a Paper Bid Bond for 10.00% of the bid total amount, to the public works office, prior to the solicitation deadline.

If Cash Security, Enter Amount

You must either attach an electronic bid bond here or provide an original bid bond (or other form of bid security authorized by Public Contract Code Section 20129(a)), **prior to** the bid opening.

Bid Security Form Section 0014313 - 2

The names of all persons interested in the foregoing proposal as principals are as follows:

Business Name *

Better Enterprises, Inc.

Note: If bidder or other interested person is a corporation, state legal name of corporation. If bidder is a co-partnership, state true name of firm.

Type of Business *

Corporation

Business Owners and Officers Names *

Marc Kerkochian, President

Note: If bidder or other interested person is:

- a corporation, list names of the president, secretary, treasurer and manager thereof.*
- a partnership, list names of all individual co-partners composing firm.*
- an individual, state first and last name in full.*

Name of Owners and Key Employees *

Marc Kerkochian, President & Owner
Susan Waid, Secretary
Ben Emerzian, Treasurer

Note: List majority owners of your firm. If multiple owners, list all. Also include anyone, including key employees, who are actively promoting the contract. (SB1439)

Licensed in accordance with an act providing for the registration of Contractors:

Class *

B, C33, C-8

Contractor License *

1012660

Expires *

04/30/2026

DIR Registration Number *

1000565193

Business Address *

1148 N Cypress Ave, Fresno, CA 93727-6871

Zip Code *

93727

Mailing Address *

1148 N. Cypress Avenue, Fresno, CA

Zip Code *

93727

Business Phone *

(559) 233-2225 x1007

Fax Number

(559) 233-2850

Email Address *

marc@betterenterprisesinc.com

Signature of Bidder *

Better Enterprises, Inc., a California Corporation by Marc Kerkochian, President

Dated *

04/03/2025

NOTE: If bidder is a corporation, the legal name of the corporation shall be set forth above together with the signature of the officer or officers authorized to sign contracts on behalf of the corporation; if bidder is a co-partnership, the true name of the firm shall be set forth above together with the signature of the partner or partners authorized to sign contracts on behalf of the co-partnership; and if bidder is an individual, bidder signature shall be placed above. If signature is by an agent, other than an officer of a corporation or a member of a partnership, a Power of Attorney must be on file with the Owner prior to opening bids or submitted with the bid; otherwise, the bid will be disregarded as irregular and unauthorized.

Subcontractors List Section 004336 - 1

SUBCONTRACTORS

The following named subcontractor(s) will perform with labor, or otherwise render services to the general contractor in or about the construction of the work or improvement in an amount in excess of one-half of one percent of the total bid presented herewith. Please fill out as completely as possible when submitting your bid. Use subcontractor's business name style as registered with the License Board. Submission of subcontractor's name, location of business and description of work, California contractor's license number and public works contractor registration number issued pursuant to Section 1725.5 of the Labor Code, all are REQUIRED, by Section 4104 of the California Public Contract Code, to be submitted prior to bid opening. (The "location of business" must specify the city in which the subcontractor's business is located, and the state if other than California.) All other requested information shall be submitted, either with the bid or within 24 hours after bid opening.

Please fill out as completely as possible when submitting your bid. Use subcontractor's business name style as registered with the License Board.

FAILURE TO LIST SUBCONTRACTORS AS DIRECTED MAY RENDER THE BID NON-RESPONSIVE, OR MAY RESULT IN ASSESSMENT OF A PENALTY AGAINST THE BIDDER IN ACCORDANCE WITH SECTION 4110 OF THE CALIFORNIA PUBLIC CONTRACT CODE.

Subcontractor: To add more subcontractor listings, click the "+" to add additional fields.

Subcontractor: *

Better Flooring, Inc.

Business Address *

1148 N. Cypress Avenue, Fresno, CA 93727

Class

C15, C54

License No. *

820202

DIR Registration No. *

1000000130

Item No. or Description of Work *

Flooring, Ceramic Tile

Dollar Amount:

OR

Percentage of Total Bid:

Email Address:

marc@betterflooringinc.com

Subcontractor: To add more subcontractor listings, click the "+" to add additional fields. 1

Subcontractor: *

Best Fire Protection

Business Address *

1201 24th Street, Suite B110-334, Bakersfield, CA 93301

Class

C-16

License No. *

1054075

DIR Registration No. *

1000580773

Item No. or Description of Work *

Fire Sprinklers

Dollar Amount:

OR

Percentage of Total Bid:

Email Address:

chris@bestfire.us

Subcontractor: To add more subcontractor listings, click the "+" to add additional fields. 2

Subcontractor: *

Western Building Materials Co.

Business Address *

4620 E. Olive Avenue, Fresno, CA 93702

Class

C-2

License No. *

248608

DIR Registration No. *

1000003005

Item No. or Description of Work *

Suspended Acoustical Ceilings; Fiberglass Reinforced Panels; Acoustic Wall Panels

Dollar Amount:

OR

Percentage of Total Bid:

Email Address:

brian@wbmco.com

Subcontractor: To add more subcontractor listings, click the "+" to add additional fields. 3

Subcontractor: *

KC&S Construction Specialties, Inc.

Business Address *

432 Bitritto Way, Unit 3, Modesto, CA 95356

Class

C-61/D28, C-61/D34, C23

License No. *

1048604

DIR Registration No. *

1000063244

Item No. or Description of Work *

WD Doors, HM Frames and Finish Hardware

Dollar Amount:

OR

Percentage of Total Bid:

Email Address:

a.landingham@kcsconstructionspecialties.com

Subcontractor: To add more subcontractor listings, click the "+" to add additional fields. 4

Subcontractor: *

Fresno Roofing Co., Inc.

Business Address *

5950 E. Olive Avenue, Fresno, CA 93727

Class

C39

License No. *

302777

DIR Registration No. *

1000004536

Item No. or Description of Work *

Roofing

Dollar Amount:

OR

Percentage of Total Bid:

Email Address:

ed@fresnorroofingco.net

Subcontractor: To add more subcontractor listings, click the "+" to add additional fields. 5

Subcontractor: *

Shelco Industries

Business Address *

5425 E. Home Avenue, Suite 101, Fresno, CA 93727

Class

C-61/D34

License No. *

423565

DIR Registration No. *

1000007336

Item No. or Description of Work *

Toilet Partitions; Toilet Accessories; Lockers

Dollar Amount:

OR

Percentage of Total Bid:

Email Address:

bobs@shelcoindustries.com

Subcontractor: To add more subcontractor listings, click the "+" to add additional fields. 6

Subcontractor: *

Cencal Services, Inc.

Business Address *

3299 S. Cedar Avenue, Fresno, CA 93725

Class

C21, C22, C-8

License No. *

976935

DIR Registration No. *

1000002906

Item No. or Description of Work *

Demolition; Saw Cutting

Dollar Amount:

OR

Percentage of Total Bid:

Email Address:

Jamesd@cencaldemo.com

Subcontractor: To add more subcontractor listings, click the "+" to add additional fields. 7

Subcontractor: *

Alcal Specialty Contracting, Inc.

Business Address *

2647 N. Weber Avenue, Fresno, CA 93705

Class

C39, C-2, C-35

License No. *

815286

DIR Registration No. *

1000000315

Item No. or Description of Work *

Batt Insulation; Operable Partitions

Dollar Amount:

OR

Percentage of Total Bid:

Email Address:

mike.donahoo@alcal.com

Subcontractor: To add more subcontractor listings, click the "+" to add additional fields. 8

Subcontractor: *

Valley Air Conditioning & Repair, Inc.

Business Address *

825 S. Topeka Avenue, Fresno, CA 93721

Class

C36, C-4

License No. *

669606

DIR Registration No. *

1000009688

Item No. or Description of Work *

Plumbing

Dollar Amount:

OR

Percentage of Total Bid:

Email Address:

sjohnson@valleyairrepair.com

Subcontractor: To add more subcontractor listings, click the "+" to add additional fields. 9

Subcontractor: *

San Joaquin Glass

Business Address *

2150 E. McKinley Avenue, Fresno, CA 93703

Class

C-17

License No. *

248167

DIR Registration No. *

1000010471

Item No. or Description of Work *

Storefronts; Glazing

Dollar Amount:

OR

Percentage of Total Bid:

Email Address:

anthony@sjglass.com

Subcontractor: To add more subcontractor listings, click the "+" to add additional fields. 10

Subcontractor: *

Frontline Plastering, Inc.

Business Address *

2549 N. Bundy Drive, Fresno, CA 93727

Class

C35, C-9

License No. *

1017354

DIR Registration No. *

1000055393

Item No. or Description of Work *

Cold Formed Metal Framing; Gypsum Board; Firestopping; Joint Sealants

Dollar Amount: **OR** **Percentage of Total Bid:**

Email Address:

doug@frontlineplasteringinc.com

Subcontractors List Section 004336 - 2

Optional: Vendor is not required to complete.

SUBCONTRACTORS

Subcontractor: To add more subcontractor listings, click the "+" to add additional fields.

Subcontractor: *
Tarlton & Son, Inc.

Business Address *
3562 S. Elm Avenue, Fresno, CA 93706

Class
C33

License No. *
342341

DIR Registration No. *
1000004368

Item No. or Description of Work *
Painting

Dollar Amount:

OR

Percentage of Total Bid:

Email Address:
randyt@tarltonandson.com

Subcontractor: To add more subcontractor listings, click the "+" to add additional fields. 1

Subcontractor: *
EI Executive Interiors

Business Address *
1020 S 10th St Fresno Ca 93702

Class

C-6

License No. *

885715

DIR Registration No. *

1000013318

Item No. or Description of Work *

Cabinets/Countertops

Dollar Amount:

OR

Percentage of Total Bid:

Email Address:

pfachenda@executiveinteriorsinc.com

Subcontractor: To add more subcontractor listings, click the "+" to add additional fields. 2

Subcontractor: *

Strategic Mechanical, Inc.

Business Address *

4661 E. Commerce Avenue, Fresno, CA 93725

Class

C20, C38, C43

License No. *

834679

DIR Registration No. *

1000001726

Item No. or Description of Work *

Mechanical

Dollar Amount:

OR

Percentage of Total Bid:

Email Address:

AFornes@strategicmech.com

Subcontractor: To add more subcontractor listings, click the "+" to add additional fields. 3

Subcontractor: *

The Boelter Companies, Inc.

Business Address *

9960 Business Park Drive, #120, Sacramento, CA 95827

Class

B

License No. *

1109217

DIR Registration No. *

1001103677

Item No. or Description of Work *

Food Service Equipment

Dollar Amount:

OR

Percentage of Total Bid:

Email Address:

kedens@boelter.com

Subcontractor: To add more subcontractor listings, click the "+" to add additional fields. 4

Subcontractor: *

Meyers Constructors, Inc.

Business Address *

40488 Brickyard Dr., Madera, CA 93636

Class

B, C51

License No. *

1004811

DIR Registration No. *

1000034927

Item No. or Description of Work *

Rough Carpentry; Structural Steel

Dollar Amount:

OR

Percentage of Total Bid:

Email Address:

bryan@meyersconstructors.com

Subcontractor: To add more subcontractor listings, click the "+" to add additional fields. 5

Subcontractor: *

A-C Electric Company

Business Address *

P O BOX 81977, Bakersfield, CA 93380

Class

C10

License No. *

99849

DIR Registration No. *

1000000365

Item No. or Description of Work *

Electrical

Dollar Amount:

OR

Percentage of Total Bid:

Email Address:

jeff.waughtal@a-celectric.com

Non-Collusion Declaration Section 004519 - 1

CONTRACT: DEPARTMENT OF PUBLIC HEALTH BASEMENT RENOVATION
CONTRACT NO.: 24-S-14

To the Board of Supervisors, County of Fresno:

NON-COLLUSION DECLARATION TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID *

The undersigned declares:

I am the (Choose one of the following options): *

Corporate Officer

If Corporate Officer please list Title:

President

of (Business Name): *

Better Enterprises, Inc.

the party making the foregoing bid.

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

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

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration is executed on

Date: *

04/03/2025

at City, State: *

Fresno, California

Signature: *

Marc Kerkochian, President

(See Title 23 United States Code Section 112; Calif Public Contract Code Section 7106)

*NOTE: Completing, signing, and returning the Non-Collusion Declaration is a required part of the Proposal. Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

Equal Opportunity Clause - Section 004536 - 1

CERTIFICATION WITH REGARD TO THE PERFORMANCE OF PREVIOUS CONTRACTS OR SUBCONTRACTS SUBJECT TO THE EQUAL OPPORTUNITY CLAUSE AND THE FILING OF REQUIRED REPORTS

The bidder or proposed subcontractor hereby certifies that they

Please choose an option below *

have not participated

in a previous contract or subcontract subject to the equal opportunity clause, as required by Executive Orders 10925 or 11114, and that they

Please select an option below *

have not filed

with the Joint Reporting Committee, the Director of the Office of Federal Contract Compliance, a Federal Government contracting or administering agency, or the former President's Committee on Equal Employment Opportunity, all reports due under the applicable filing requirements.

Company *

Better Enterprises, Inc.

By: *

Marc Kerkochian

Title *

President

Date *

04/03/2025

NOTE: The above certification is required by the Equal Employment Opportunity Regulations of the Secretary of Labor (41 CFR 60-1.7(b) (1), and must be submitted by bidders and proposed subcontractors only in connection with contracts and subcontracts which are subject to the equal opportunity clause. Contracts and subcontracts which are exempt from the equal opportunity clause are set forth in 41 CFR 60-1.5. (Generally only contracts or subcontracts of \$10,000 or under are exempt.) Currently, Standard Form 100 (EEO-1) is the only report required by the Executive Orders or their implementing regulations.

Currently, Standard Form 100 (EEO-1) is the only report required by the Executive Orders or their implementing regulations.

Proposed prime contractors and subcontractors who have participated in a previous contract or subcontract subject to the Executive Orders and have not filed the required reports should note that 41 CFR 60-1.7(b) (1) prevents the award of contracts and subcontracts unless such contractor submits a report covering the delinquent period or such other period specified by the Director, Office of Federal Contract Compliance, U. S. Department of Labor.

Debarment and Suspension Certification - Section 004546 - 1

TITLE 49, CODE OF FEDERAL REGULATIONS, PART 29
DEBARMENT AND SUSPENSION CERTIFICATION

The bidder or proposed subcontractor under penalty of perjury, certifies that, except as noted below, he/she or any person associated therewith in the capacity of owner, partner, director, officer, manager:

is not currently under suspension, debarment, voluntary exclusion, or determination of ineligibility by any federal agency;

has not been suspended, debarred, voluntarily excluded or determined ineligible by any federal agency within the past 3 years;

does not have a proposed debarment pending; and

has not been indicted, convicted, or had a civil judgment rendered against it by a court of competent jurisdiction in any matter involving fraud or official misconduct within the past 3 years.

If no exceptions enter "No Exceptions." If there are any exceptions to this certification, insert the exceptions in the following space: *

No Exceptions

Exceptions will not necessarily result in denial of award, but will be considered in determining bidder responsibility.

For any exception noted above, indicate below to whom it applies, initiating agency, and dates of action:

Note: Providing false information may result in criminal prosecution or administrative sanctions.

The above certification is part of the Proposal. Signing the Proposal on the signature portion thereof shall also constitute signature

of this Certification.

By my signature on this proposal, I certify, under penalty of perjury under the laws of the State of California and the United States of America, that the Title 23 United States Code, Section 112 Non-Collusion Declaration and the Title 49 Code of Federal Regulations, Part 29 Debarment and Suspension Certification are true and correct.

Company *

Better Enterprises, Inc.

By *

Marc Kerkochian

Date *

04/03/2025

Title *

President

Nonlobbying Certification For Federal-Aid Contracts - Section 004556

The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with awarding of any cooperative agreement, and the extension, continuation, renewal, amendment, or INSTALLATION of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, **the undersigned shall complete and submit Standard Form-LLL, "Disclosure of Lobbying Activities," in accordance with its instructions.**

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, Title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

The prospective participant also agrees by submitting his or her bid or proposal that he or she shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such subrecipients shall certify and disclose accordingly.

Bidder *

Better Enterprises, Inc.

By *

Marc Kerkochian

Date *

04/03/2025

Title *

President

Disclosure of Lobbying Activities - Section 004566

Disclosure of Lobbying Activities - Section 004566 (223 KB)
Disclosure of Lobbying Activities

Title 13 CARB Certification Section 004656 - 1

In conformance with Title 13 § 2449(i), bidders will be required to attach copies of valid Certificates of Reported Compliance for the fleet selected for the contract and their listed subcontractors.

Before May 15th of each year, the prime contractor must collect a new valid Certificate of Reported Compliance for the current compliance year, as defined in section 2449(n), from all fleets that have an ongoing contract with the prime contractor as of March 1 of that year. Prime contractors must not write contracts to evade this requirement. Annual renewals must be provided to the Resident Engineer at least one week prior to the expiration date of the current certificate.

<https://ww2.arb.ca.gov/resources/fact-sheets/fact-sheet-contracting-requirements>

Choose all that apply:

- ☐ Bidder’s Certificate of Reported Compliance has been attached to the bid.
- ☒ Bidder does not have a fleet subject to this regulation as outlined in Section 2449(i)(1)-(4).
- ☒ Listed subcontractors’ Certificate of Reported Compliance have been attached.
- ☐ The following subcontractors do not have a fleet subject to this regulation as outlined in Section 2449(i)(1)-(4):

Subcontractors

☒ Additional information regarding subcontractor fleets and/or certificates will be submitted within five (5) calendar days of the bid opening.

FAILURE TO PROVIDE THE CERTIFICATES OF REPORTED COMPLIANCE AS DIRECTED MAY RENDER THE BID NON-RESPONSIVE.

Guaranty Section 006536 - 1

Optional: Vendor is not required to complete.

CONTRACT NO: 24-S-14

This guaranty shall be executed by the successful bidder in accordance with Section 2.32 of the General Conditions. The bidder may execute the guaranty on this page at the time of submitting the bid or may, in the alternative, submit it with the insurance certificates and bonds within ten (10) days after award.

G U A R A N T Y

To the Owner: County of Fresno

The undersigned guarantees the construction and installation of the following work included in this project:

ALL WORK

Should any of the materials or equipment prove defective or should the work as a whole prove defective, due to faulty workmanship, material furnished or methods of installation, or should the work or any part thereof fail to operate properly as originally intended and in accordance with each individual Work Order Detailed Scope of Work and specifications, due to any of the above causes, all within 365 calendar days after the date on which the Work under this contract is accepted by the Owner, the undersigned agrees to reimburse the Owner, upon demand, for its expenses incurred in restoring said work to the condition contemplated in said project, including the cost of any such equipment or materials replaced and the cost of removing and replacing any other work necessary to make such replacement or repairs, or, upon demand by the Owner, to replace any such material and to repair said work completely without cost to the Owner so that said work will function successfully as originally contemplated.

The Owner shall have the unqualified option to make any needed replacement or repairs itself or to have such replacements or repairs done by the undersigned. In the event the Owner elects to have said work performed by the undersigned, the undersigned agrees that the repairs shall be made and such materials as are necessary shall be furnished and installed within a reasonable time after the receipt of demand from the Owner. If the undersigned shall fail or refuse to comply with his or her obligations under this guaranty, the Owner shall be entitled to all costs and expenses reasonably incurred by reason of said failure or refusal.

Date: *

04/03/2025

Name (Printed): *

Marc Kerkochian

Signature: *

Marc Kerkochian

Title: *

President

Contractor: *

Better Enterprises, Inc.

Required Documents

Name	Omission Terms	Submitted File
Electronic Bid Bond - Scan of Bid Bond Scan of Notarized Paper Bid Bond with original due by 4pm on the 5th calendar day after the bid opening.	I have already provided a bid bond, i.e. through an electronic Surety above or to the public works office prior to the deadline.	County of Fresno DPH Basem Bond.pdf
Disclosure of Lobbying Activities - Section 004566 Complete this form to disclose lobbying activities pursuant to 31 U.S.C. 1352	Submit disclosure if needed.	I am not enclosing this document omission terms have been met
CARB Certification of Reported Compliance - Bidder Valid CARB Certification of Reported Compliance - Bidder	Does not have a fleet subject to this regulation.	I am not enclosing this document omission terms have been met
CARB Certification(s) of Reported Compliance - Subcontractors Valid CARB Certification(s) of Reported Compliance - Subcontractors	Due by 4pm on the 5th calendar day after bid opening or no listed subcontractors have a fleet subject to this regulation.	BFI E149998_FleetwideCompliance
4 Required Documents		

Additional Documents (use if needed)

Name	Omission Terms	Submitted File
Not Required - Extra Space if needed Not Required - Extra Space if needed	Not Required - Extra Space if needed	I am not enclosing this document because the omission terms have been met.
Not Required - Extra Space if needed Not Required - Extra Space if needed	Not Required - Extra Space if needed	I am not enclosing this document because the omission terms have been met.
Not Required - Extra Space if needed Not Required - Extra Space if needed	Not Required - Extra Space if needed	I am not enclosing this document because the omission terms have been met.
3 Required Documents		

A G R E E M E N T

THIS AGREEMENT is made at Fresno, in Fresno County, California, by and between **Better Enterprises, Inc.**, hereinafter "Contractor", and the **County of Fresno**, hereinafter "Owner".

WITNESSETH, the Contractor and the Owner, for the consideration hereinafter named, agree as follows:

ARTICLE I. The Contractor agrees to furnish all labor, equipment and materials, including tools, implements, and appliances required, and to perform all the work in a good and workmanlike manner, free from any and all liens and claims of mechanics, materialmen, subcontractors, artisans, machinists, teamsters, and laborers required for:

**DEPARTMENT OF PUBLIC HEALTH BASEMENT RENOVATION
Contract No. 24-S-14**

Located at 1221 Fulton Street, Fresno, California, all in strict compliance with the plans, drawings, and specifications therefore prepared by the Director of the Fresno County Department of Public Works and Planning and his authorized representatives, hereinafter called the Project Manager, and other contract documents relating thereto.

ARTICLE II. The Contractor and the Owner agree that the Advertisement (Notice to Bidders), the Wage Scale, the Proposal hereto attached, the Instructions to Bidders, the General Conditions of the contract, the Technical Specifications, the Drawings, and the Addenda and Bulletins thereto, the Contract Bonds and Certificates of Liability and Workers Compensation Insurance, and the Contract Change Orders, together with this Agreement form the Contract Documents, and they are as fully a part of the contract as if hereto attached or herein repeated. The Specifications and Drawings are intended to cooperate so that any work exhibited in the drawings and not mentioned in the specifications, or vice versa, is to be executed the same as if both are mentioned in the specifications and set forth in the drawings, to the true intent and meaning of the said drawings and specifications when taken together. Provided, however, that no part of said specifications that is in conflict with any portion of this Agreement, or that is not actually descriptive of the work to be done thereunder, or of the manner in which the said work is to be executed, shall be considered as any part of this Agreement, but shall be utterly null and void, and anything that is expressly stated, delineated or shown in or upon the specifications or Detailed Scope of Work shall govern and be followed, notwithstanding anything to the contrary in any other source of information or authority to which reference may be made.

ARTICLE III. The Contractor agrees that the work under the contract shall be completed as determined by the Owner within **THREE HUNDRED TEN (310) WORKING DAYS** from the date shown in the Notice to Proceed. Time of performance shall be deemed as of the essence hereof and it is agreed that actual damages to the Owner from any delay in completion beyond the date provided for herein, or any extension thereof until the work is completed or accepted, shall be all provable damages plus liquidated damages in the amount of **ONE THOUSAND FIVE HUNDRED 00/100 DOLLARS (\$1,500.00)** per day; that said liquidated damage was arrived at by a studied estimate of loss to the Owner in the event of a delay considering the following damage items which are extremely difficult or impossible to determine: Additional construction expense resulting from delay of completion including, but not limited to, engineering, inspection, rental and utilities; provided, however, the Owner may conditionally accept the work and occupy and use the same if there has been such a degree of completion as shall in its opinion render

the same safe, fit and convenient for the use for which it is intended and in such cases the Contractor and Surety shall not be charged for liquidated damages for any period subsequent to such conditional acceptance and occupation by the Owner but Owner may assess actual damages caused by failure of total completion during such period. The time during which the Contractor is delayed in said work by the acts or neglects of the Owner or its employees or those under it by contract or otherwise, or by the acts of God which the Contractor could not have reasonably foreseen and provided for, or by storms and inclement weather which delays the work, or by any strikes, boycotts, or like obstructive action by employee or labor organizations, or by any general lockouts or other defensive action by employers, whether general, or by organizations of employers, shall be added to the time for completion as aforesaid.

ARTICLE IV. COMPENSATION: The Owner agrees to make payments on account thereof as provided in the General Conditions in the total amount of **SIX MILLION SEVEN HUNDRED SIXTY-THREE THOUSAND AND 00/100 DOLLARS (\$6,763,000.00)** in current funds for the performance of the contract which sum is computed as follows: **TOTAL BID LUMP SUM.**

ARTICLE V. The Contractor and the Owner agree that changes in this Agreement or in the work to be done under this Agreement shall become effective only when written in the form of a supplemental agreement or change order and approved and signed by the Owner and the Contractor. It is specifically agreed that the Owner shall have the right to request any alterations, deviations, reductions, or additions to the contract, plans, and/or specifications and the amount of the cost thereof shall be added to or deducted from the amount of the contract price aforesaid by fair and reasonable valuations thereof.

This contract shall be deemed completed when the work is finished in accordance with all Contract Documents as amended by such changes. No such change or modification shall release or exonerate any surety upon any guaranty or bond given in connection with this contract.

ARTICLE VI. In the event of a dispute between the Owner or Project Manager and the Contractor as to an interpretation of any of the specifications or as to the quality of sufficiency of material or workmanship, the decision of the Project Manager shall for the time being prevail and the Contractor, without delaying the job, shall proceed as directed by the Project Manager without prejudice to a final determination by negotiation, arbitration by mutual consent or litigation and should the Contractor be finally determined to be either wholly or partially correct, the Owner shall reimburse them for any added costs they may have incurred by reason of work done or material supplied beyond the terms of the contract as a result of complying with the Project Manager's directions as aforesaid. In the event the Contractor shall neglect to prosecute the work properly or fail to perform any provisions of this contract, the Owner, after three days' written notice to the Contractor, may, without prejudice to any other remedy it may have, make good such deficiencies and may deduct the cost thereof from the payment then or thereafter due to the Contractor, subject to final settlement between the parties as in this paragraph hereinabove provided.

ARTICLE VII. TERMINATION: If the Contractor should be adjudged a bankrupt, or if they should make a general assignment for the benefit of their creditors, or if a receiver should be appointed on account of his insolvency, or if they or any of their subcontractors should persistently violate any of the provisions of the contract, or if they should persistently or repeatedly refuse or should fail, except in cases for which extension of time is provided, to supply enough properly skilled workmen or proper material, or if they should fail to make prompt payment to subcontractors or

for material or labor or persistently disregard laws, ordinances or the instructions of the Project Manager, then the Owner may, upon the certificate of the Project Manager, when sufficient cause exists to justify such action, serve written notice upon the Contractor and their surety of its intention to terminate the contract, such notice to contain the reasons for such intention to terminate the contract, and unless within five (5) days after the serving of such notice, such violations shall cease and satisfactory arrangements for correction thereof be made, the contract shall, upon the expiration of said five days, cease and terminate.

In the event of any such termination, the Owner shall immediately serve written notice thereof upon the surety and the Contractor, and the surety shall have the right to take over and perform the contract, provided, however, that if the surety within ten (10) days after the serving upon it of notice of termination does not give the Owner written notice of its intention to take over and perform the contract or does not commence performance thereof within the ten (10) days stated above from the date of the serving of such notice, the Owner may take over the work and prosecute the same to completion by contract or by any other method it may deem advisable for the account and at the expense of the Contractor, and the Contractor and their surety shall be liable to the Owner for any excess cost occasioned the Owner thereby, and in such event the Owner may without liability for so doing, take possession of and utilize in completing the work, such materials, appliances, plant and other property belonging to the Contractor as may be on the site or the work and necessary therefore. In such case, the Contractor shall not be entitled to receive any further payment until the work is finished.

If the unpaid balance of the contract price shall exceed the expense of finishing the work, including compensation for additional managerial and administrative services, such excess shall be paid to the Contractor. If such expense shall exceed such unpaid balance, the Contractor shall pay the difference to the Owner. The expense incurred by the Owner as herein provided, and damage incurred through the Contractor's default, shall be certified by the Project Manager.

ARTICLE VIII. The Contractor and his subcontractors shall comply with Sections 1770 – 1780 of the California Labor Code and the provisions of Sections 2.52 and 2.55 of the General Conditions concerning the payment of wages to all workers and mechanics, and the employment and payment of apprentices by the Contractor or any subcontractor for all work performed under this Agreement.

ARTICLE IX. The Contractor and his subcontractors shall comply with Sections 1810 to 1815 of the California Labor Code and the provisions of Section 2.51 of the General Conditions, concerning hours of work and payment of overtime compensation for all work performed under this Agreement.

The Board of Supervisors hereby specifies that portions of the work can only be performed outside the regular working hours as defined in the applicable collective bargaining agreement filed with the Director of Industrial Relations in accordance with Labor Code Section 1773.1, and that the overtime requirements for Saturdays, and holidays are hereby waived for these portions of the work, as more particularly described in the specifications. However, this exemption shall not negate the overtime provisions specified in Labor Code Section 1815.

ARTICLE X. INDEMNIFICATION: To the fullest extent permitted by law, Contractor agrees to and shall indemnify, save, hold harmless and at County's request, defend County and its officers, agents and employees, and the Project Manager and their respective officers, agents and employees, from any and all costs and expenses, attorney fees and court costs, damages, liabilities, claims and losses occurring or resulting to County, or the Project Manager in

connection with the performance, or failure to perform, by Contractor, its officers, agents or employees under this Agreement, and from any and all costs and expenses, attorney fees and court costs, damages, liabilities, claims and losses occurring or resulting to any person, firm or corporation who may be injured or damaged by the performance, or failure to perform, of Contractor, its officers, agents or employees under this Agreement. In addition, Contractor agrees to indemnify County for Federal, State of California and/or local audit exceptions resulting from non-compliance herein on the part of Contractor.

In any and all claims against the County, the Project Manager, or any of their respective officers, agents or employees, initiated by any employee of the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the indemnification obligation set forth in the immediately preceding paragraph shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or any Subcontractor under workmen's compensation acts, disability benefit acts or other employee benefit acts.

ARTICLE XI. INSURANCE: Without limiting the Owner's right to obtain indemnification from Contractor or any third parties, Contractor, at its sole expense, in accordance with the provisions of Section 2.40 of the General Conditions, shall maintain in full force and effect the following insurance policies throughout the term of this Agreement, excepting only those policies for which a longer term is specified:

A. Course of Construction (Builder's All Risk) Insurance, with scope and amount of coverage as specified in Section 2.40 E.1 of the General Conditions.

B. Commercial General Liability Insurance, with scope and amount of coverage as specified in Section 2.40 E.2 of the General Conditions.

C. Automobile Liability Insurance, with scope and amount of coverage as specified in Section 2.40 E.2 of the General Conditions.

D. Professional Liability Insurance, with scope and amount of coverage as specified in Section 2.40 E.3 of the General Conditions.

E. Worker's Compensation Insurance, with scope and amount of coverage as specified in Section 2.40 E. 4 of the General Conditions.

The Certificate of Insurance shall be issued in triplicate, to the County of Fresno, and all other participating agencies, whether or not said agencies are named herein, who contribute to the cost of the work or have jurisdiction over areas in which the work is to be performed and all officers and employees of said agencies while acting within the course and scope of their duties and responsibilities.

ARTICLE XII. MISCELLANEOUS PROVISIONS:

1. AUDITS AND INSPECTIONS: The Contractor shall at any time during business hours, and as often as the Owner may deem necessary, make available to the Owner for examination all of its records and data with respect to the matters covered by this Agreement. The Contractor shall, upon request by the Owner, permit the Owner to audit and inspect all of such records and data necessary to ensure Contractor's compliance with the terms of this Agreement. If this Agreement exceeds ten thousand dollars (\$10,000.00), Contractor shall be subject to the examination and audit of the Auditor General for a period of three (3) years after final payment under contract (Government Code Section 8546.7).

2. INDEPENDENT CONTRACTOR: In performance of the work, duties, and obligations assumed by Contractor under this Agreement, it is mutually understood and agreed that Contractor, including any and all of Contractor officers, agents and employees, will at all times be acting and performing as an independent contractor, and shall act in an independent capacity and not as an officer, agent, servant, employee, joint venture, partner, or associate of the Owner. Contractor and Owner shall comply with all applicable provisions of law and the rules and regulations, if any, of governmental authorities having jurisdiction over matters of the subject thereof. Because of its status as an independent contractor, Contractor shall have absolutely no right to employment rights and benefits available to Owner's employees. Contractor shall be solely liable and responsible for providing to, or on behalf of, its employees all legally-required employee benefits. In addition, Contractor shall be solely responsible and save Owner harmless from all matters related to payment of Contractor's employees, including compliance with social security, withholding, and all other regulations governing such matters. It is acknowledged that during the term of this Agreement, Contractor may be providing services to others unrelated to the Owner or to this Agreement.

3. DISCLOSURE OF SELF-DEALING TRANSACTIONS: This provision is only applicable if the Contractor is operating as a corporation (a for-profit or non-profit corporation) or if during the term of the agreement, the Contractor changes its status to operate as a corporation. Members of the Contractor's Board of Directors shall disclose any self-dealing transactions that they are a party to while Contractor is providing goods or performing services under this agreement. A self-dealing transaction shall mean a transaction to which the Contractor is a party and in which one or more of its directors has a material financial interest. Members of the Board of Directors shall disclose any self-dealing transactions that they are a party to by completing and signing a Self-Dealing Transaction Disclosure Form, attached hereto as Exhibit A and incorporated herein by reference, and submitting it to the Owner prior to commencing with the self-dealing transaction or immediately thereafter.

ARTICLE XIII. The Contractor represents that he has secured the payment of Workers Compensation in compliance with the provisions of the Labor Code of the State of California and Paragraphs B.3, C.3 and E.4 of Article 2.40 of the General Conditions, and will continue so to comply with such statutory and contractual provisions for the duration and entirety of the performance of the work contemplated herein.

DEPT OF PUBLIC HEALTH BASEMENT RENOVATION
FRESNO, CA

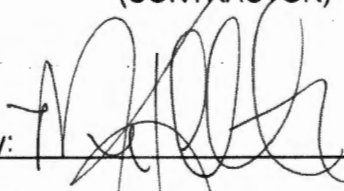
AGREEMENT
SECTION 005213 - 6

This Contract, **24-S-14**, was awarded by the Board of Supervisors on **May 20, 2025**. It has been reviewed by the Department of Public Works and Planning and is in proper order for signature of the Chairman of the Board of Supervisors.

IN WITNESS WHEREOF, they have executed this Agreement this 24th day of June, 2025

BETTER ENTERPRISES, INC.

(CONTRACTOR)

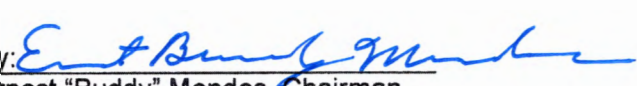
By: 

Name: Marc Kerkochian

Title: President

COUNTY OF FRESNO

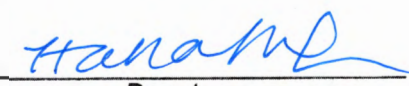
(OWNER)

By: 

Ernest "Buddy" Mendes, Chairman
of the Board of Supervisors of the
County of Fresno

ATTEST:

Bernice E. Seidel
Clerk of the Board of Supervisors
County of Fresno, State of
California

By: 

Deputy

FOR ACCOUNTING USE ONLY
VARIOUS ORGS.
5620 / 1500 / 08150 / 91760

END OF SECTION

CONTRACT # 24-S-14

GENERAL CONDITIONS

1.01 IDENTIFICATION OF CONTRACT

- A. The Agreement shall be signed by the Contractor and the Owner.
- B. The Contract Documents are defined in ARTICLE II of the Agreement.
- C. The Contract Documents are the Contract for Construction ("Contract"). This Contract represents the entire and integrated agreement between the parties hereto and supersedes all prior negotiations, representations or agreements, either written or oral. The Contract shall be amended or modified only by a Modification as defined herein. The Contract Documents shall be construed to create no contract relationship between and between the Architect or record and the Contractor, but the Architect or record shall be entitled to perform once the conditions of the Contract intended for their benefit and to enforce them as contained in the Contract Documents shall create no contract relationship between the Owner and the Subcontractor or Sub-subcontractor.

1.02 EXECUTION, CORRECTION, AND MAINTENANCE OF CONTRACT DOCUMENTS

- A. The Contract Documents are complete and contain all that shall be supplied as indicated or as provided it comes clearly within the scope of the Contract.
- B. The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the work. All methods and procedures that are commonly known technical or trade techniques are used in the Contract Documents in accordance with such recognized techniques.
- C. Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become familiar with the conditions under which the work is to be performed, and has corrected personal observations of the requirements of the Contract Documents.
- D. Materials and methods shall be the best of the respective kinds specified or indicated. Should any discrepancy or materials be required that are not direct or indirect covered in the Contract Documents, the Architect or record shall be necessary for proper maintenance of the materials intent thereon, said discrepancy or materials shall be the same for similar parts that are detailed, indicated or specified, and the Contractor shall understand the same to be implied and provide for it in his tender as if it were particularly described or delineated.

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Contract Documents and copies thereof shall be furnished to the property owner. In the event the contract set for execution of the Contract, such documents are to be returned to Contractor or submitted to the owner upon request at the completion of the work. No issuance or distribution to meet official requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the architect's copyright or other reserved rights. The owner's use of the documents shall not increase the architect's design liability beyond the Project and the site for which the design was originally intended.

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The definitions, or variations thereof, as used in these documents shall be defined as follows:

- A. The Work – The Work comprises the completed construction required by the Contract Documents, and includes materials, labor, equipment and services necessary to produce such construction, and all materials, labor permits and equipment incorporated or to be incorporated in such construction.
- B. The Project – The collective improvements to be constructed by the Contractor pursuant to the construction of the Sewer Station, Electric/Evidence Storage Building, parking, and associated site improvements for Reservoir Control.
- C. Owner – The County of Fresno, State of California, is represented by the Reservoir Control Board of Supervisors and so named in the Agreement. The term Owner additionally includes the Owner's authorized representative who shall be the Project Manager for this Project.
- D. Architect Record – The Owner and its authorized representative, as defined in Section 00000, or duly Licensed Architect.
- E. Contractor – As used in the General Conditions refers to person(s) or entity (partnership or corporation) named in the Agreement and as used in the Addendum to the Specifications, refers to the Contractor for that specific work, whether it be the General Contractor, Subcontractor, or other Contractor. The term Contractor means the Contractor or the Contractor's authorized representative.
- F. Subcontractor – Person, persons, entity, partnership or corporation having direct contract with Contractor to perform work on the project site. The term Subcontractor means a Subcontractor or a Subcontractor's authorized representative. The term Subcontractor does not include any separate contractor or any separate contractor's subcontractors.

- . **Subcontractor** – Person, persons, entity, partnership or corporation acting in direct or indirect contract with a Contractor to perform on-site or off-site work i.e. second tier, third tier or fourth tier Subcontractor. The term Subcontractor means a Subcontractor or an authorized representative thereof.
- . **Notice to Proceed** – A written notice issued by the Owner directing the Contractor to proceed with construction activities to complete the Project.
- I. **Technical Specifications** – Contains the written requirements for materials, equipment, systems, standards and workmanship for the work, and performance related services.
- . **Drawings** – Includes drawings issued in contract documents unless specifically noted otherwise in these documents or referenced codes.
- . **Order** – An order issued in terms of contract documents.

0000 SPECIFICATIONS AND DRAWINGS

- . **Precedence** – Nothing mentioned in the Specifications and not shown on the Drawings, or shown on the drawings and not mentioned in the specifications, shall have effect as if shown or mentioned in both. Subject to Section 0000, in cases of discrepancy concerning dimension, quantity and location, the Drawings shall have precedence over the Specifications. Explanations on the Drawings shall have precedence over conflicting drawing indications. More specific details shall have precedence over more general details and larger dimensions shall have precedence over smaller measurements. Where there are not shown, specific measurements shall be assumed and shown in cases of verified measurements of actual conditions and are read in place. In cases of discrepancy concerning quantity and application of materials and non-technical requirements over materials, the specifications shall have precedence over Drawings.
- B. **Division of Specifications** – For convenience of reference and to facilitate the letting of independent contracts, this specification may be separated into certain sections. Such separation shall not operate to divide the Owner, Architect or Professional Consultant to establish the limits of any contract between the Contractor and Subcontractor except as may be specifically stated in the contract stipulations. The General Conditions apply to the entire work to be done, including extra work.
- C. **Governing Factors** – Dimensions shown on drawings shall be assumed in every case in preference to scale drawings.

- D. Discrepancies – Should the Contractor, at anytime, discover a discrepancy in a drawing or specification, or an contradiction between dimensions on drawings and measurements at site, or an incongruity in dimensions or other information, the Contractor shall report it once to the Project Manager requesting clarification and shall not proceed with the work affected thereby until such clarification has been made. If the Contractor proceeds with work affected by such discrepancies, without having received such clarification, the Contractor shall be deemed to assume all responsibility for any and all consequences of such discrepancies. The Contractor, prior to approval of the Project Manager, shall be at the Contractor's risk and the settlement of any complications or disputes arising therefrom shall be at the Contractor's sole expense and Contractor shall indemnify, hold harmless and defend Owner, Owner's representatives, and Project Manager from and against all loss with respect to said discrepancies.
- E. Scope of Drawings – The drawings shall be used to determine the general character of the work as well as its details. Parts not detailed shall be constructed in accordance with best standard practice for that type of work, so as to provide the requisite strength and function to complete the parts to be complete. Where it is shown that a drawing illustrates an important part of the work or a particular detail, the remainder shall be deemed repetitive and so constructed. The Contractor shall be responsible for all errors made in using the drawings and shall be deemed to have accepted them.

Scope Drawings, Product Data and Samples –

1. Scope Drawings are drawings, diagrams, schedules and other data specifically prepared for the project by the Contractor or a subcontractor, manufacturer, supplier or distributor to illustrate some portion of the work. Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished to the Contractor to illustrate a particular product or system for some portion of the work. Samples are physical samples that illustrate materials, equipment or workmanship, and establish standards applicable to the work to be added.
2. The Contractor shall prepare, review, approve and submit to the Project Manager, with reasonable promptness and in such sequence as to cause no delay in the work or in the completion of the work or a separate contractor, all Scope Drawings, Product Data and Samples required by the Contract Documents.
3. In preparing, approving and submitting Scope Drawings, Product Data and Samples, the Contractor represents that the Contractor has determined and verified all materials, field measurements and field construction criteria related thereto, or will do so with reasonable promptness, and has checked and coordinated the information contained within such submissions with the requirements of the work, the Project, the work order and the Contract Documents.

1. The Contractor shall not be relieved of responsibility or obligation from the requirements of the Contract Documents or the Architect's review of Shop Drawings, Product Data or Samples, unless the Contractor has specifically informed the Project Manager in writing of a substitution at the time of submission and the Architect has reviewed the specific deviation. The Contractor shall not be relieved of responsibility for errors or omissions in the Shop Drawings, Product Data or Samples of the Architect's review of the.
2. When professional certification or performance criteria or standards, systems or equipment is required in the Contract Documents, the Architect shall be entitled to rely upon the accuracy and completeness of such certifications and certifications. The cost of such certifications shall be borne by the Contractor. Owner may elect to have an independent certification performed at its own expense. The Owner shall not be liable for any delay or expense caused by the.
3. The Contractor shall direct specific attention, in writing or on resubmitted Shop drawings, Product Data, or Samples, to revisions other than those requested by the Architect on previous submissions.
4. No portion of the work requiring submission of Shop Drawings, Product Data or Sample shall be commenced until the submission has been reviewed by the Architect. All portions of the work shall be in accordance with the reviewed submissions.
5. Submission of Shop Drawings and Samples to the Project Manager is required for only those items specifically mentioned in the Specification Sections. If Contractor submits Shop Drawings or items other than the above, the Project Manager should be expected to distribute or review the. Contractor shall be responsible for the processing of Shop Drawings or other work as these are required for the progress of the work.
6. The term "Shop Drawings" as used herein also includes that is not limited to fabrication, erection, layout and setting drawings, manufacturers standard drawings, descriptive literature, cuttings, drawings, performance and test data, wiring and control diagrams, other drawings and descriptive data pertaining to materials, equipment, piping, duct and conduit systems, and methods of construction as may be required to show that the materials, equipment or systems and the positions and layout comply conform to the Contract requirements. As used herein the term "unfabricated" applies to standard units as shown on drawings, and the term "fabricated" means items specifically designed or made for selected materials to meet individual design requirements. Shop Drawings shall establish the exact details of the unfabricated or fabricated items indicate proper relation to adjoining structural design details and mechanical and electrical equipment in proper relation to physical spaces in the structure and incorporate minor changes in design or construction to suit actual conditions.

- Drawings. _____ Contractor's review and approval. Contractor shall submit to the Project Manager for approval _____ initial set of six (6) copies of prints and/or PDF submission of the same information of each Required deliverables and quantities as submitted by the determined at the time of the Pre-Construction Meeting. The Project Manager will check the submitted set to see if it is complete. If complete, the Project Manager will forward the drawings to the Owner and the Architect. The Architect and Owner will check the drawings and note Architect and Owner comments and may stop to the drawings indicating the status acceptance, and will return some to the Project Manager, each retaining prints for his/her records. The Architect or his/her consultants, as applicable, will review the Shop Drawings on the prints if required revisions stop the prints and indicate "No Exceptions Taken", "Make Corrections Noted", "Revise and Resubmit", "Submit Specified Item", or "Rejected", and return the prints. The Project Manager will return the prints to the Contractor. The Contractor shall then print and distribute the appropriate number of copies to his/her job personnel as required. If a drawing is stamped "Rejected" or "Revise and Resubmit", the Contractor shall correct and resubmit as outlined above. When stamped "Make Corrections Noted", or similar instructions, the Contractor shall correct and resubmit for record on three (3) prints each drawing. Also see Technical Specifications, Division I, General Requirements.
- Samples. _____ Contractor's review and approval. Contractor shall submit to the Architect, five (5) copies of samples of materials in quantities and sizes as specified herein as requested by the Architect. Samples shall be given to the Architect at a time determined by the Contractor, which samples are unnecessary resubmitted and which will not cause undue delay in the work. Samples will be forwarded to the Architect. If a sample is stamped "Rejected" or "Revise and Resubmit", one sample is noted will be returned to the Contractor. The Contractor shall correct and resubmit as outlined above. If a sample is stamped "Make Corrections Noted", one sample is noted will be returned. Corrected samples shall be resubmitted for approvals per the original submitted. Also see Technical Specifications and General Requirements.
- Brochures. _____ Contractor's review and approval. Contractor shall submit to the Architect, five (5) copies of brochures and/or contractor's catalogs or brochures as required. Brochures will be forwarded to the Architect for review. If a brochure is stamped "No Exception Taken", two (2) copies will be returned to the Contractor. If stamped "Rejected", one (1) corrected copy and two (2) additional copies will be returned. Corrected copies shall be resubmitted for approvals per the original submitted. Also see General Requirements.
- Manufacturer's Instructions. _____ Where needed or where is required by Specifications to be furnished, installed or performed in accordance with specified product manufacturer's instructions, Contractor shall procure and distribute the necessary copies of such instructions to all concerned parties.

1. **Materials** – unless otherwise specified, supplies and materials shall be provided by the Contractor in case and as to kind or quality required, supplies shall be submitted to the Architect for the Project Manager and the Architect to the Architect for the Project Manager appropriate to the location and the function of the item in question. Contractor shall submit samples according to the instructions. Before installation, the Architect or Project Manager shall promptly reject the materials of the Contractor, whether or not completely installed, and promptly and properly replaced with correct materials, including material of the Contractor, in accordance with the contract and without expense to the Owner. The Contractor shall submit for the Architect's approval as is required by the specifications and requirements.

1.05 THE ARCHITECT

- A. The Owner shall delegate to the Architect its rights and responsibilities to the Architect licensed Architect as deemed necessary.
- B. The Architect advises the Project Manager in all respects of the construction progress of the Project. The Architect's functions include advice and assistance to the Project Manager in the correct interpretation and application of the Contract Documents. The Architect is not authorized independently to issue addenda, modifications, field orders, or other instructions, or Supplemental field orders, or in any other matter and the Owner in discussions with the Contractor.
- C. The Contractor shall deliver all correspondence relating to the proper execution of the Project to the Project Manager. The Project Manager reserves the right to consult with the Architect and Owner prior to responding to the Contractor's correspondence.
- D. When discussions between the Contractor and the Project Manager occur either on the site or elsewhere, if the Architect is not present, the Project Manager reserves the right to consult with the Architect and Owner prior to issuing a decision, instruction or instruction.
- E. The Architect shall review or take other appropriate action upon the Contractor's submittals such as Shop Drawings, Product Data and Samples, and may or may not concur with the design concept of the Project and the instructions given in the Contract Documents. Such action shall be taken within ten working days, whether under certain circumstances such as for completed submittals or for a new or revised submittal are submitted at one time or at different times. In this case the Contractor shall be notified and given the opportunity to advise the Architect of priorities. The Architect's review of specific items shall not indicate review of the entire submittal or is a comment.

THE PROJECT MANAGER

- A. The Project Manager is the authorized representative of the owner in all aspects relating to the construction contract on behalf of the owner. All communications from and to the Contractor shall be connected through the Project Manager. However, the Project Manager does not have the authority to bind the owner in matters relating to the time or cost of the Project as defined in the agreement for Construction.
- B. The Project Manager shall be the owner's representative during the construction and warranty periods, and notification of the contract is due. The Project Manager shall advise and consult with the owner. All instructions to the Contractor shall be forwarded through the Project Manager. The Project Manager shall have authority to act on behalf of the owner within the extent provided in the Contract Documents, unless otherwise modified or written instruction.
- C. The Project Manager shall be on site during construction to monitor the progress and quality of the work and to determine in general if the work is proceeding in accordance with the Contract Documents. On the basis of on-site observations and communication with the Contractor, the Project Manager shall keep the owner informed of the progress of the work, and recommend to the owner against defects and deficiencies in the work of the Contractor.
- D. The Project Manager shall permit access to the work wherever it is in preparation and progress. The Contractor shall provide facilities for such access so that the Project Manager can perform its functions under the Contract Documents.
- E. Based on the Project Manager's observations, and on examination of the Contractor's application for Payment, the Project Manager shall determine the amount owing to the Contractor and advise to the owner Certificates for Payment incorporating such amount.
- F. The Project Manager shall be the initial interpreter of the requirements of the Contract Documents and the initial order of the performance of the Contractor. The owner shall have the right to appeal such orders.
- G. The Project Manager shall render interpretations necessary for the proper execution or progress of the work, with reasonable promptness and in accordance with agreed upon time limits. Either party to the Contract may make written request to the Project Manager for such interpretations.
- H. Claims, disputes and other matters in question between the Contractor and the Project Manager relating to the execution or progress of the work or the interpretation of the Contract Documents shall be referred to the owner for final decision.
- I. All interpretations and decisions of the Project Manager shall be in writing or in proper form, and shall be consistent with the intent of the Contract Documents and reasonable interpretation thereof.

- The Project Manager shall have the authority to reject, or recommend to the Owner the rejection, of any work that does not conform to the Contract Documents. However, in the Project Manager's opinion, it is considered necessary or advisable for the implementation of the intent of the Contract Documents, the Project Manager shall have authority to require special inspection or testing of the work whether or not such work is then indicated, installed or completed.
- The Project Manager shall receive from the Contractor and review Shop Drawings, Product Data and Samples, and forward same to Architect and Owner for review.
- Following consultation with the Owner, the Project Manager shall take appropriate action on changes, and shall have authority to order minor changes in the work as provided herein.
- M. The Project Manager shall conduct inspections to determine the date of Completion, and shall receive and forward to the Owner for the Owner's review written warranties and related documents required by the Contract Documents and issued by the Contractor. The Project Manager shall issue a final Project Certificate of Payment upon compliance with the requirements for completion and final payment. The Project Manager shall monitor the progress for period of 90 Calendar Days from and after the date of acceptance of the work, unless otherwise specified as another term.
- The duties, responsibilities and limitations of the Project Manager as the Owner's representative during construction, as set forth in the Contract Documents, shall not be modified or extended without written consent of the Owner, the Contractor and the Project Manager, and such consent shall not be unreasonably withheld. Where the Contractor to respond within ten business days to a written request shall constitute consent of the Contractor.
- In case of the termination of the employment of the Project Manager, the Owner shall appoint a successor Project Manager, whose status and duties under the Contract Documents shall be the same as those of the former Project Manager.

1.01 GENERAL

- Installation and Services Required of the Owner
 - Unless otherwise provided in the Contract Documents, the Owner shall secure and provide necessary approvals, easements, assessments and charges required for the construction, use or occupancy of permanent structures or permanent changes in existing facilities.
 - Installation of services under the Owner's control shall be furnished to the Owner in a reasonably prompt manner to avoid delay in the overall progress of the work.
 - The Owner shall provide instructions to the Contractor through the Project Manager.

B. Owner's Right to Stop the Work

If the Contractor fails to correct defective work as required in Section 0000 herein or persistent fails to correct the work in accordance with the Contract Documents, the Owner, in a written order signed personally or by an agent specifically empowered by the Owner in writing, may order the Contractor to stop the work, or any portion thereof, until the cause for such order has been eliminated. However, this right of the Owner to stop the work shall not give rise to an addition to the part of the Owner to exercise this right for the benefit of the contractor or any other person or entity, except to the extent required in Section 0000C.

C. Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to correct the work in accordance with the Contract Documents, and after written notice from the Owner to correct such default or neglect with diligence and promptness, the Owner may, after an additional written notice and without prejudice to any other remedy the Owner may have, make such deficiencies. In such case an appropriate Contract Change Order shall be issued deducting from the payments then or thereafter due the Contractor the cost of correcting such deficiencies, including compensation for the additional services of the architect or other professionals as may be necessary for such default, neglect or failure. Such action by the Owner and the amount charged to the Contractor are not subject to the prior approval of the architect. If the payments then or thereafter due the Contractor are not sufficient to cover such amount, the Contractor shall pay the difference to the Owner, or the Owner may require payment of the sum then or thereafter due or amounts due as appropriate. Such action shall in no way affect the status of either party under contract, nor be held as a basis for any claim of the Contractor for damages or extension of time.

0000 CONTRACTOR RESPONSIBILITIES

0. Review of Contract Documents and Field Conditions

0. The Contractor shall carefully study and compare the Contract Documents and submit once report to the Project Manager any discrepancy or inconsistency that may be discovered. The Contractor shall not be liable to the Owner or the Project Manager for any discrepancies or inconsistencies in the Contract Documents unless the Contractor recognized such inconsistencies or discrepancies and knowingly failed to report it to the Project Manager. The Contractor shall perform no portion of the work at any time unless authorized by the Contract Documents or, where required, approved Shop Drawings, Product Data or Samples for such portion of the work.

- Neither the Owner nor the Project Manager or Architect assume any responsibility for an understanding or representation made by or on behalf of their agents or representation prior to the execution of the agreement unless such understanding or representations are expressly stated in the agreement, and the agreement expressly provides that responsibility therefor is assumed by the Owner.
- Require the Contractor to account for sewerage and stormwater in the construction and not rely on the Owner for responsibility or estimation of proper the design or cost of sewerage and stormwater in the project.
- The Contractor shall be held responsible and verified conditions and shall be responsible for all field measurements and conditions and other information known to the Contractor at the time the Contract Documents were commenced activities. Any inconsistencies or discrepancies discovered by the Contractor shall be reported to the Project Manager at once.
- Before submitting any Request for Information (RFI) or other contractor-initiated request for information, the Contractor shall determine that the information requested is not clearly provided in the Contract Documents. RFI's shall be submitted to the Project Manager and not the Contractor, or Owner, and not any subcontractor, supplier or other vendor, and shall be on or approved by the Project Manager. The Contractor shall provide a revised and updated RFI Priority Schedule on a weekly basis. The RFI Priority Schedule shall rank RFI's in order of priority and include a brief statement of reason for priority. Owner initiated RFI's will not be listed on the Contractor's RFI Priority Schedule. The Owner will provide the Architect a separate list of Owner initiated RFI's upon request of the Architect. The Architect will endeavor to respect the order of priorities as requested by the Contractor or Owner for the betterment of the Project. The RFI process is for information and clarification only and shall not be utilized to obtain approval of changes in the Order Price or time. See Division 01 General Requirements.

B. Supervision Procedures

- The Contractor shall efficiently supervise and direct the work, using therein the Contractor's best skill and diligence for which he/she is remunerated in the Contract Price. The Contractor shall carefully inspect the site and stand and compare the Contract Documents, as hereinbefore and pose upon the features or conditions affecting the Contract and not excuse the Contractor from carrying out its provisions to its intent.

- The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during the progress of the work. The superintendent shall represent the Contractor and communicate with the superintendent who shall be as binding as if given to the Contractor. Important communications shall be confirmed in writing. Other communications shall be so confirmed upon written request in each case. The Superintendent shall begin the Project immediately upon the Project until the Project is completed, as and as the Contractor employs that person. The Superintendent shall not be replaced without the approval of the Owner.
- The Contractor shall be responsible to the Owner for the acts and omissions of its employees, subcontractors and their agents and employees, and other persons performing work under a contract with the Contractor.
- The Contractor shall enforce strict discipline and good order among its employees and shall employ on the work only that person or persons not listed in the list assigned to the work.
- The Contractor shall not be relieved from its duties or obligations to perform the work in accordance with the Contract Documents either of the activities or duties of the Owner or the Architect in its administration of the Contract, or of inspections, tests or approvals required or performed by persons other than the Contractor.
- Contractor shall alert and inform their employees that State law requires that the identities of individuals who provide services to the State be confidential. Recording the identities of individuals who provide services to the State is prohibited by law.

C. Construction Procedures

- Means and Methods – The Contractor shall be responsible for and control construction means, methods, techniques, sequences, coordination and procedures for the work of this contract. Additionally, the Contractor shall be responsible for safety precautions and programs in connection with the work.
- Laws, Ordinances and State – The Contractor must comply with all laws, rules, regulations, provisions and ordinances of the County in which the work is being done, and all State laws pertaining to the work.
- Signs and Markings – The Contractor shall provide, in accordance with all applicable codes and ordinances and as may be required, safety equipment, signs, fences, barriers, barricades, lights, danger signs, enclosures, etc., and shall maintain such safety measures until the work is completed.

1. **Housekeeping** – Contractor shall keep the premises free of excess accumulated debris. Clean up is required and is directed to the Project Manager. At completion all debris shall be removed from the site. Refer to General Requirements for additional requirements.
2. **Tools and Materials** – Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for all tools, materials, equipment, tools, construction equipment and machinery, labor, fuel, utilities, transportation, and other facilities and services necessary for the proper execution and completion of the work, whether temporary or permanent and whether or not incorporated or to be incorporated in the work.
3. The Contractor shall deliver to the Project Manager, prior to initial acceptance of the work, signed certificates from suppliers of materials and manufactured items stating that materials conform to the Contract Documents.
4. The Contractor, immediately upon receipt of the notice to Proceed for where stop drawings, shop plans, etc., are required, immediately upon receipt of the drawings, shop plans, orders for materials, work instructions, and equipment to be employed shall order in connection with that portion of the contracted work. The Contractor shall keep all materials, work instructions and equipment specified and shall advise the Project Manager promptly, in writing, of all orders placed and of all materials, work instructions and equipment which do not be available in a timely manner for the purposes of the Contract.
5. Unordered work is unsatisfactory to the Owner or the Architect, or are considered as the Owner or Architect to be careless, incompetent, unsafe or otherwise unfit, shall be disallowed under the Contract upon written request to the Contractor from the Owner or the Architect.
6. **Temporary Utilities** – Contractor shall connect to existing water and electric utilities on the site, provided it is suitable to the Contractor's requirements. Water and electric used shall be paid by the Owner. Contractor shall pay expenses for carrying the water or electric to the appropriate locations and to connect or tap into existing lines. All utilities shall be available on a site to the extent shown in the performance of this contract. It shall be the responsibility of the Contractor to control all the water and electric utilities on the site. The use of all utilities shall be recorded in the event of excess utility requirements.
7. Contractor shall not perform any fire alarm operation adjacent to construction materials. Fire alarm operation shall be proper fire extinguisher case and the adjacent area shall be properly stopped for the day. Contractor shall provide not less than one Class ABC fire extinguisher for each 1,000 square feet of Project area or fraction thereof.

1. Contractor shall erect temporary dust separation partitions and other devices as necessary to confine dust and debris within area of work. Contractor shall post signs, erect and maintain barriers and warning devices for the protection of the general public and other personnel.
2. Trenching and Excavation – In accordance with Section 01000 of the Comprehensive Public Contract Code, the following provisions shall apply to any contract involving digging trenches or other excavations that extend deeper than six feet below the surface.
- a. The Contractor shall prepare, and before the following conditions are disturbed, notify the owner, in writing, of the following:
- i. Material that the Contractor believes may be material that is hazardous waste, as defined in Section 01000 of the Health and Safety Code that is required to be reported to Class I, Class II, or Class III disposal site in accordance with provisions applicable to.
 - ii. Subsurface or latent physical conditions at the Project site differing from those indicated on information about the site made available to bidders prior to the deadline for submitting bids.
 - iii. Unknown physical conditions at the site whose nature, different material from those ordinarily encountered and generally recognized as inherent in the type of work provided for in the contract.
- b. The owner shall promptly investigate the conditions, and if it finds that the conditions do materially so differ, or do involve hazardous waste, and cause a decrease or increase in the Contractor's cost or the time required for, performance of any part of the work, shall issue a Contract Change Order in accordance with the provisions of Section 01000 of the General Conditions.
- c. In the event that a dispute arises between the owner and the Contractor whether the conditions materially differ, or involve hazardous waste, or cause a decrease or increase in the Contractor's cost or the time required for, performance of any part of the work, the Contractor shall not be excused from the scheduled completion date provided for in the contract, but shall proceed with the work to be performed under the contract. The Contractor shall retain any and all records provided either in contract or in any correspondence pertaining to the resolution of disputes and protests between the contracting parties.

SUBCONTRACTORS

- A. **Subcontractors** – Subcontractors between the Contractor, Subcontractors, and Subcontractors shall be subject to the appropriate Owner, and in no case does subcontractor relieve the Contractor of any conditions imposed in the Contract Documents. The Contractor shall not use those subcontractors that are required to be listed and included in lister section of Subcontract list, section 00000, unless the proposed substitution is first approved by the Owner pursuant to statute. The Contractor shall not use any subcontractor who is ineligible to perform work on a Public Works Project pursuant to section 00000 or 00000 of the Public Code. Notwithstanding any other provision in the Contract Documents, subcontractors may be added, deleted or substituted in accordance with the provisions of Public Contract Code Section 00000 et seq.
- B. **Retention of Subcontractor** – By an appropriate agreement, written or otherwise required or enforceable, the Contractor shall bind each Subcontractor and require therein that each Subcontractor agrees to be bound by the terms of the Contract Documents to carry out their provisions insofar as applicable to their work and the Contractor further agrees to pay to each Subcontractor promptly upon issuance of Certificate of Payment, lister or their due portion. Said agreement shall preserve and protect the rights of the Owner and the Architect under the Contract Documents with respect to the work to be performed by the Subcontractor so that the subcontracting thereon shall not prejudice said rights, and shall comply with the Subcontractor, unless specifically provided otherwise in the Contractor-Subcontractor agreement, the benefit, remedies and redress against the Contractor that the Contractor, under the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with their Subsubcontractors. The Contractor shall be permitted to each proposed Subcontractor, prior to the execution of the Subcontract, copies of the Contract Documents to indicate the Subcontractor will be bound by this Paragraph and identify to the Subcontractor the terms and conditions of the proposed Subcontract which may be in variance with the Contract Documents. Each Subcontractor shall sign and provide copies of Contract Documents to their Subsubcontractors. Notwithstanding contained herein shall be deemed to create an agency relationship between the Owner and any Subcontractor or their representatives.
- C. **Owner's Retention** – Neither the acceptance of the work by Subcontractor nor the suggestion of work by Owner nor any other act of the Owner or Architect nor anything contained in any Contract Document is to be construed as creating any contractual relation between the Owner (or Owner's authorized representatives) and any Subcontractor or any tier nor is creating any contract relationship between the Architect and any Subcontractor or any tier.
- D. **Subcontractors employed** by the Contractor shall be appropriately licensed in accordance with the laws of the State of California.

- E. Jurisdiction disputes between Subcontractors or between Contractor and Subcontractor shall not be edited or decided by the Owner or the Architect. The Contractor shall be responsible for the resolution of all such disputes based upon its contract relationships with its Subcontractors.

0000 OWNER'S RIGHT TO PERFORM OR RECORD TO BE ORDER SEPARATE
CONTRACTS

- A. The Owner reserves the right to perform or record to the Project with the Owner's own forces, and to order separate contracts in connection with other portions of the Project or other work on the site under these or similar Conditions of the Contract. If the Contractor claims that the Owner's action results in delay, damage or additional cost attributable thereto, the Contractor shall be subordinated as provided elsewhere in the Contract Documents.
- B. When separate contracts are ordered for different portions of the Project or other work on the site, the term Contractor in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor agreement.
- C. The Owner shall provide for coordination of the activities of the Owner's own forces and of each separate contractor with the project of the Contractor, and shall cooperate with the Contractor. The Contractor shall participate with other separate contractors and the Owner in reviewing their construction schedules when directed to do so. The Contractor shall be responsible for the construction schedule deemed necessary after a final review and a final agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, separate contractors, and the Owner, unless otherwise revised.
- D. Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces, the Owner shall be deemed to be subject to the same regulations and to have the same rights and obligations as the Contractor under the Conditions of the Contract.

0000 MASTER RESPONSIBILITY

- A. The Contractor shall coordinate the Owner and separate contractors responsible for introduction and storage of their materials and equipment and performance of their activities and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

- B. When the part of the Contractor's work depends upon proper execution or results of the work of the Owner or of a separate contractor, the Contractor shall, prior to proceeding with the work, promptly report to the Project Manager any apparent discrepancies or defects in such other work that render it unsuitable for such proper execution and results. Where the Contractor is to report such conditions in acceptance of the Owner's or separate contractor's work as fit and proper to receive the work, except as to defects which are subsequently detected or apparent in such other work.
- C. In addition to the reporting of any discrepancy or defect as required herein above, the Contractor shall give due to description or demonstrated of the separate contractor, without fault of the Owner, the Contractor's record shall be limited to seeing records from the separate contractor.
- D. Any costs caused by defective or omitted work shall be borne by the Contractor responsible therefor.
- E. Should the Contractor cause damage due to the work or property of the Owner, or to other work or property on the site, the Contractor shall promptly remediate such damage as provided herein.
- F. Should the Contractor or his agent damage or cause damage due to the work or property of any separate contractor, the Contractor shall, upon due notice, promptly attempt to settle with such other contractor by agreement, or otherwise to resolve the dispute. If such separate contractor sues the Owner in account of any damage or damage alleged to have been caused by the Contractor, the Owner shall notify the Contractor and shall defend such proceedings, and if any judgment or award against the Owner (or Owner's authorized representatives) arises therefrom, the Contractor shall pay or satisfy such judgment or award in kind and shall reimburse the Owner for any costs which the Owner has incurred in connection with such matter.

1000 DISPUTES RIGHT TO CHOOSE OP

If a dispute arises between the Contractor and separate contractors as to their responsibility or claim on work as required in the Contract Documents, the Owner shall claim on and the contractor responsible shall pay the Owner such portions of the cost as the Project Manager shall determine to be just.

1000 GENERAL NOTES

The Contract shall be governed by the laws of the State of California.

INSPECTION

- A. Materials and workmanship not otherwise designated in the Contract Documents shall be subject to inspection, examination, and test by the Owner and Project Manager at any and all times during construction and at any and all places where such construction and construction are carried on. The Owner and Project Manager shall have the right to reject defective materials and workmanship or require its correction.
- B. The Contractor shall provide prompt without additional charge, reasonable facilities, work, and materials necessary for the safe and convenient inspection and tests that may be required by the Owner and Project Manager.
- C. Where the Contract Documents, instructions of the Owner, laws, ordinances, or applicable authority within jurisdiction requires work to be inspected, tested or approved before proceeds, such work shall not proceed, nor shall be concealed prior to inspection.
- D. The Contractor shall give the Project Manager at least two business days advance notice of the readiness for any Contract compliance inspection by the Inspector. The Contractor shall give notice as required by other inspection and testing agencies in jurisdiction for Code and regular compliance inspection. In all cases, the Contractor shall schedule inspections so as not to interfere with.
- E. If the Project Manager determines that any work requires additional special inspection beyond that identified in the specifications, the Project Manager may upon written authorization from the Owner, instruct the Contractor to order such special inspection, testing or approval, and the Contractor shall give notice as provided above. If such special inspection or testing reveals a failure of the work to comply with the requirements of the Contract Documents, the Contractor shall bear all costs thereof, including compensation for the Project Manager's additional services, testing or inspections made necessary by such failure other than the Owner shall bear such costs, and an appropriate Contract Change Order shall be issued.
- F. Should it be considered necessary or advisable by the Project Manager at any time, either before acceptance of the entire work, or after acceptance and within the contract period, to place an examination of work already completed, or reworking or tearing out same, the Contractor shall upon request promptly provide all necessary facilities, work, and materials. If such work is found to be defective in any material respect, due to the fault of the Project Manager or other Subcontractors, the Contractor shall be reimbursed for the expenses of such examination and reconstruction. If, however, such work is found to meet the requirements of the contract, the Contractor shall be compensated for the appropriate amount of the Contract Change Order to the Contractor and the Contractor shall provide in addition, if completion of the work has been delayed thereby, be granted a suitable extension of time on account of the additional work involved.
- G. Required certificates of inspection, testing, or approvals shall be secured by the Contractor and the Contractor shall promptly deliver them to the Project

Monitor for review and evaluation of compliance with the appropriate specifications and standards.

1. When the work is completed, the Contractor shall notify the Project Manager in writing that the work is ready for inspection and test on a definite date, as is stated in section notice.

0000 TOWNS, PERMITS, FEES, AND INDEMNIFICATION FOR PROTECT INTERESTS OF THE COMMUNITY

1. The Contractor shall pay for and include in the contract, State, and counties direct or indirect for the work or portions thereof provided by the Contractor. The Contractor shall be responsible for the time the notice to Proceed is issued, whether or not yet enacted, and secure and pay for all fees and charges for permits and licenses, unless otherwise specified.
- B. Rights and license fees incident to the use of patented material, device, or process shall be paid by the Contractor and in the event of a claim for infringement of patent copyright, or Trade Secret rights, the Contractor shall indemnify, save the Owner (and Owner's authorized representatives) free and clear, and defend, at the Contractor's own expense, and hold harmless the Owner from and against in such connection.
- C. Unless otherwise provided in the Contract Documents, the Owner shall secure and pay for the building permit, permit connection fees, and right-of-way encroachment permit. The Contractor shall secure and pay for the construction utilities, and other permits and concerns, licenses, and inspections necessary for the proper execution and completion of the work.
- D. The Contractor shall comply with notices and comply with laws, ordinances, rules, regulations, and orders of any public authority arising on the performance of the work.
- E. It is not the responsibility of the Contractor to be certain that the Contract Documents are in accordance with applicable laws, statutes, building codes and regulations. If the Contractor observes that any of the Contract Documents are in variance therewith in any respect, the Contractor shall promptly notify the Project Manager in writing, and any necessary changes shall be accepted by appropriate Modification.
1. If the Contractor performs any work involving it to be contrary to any laws, ordinances, rules, and regulations, without notice to the Project Manager, the Contractor shall be responsible therefor and shall bear all costs attributable thereto.
2. In reference to the Contract Documents to codes, standard specifications, or manufacturer's instructions, shall be the latest printed edition in effect at the Contract date.

1000 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Within thirty (30) calendar days after receipt of notice to Proceed, the Contractor shall submit a Construction Schedule in CPM (Critical Path Method) form to the Project Manager for approval. The Construction Schedule shall be sufficiently detailed to accurately depict the work required on the Contract. CPM Construction Schedule shall reflect shop drawings, submittals due and return dates, mobilization and demobilization times, cost loading, crew size, and equipment loading data. The Contractor shall thereafter adhere to the Construction Schedule, as updated or amended, or as necessary in accordance with the Contract Documents, including any scope changes or changes in the work approved by the Owner during the course of construction. "Start" or "Finish" time on the CPM Construction Schedule is not intended, and shall not be, for the sole benefit of either the Owner or Contractor.
- B. Within fourteen (14) calendar days after the preconstruction conference, the Contractor shall provide a Submittal and Procurement Schedule indicating time periods for review of Shop Drawings, Data, Samples, and procurement of materials and equipment required for the work. Contractor shall submit the schedule in accordance with the General Requirements Section – Construction Progress Documentation. Items that require review by the Project Manager and are not readily available shall be staged and resubmitted within thirty (30) calendar days. Additional items shall be included in the Submittal and Procurement Schedule. Items listed in the Submittal and Procurement Schedule shall also be identified as activities on the CPM Construction Schedule. Contractor shall identify items requiring coordination with other separate contractors. The ordering date to calendar date correlation shall be based upon the Contractor's proposed work week with adequate allowance for weekend holidays, days lost due to inclement weather, and any special requirements of the Project.
- C. The Construction Schedule shall be prepared and contained on the Contractor.
- D. The Owner, Project Manager, Contractor, and other Contractors shall jointly review the progress of the work. Should this review, in the opinion of the Project Manager, indicate that the work is behind the schedule established on current revised Construction Schedule, the Contractor shall either provide a plan to the Project Manager indicating the steps the Contractor intends to take in order to recover the time behind schedule and conform to the revised Construction Schedule or shall submit a revised Construction Schedule for completion of the work, re-loading within the contract completion time, to the Project Manager for review at the next meeting. If the Contractor's recovery or revised schedule requires work to occur during other than normal working hours, the Contractor shall be responsible for any resulting costs incurred by the Owner, including but not limited to, the costs for construction inconvenience, contract administration, inspection, testing, and staining.

- E. The Contractor shall deliver copies of disaster data and logs to the Project Manager and Owner on a weekly basis or as otherwise agreed to by Owner. At a minimum, the Contractor's daily job log should include the subcontractors working onsite, number of workers and their trade classification, description of work, visitors, temperature and weather conditions, accidents, deaths, and other important information pertaining to the Project that day. The Contractor will schedule and coordinate the work of all subcontractors on the Project. The Contractor will keep the Subcontractors informed of the Construction Schedule to enable the Contractor to plan and perform the work properly.

000 RECORDS, DOCUMENTS, AND SAMPLES AT THE SITE

- A. The Contractor shall maintain records required by Federal Agencies, County, or State inspections, and shall promptly notify the Project Manager of the results of each inspection. Copies of all records shall be provided to the Owner.
- B. The Contractor shall secure and maintain required certificates of inspection, testing, or approval and shall promptly deliver them to the Project Manager.
- C. The Contractor shall maintain at the Project site, on a daily basis, one set of record copy of all Drawings, Specifications, Addenda, Change Orders, and other Modifications, in good order and updated current to record all changes made during construction, and retained Shop Drawings, Product Data, and Samples. These shall be available to the Project Manager and the Owner and retained weekly, and shall be delivered to the Project Manager or according to the Owner upon completion of the Project. The Contractor shall advise the Project Manager on a current basis of all changes in the work made during construction. Payment of the retained set of Contractor or failure to maintain current Record Documents.

000 USE OF SITE

- A. The Contractor shall confine operations at the site to areas permitted by laws, ordinances, permits, and the Contract Documents, and shall not encroach upon or interfere with the site of other projects or equipment.
- B. The Contractor shall coordinate with the Contractor's operations with, and secure appropriate, the Project Manager before using any portion of the site. (See Technical Specifications, Division 00, General Requirements).

000 CONTINGENT AND POTENTIAL WORK

- A. The Contractor shall be responsible for obtaining, fitting, or purchasing all items required to complete the work or to make its subcontractors fit together properly.

- B. The Contractor shall not do any work or endeavor in portion of the work or the work of the owner, or any separate contractors or cutting, patching or otherwise altering the work or the work of the owner or any separate contractor except with the written consent of the owner and each separate contractor. The Contractor shall not increase the cost of the work or any separate contractor consent to cutting or otherwise altering the work.
- C. The Contractor in all cases shall exercise entire care in the cutting operations, and perform such operations under adequate supervision of competent mechanics skilled in the applicable trade. Openings shall be neatly cut and smooth edge as far as possible to avoid unnecessary damage. Careless and/or careless cutting, etc., shall not be tolerated, and the Contractor shall be responsible for such damage or diminished work.
- D. Replacing, patching, and repairing materials and surfaces cut or damaged in the execution of the work shall be performed by experienced mechanics of the same trades involved. All work shall be done with the applicable materials, in such a manner that surfaces so replaced, repaired, or patched, will upon completion of the work, blend with the surrounding similar surfaces.

0000 CLEANUP

- A. The Contractor shall be responsible to keep the premises free from accumulation of waste materials or rubbish caused by the Contractor's operations. At the completion of the work, the Contractor shall remove the Contractor's waste materials and rubbish from and about the Project as well as the Contractor's tools, construction equipment, containers and surplus materials.
- B. If the Contractor is to clean up at the completion of the work, the owner shall do so, and the cost thereof shall be paid to the Contractor.

0000 INDEMNIFICATION

- A. To the extent permitted by law, Contractor agrees to and shall indemnify, save, hold harmless and at Owner's request, defend Owner and its officers, agents and employees, and the Architect and Consultants and their respective officers, agents and employees, from and against all costs and expenses, attorneys' fees and court costs, damages, liabilities, claims and losses occurring or resulting to owner, the Architect or Consultants in connection with the performance, or failure to perform, by Contractor, its officers, agents or employees under this agreement, and from and against all costs and expenses, attorneys' fees and court costs, damages, liabilities, claims and losses occurring or resulting to any person, firm or corporation who or which is injured or damaged by the performance, or failure to perform, by Contractor, its officers, agents or employees under this agreement. In addition, Contractor agrees to indemnify owner for Federal, State or Communal and/or local credit exceptions resulting from noncompliance herein on the part of Contractor.

- B. In and against the owner, the architect or consultants, or any of their respective officers, agents or employees, initiated or employee of the Contractor, any Subcontractor, anyone direct or indirect employee of any of them or anyone for whose acts and omissions they are liable, the indemnification obligation set forth in the immediately preceding paragraph shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or any Subcontractor under workmen's compensation acts, disability benefit acts or other employee benefit acts.

0000 AIR EMPLOYMENT PRACTICES COMPLIANCE

0000 nondiscrimination In connection with the performance of work under the contract, the Contractor agrees as prescribed in Chapter 0000 Division 0000 Title II of the Government Code of the State of California, including at Section 00000 and 000000 Code Section 000000 not to discriminate against any employee or applicant for employment because of race, religious creed, color, national origin, ancestry, physical disability, mental disability, medical condition, marital status, or sex. The aforesaid provisions shall include, but not be limited to, the recruitment, employment, promotion, demotion or transfer, recruitment or recruitment advertising, termination, rates of pay or other compensation, and selection for training, including apprenticeship. The Contractor agrees to post hereafter in conspicuous places, including for employees and applicants for employment, notices to be provided by the County, setting forth the provisions of this discrimination clause. The Contractor further agrees to insert the foregoing provisions in all subcontracts hereunder, except subcontracts for standard commercial supplies or services.

0000 PAYMENT

0. CONTRACT SUM

The Contract Sum is stated in the owner/Contractor agreement ("the Agreement"), Section 000000, and, including authorized addenda thereto, is the total amount payable by the owner to the Contractor for the performance of the work under the Contract Documents.

B. SCHEDULE OF VALUES

Before the first application for Payment, and within eight months after bid opening, the Contractor shall submit to [Design Services, resn@countycal.org](#) a Schedule of Values submitted to the various portions of the work, prepared in accordance and supported by schedule data to substantiate its accounting as the Project Manager may require. This schedule, unless objected to by the Project Manager, shall be used and as a basis for the Contractor's applications for Payment.

C. PROGRESS PAYMENTS

The owner will pay progress payments to the Contractor upon completion of portions of the work, as covered by the Contract Documents, in accordance with established owner procedures. Before submitting an application for Payment on Progress, the Contractor shall receive in agreement with the Project Manager in consultation with the Architect concerning the percentage complete of the work and the dollar value for which the application for Payment will be submitted.

On or about the twelfth month after the date of the contract, the Contractor shall submit to the Project Manager an itemized application for Payment, notarized if required, supported by satisfactory substantiation of the Contractor's right to payment as the owner or the Project Manager may require, including appropriate updates to the Construction Schedule, and reflecting retention, if any, as provided elsewhere in the Contract Documents. Payment is expressly conditioned upon submission of the Contractor to condition and unconditioned orders and release when rights upon progress payment as the owner or the Architect may require. Order and Release forms must be submitted in forms approved by the owner. Copies shall be submitted into Civil Code Section 8130.01, including.

Unless otherwise provided in the Contract Documents, payments shall be made on account of materials or equipment not incorporated in the work not delivered and sitom stored at the site and, if approved in advance by the owner, payments may also include work of materials or equipment sitom stored at some other location agreed upon in writing. Payments for materials or equipment stored on or at the site shall be conditioned upon submission of the Contractor to the owner or such other procedures satisfactory to the owner to establish the owner's title to such materials or equipment or otherwise protect the owner's interest, including appropriate insurance and transportation to the site for those materials and equipment stored at the site.

The Contractor warrants that title to work, materials, and equipment covered by an application for Payment will pass to the owner either by incorporation in the construction or upon receipt of payment by the Contractor, whichever occurs first, free and clear of all liens, stop notices, claims, security interest or encumbrances, hereinafter referred to as "liens" and that no work, materials or equipment covered by an application for Payment will have been covered by the Contractor, or any other person performing work at the site or furnishing materials and equipment for the Project, subject to an agreement under which an interest therein or an encumbrance thereon is retained by the seller or otherwise imposed by the Contractor or such other person.

On or about the twelfth month after the date of the contract, the owner shall pay to the Contractor ninety percent of the dollar value of the work as completed and approved by the Project Manager. The balance of the percent of the estimate shall be retained by the owner until the time of

in acceptance as said. In the case the percent of retention, the Contractor shall substitute securities as provided herein.

- a. If the owner does not pay the Contractor within thirty days after receipt of an undisputed and properly submitted payment request or progress payment, including that portion of the independent designated contract retention earnings, then the owner shall pay interest to the Contractor as provided in Public Contract Code Section 23-21. Said interest penalty is the same recourse of Contractor and Contractor shall have no right to stop the work or anticipated work if no payment has been received, nor shall the contract completion time be extended, nor shall the Contract Sum be increased in any way, including any reason for costs incurred by Contractor, except to the extent of said interest payment.
- b. Pursuant to Public Contract Code Section 23-21, in the event of a dispute between the owner and Contractor, the owner shall withhold from the independent work payment not to exceed one hundred and fifty percent of the disputed amount. Except as so provided, the owner shall release the retention withheld within sixty days after the date of completion of the work, as "completion" is defined in Public Contract Code Section 23-21. In the event that retention payments are not made within the time periods required in Public Contract Code Section 23-21, the owner shall be subject to the interest provisions of Public Contract Code Section 23-21.
- c. Security Substitutions and Escrow for Monies Withheld to Insure Contractors Performance. Pursuant to Public Contract Code section 23-21, the Contractor shall deposit in an escrow, equivalent securities or monies withheld to ensure performance and once said monies paid directly to Contractor, or, in the alternative, once the owner deposit said monies directly into an escrow. Upon the closing of the escrow, Contractor shall pay to each Subcontractor, not after than ten days after receipt of the closing payment, the respective amount of interest earned, net of costs attributed to retention withheld from each Subcontractor, on the amount of retention withheld to insure the performance of the Contractor. An escrow established pursuant to this article shall be in state or federally chartered bank, savings or the same expense of the Contractor, and shall be established in an escrow agreement in substantiated manner.

Bein Escrow Agent

ESCROW AGREEMENT FOR SECURITY DEPOSITS IN LIEU OF RETENTION

This Escrow Agent is made and entered into and between the County of Fresno, hereinafter called "Owner", and the Contractor, hereinafter called "Contractor", and the Escrow Agent, state or federally chartered bank in California, hereinafter called "Escrow Agent".

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

1. Pursuant to Section 5300 of the Public Contract Code of the State of California, Contractor has the option to deposit securities in Escrow Agent as a substitute for retention earnings required to be withheld by Owner pursuant to the Construction Contract entered into between the Owner and Contractor for the construction of the project described in the contract, and dated [blank] hereinafter referred to as the "Contract". Alternatively, on written request of the Contractor, the Owner shall make payments of the retention earnings directly to the Escrow Agent. When Contractor deposits the securities as a substitute for Contract earnings, the Escrow Agent shall notify the Owner within ten business days of the deposit. The amount of the securities at the time of the substitution, as agreed by the Owner, shall be at least equal to the cash value of the securities required to be withheld as retention under the terms of the contract between Owner and Contractor. In the event the Owner determines that the securities are not adequate, it shall notify Contractor and Escrow Agent, and Contractor shall deposit additional securities as further determined by the Owner. Securities shall be held in the name of the Owner and shall designate the Contractor as the beneficiary.
2. Securities eligible for investment under subdivision (c) of the above-referenced Section 5300 shall include those listed in Section 5300 of the Government Code, and shall also include bonds or notes and other certificates of deposit, interest-bearing demand deposit accounts, and standing letters of credit. Deposit of any other type of security shall be permitted only if agreed to by the Contractor and the Owner, evidenced on an addendum to this agreement executed by both the parties hereto.
3. Upon the deposit of adequate securities, Owner shall be deemed to have agreed to the Contractor's schedule of work and shall be deemed to have agreed to the Contractor's provisions.
4. When the Owner, at Contractor's written request, makes payments of retention earnings directly to the Escrow Agent, the Escrow Agent shall hold the same for the benefit of the Contractor until such time as the escrow created under this contract is terminated. The Contractor shall direct the investment of the payments into securities. Afterward and conditions of this agreement and the rights and responsibilities of the parties shall be applicable and binding upon the Owner upon the Escrow Agent directly.

1. Contractor shall be responsible for payment of all fees and the expenses incurred by Escrow Agent in administering the Escrow Account and the expenses of the Owner. The Owner, Contractor, and Escrow Agent shall determine these expenses and payment terms.
1. The interest earned on the securities, or the one-half net accounts held in escrow, and the interest earned on that interest, shall be for the sole account of Contractor and shall be subject to withdrawal by Contractor at any time and from time to time without notice to the Owner.
1. Contractor shall have the right to withdraw from or part with the principal in the Escrow Account on written notice to Escrow Agent accompanied by written authorization from Owner to the Escrow Agent that Owner consents to the withdrawal of the amount to be withdrawn by Contractor.
1. The Owner shall have the right to draw upon the securities or monies not paid directly to Escrow Agent in the event of default by the Contractor. Upon seven (7) days written notice to the Escrow Agent from the Owner of the default, the Escrow Agent shall immediately convert the securities to cash and shall distribute the cash, including any amounts paid directly to Escrow Agent, as instructed by the Owner. Escrow Agent shall not be concerned with the validity of any notice of default given by Owner pursuant to this paragraph, and shall promptly comply with Owner's instructions to pay over said escrowed assets. Escrow Agent shall not be required to interpret the escrowed assets in response to conflicting demands and directions in present or future right of interpretation.
1. Upon receipt of written notification from the Owner certifying that the Contract is final and complete, and that the Contractor has complied with all requirements and procedures applicable to the Contract, Escrow Agent shall release to Contractor all securities and interest on deposit less escrow fees and charges of the Escrow Account. The escrow shall be closed immediately upon disbursement of all monies and securities on deposit and payment of fees and charges.
1. Escrow Agent shall rely on the written notifications from the Owner and Contractor pursuant to Sections 100, 101, 102, and 103 of this Agreement and the Owner and Contractor shall hold Escrow Agent harmless from Escrow Agent's release and disbursement of the securities and interest as set forth above.
1. The entire construction litigation concerning the rights and obligations of the parties to this Agreement shall be governed by the Contract documents and the parties hereto waive the right to provisions of Code of Civil Procedure Section 100.
1. The notices of the persons who are authorized to give written notice or to receive written notice on behalf of the Owner and on behalf of Contractor in connection with the Agreement, and each party's respective signatures are as follows:

On Behalf of Owner:

Title – Business Manager

Name – Lemuel Asprec

Signature

Address 2220 Tulare St, 6th Floor
Fresno, CA 93721

On behalf of Contractor:

Title

Name

Signature

Address

On behalf of Escrow Agent:

Title

Name

Signature

Address

At the time the Escrow Account is opened, the Owner and Contractor shall deliver to the Escrow Agent a duly executed counterpart of this agreement

IN WITNESS WHEREOF, the parties have executed this agreement at their proper offices on the date first set forth above.

Owner:

Title – Steve White, Director

Department of Public Works
and Planning

Signature

Address – 2220 Tulare St, 6th Floor
Fresno, CA 93721

Contractor:

Title

Name

Signature

Address

Escrow Agent:

Title

Name

Signature

Address

End Escrow Agreement

- Itemized Breakdown The Contractor shall submit a financial breakdown of the work, itemized by crafts or sections as designated by the Owner. The Contractor's payment schedule shall be based upon the percentage completion of these items.
- Item Orders The Owner may require the Contractor to submit, within the progress payment request, notarized item orders from each Subcontractor, materials, or equipment supplier. Item orders shall comply with City Code Section 23A, et seq., and the contractor shall thereupon reflect all progress payments previously made.

D. CERTIFICATES OF PAYMENT

- The Project Manager shall submit in seven days after the receipt of the Project Application for Payment, review the Project Application for Payment and either issue a Project Certificate of Payment to the Owner or state in writing as the Project Manager determines the proper date, or notify the Contractor in writing of the reasons for withholding a Certificate provided in Part 1 of this Section 000.
- The issuance of a Project Certificate of Payment shall constitute a representation of the Project Manager to the Owner that, based on the Project Manager's observations of the site as provided herein and the data comprising the Project Application for Payment, the work has progressed to the point indicated and that, to the best of the Project Manager's knowledge, information and belief, the quality and fitness of the work is in accordance with the Contract Documents subject to an examination of the work or concurrence with the Contract Documents upon completion of the work, to the results of any subsequent tests required or performed under the Contract Documents, to minor deviations from the Contract Documents correctable prior to completion, and to any specific qualifications stated in the Certificate and that based upon all current information and information, the Contractor is entitled to payment in the amount certified. However, in issuing a Project Certificate of Payment, the Project Manager shall not be deemed to represent that the Project Manager has made exhaustive or continuous on-site inspections to detect the quality or quantity of the work, has reviewed the construction means, methods, techniques, sequences, or procedures, or has made any examination to ascertain any or all work for which the Contractor has used the monies previously paid in account with the Contract Sum.

E. PROGRESS PAYMENTS

- After the Project Manager has issued a Project Certificate of Payment, the Owner shall pay the payment in the manner and within the time provided in the Contract Documents.

- 1. The Contractor shall promptly pay each Subcontractor upon receipt of payment from the Owner, but not the amount paid to the Contractor on account of such Subcontractors or, the amount to which Subcontractor is entitled, reflecting the percentage retained, if any, the payments to the Contractor on account of such Subcontractors or. The Contractor shall, on appropriate agreement with each Subcontractor, require each Subcontractor to make payments to their Subsubcontractors in similar manner.
- 2. The Project Manager may, on request of any Subcontractor, at the Project Manager's discretion, advise to that Subcontractor, in practice, in writing, the percentage completion of the amounts applied for by the Contractor and the action taken thereon by the Project Manager on account of the same Subcontractor.
- 3. Neither the Owner nor the Project Manager shall be under any obligation to pay or to see to the payment of any claims to any Subcontractor or Material Suppliers except as may otherwise be required by law.
- 4. Neither certification nor progress payment, delivery nor progress payment, nor partial or entire use or acceptance of the Project by the Owner, shall constitute an acceptance of any work not performed in accordance with the Contract Documents.
- 5. PAYMENTS TO THE OWNER
 - 1. The Project Manager may decline to certify payment and may withhold the Certificate in whole or in part to the extent necessary to reasonably protect the Owner, if, in the Project Manager's opinion, the Project Manager is unable to make representations to the Owner as provided herein under Certificates for Payment. If the Project Manager is unable to make representations to the Owner and certify payment in the amount of the Project Application, the Project Manager shall inform the Contractor as provided herein. If the Contractor and the Project Manager cannot agree on a revised amount, the Project Manager may promptly issue a Project Certificate for Payment for the amount for which the Project Manager is able to make such representations to the Owner. The Project Manager may also decline to certify payment or, because of subsequent discovered evidence or subsequent observations, the Project Manager may withhold the whole or in part of any Project Certificate for Payment previously issued to such extent as may be necessary, in the Project Manager's opinion, to protect the Owner from loss because of:
 - a. Defective or not remedied
 - b. Third party claims filed or reasonable evidence indicating probable claim of such claims, including claims of separate contractors
 - c. Failure of the Contractor to make payments properly to Subcontractors, or for labor, materials or equipment
 - d. Architect's determination, based upon reasonable evidence, that the work cannot be completed for the unpaid balance of the Contract Sum

- e.
 - Determine to the owner or another contractor
 - Architect's determination, based upon reasonable evidence, that the work cannot be accomplished in compliance with the Construction Time
 - Persistent failure to correct the work in accordance with the Contract Documents
 - Require the Contractor to submit Construction Schedules or Submittal and Procurement Schedules as required
- i.
 - Require the Contractor to maintain record drawings on a current basis
 - Require the Contractor to submit notified lien notices from subcontractors, vendors, or equipment supplier
 - Require the Contractor to submit certified payroll reports
 - Stop notice served upon the owner.
- Retention in the amount of one thousand dollars (\$1,000) shall be withheld from the Contractor's monthly progress payment for each and every required document not submitted in a timely manner by the Contractor or its subcontractors up to a total of ten thousand dollars (\$10,000). For purposes of this Paragraph, the term "required document" includes, but is not limited to, certified payrolls, labor compliance documents, Disadvantaged Business Enterprise documents, and any other information or documents required to be submitted by the Contractor or its subcontractors under the terms of this agreement or pursuant to applicable federal, state, or local laws or regulations. The retention provided for in this Paragraph shall be in addition to any other deduction or retention provided under this agreement, and shall be in addition to any other remedy or consequence provided in the contract for anti-emission non-compliance document. Such retention shall be in effect until the time that the required documents have been submitted by the Contractor or its subcontractors and have been determined by the owner to be complete and acceptable as to form.
- When the grounds as noted above are resolved, payment shall be made for all amounts withheld on the basis thereof.

1. COMPLETION AND ACCEPTANCE

1. Upon completion of the Contractor's obligation under the Contract, the Contractor shall submit to the Project Manager a written notice that the work is ready for inspection and acceptance, and shall also submit to the Project Manager an application for Payment. Upon receipt, the Project Manager will promptly schedule inspection. When the Project Manager finds the work acceptable under the Contract documents and the Contract is completed, the Project Manager will issue a Project Certificate for Payment which will certify the independent due to the Contractor. This certification will constitute a representation that, to the best of the Project Manager's knowledge, information and belief, and on the basis of observations and inspections, the work has been completed in accordance with the Terms and Conditions of the Contract Documents and that the entire amount should be due to the Contractor, and noted in said Certificate, is due and payable. The Project Manager's certification on said Project Certificate for Payment will constitute a further representation that the conditions precedent to the Contractor's being entitled to independent as set forth herein have been satisfied.
2. Neither the independent nor the retention of the subcontractor shall constitute the Contractor's obligation to the Project Manager which shall constitute the Contractor's obligation to the Project Manager for the work, and after indebtedness connected with the work or the Contractor's obligation to the owner's property is paid in whole or in part, shall be paid or otherwise satisfied, and consent to release, in whole or in part, the independent, and after due establishment of payment or satisfaction of all obligations, shall be receipts, releases and orders of release arising out of the Contract, to the extent and in such form as may be designated by the owner. If the Subcontractor refuses to furnish a release or order required by the owner, the Contractor shall furnish a bond satisfactory to the owner to indemnify the owner against any such lien. The bond cannot be from the original subcontract insurer or the Project or any affiliate of the original subcontract. If the subcontract lien remains unsatisfied after payments are made, the Contractor shall be bound to the owner and shall be liable for the entire amount of the bond in discharge of such lien.
3. The provisions of this agreement, including without limitation those establishing obligations and procedures, shall remain in full force and effect notwithstanding the signing or acceptance of independent, and the signing of independent shall constitute a further acknowledgment of the owner.
4. Upon completion and acceptance of the work or as otherwise required, and upon the release of all claims against the owner as specified, the owner shall issue a written notice of Completion to the County Recorder as to the entire amount of the bond.

1. In payment of the release of the contract, the Contractor shall release the contract to the Owner, after the date of acceptance of the contract by the Owner, provided, that Owner may withhold from the Contractor, in the event of dispute between Owner and Contractor, retentions in, and shall not exceed, one hundred percent of the amount of the contract. At the Contractor's option, the Owner may release retention upon receipt of an unconditional release of the contract by the Contractor and its Contract Documents.
2. The Contractor shall be responsible for the Contractor's obligations to the Owner on the date of the contract, and the Contractor shall be responsible for the Contractor's obligations to the Owner, through appropriate contractual arrangements with its subcontractors, vendors, and suppliers, to ensure compliance with the contract.
3. The Contractor shall be responsible for the Contractor's obligations to the Owner, after the date of acceptance of the contract by the Owner, provided, that Owner may withhold from the Contractor, in the event of dispute between Owner and Contractor, retentions in, and shall not exceed, one hundred percent of the amount of the contract. At the Contractor's option, the Owner may release retention upon receipt of an unconditional release of the contract by the Contractor and its Contract Documents.

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- A. The Owner, its agent in addition to the Contract, may order changes in the work or in the general scope of the Contract consisting of additions, deletion, or other revisions. These changes in the work shall be performed under the applicable conditions of the Contract Documents.
- B. CONTRACT CHANGE ORDER. A Change Order issued to add or delete work to the Contract. An executed Contract Change Order immediately becomes a part of the Contract. A Change Order is a written order to the Contractor directed to some part of the project and its execution, issued after execution of the Contract. A Change Order signed by the Contractor indicates the Contractor's agreement to the change, including any adjustment in the Contract Sum or the contract time, and the amount in settlement of costs, direct, indirect, and overhead related to the work authorized by the Change Order.
- C. The Owner may add compensation to the Contractor's fee presented in the Contract if the expense is incurred, and the amount is provided herein. The Contractor is required to suspend work until the amount is provided. The Contractor is directed, even if it is disputed, to consider the amount as a loan. The Contractor shall be considered to have accepted the loan unless the Contractor Change Order has been issued or a written notice of objection has been made by the Contractor.

- D. Costs shall be itemized breakdown of all costs, materials, fees, taxes, equipment rental, etc., for each portion of the project. The Change Order including any Subcontractor's itemized breakdown, plus not more than ten percent for contractor's profits and administration.
1. Under no circumstance shall the total cost of the project for General Conditions, General Requirements, Supervision, Overhead and Profit, including all taxes and profit, exceed a cost of ten percent of the total project cost, including all taxes and profit, for all parties involved in the project.
- Work done by Contractor's own forces, not including bond and insurance premiums, shall not exceed a cost of ten percent of the total project cost.
 - Work done by subcontractors, suppliers, including bond and insurance premiums, shall not exceed a cost of ten percent of the total project cost.
 - General Conditions, General Requirements, Supervision, Overhead and Profit for Contractor on Subcontractor's work, shall not exceed a cost of ten percent of the total project cost.
2. The cost or credit to the owner resulting from a change in the project shall be determined in the following manner:
- Based on acceptance of the work as proper itemized and supported by sufficient substantiated data to permit verification.
 - Based on prices stated in the Contract Documents or subsequent agreed upon.
 - Based on cost to be determined in a manner agreed upon by the parties and based on acceptance of the cost or percentage fee.
3. Based on method provided under Article 1.1.
- E. The amount of credit to be allowed to the Contractor to the owner, as controlled by the Project Manager, for any deletion or change that results in a decrease in the Contract Sum shall be the amount of the actual cost. All net additions and credits concerning related to any substitutions are included in the net change, the amount of the overhead and profit shall be based on the basis of the net increase, including, with respect to that change.

ARTICLE 1. COSTS TO THE CONTRACTOR

- a. In the event the methods set forth in Section 1.04D, is agreed upon, the Contractor, provided that a written order signed by the owner is received, shall promptly proceed with the work. The cost of such work shall be determined by the Project Manager, on the basis of reasonable expenditures or savings of the project in the work attributable to the change, including, in the case of an increase in the Contract Sum, not more than ten percent of the net increase in cost and profit. In such case, and as under Section 1.04D, Paragraph, the Contractor shall keep and present, in such form as the owner or the Project Manager may prescribe, an itemized account of the cost of the work together with appropriate supporting data or inclusion in a Contract Change Order. Unless otherwise provided in the Contract Documents, cost shall be limited to the following:
 - a. Labor Cost is the cost of labor for the workers including working time expended in the contract and direct overhead and the extra work, whether employed by the Contractor, or Subcontractors and Specified forces or not. Labor Cost shall include:
 - a. Contractual fees paid to the workers, plus employer payments for an amount of the workers for death and disability, pension, vacation, and training. It is required by the Project Manager, certified payroll shall be submitted into extra work reports as verification of fees paid to the workers.
 - b. A Labor Surcharge of ten percent shall be added to the percent of the cost of labor and working time added to the contract cost as defined above. The Labor Surcharge shall constitute compensation for employees imposed by State and Federal laws, including Workers Compensation Insurance, Social Security, and Unemployment Insurance.
 - c. Subsistence and Travel Allowance is contractually paid to the workers. Labor Surcharge shall be added to Subsistence and Travel Allowance.
- b. Equipment Cost is the payment made for the equipment used in the project once the extra work.
 - a. Equipment valued at three hundred dollars or less shall be considered as self-owned, and no payment shall be made therefor.
 - b. Equipment costs shall be paid in accordance with the rates listed in the "CalTrans Equipment Rental Rates, County of Fresno, Department of Public Works and Planning," in effect at the time of bid, available from the Department, State of California, Fresno County Public Building, 1000 Tower Street, Fresno, CA 93701.

- c. In the event that an off-the-shelf equipment to be used is not listed in the price publication, the renter shall agree upon in writing with the Contractor and CM where the extra cost is borne.
- Materials Cost is the present value for materials incorporated into the work.
- Materials Cost shall include sales tax, freight, and delivery charges, less any available discounts whether or not said discounts are taken.
- Materials Cost shall be based upon supplier's or manufacturer's invoice. Invoices or other satisfactory evidence of cost are not furnished within sixty days of delivery or within fifteen days after acceptance of the Contract, whichever occurs first, then the Project Manager shall determine the Materials Cost, in his/her sole discretion, on the basis of reasonable information and in his/her considered experience.
- Specified Services are those services or items described, or agreed upon by the Contractor and the Project Manager, cannot be performed by forces of the Contractor or other subcontractors, and must be performed by a specialist.
- Specified Services may be paid for by invoice if the established practice of the specified work industry does not provide complete itemization of labor, Equipment, and Materials Costs.
- Markup for Profit, office and field office overhead, Bond Premium, insurance, taxes, and supervision shall be added to the total of Labor Cost, Equipment Cost, Materials Cost, and Specified Services.
- Markup shall be added only once on an Extra Work at Force Account, regardless of the number of contractors and subcontractors involved.
- It is recognized that individual contractors and subcontractors have different overhead costs, profit requirements, and bond premium rates. The amount to be added to Extra Work at Force Account shall include compensation for profit, overhead and bond premium without distinction of and these items.
- c. The Markup to be added for Extra Work at Force Account on this Project shall be fifteen percent of the sum of Labor, Permitted and Permitted Bonds for Contractor and

- Records shall be maintained by the Contractor and Subcontractors in such a manner as to provide a clear distinction between the costs of Extra Work paid for on a lump sum basis and the costs of other operations. From these records, the Contractor shall furnish the Project Manager a completed extra work report for each day's extra work to be paid for on a lump sum basis. Extra Work reports shall include the materials used, equipment rental charges, and specified services costs, and shall provide names or identifications and classifications wherever, the appropriate copy, and hours worked. Extra Work reports shall be copied and submitted to the Project Manager for verification and signature. Extra Work reports shall be signed by the Contractor or his authorized representative.
- If the Contractor disputes the Architect's cost determination, the Contractor may initiate a claim in compliance with the Claims and Disputes Resolution provisions of these General Conditions.

1. SITE CONDITIONS

- A. Where investigations have been conducted under existing conditions on site, including subsurface conditions, such investigations are made for the purpose of design and for the information of bidders. The results of such investigations represent only the statement of the owner as to the circumstance and character of conditions actually encountered on the owner during the investigations. The owner makes no warranty or warrant, express or implied, that the conditions indicated are representative of conditions existing throughout the site for Project or in part of it, or that anticipated conditions will not occur.
- B. Excavation shall be performed on an "unclassified basis" that is, shall include the removal of all materials encountered including earth or rock formations, regardless of the type or hardness thereof, or groundwater conditions in the excavation, the cost of such excavations being included in the Contract Sum. Unclassified excavation shall include drilling or testing operations.
- C. If site conditions are discovered that materially differ from previous information that the Contractor has received, and that could not have been discovered by the Contractor through prudent and reasonable investigation prior to accepting the Contract Sum for the work, the Contractor shall be compensated for additional costs incurred in dealing with the unknown site conditions, but only to the extent that such previous unknown and undiscovered site conditions cause the Contractor to incur costs in addition to the Contract Sum for that portion of the work. The Contractor must be able to demonstrate clearly the original Contract Sum for that portion of the work and Contract Change Orders applicable to that portion of the work and the additional costs incurred as a direct result of the unknown site conditions. Any additional costs over and above the amount of the Contract Sum for that portion of the work shall be compensated upon receipt of a written application to the Project Manager.

1.00 REQUEST FOR REEVALUATION OF COSTS

- A. If the Contractor considers a Request for Reevaluation of Costs is justified for an increase in the contract time, the Contractor shall promptly, upon first occurrence of the condition giving rise to the request, provide the Project Manager and Owner written notice of such condition and circumstance. This notice shall be given to the Contractor before proceeding to execute the work, except in emergency endangering life or property, in which case the Contractor shall proceed in accordance with the Emergency provisions of these General Conditions. Such request shall be valid unless so ordered. A Contract Change Order shall be required to authorize any change in the contract time resulting from such request for reevaluation of cost.
- B. If the Contractor requests that additional cost of time is included because of, but not limited to, any and written interpretation pursuant to Section 1.00, and an order of the Owner to stop the work pursuant to Section 1.00 where the Contractor has not at work, or any such order of the Project Manager as the Owner's agent, and any written order or order change in the work issued pursuant to Section 1.00, the Contractor shall file such request for reevaluation of cost as provided in Section 1.00.

1.00 MINOR CHANGES TO THE WORK

The Project Manager may authorize to order minor changes in the work not included in the contract or extension of the contract time and not inconsistent with the intent of the Contract Documents. Such changes shall be enacted by written order issued to the Project Manager, and shall be binding on the Owner and the Contractor. The Contractor shall carry out such written orders promptly.

1.00 SUCCESSORS AND ASSIGNS

The Owner and the Contractor, respectively, and their assigns, their partners, successors, assigns, and representatives to the other party hereto and to the partners, successors, assigns, and representatives of each other party with respect to commitments, agreements, and obligations contained in the Contract Documents. Neither party to the Contract shall assign the Contract or subcontract it to any other party without the written consent of the other.

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The Contractor shall not assign or sublicense the right to receive fee income under the contract without the written consent of the Editor/Controller. The Controller may assign or sublicense the right to receive fee income to appropriate persons in order to fulfill the Controller's responsibilities and to provide services provided for in the contract and participate in the fee income. Whether assigned or not, licensee shall be bound by the Controller's responsibilities for the completion of the work in the event that the Contractor should be in default thereon.

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- A. The Contractor warrants to the Owner that all materials and equipment and the work shall be furnished under this Contract without any other conditions specified, and that the Contractor shall be responsible for all costs and defects, and in connection with the Contract Documents, for a period of one year after the date of acceptance of the work as specified in the Notice of Completion, unless a longer period is otherwise specified. All manufacturer's warranties required by the Contract Documents shall commence on the date of the final Notice of Completion or the expiration date necessary to complete the performance under separate contracts. It shall be the Contractor's responsibility to ensure appropriate contract arrangements with subcontractors, subcontractors, and suppliers, to ensure compliance with all requirements. The Contractor shall not be liable for these requirements, including substitutions not properly reviewed and approved, shall be considered defective. It is required by the Project Manager, the Contractor shall provide satisfactory evidence as to the kind and quality of materials and equipment.
- B. Repairs or changes are required in connection with the warranted work within the warranted period, which, in the opinion of the Project Manager is rendered necessary as the result of the use of materials, equipment, or workmanship which are inferior, defective, or not in accordance with the Contract Documents, the Contractor shall, upon receipt of notice from the Owner, and without expense to the Owner, make good the defective condition in every particular. The Contractor shall, upon receipt of notice, correct all defects therein and shall be held responsible to the adjoining or site, or equipment or contents thereof, which, in the opinion of the Project Manager, is the result of the use of materials, equipment, or workmanship which are inferior, defective, or not in accordance with the Contract Documents and shall be held responsible for materials, or the equipment and contents of said adjoining or site damaged in connection with the warranty.
- C. If the Contractor disturbs any work warranted under another contract in connection with the requirements of the contract or the warranty, the Contractor shall be required to restore the same to the condition it was in before the work was disturbed and shall be held responsible for the same as if it was warranted under such other contract.
- D. The Owner shall not be responsible for the defects corrected by the Contractor, after notice, and shall proceed promptly to comply with the terms of the warranty and the Contractor and its subcontractors shall be held responsible for all costs and expenses incurred in connection therewith.

- E. specifications Intentees apply to definite parts of the contract that are stipulated in the Contract Documents subject to the terms of this Article. In drafting the first order, the Contractor shall include the specific intention.

RESP SIBIT R D M E

- A. Neither the Owner, the Architect, nor any officer or employee of the Contractor or officer or employee thereof, within the limits of its obligation the Contractor is indemnified, nor shall the Contractor be responsible for or account for in any manner, for any loss or damage that may happen to the Contractor or any part thereof or for any other materials or other things used or employed in performance of the Contractor's obligations to the Owner or persons, either personally or the public, for damage to property from any cause which might have been prevented by the Contractor, or his/her servants or agents, or anyone employed by the Contractor, against any and all injuries or damages to persons and property the Contractor and its subcontractors shall be held responsible for.
- B. The Contractor shall be responsible for and indemnify the Owner for any damage to any person or property resulting from defects or omissions or from any cause whatsoever during the progress of the work or at any time before the issuance of the Certificate of Completion.
- C. The Contractor shall indemnify and hold harmless the Owner, the Project Manager, the Architect, and each of their respective officers and employees, from all claims, suits or actions of every kind and nature whatsoever, or cost of, or an account of any injuries or damages received or sustained by any person or persons, resulting from any act or omission of the Contractor or his/her servants or agents, in the construction of the work or in any consequence of any negligence in, according to the scope, in improper materials used in its construction, or any or an account of any act or omission of the Contractor or his/her agents in the performance of Contractor's obligations under the Contract Documents. In addition to the foregoing, the Contractor shall be held responsible for the performance of the Contractor under and on the part of the Contractor as shall be considered necessary by the Owner and shall be retained by the Owner until disposition has been made of all claims, suits, or actions or damages as may arise.

☐ ☐ RITTE ☐ ☐ TICE

Subject to no additional requirements that may be applicable to claims under the
 immediate provisions of article 4.00 RESOLUTION OF CONTRACT CLAIMS AND
 DISPUTES, any service, when required, written notice shall be deemed to have
 been delivered if delivered in person, to the individual or person for the firm or entity
 or to an officer of the corporation or other it is intended, or is sent by registered or
 certified mail to the listed address of that entity or the attention of such individual.

1. If the contract disputes the written response or either designee, or either fails to respond within the time prescribed, the contract or designee, either designee, in writing, either within fifteen (15) days of receipt of the Owner (or his/her designee's) response or within fifteen (15) days of the Owner (or his/her designee's) failure to respond within the time prescribed, respectively, and demand an in-person conference to meet and confer or settlement of the issues in dispute. Upon demand, the Owner or designee's scheduled or meet and confer conference within thirty (30) days or settlement of the dispute.
2. If within ten (10) business days following conclusion of the meet and confer conference, an unpaid portion of the contract remains in dispute, the contract shall be subject to mediation, as that term is defined in Public Contract Code Section 99999.9.
3. Following the conclusion of the meet and confer conference and the mediation process, the contract or a portion thereof remains in dispute, the contract or a portion thereof pursuant to Chapter 9 of the Code of Ordinances of the City of Boulder and Chapter 9 of the Code of Ordinances of the City of Denver, the provisions of the period of time within which the contract or a portion thereof shall be subject to mediation shall be the time the contract or a portion thereof is denied, including the period of time within which the meet and confer conference and mediation process as described in the immediately preceding paragraphs and of this Section D.
4. In the event of any perceived conflict between the provisions of the procedure set forth in this article and the provisions of the Public Contract Code Section 99999 and Section 99999, et seq., the statutory provisions shall control and in the event of any perceived conflict between the provisions of Section 99999 and Section 99999, et seq., the provisions of Section 99999 shall control.

E. PROCEDURES FOR CIVIL ACTIONS TO RESOLVE DISPUTED CLAIMS.
Notwithstanding Mediation or any other process, not earlier than thirty (30) days, following the time the responsive pleading, the court shall submit the matter to non-binding mediation unless ordered or stipulation of the parties. The mediation process shall provide for the selection within fifteen (15) days of the parties of a disinterested third person as mediator, shall be conducted within thirty (30) days of the selection, and shall be concluded within fifteen (15) days of the conclusion of the mediation unless the requirement is extended upon a good cause shown to the court. The parties shall select a mediator within the ordered period, and upon petition the court to appoint the mediator.

Mediation. If the matter remains in dispute, the case shall be submitted to mediation pursuant to Chapter 9 of the Code of Ordinances of the City of Boulder, not later than Section 99999 of the code. The Civil Discovery Act, article 9 of the Code of Ordinances of the City of Boulder, Chapter 9 of the Code of Ordinances of the City of Denver, shall apply to the proceeding conducted under this

section consistent with the rules pertaining to adjudication. Arbitrators shall be experienced in construction.

Appeals as provided in state specific Public Contract Code section and Code of Civil Procedure section shall, in part, appeal in arbitration shall does not act in the same manner and shall, in addition to payment costs and fees, also pay the attorneys fees in appeal the other party.

- a. CLAIMS AND DISPUTES EXEMPT FROM OTHER REQUIREMENTS. The requirements and procedures imposed by this article do not apply to:
 - a. Incidents of the owner
 - a. Incidents of or respecting personal injury or death or reimbursement or other compensation arising out of or resulting from injury or personal injury or death
 - a. Incidents of dispute relating to stop payment requests or stop notices
 - a. Incidents of dispute related to the approval, reissuance, approval, or substitution of subcontractors, regardless of tier, and suppliers.
- a. PORTION OF DISPUTED PORTION OF CLAIM. Owner shall pay the portion of the claim that is undisputed except as otherwise provided in the contract.
- a. COUNTERCLAIM OR CROSS CLAIM. In the event of a disputed claim or other dispute between the owner and the Contractor, the Contractor shall not stop or discontinue the performance of the contract in order to counterclaim directed at the owner, and the dispute shall be resolved by court after completion of the work. However, Contractor may suspend its disputes in accordance with the provisions of this Section.
- I. SUIT IN RESORT COURT. Any litigation arising out of this Contract shall be brought in Resort Court and Contractor hereby agrees to the relevant provisions of Civil Code of Civil Procedure Section.

PERFORMANCE BOND, LABOR AND MATERIAL PAYMENT BOND, AND
WARRANTY BOND

- a. The Contractor shall furnish Performance Bond in the amount of one hundred percent of the Contract Sum, and Payment Bond in the amount of one hundred percent of the Contract Sum and one year of current Bond in the amount of ten percent of the Contract Sum, which is the cost of the bond that shall be paid to Contractor or its surety or approved under the Contract once the Project has been completed and the work has been accepted by the County.

- B. Bonds required, Letter Bid bonds, Performance, Payment, Current, or other bonds, shall be issued by an admitted surety insurer authorized by the California Insurance Commissioner to transact surety insurance in the state. The same admitted surety insurer shall issue the Bid Bond, Performance Bond, Payment Bond, and Current Bond. The payment, performance, and current bonds required by these specifications shall neither be accepted nor approved by the owner unless the bonds are underwritten by an admitted surety and the requirements of California Code of Civil Procedure section 910.000 are met. The bonds shall include a provision of address, phone number, and contact person for the admitted surety insurer. The owner further reserves the right to satisfy itself as to the acceptability of the surety and the bond amount. Upon request of the owner, the bidder shall submit the following documents:
- a. The original, or a certified copy, of the unrevoked appointment, power of attorney, powers, or other instrument authorizing the person who executed the bond to do so.
 - b. A certified copy of the certificate of authority of the insurer issued by the California Insurance Commissioner.
 - c. A certificate from the contractor that the certificate of authority has not been surrendered, revoked, canceled, annulled, or suspended, or in the event that it has, that renewed authority has been granted.
 - d. A financial statement of the assets and liabilities of the insurer to the end of the quarter ending or prior to the month next preceding the date of the execution of the bond, in the form of an officers' certificate as defined in Corporations Code section 910.

000 RIGHTS AND REMEDIES

- a. The duties and obligations imposed by the Contract Documents and the rights and remedies herein shall be in addition to, and not a limitation on, the duties, obligations, rights, and remedies otherwise imposed or available by law.
- B. No action or failure to act by the owner, or by the Project Manager or Architect, regarding a deficiency, breach, or default in performance by the Contractor under the Contract Documents, shall be deemed or construed to constitute acquiescence by the owner in connection therewith or with regard to any subsequent deficiency, breach, or default in performance by the Contractor, nor shall any such prior act or failure to act by or on behalf of the owner be deemed or construed as a waiver of any rights in favor of the owner regarding any such deficiency, breach, or default in performance by the Contractor, regardless of the similarity to the prior incident or circumstance when no action was taken regarding any alleged deficiency, breach, or default in performance by the Contractor.

TIME, DEMOS, AND IDENTIFIED DOMAINS

A. DEFINITIONS

- Unless otherwise provided, the contract time is the period allotted in the Contract Documents for completion of the work, including authorized extensions thereto.
- The Date of Commencement of the work is the date established in the Notice to Proceed.
- The Date of Completion of the work is the date on which the work is certified as complete by the Project Manager as specified in the Notice of Completion.
- The term "day" as used in the Contract Documents shall mean calendar day unless specifically designated otherwise.

B. PROGRESS AND COMPLETION

- Time is of the essence regarding the time limits stated in the Contract Documents. By execution of the agreement, the Contractor covenants that the contract time is a reasonable period for performance of the work.
- The Contractor shall begin the work on the Date of Commencement. The Contractor shall not delay, except as agreed or instructed by the Owner in writing, preclude or commence operations on the site or elsewhere prior to the effective date of insurance required herein to be furnished by the Contractor. The Date of Commencement of the work shall be deemed to be the effective date of such insurance.
- The Contractor shall carry the work forward expeditiously with adequate forces and shall achieve Completion of the work within the contract time.

C. DEMOS AND EXTENSIONS OF TIME

- Demos in prosecution of parts or classes of the work that are not deconstructed to prevent or delay completion of the entire Project or specific milestones within the contract time are not "unavoidable demos" for purposes of this section.
- In cases, the time authorized for extension of the contract time shall be no greater than the number of days directly attributable to the event or circumstances of the cases unavoidable demos in the completion of the Project. Contractor shall be entitled, in the case of unavoidable demos, to an extension in the contract time, but not to an increase to the Contract Sum. "Unavoidable demo" for this purpose shall be defined as follows:

- b. Unavoidable Materials. That materials or articles covered in the Contract Documents are not obtainable within the time required for time completion provided that such materials or articles were listed on the Contract in the schedule required in Section 00000000 CONTRACTOR'S CONSTRUCTION SCHEDULE that the Contractor demonstrates that the unavailability of the material is in fact the cause for the delay, and could not have been avoided upon appropriate adjustment in the Construction Schedule and that the unavailability of such materials is due to circumstances beyond the Contractor's control. In such case or delay is demonstrated pursuant to this subsection, the Owner, at its sole discretion, may grant a time extension.
- c. Force Majeure. That delays in construction were resulted from circumstances beyond the control of the Contractor and which the Contractor could not have provided against or the exercise of reasonable care, prudence, foresight, and diligence. Unavoidable delays within the meaning of this subsection shall include those caused by acts of God, war, insurrection, civil disorder, fire, floods, epidemic, or strikes.
- c. Unseasonable Weather. An extension of contract time shall be granted due to weather which is unusual for the area currently in progress, upon the determination of the Owner that the weather conditions in fact caused the delay in completion of the Project and that such weather conditions were not, and could not in the exercise of reasonable diligence, have been foreseen by the Contractor. Seasonable weather that, in the exercise of reasonable foresight and diligence, should be expected in the area at the time when in question is not cause for an extension of time.
- d. Time Extensions Due to Contract Change Orders or Other Authorizations. A time extension shall be granted due to additional work that results in a delay in the Project caused by the appropriate Owner Contract Change Order or other authorization. The Contractor shall be entitled to a contract time extension Change Order when when the extra work is demonstrated by the Contractor to have caused a delay in the Project.
- e. Owner-Caused Delays. In the event that the Project is delayed by acts of the Owner not authorized by the Contract Documents which the Contractor demonstrates either were caused by unavoidable delay, the Contractor shall be entitled to a contract time Change Order to offset the extra time incurred by the Contractor. The Contractor shall not be entitled to adjustments in the Contract Sum. Extra time shall be limited to that which is directly identified as critical to the delay.

- The Contractor specifically agrees that a time extension as provided herein is its sole remedy for owner-caused delays, and agrees that no claim for delay and/or additional costs, nor claim for acceleration of the time or performance.
- The Contractor shall not be entitled to an contract time extension nor Contract Sum adjustment for owner-caused delays if the owner has acted within the time in its specified Contract Documents.

D. NOTICE OF DELAYS

- Contractor shall notify the Project Manager promptly whenever the Contractor perceives an event or circumstance that it may demand the prosecution of the Work and in Contractor's opinion may provide grounds for an extension, and shall in the event notify the Project Manager immediately upon the occurrence of such event. The Contractor shall take immediate steps to prevent, if possible, the occurrence or continuance of the event. If this cannot be done, the Project Manager shall determine how and the delay shall continue and to what extent the prosecution and completion of the Work are being delayed thereby. Such notification shall specify with detail the cause asserted by the Contractor to constitute grounds for an extension. Within the Contractor to submit such a notice within ten working days after the initial occurrence of the event and no rise to the delay shall constitute a waiver by the Contractor of any request for a time extension, and no extension shall be granted as a consequence of such delay.
- If the Contractor believes that the delay in prosecution in the Work will result in an unduly long delay in completion of the entire Project, the Contractor shall submit evidence to support that belief, together with its request for a time extension. Such evidence shall include a demonstration that the delayed portion of the Work is critical to the Critical Path Schedule of the entire Project. The Contractor shall submit a proposed revised Construction Schedule, which accounts for the delay in completion of the entire Project caused by the delay in prosecution of the Project, and includes a revised Critical Path demonstration of the Project which is completed within the proposed revised contract time.

E. INVESTIGATION PROCEDURE

- Upon receipt of a request for Time extension, the Project Manager shall conduct an investigation of the facts asserted by the Contractor to constitute grounds for an extension. The results of this investigation shall be reported by the Project Manager to the Contractor and shall indicate whether or not the delay is or is not against such extension to the owner. The performance of this investigation by the Project Manager shall not be construed as direction or recommendation to the Contractor regarding scheduling of the Work. Scheduling of the Work is the sole responsibility of the Contractor.

- The Project Manager may, in his/her sole discretion, defer this request pending the receipt of the necessary information and extensions due to the Contractor into a periodic or final Contract Change Order request.
- Upon receipt of the Project Manager's request for a time extension, the Contractor may either withdraw its application for extension, or request that it be scheduled for action by the Owner. If the Owner disallows the request, there shall be no compensation of any kind for the time during which the request is pending, and the Contractor shall proceed in expediting to complete the work in the time specified.
- If the Owner approves the time extension Contract Change Order, the new Construction Schedule shall be submitted by the Contractor and approved by the Owner. The schedule shall be deemed to extend the original Construction Schedule approved by the Owner. Thereafter, the extended Construction Schedule shall have the same force and effect as the original approved Progress Schedule.
- The revised Construction Schedule must be submitted within seven calendar days of the date on which the Owner approves the change.
- The Contractor agrees that the Owner's determination as to the existence or grounds for an extension, and the duration of any such extension, shall be final and binding upon both Owner and Contractor.
- DISCRETIONARY TIME EXTENSION FOR BEST INTEREST OF OWNER
 - The Owner reserves the right to extend the contract time for completion of the work if the Director of Public Works and Planning or designee determines that such extension is in the best interest of the Owner.
 - In the event that such discretionary extension is made at the request of the Contractor, the Owner shall have the right to charge to the Contractor, for and on behalf of, as the Board may deem proper, the actual cost to the Owner for engineering, inspection, supervision, contract administration, incidentals, and other increased expenses that accrue during the period of such extension, and to deduct such proportion of such amounts from the final payment for the work.
 - In the event such extension is ordered over the objection of the Contractor, the Contractor shall be entitled to a Contract Change Order adjusting the price paid to reflect the actual costs incurred by the Contractor as a direct and proximate result of the delay, upon a written application therefor, accompanied by such verification of costs as the Project Manager requires. In addition, direct costs incurred at the site while the work is delayed shall be a Contract Change Order.

1. COMPLETED DATES

- 1. If the work is not completed by Contractor in the time specified in the work order, or within the period of extension authorized pursuant to this article, the Contractor acknowledges and admits that the owner will suffer damages, and that it is impracticable and inequitable to set the amount of damages. Therefore, it is agreed between the Contractor and the owner that the Contractor shall pay to the owner as fixed and liquidated damages, and not as a penalty, the sum specified in Section 000000, Agreement, Article III or each calendar month the work is completed and accepted, and that after the Contractor and the Contractor's surety shall agree on the total amount thereof, and that the owner may deduct said sums from any monies due or that may become due to the Contractor.
- 2. This liquidated damages provision shall apply to damages of whatever nature whatsoever, save and except any nonliquidated damages approved by the owner pursuant to the provisions of Article 1.00.C.0 hereinabove, or discretion or time extensions approved by the Board of Supervisors pursuant to the provisions of Article 1.00.0 hereinabove.

1. EXTENSION OF TIME OF WORK

- 1. An extension of contract time granted pursuant to this article shall not constitute an order by the owner, nor release the Contractor, from other obligations to perform the work within the allotted contract time.
- 2. A continuing time extension due to one circumstance or one request therefor shall not constitute a continuing or the owner an extension of time for another circumstance or the same circumstance occurring at some later time, and shall not be interpreted as a precedent for another request for extension.

1.00 PROTECTION OF PERSONS AND PROPERTY

1. SAFETY PRECAUTIONS AND PROGRAMS

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the work.

B. SAFETY PERSONS AND PROPERTY

The Contractor shall take reasonable precautions for the safety of, and shall provide reasonable protection to prevent damage, injury, or loss to:

- ☐ the employees on the job and other persons who may be affected thereby
 - ☐ the job and materials and equipment to be incorporated therein, whether in storage or at the site, and that is under the care, custody, or control of the Contractor or any other Contractor's Subcontractors or Subsubcontractors
 - ☐ other property at the site or adjacent thereto, including trees, shrubs, ponds, ditches, pipelines, roads, structures, and utilities not designated for removal, relocation, or replacement in the course of construction and
 - ☐ The appropriate owner or other separate contractors.
- C. The Contractor shall give notices and comply with applicable laws, ordinances, rules, regulations, and requirements concerning protection of the safety of persons or property or their protection from damage, injury or loss.
- D. The Contractor shall erect and maintain, as required by existing conditions and the progress of the job, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, proper marking safety regulations, and notifying owners and users of adjacent facilities.
- E. When the use or storage of explosives or other hazardous materials or equipment is necessary for the execution of the job, the Contractor shall exercise the utmost care and shall carry on such activities under the supervision of properly qualified personnel.
- ☐ The Contractor shall promptly remediate damage or loss to any property referred to above caused in whole or in part by the Contractor, any Subcontractor, any Subsubcontractor, anyone direct or indirect employee of any of them, or anyone for whose acts any of them may be liable, and for which the Contractor is responsible under the above noted clauses, except damage or loss attributable solely to the acts or omissions of the owner, the Project Manager, or anyone direct or indirect employee of any of them, or anyone for whose acts any of them may be liable, and not attributable in any degree to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under the Indemnification provisions provided herein.
 - ☐ The Contractor shall designate a responsible officer of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the owner and the Project Manager.

- The Contractor shall not add or permit any part of the work to be added in any manner that could endanger its safety or pose a risk to anyone working at the Project site.

I. **EMERGENCIES**

In the event of an emergency affecting the safety of persons or property, the Contractor shall, at the Contractor's discretion, to prevent threatened damage, injury, or loss. In addition, compensation or extension of time shall be paid to the Contractor on account of any emergency or any other matter determined as provided in the provisions herein or Changes in the work.

00000000 **INSURANCE**

00000000 **CONTRACTOR'S INSURANCE**

- Bidders' attention is directed to the insurance requirements herein. It is recommended that Bidders confer with their respective insurance carriers or brokers to determine in advance what shall issue the appropriate insurance certificates and endorsements required herein. A bidder who is awarded a contract and thereafter fails to comply strictly with the insurance requirements, will be deemed to be in default of its obligations.

- Contractor shall procure and maintain for the duration of the Contract, and for three months thereafter, insurance against claims or injuries to persons or damages to property which may arise from, or in connection with, the performance of the work hereunder by the Contractor, its agents, representatives, employees, or subcontractors. The cost of such insurance shall be included in the Contractor's bid.

- Not later than ten days prior to the award of the Contract, and prior to execution of the agreement for Construction of the Project, the Contractor shall submit certificates of insurance, signed by an authorized agent of the insurer, attesting to insurance coverage of the Contractor as required by this Article.

B. **MINIMUM SCOPE OF LIMITS OF INSURANCE**

Contractor shall at least as good as

- Commercial General Liability (CGL) Insurance Services Policy (ISO Form CG 00 01 covering CGL on an "occurrence" basis, including products and completed operations, property damage, bodily injury, and personal and advertising injury liability in its not less than the minimum amounts of, \$1,000,000 per occurrence and an annual aggregate of ten million dollars (\$10,000,000). The General Liability policy shall apply, either the General Liability policy or it shall be separate to this project. The ISO CG 00 01 or any other the General Liability policy it shall be three times the required occurrence limit.

- 1. The contractor shall provide Insurance Services Office (ISO) Form C-0000 covering Code 00000000, with its not less than the \$1,000,000 per accident or \$1,000,000 per occurrence and property damage. Coverage shall include named and nonnamed perils used in connection with this agreement and all applicable endorsements.
- 2. Workers' Compensation insurance as required by the State of California, with Statutory Limits, and Employers' Liability insurance with a limit of no less than one \$1,000,000 per accident or \$1,000,000 or disease.
- 3. If Contractor is a licensed professional engineer, architect, etc., in providing services, Professional Liability shall be its not less than \$1,000,000 per occurrence or claim, and \$1,000,000 cumulative.
- 4. Builder's Risk (Course of Construction) insurance utilizing an "All Risk" (Special Perils) coverage form, with its entire completed term of the project and no insurance penalties.

If Contractor contains broader coverage and/or higher limits than the minimum specified, the owner requires and shall be entitled to the broader coverage and/or the higher limits contained in the Contractor. Any additional insurance proceeds in excess of the specified minimum in its insurance and coverage shall be payable to the owner.

Self-Insured Retentions

Self-insured retentions shall be declared to and approved by the owner. At the option of the owner, either the Contractor shall be required to reduce or eliminate self-insured retentions as respects the owner, its officers, directors, employees, and volunteers or the Contractor shall provide a financial guarantee satisfactory to the owner guaranteeing payment of losses and related investigations, claim administration, and defense expenses. The policy shall provide, or be endorsed to provide, that the self-insured retention shall be satisfied by either the named insured or owner.

C. OTHER INSURANCE PROVISIONS

Contractor's insurance policies are to contain, or be endorsed to contain, the following provisions:

- 1. The coverage shall contain no specifications on the scope of protection afforded to the owner, its officers, directors, employees, or volunteers.

- 1. The Contractor, its officers, directors, employees, and volunteers are to be named individually and collectively, as additional insureds on the Commercial General Liability policy arising out of or operations performed by or on behalf of the Contractor including materials, parts, or equipment furnished in connection with such operations and policies owned, leased, hired, or borrowed by or on behalf of the Contractor. The coverage shall contain no special limitations on the scope of protection afforded to the owner, its officers, directors, employees, or volunteers.
- 2. The insurer shall agree to waive subrogation against the owner, its officers, directors, employees, and volunteers for losses arising from or performed by the Contractor for the owner.
- 3. For any claims related to this project, the Contractor's insurance coverage shall be primary insurance coverage at least as good as ISO CG 00 00 00 as respects the owner, its officers, directors, employees, and volunteers. Any insurance or reinsurance obtained by the owner, its officers, directors, employees, or volunteers shall be excess of the Contractor's insurance and shall not contribute to it.
- 4. Any failure to comply with reporting provisions of the policies shall not affect coverage provided to the owner, its officers, directors, employees, agents, Engineers, Consulting Engineers, or volunteers.
- 5. The Contractor's insurance shall provide separate coverage against each claim is made or suit is brought, except with respect to the limits of the insurer's limit.
- 6. All Contractor's insurance policies for coverage required under this agreement shall not be canceled or nonrenewed, subject to reduction in coverage, without 30 days prior written notice given to the owner.
- 7. The insurer shall agree to waive subrogation against the owner, its officers, directors, employees, and volunteers for losses arising from or performed by the Contractor for the owner.
- 8. The Builder's Risk (Course of Construction) policy shall be an "All Risk" (Special Perils) coverage form, with its effective date completed before the project and no coinsurance penalty provisions. The Contractor shall be insured to the extent of their portion of the work under the Contractor. The Contractor shall request, and is responsible to confirm with its insurer, that the Contractor, its subcontractors are named, and are additional insured and as additional loss payees, on the Builder's Risk insurance policy. The Contractor and its subcontractors shall waive subrogation, each against the others, for damages arising from perils covered by the insurance required under the terms of this article, except such rights as they may have to the proceeds of the Builder's Risk insurance obtained and retained by the Contractor.

D. ACCEPTABLE INSURERS

Contractor shall obtain the policies and coverages specified herein from an admitted insurer in good standing and authorized to transact business in this state of the California Department of Insurance, and having a Best's rating of no less than A FSC III.

E. SUBCONTRACTORS

Contractor shall include all subcontractors as insured under its policies or shall furnish separate certificates and endorsements for each subcontractor.

F. EVIDENCE OF COVERAGE

Within ten working days prior to start, Contractor shall furnish the owner with original Certificates of Insurance including required endorsements and copies of the applicable policy and the effective coverage required by this article and of copies of the Declarations and Endorsement Page of the Coverage. Contractor shall provide evidence of coverage to the owner. Further, failure to obtain the required documents prior to the work beginning shall not waive the Contractor's obligation to provide them. The Owner reserves the right to require complete, certified copies of all required insurance policies, including endorsements, required by these specifications, at any time.

Certificates of Insurance and Endorsements for all policies must be signed by a person authorized by the insurer to bind coverage on its behalf, indicate the name and address of the official who administered this contract, state that such insurance coverages have been obtained and are in force and effect, and clearly indicate that coverage shall not be suspended, voided, canceled or either party reduced in coverage or in its effect after thirty working days prior written notice has been given to the owner.

Contractor shall ensure that all Endorsements must name the Contractor, its officers, agents and employees, individuals and collective, as additional insured, that all insurance as the operations under this agreement are concerned that such coverage for additional insured shall apply as primary insurance and not other insurance, or self-insurance, continued by owner, its officers, agents and employees, shall be excess and not contributing with insurance provided under Contractor's policies herein.

CORRECTION

- A. This Section shall apply to work installed and covered up by the Contractor that is required by the Building Code or other statute or regulation or requirement to undergo inspection or special inspection and/or testing appropriate in appropriate official representation of the owner or other public authority within jurisdiction to conduct such inspection and/or testing. Work covered up by the Contractor, Contractor's Subcontractors, or Suppliers prior to inspection, special inspection and/or testing appropriate shall be uncovered and repaired or replaced after inspection appropriate at the sole expense of the Contractor. This shall apply to uncover and material needed to complete the basic and cosmetic repairs, and in addition inspection costs associated with restoring the work.
- B. This Section shall apply to work installed and covered up by the Contractor, Contractor's Subcontractors, or Suppliers that is determined by the owner or its Project Manager, during construction or within the current period, to be defective, rotten, or inoperative. Work covered up by the Contractor, Contractor's Subcontractors, or Suppliers that is found to be defective, rotten, or inoperative shall be uncovered and repaired or replaced at the sole expense of the Contractor. This shall apply to uncover and material needed to complete the basic and cosmetic repairs, and in addition inspection costs associated with restoring the work.

CORRECTION

- A. The Contractor shall promptly correct work reflected by the Project Manager as defective or as in need of repair to the Contract Documents, whether or not specified, installed, or completed. The Contractor shall submit a plan of action, within ten days of notification of the defect to the Project Manager, for correction of the defect. The Contractor shall bear the costs of correction such as reflected in the contract, including compensation for the additional architect and/or engineering services if necessary.
- B. If, within the Calendar Days after the date of acceptance of the work as specified in the Notice of Completion, or designated portion thereof, or within the Calendar Days after acceptance of the owner of designated equipment, or within such longer period as may be prescribed by the terms of the applicable specification required by the Contract Documents, and if the work is found by the owner to be defective or not in accordance with the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the owner to do so, unless the owner has previously given the Contractor written acceptance of such condition. This obligation shall arise only in respect to the work or designated portion thereof and termination of the Contract. The owner shall give such notice promptly after discovery of the condition.
- C. The Contractor shall, at its own sole expense, remove from the site portions of the work that are defective or nonconforming and which have not been corrected under Articles A, B, and C, unless the owner orders removal.

- D. If the Contractor fails to submit it upon objection, within ten calendar months notification of the rejected work to the Project Manager, for correction of the rejected work, or fails to correct defective or nonconforming work as provided herein in Articles 1.04, 1.04.01, and 1.04.02, the Owner may correct it in accordance with Article 1.04.03.
- E. If the Contractor does not take action under the plan to initiate such correction of defective or nonconforming work within ten calendar months written notice from the Project Manager, the Owner may remove it and may store the materials or equipment at the expense of the Contractor. If the Contractor does not pay the cost of such removal and storage within ten calendar months thereafter, the Owner may, upon ten additional calendar months written notice, sell such work at auction or at private sale and shall account for the proceeds thereof, after deducting all the costs that should have been borne by the Contractor, including compensation for the Project Manager, Architect, or other Professionals additional services made necessary thereby. If such proceeds of sale do not cover all costs that the Contractor should have borne, the difference shall be charged to the Contractor and an appropriate Stop Payment Order shall be issued. If the payments then or thereafter due the Contractor are not sufficient to cover such amount, the Contractor shall pay the difference to the Owner.
- F. The Contractor shall bear the cost of any work removed by the Owner or separate contractors destroyed or damaged as such correction or removal.
- G. Nothing contained in this Section shall be construed to establish a period of limitation with respect to any other obligation of the Contractor arising under the Contract Documents, including Section 1.04 hereof. The establishment of the time periods noted in this Section 1.04, or such other period of time as may be prescribed by law or by the terms of any agreement required by the Contract Documents, relates only to the specific obligation of the Contractor to correct the defective or nonconforming work, and has no relationship to the time within which the Contractor's obligation to comply with the Contract Documents shall be deemed to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations after such specific time to correct the defective or nonconforming work.

1.04 ACCEPTANCE OF DEFECTIVE WORK COMPLETION OR R

If the Owner prefers to accept defective or nonconforming work, the Owner may do so instead of requiring its removal and correction, in which case a Contract Completion Order may be issued to reflect a reduction in the Contract Sum where appropriate and equitable. Such adjustment shall be given effect whether or not independent has been made. The Project Manager shall determine the amount of reduction in the Contract Sum.

0000 TERMINATION BY OWNER

- A. If the Contractor is adjudged bankrupt, or files a receivership or the benefit creditors, or a receiver is appointed on account of the Contractor's insolvency, or stop notices are served upon the owner, or if the Contractor persistent or repeated refuses or fails, except in cases of which extension of time is provided, to supply enough proper sized orders or proper materials, or fails to take prompt payment to Subcontractors or for materials or labor, or persistent disregard applicable laws, ordinances, rules, regulations, or orders having public authority within jurisdiction, or otherwise is guilty of substantial violation of provision of the Contract Documents, and fails after written notice to commence and continue correction as soon as possible, neglect, or omission with diligence and promptness, the owner upon certification of the Project Manager that sufficient cause exists to justify such action, may, after an additional written notice and without prejudice to another remedy the owner may have, terminate the Contract and take possession of the materials, equipment, tools, construction equipment, and other materials owned by the Contractor and may finish the work by whatever means the owner may deem expedient. In such case, the Contractor shall not be entitled to receive any further payment until the work is finished.
- B. If the unpaid balance of the Contract Sum exceeds the costs incurred by the owner, including compensation for the Project Manager's and Architect's additional services if necessary therefore, Contractor shall be paid for disbursements and unpaid costs from such excess. If such costs exceed the unpaid balance, the contractor shall pay the difference to the owner. The amount to be paid to the Contractor or to the owner, as the case may be, shall be certified by the Project Manager, upon application, in the manner provided in Section 0000 and this condition of payment shall survive the termination of the Contract.

0000 SUBSTITUTION OF MATERIALS

- A. When a specific manufacturer, trade name, or material is specified, or indicated, it is to establish a standard quality and shall not be construed as limiting competition. The intent of the Contract Documents is to specify a particular trade standard material and equipment, and it is not the intent of these Contract Documents to exclude or limit the products of any responsible manufacturer, if such products are equally acceptable in terms of quality, finish, performance, durability, and serviceability, in the judgment of the owner and the Architect, to those specified herein. Whenever an article, or a class of materials, is specified by the trade name or by the name of a particular patentee, manufacturer, or dealer, it shall be taken as intending to reach and specify the article or material described or another equivalent in quality, finish, performance, durability, and serviceability, in the judgment of the owner and the Architect, for the purpose for which it is or they are intended.

- B. If the Contractor desires to use alternative equipment other than that specified, he/she shall submit a request for appropriate substitution, in writing, to the Project Manager no later than ten (10) days prior to bid opening. Substitution requests must be considered if received after the time stipulated.
- C. The Owner does not warrant that alternative articles, components, materials, or equipment other than the item specified or trade name or other specific identification, limit within the design parameters of the Project without alteration of the Project design of the Contractor.
- D. The Owner has the right to reject any proposed alternative material or equipment requires alteration of the project design which impacts the safety of the public or the user of the completed facility. If the proposed alternative material requires alteration of the design of the Project or in respect thereof, and said alterations are acceptable to the Owner, the Contractor shall be responsible for payment of said alterations at no additional cost to the Owner.
- E. Submittals for appropriate substitute materials shall contain sufficient detailed information, descriptive drawings, drawings, samples, or other data as is necessary to provide a detailed side-by-side comparison to the specified materials. It is the sole responsibility of the Contractor to submit complete descriptive and technical information so the Project Manager can make proper appraisal of the proposed proper or sufficient information shall constitute cause for rejection. Reference to product data must be acceptable.
- F. It is the Contractor's responsibility to confirm and correct quantities and dimensions, and coordinate with trades whose work may be affected by the requested substitution.

REFERENCE TO STANDARDS

- A. Reference to known standards shall mean and intend the latest edition or amendment published prior to date of these Specifications, unless specifically indicated otherwise, and to sections that relate and apply directly to the material installation called for on the Project.
- B. Where materials specified shall refer to standard specifications, the Contractor shall request to the Project Manager, submit to the Project Manager for review approval, data on any proposed to be incorporated into the work of the Contractor, listing the name and address of the vendor, the manufacturer or producer, and the trade or brand names of such materials.

000 SPECIFICATIONS

- A. The Specifications are organized into Divisions, Sections, and Trade Sections based on the Construction Specifications Institute's Master Format and the Master Format numbering system. This organization shall not control the Contractor in dividing the work into Subcontractors or in establishing the extent of the work to be performed on each trade. The Contractor shall be responsible for establishing the Sections of the Specifications or interrelated items of the work, and for furnishing each item identified or specified.
- B. The responsibility shall be assigned to the Owner, Architect, or the Project Manager for omissions or duplications of the Contractor in the completion of the Contract due to uncorrected discrepancies in the referenced code of materials in these Specifications, nor shall any subcontractor's selection of materials operate to release the Project Manager or Architect in defining the limits to the agreements between the Contractor and its Subcontractors or suppliers.
- C. The displacement, addition, or omission of any letter, word, or punctuation shall remain in accordance with the true spirit, intent, or meaning of these Specifications.
- D. The words "shown", "indicated", "noted", "scheduled" or words that effect shall be understood to mean that reference is made to Drawings accompanying these Specifications.
- E. Where reference herein is made to codes or titles "as selected", the reference is to the Architect's concurrence with the Owner.

000 APPROVED APPLICATORS

- A. Where specific instructions in these Specifications require that a particular product and/or materials be installed and/or applied on "approved applicator" of the Contractor, it shall be the Contractor's responsibility to ensure that Subcontractors used or subcontractors approved applicators.
- B. Contractor shall reimburse Owner and costs, and shall reimburse Owner for any such costs incurred by Owner, resulting from Contractor's failure to insure the use of an "approved applicator".

000 DELIVER AND STORE OF MATERIALS

- A. Deliver and/or constructed materials in the original packages, containers, or bundles into the site intact, bearing the name or identification of the Contractor.
- B. Deliver materials in as close as possible to practical and where specified to be supplied or supplied to the site shall be placed or stored as required to preserve such prior to and/or intact and free from corrosion.

- C. Store materials in secure manner as necessary to properly protect same from damage, as materials are important and used in and in, wetter, dirt or rain in other case which be accepted.
- D. Store materials so as to cause no obstructions i.e. stored materials and other materials, roads, and underground services. The Contractor shall be responsible for protection from damage of materials and equipment furnished under the Contract.

Q.00 0000IT0000R0

- A. Where not more specifically described in the other various Sections of these Specifications, the submitter agrees to observe the methods and operations, test standards and accepted practices of the trade or trades involved, and shall include written specification, construction, or installation requirements or required competition to be incorporated in this, and its successful operation is intended for the Project and the component thereon corresponding to that part.
- B. The various electrical and electronics shall be in their respective lines and parts.
- C. When completed, the parts shall be seen directly and substantiated and shall present neat, finished appearance.

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- [illegible]

E. The Contractor shall comply with the Code Section 0000. In accordance with said Section 0000, it is hereby further agreed that the Contractor shall warrant to the Owner, as open shop, that all work shall be done under the contract, or economic employment or economic employer does or portion thereof, shall be paid less than the said stipulated rates for the work done under the contract, or the work, or the subcontractor under the work. The difference between said stipulated rates and the amount paid to economic employer or economic employer does or portion thereof shall be paid less than said stipulated rate, shall be paid to economic employer of the Contractor. The Contractor, and economic subcontractor, shall keep or cause to be kept an accurate record showing the name, address, social security number, race classification, street time and overtime hours worked each day and week, and the total per day wages paid to economic worker, apprentice, worker or other employee employed on the work in connection with the public work. The records shall be open at all reasonable hours to the inspection of the Owner, to its officers and agents, and to the Division of Labor Enforcement of the State Department of Industrial Relations, its deputies and agents, or as otherwise provided or applicable in accordance with the Code Section 0000.

F. In case it becomes necessary for the Contractor or the subcontractor to employ on the work under this Contract any person in a trade or occupation except executive, supervisory, administrative, clerical, or other non-manual orders as specified in the Code, the Contractor shall notify the Owner, who shall promptly thereafter determine the prevailing rate for such additional trade or occupation and the time of the initiation of payment to the person affected and during the continuance of such employment.

0000 APPROPRIATE OR LOWEST STANDARDS AND REQUIREMENTS

Whenever two or more standards or requirements appear in these General Conditions or in any other part of the Contract Documents that are the Contract, the lowest standard or requirement shall be applied and followed in the performance under this Contract.

0000 DISCRIMINATION AND EMPLOYMENT

Contractor shall comply with Federal and State laws prohibiting discrimination in employment, including the following:

F. Contrary to Code Section 0000, which prohibits discrimination in employment on any basis listed in subdivision (a) of Section 0000 of the Government Code, as those cases are defined in Sections 0000 and 0000 of the Government Code, except as otherwise provided in Section 0000 of the Government Code, and applies to all employers, employment agencies and their organizations.

ere included, and if it is not correct, the provision is not inserted or is not correct. If it is not correct, the provision is not inserted or is not correct. If it is not correct, the provision is not inserted or is not correct.

DRUG-FREE WORKPLACE CERTIFICATION

- A. The Contractor shall comply with the Government Code Section 18600 in all matters relating to providing a drug-free workplace.
- B. The Contractor shall provide a statement notifying employees that no use of alcohol, distribution, dispensation, possession, or use of controlled substance is prohibited, and specifying actions to be taken against employees or violations, as required by the Government Code Section 18600.
- C. The Contractor shall establish a Drug-Free Awareness Program as required by the Government Code Section 18600, to inform employees about the program.
 - A. The donors shall provide in the workplace,
 - B. The Contractor's policy for maintaining a drug-free workplace,
 - C. An employee counseling, rehabilitation, and employee assistance programs,
 - D. Penalties that may be imposed upon employees for drug use or violations.
- D. Provide as required by the Government Code Section 18600, that the contractor provides a copy of the policy to:
 - A. Will receive a copy of the company's drug-free policy statement, and
 - B. Will agree to abide by the terms of the Contractor's statement as a condition of employment in the contract.

BIDDING PERMIT AND OTHER PERMITS

The Bidding permit shall be obtained and paid for by the owner. The contractor shall be responsible for the Contractor to obtain. Fees for other required permits shall be reimbursed to the Contractor at actual cost when the Contract is presented with a valid receipt.

CODES AND REGULATIONS

Building, fire, and equipment shall be in compliance with the California Building Code, California Fire Code, California Electrical Code, California Mechanical Code, California Fire Code, California Energy Codes, and all other codes and regulations that may be applicable to the project. The Contractor shall be responsible for obtaining all necessary permits and licenses from the appropriate State, Federal, and local agencies.

DEPT OF PUBLIC HEALTH BASEMENT RECONSTRUCTION
RESERVES, C

RECONSTRUCTION CONDITIONS
SECTION 1

and ordinances, regulations and Resonance Counter provisions in
effect and applicable in the performance of the work.

END OF SECTION

CONTRACT 100S

FEDERAL REQUIREMENTS FOR ARPA CONSTRUCTION PROJECTS

General

The project is financed in whole or in part with federal funds, and therefore the federal statutes, rules, regulations, and provisions applicable to the project financed in whole or in part with federal funds apply.

In addition to the provisions in the agreement, the Contractor shall comply with the following:

Performance Of Previous Contracts

The bidder shall execute the "Certification with Regard to the Performance of Previous Contracts or Subcontracts Subject to the Equal Opportunity Clause and the Filing of Required Reports" located in the proposal request or solicitation or assignment in participation of the contract in excess of \$100,000. The bidder is considered under the provisions of Section 111 of the required contract provisions unless such request is accompanied by the Certification referred to above, executed by the proposed subcontractor.

Non-Collusion Provision

The provisions in this section are applicable to all contracts except contracts for federal second-order projects. Title 18, United States Code, Section 2385, requires as a condition precedent to approval of the federal contract by the administrator of the contract for this contract that each bidder or subcontractor state or in connection with the person, firm, association, or corporation to which such contract is to be awarded, certifying that such person, firm, association, or corporation does not, either directly or indirectly, entered into an agreement, participated in an agreement, or otherwise taken any action in restraint of trade or petition filed in connection with the submitted bid. It is the policy of the noncommissioned state or territory required by Section 2385 as a certification under penalty of perjury that such person, firm, association, or corporation is permitted by the SC, Sec. 2385, is included in the proposal.

Contracting with Small and Minority Businesses, Women's Business Enterprises, and Labor Surplus Area Firms

Conducting the following steps to ensure the use of small and minority businesses, women's business enterprises, and labor surplus area firms when possible:

- Place such organizations that are identified on solicitation lists.
- Ensure such organizations are solicited whenever they are potential sources.
- Divide the requirements, when economically feasible, into smaller tasks or quantities.
- Establish deliverables, where the requirement permits, to encourage their participation.
- Use the services and assistance, as appropriate, of the Small Business Administration and the Minority Business Development Council of the Department of Commerce.
- Require prime contractor to conduct the above steps in subcontracting.

Prohibition of Certain Telecommunications and Video Surveillance Equipment and Services

In response to significant national security concerns, the following prohibited vendors list are of the telecommunications and video surveillance purchase because recipients and subcontractors of federal funds are prohibited from providing or depending upon or grant funds to:

- Procure or obtain
- Extend or renew contract to procure or obtain
- Enter into contract or extend or renew contract to procure or obtain equipment, services, or systems that uses covered telecommunications equipment or services as a substantial or essential component of such system, or as critical technology to support such system.

The prohibited vendors and their subsidiaries or affiliates are

- Huawei Technologies Company
- ZTE Corporation
- InterDigital Communications Corporation
- Chinese Division of ZTE Corporation
- Docomo Technology Company
- Subsidiaries or affiliates of the above-mentioned companies.

In implementing the prohibition, the concerned minister in charge, front, or subsidiary programs shall prioritize financial and technical support to assist affected businesses, institutions and organizations as is reasonably necessary for those affected entities to transition from covered telecommunications equipment and services, to procure replacement equipment and services, and to ensure that telecommunications service to users and customers is sustained.

Executive Order N-6-22:

Under Executive Order 13884 as a contractor, subcontractor, or grantee, compliance with the economic sanctions imposed in response to Russia's actions in Ukraine is required, including with respect to, but not limited to, the federal executive orders identified in the EO and the sanctions identified in the U.S. Department of the Treasury's

<https://www.ctreasury.gov/sanctions/practices-and-contracting-in-relation-to-russia-related-sanctions>

order to comply with results in the termination of contracts or grants, as applicable. Specified Designated Persons and Blocked Persons List (SD)

<https://sanctionslist.ctreasury.gov/SdnList>

ARPA CONTRACT PROVISIONS

The Contract is being funded in part by the American Rescue Plan Act ("ARPA"). Therefore, CONTRACTOR must comply with all federal laws and regulations applicable to the receipt of ARPA funds, including, but not limited to, the contract provisions set forth in 48 CFR, Part 101, in connection with the CONTRACTOR's performance of the work or services covered by the Contract (the "Project"). All applicable federal laws and regulations shall be deemed to be inserted in the Contract and the Contract shall be read and enforced as though such federal laws and regulations were included therein. In addition, the CONTRACTOR agrees to the following specific provisions:

Equal Employment Opportunity

During the performance of this contract, the contractor agrees as follows:

(1) The contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The contractor shall take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following:

Employment, promotion, demotion, or transfer; recruitment or recruitment advertising; termination; compensation and selection for training; including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

(2) The contractor shall, in advertisements or advertisements for employees placed on or on behalf of the contractor, state that unqualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.

(3) The contractor shall not discriminate or in any other manner discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. This provision shall not apply to instances in which an employee or applicant has access to the compensation information of other employees or applicants as part of such employee's essential job functions; discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a written request or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the contractor's legal duty to furnish information.

(4) The contractor shall send to each labor union or representative of workers a copy of each order of collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

Rights and Remedies

(1) The duties and obligations imposed by the Contract Documents and the rights and remedies shall be deemed to be included in addition to, and not in limitation of, the duties, obligations, rights and remedies otherwise imposed or available by law.

(2) Action or failure to act on a deficiency or error in performance of the Contractor under the Contract Documents, shall be deemed or construed to constitute acquiescence by the Owner in connection therewith or its record to an subsequent deficiency, error or defect in performance of the Contractor or subsequent prior act or failure to act on a deficiency or error deemed or construed as a later right in the Owner regarding a subsequent deficiency, error or defect in performance of the Contractor, regardless of the significance of the prior incident or circumstance when no action is taken regarding an alleged deficiency, error or defect in performance of the Contractor.

Termination of Convenience

Under circumstances other than those set forth in Section 10 of the Agreement concerning termination of this Contract or cause, this Contract may be terminated by the County, with or without the contractor's consent to the County's exercise of such right, upon the giving of written notice of intention to terminate to the contractor. In the event of termination, the contractor shall be entitled to payment for work performed to date and including that date. The County and the contractor shall meet and confer in an effort to resolve any and all remaining issues relating to completion of the work, payment to the contractor for incurred and unpaid costs to complete the contract or the contractor's entitlement under the Contract, and any other issues pertaining to the relationship of the contractor. In the event of any remaining disputes after the parties meet and confer, the dispute shall be resolved in accordance with the RESOLUTION OF CONTRACT CLAIMS of the Special Provisions.

Copeland Anti-Kickback Act

(1) The contractor shall comply with 18 U.S.C. § 873, 18 U.S.C. § 874, and the requirements of 18 C.F.R. pt. 201 as they apply, which are incorporated by reference into this contract. Each contractor or subcontractor is prohibited from inducing, attempting, or attempting to induce any person employed in the construction, completion, or repair of public work, to give or report any compensation to which he or she is otherwise entitled.

(2) The contractor or subcontractor shall insert in all subcontracts the same clause in all lower tier subcontracts. The prime contractor shall be responsible for the compliance of all subcontractor or lower tier subcontractor with these contract clauses.

(3) If the contract clauses shall be grounds for termination of the contract, and the default is by contractor or subcontractor as provided in 18 C.F.R. § 201.

Contract Work Hours and Safety Standards Act

(1) *Overtime requirements.* The contractor or subcontractor contracting for any part of the contract shall be required to include the employment of mechanics or laborers shall be required to permit any such worker or mechanic in any workday in which he or she is employed on such project to earn excess earnings in such workday unless such worker or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for workers employed in excess workdays in such workday.

(2) *Violation; liability for unpaid wages; liquidated damages.* In the event of violation of the clause set forth in paragraph of this section the contractor and subcontractor shall be jointly and severally liable for the unpaid wages. In addition, subcontractor and

contractor shall comply with the United States in the case of work done under contract in the District of Columbia or in a territory, to such District or to such territory, as indicated in the contract. Such indicated documents shall be completed with respect to each individual worker or economic, including its own and others, employed in connection with the work set forth in paragraph of this section, in the same manner as each contractor doing business with such individuals is required or permitted to comply in excess of the standard or other requirements set forth in paragraph of the certificate of work required in the case set forth in paragraph of this section.

(3) Withholding for unpaid wages and liquidated damages. The County of Fresno shall upon its own action or upon written request from authorized representative of the Department of Labor, withhold or cause to be withheld from any one's payment on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other Federal-assisted contract subject to the Contract Disputes Act and Small Business Act, which is held by the same prime contractor, such sums as shall be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the case set forth in paragraph of this section.

(4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph of this section and shall cause to be included in the subcontracts to include these clauses in any further tier subcontracts. The prime contractor shall be responsible for compliance of any subcontractor or further tier subcontractor with the clauses set forth in paragraphs of this section.

Clean Air Act and the Federal Water Pollution Control Act

The contractor agrees to comply with applicable standards, orders or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. 1855 et seq., and the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1361 et seq.

(1) The contractor agrees to report each violation to the County and understands and agrees that the County, in turn, report each violation as required to assure notification to the Federal Environmental Management Agency, and the appropriate Environmental Protection Agency Region Office.

(2) The contractor agrees to include these requirements in each subcontract exceeding \$100,000 financed in whole or in part with Federal assistance provided by EPA.

Suspension and Debarment

(1) This contract is a covered transaction for purposes of CCR, part and CCR, part . As such, the contractor is required to verify that none of the contractor's principals defined at CCR 101.1000 or its affiliates defined at CCR 101.1000 are excluded defined at CCR 101.1000 or disqualified defined at CCR 101.1000.

(2) The contractor must comply with CCR, part , support C and CCR, part , support C, and must include a requirement to comply with these regulations in any further tier covered transaction it enters into.

(3) This certification is a material representation upon which the County relies. It is further determined that the contractor did not comply with CCR, part , support C and CCR, part

support C, in addition to remedies available to the Contract, the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment.

(4) The bidder or proposer agrees to comply with the requirements of FAR, part 25, support C and FAR, part 25.1, support C if this offer is valid and throughout the period of the contract that it arises from this offer. The bidder or proposer further agrees to include a provision requiring subcontract compliance in its lower tier covered transactions.

Byrd Anti-Lobbying Amendment

Contractors agree to certify or bid on an order, contract, or other solicitation the required certification. Each tier certifies to the tier below that it did not and does not use Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, officer or employee of Congress, or an employee of a Member of Congress in connection with obtaining any Federal contract, grant, or other order covered by 41 U.S.C. 101-5. Each tier solicits disclosure on obtaining any non-Federal funds that takes place in connection with obtaining any Federal order. Such disclosures are forwarded from tier to tier up to the recipient in turn and forward the certifications to the ordering agency.

Access to Records

(1) The Contractor agrees to provide the Contract address, the US Department of Treasury, the Comptroller of the Treasury, United States, or any of their authorized representatives access to any books, documents, papers, and records that the Contractor deems are directly pertinent to this contract for the purposes of audits, examinations, excerpts, and transcriptions.

(2) The Contractor agrees to permit any of the foregoing parties to reproduce any number of copies of excerpts and transcriptions as reasonably needed.

Buy USA - Domestic Preference for Certain Procurements Using Federal Funds

Contractor should, to the greatest extent practicable under a Federal order, provide a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States including but not limited to iron, steel, steel products, and other manufactured products. The requirements of this section must be included in solicitations including contracts and purchase orders for goods or products under this order. For purposes of this section:

(1) "Produced in the United States" means, for iron and steel products, that all manufacturing processes, from the initial refining stage through the application processes, occurred in the United States.

(2) "Manufactured products" means items and construction materials composed in whole or in part of non-ferrous metals such as aluminum, plastics and polymer-based products such as polyethylene pipe, precast concrete, including precast concrete, and other.

SPECIFICATIONS

FRESNO COUNTY DEPARTMENT OF PUBLIC HEALTH
BASEMENT RENOVATION



1221 FULTON STREET
FRESNO, CALIFORNIA 93721

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Fresno County Department Of Public Health Basement Renovation

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**SECTION 01 1000
SUMMARY**

PART 1 - GENERAL

1.01. PROJECT

- A. Project of Fresno County Department Of Health Basement renovation
- B. Owner's of Fresno
- C. Architect's of Matthew B. Lopez, County of Fresno Capital Projects
- D. This project is to renovate the existing of the Fresno County Department Of Health Building in Downtown Fresno that is presently used for storage space and is damaged and structurally sound. Interior Improvements to the existing include for storage support services, meeting, conference, and reception. Existing ceiling and floor rooms include in. Plumbing, Mechanical, Electrical, Fire Suppression Systems will be updated

1.02. CONTRACT

- 1. Unless otherwise indicated, the Drawings and Specifications are directed to the General Contractor.

1.03. WORK BY OWNER

- 1. Furnish provided by owner.

1.04. CONTRACTOR USE OF SITE AND PREMISES

- A. Construction operations are limited to areas as directed by the Owner's Representative.
- B. Arrange use of site and premises to include:
 - 1. Driveways.
 - 2. Driveway.
 - 3. Use of public property as required by the City of Fresno.
 - 4. Use of public property as required by the County of Fresno.

1.05. Parking of all vehicles shall be limited to those areas designated by the Owner's Representative.

PART 2 - PRODUCTS -NOT USED

PART 3 - EXECUTION -NOT USED

END OF SECTION

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**SECTION 01 1100
SUMMARY OF WORK**

PART 1 - GENERAL

1.01. RELATED DOCUMENTS:

- . Drawings and General provisions of Contract, including General and Supplemental Conditions and other Division Specification section, apply to this section.

1.02. PROJECT DESCRIPTION:

- A. The Project name is Fresno County Department Of Public Health Basement Renovation, Fresno County, Fresno, CA, is shown on Contract Documents prepared by The County of Fresno and its Consultants, dated 01 May 2020.
- B. The work consists of construction of addition and interior construction. In addition to new framing, renewed finishes, new ceiling, new doors and windows and new case work, the work includes renovated Plumbing, Mechanical, Electrical, Fire Suppression systems
 - 1. The work includes structural steel, etched partitions, glass panel, hardware, interior finishes and mechanical piping, electrical systems upgrades.

1.03. QUALITY ASSURANCE:

- A. The Contractor's duties include the following, unless specifically noted,
 - 1. Provide and pay for
 - a. Labor, materials and equipment
 - b. Tools, construction equipment and machinery
 - c. Fuel and utilities required for construction
 - d. Other facilities and services necessary for proper execution and completion of the work
 - 2. Water: see specification section "Temporary Facilities and Controls"
 - 3. Provide required signs, consider and use tags.
 - 4. Secure and pay for site specific owner imposed required fees necessary for proper execution and completion of the work
 - a. Licenses
 - b. Permits and fees
 - c. Government fees
 - d. Rentals
 - 5. Give required notices.
 - 6. Comply with codes, ordinance, rules, regulations, orders and other requirements of public authorities which bear on performance of the work
 - a. The Contractor shall certify in writing that no materials containing asbestos are incorporated in the work, in accordance with the asbestos removal Enforcement Regulations Act.
 - 7. Promptly submit written notice to architect observed variance.
 - 8. Enforce strict discipline and good order on employees. Do not employ on the work
 - a. Ineligible persons
 - b. Persons not skilled in assigned tasks

1.04. SITE CONDITIONS:

- . The order of separate Contract work occur concurrent with and adjacent to the work of this Contract. The Contractor shall coordinate his work with the other parties to these separate Contracts and shall cooperate with the Contractors of these separate Contracts, if they occur.

1.05. CONTRACTOR USE OF PREMISES:

- . General The Contractor shall give notice of the premises to the designated persons so as to allow for proper occupancy of adjacent spaces. Disruption of existing occupants and activities is to be kept to a minimum. Access to occupied areas and spaces is to be coordinated with the

Fresno County Department Of Public Health Basement Renovation

- ☐ Owner at least 48 hours in advance. Where disruption is significant or when substantial activities to occupied spaces is required, then these spaces arranged to take place prior to 8:00 A.M. and after 5:00 P.M. and schedule coordinated with the Owner at least three working days in advance. Contractor shall include in bid and cost for overtime or extra cost related to working outside normal business hours.
- ☐ B. Assume full responsibility for protection and safekeeping of Contractor's and Owner's material stored on premises, and keep the site and adjoining secure at all times.
- ☐ C. Use of the Site Continue operations at the site to the areas permitted under the Contract. Portions of the site beyond areas in active construction operations are indicated are not to be disturbed. Comply to site rules and regulations affecting the project and be engaged in project construction.
 - ☐ Keep drive ways and entrances serving the premises clear and accessible to the Owner, the Owner's employees and the public at all times. Do not use these areas for parking or storage materials.
 - ☐ Do not threaten or encroach over the site with materials or equipment. Schedule deliveries to minimize space and time requirements for storage materials and equipment on site. Continue stockpiling materials and location storage sheds to the areas indicated. If additional storage is necessary obtain and pour for secure storage site.
- ☐ D. Use of the Existing Building Maintain the existing buildings in as better than condition throughout the construction period. Repair damage caused by construction operations. Take all precautions necessary to protect the building during the construction period.
 - ☐ Do not load structure with weight that endanger structure.

1.06. OWNER OCCUPANCY:

- ☐ Owner Occupancy The Owner will occupy the site and areas directly adjacent to the construction during the entire period of construction. Cooperate with the Owner during construction operations to minimize conflicts and facilitate Owner's use. Permit the areas is not to interfere with the Owner's operation and security.

1.07. OWNER-FURNISHED ITEMS:

- ☐ A. The Contractor will be responsible for the items that are to be relocated and or reused in other areas of the work. The Contractor shall submit new items where existing items are damaged during relocation. Damaged items shall not be reinstalled. Contractor shall be responsible for the relocation and reinstallation of designated items. The Contractor shall notify the Architect of existing items that are damaged before relocation so as to prevent reinstallation.
- ☐ B. Obtain and pour for use additional storage as needed items, as needed.

PART 2 - PRODUCTS (Not applicable).

PART 3 - EXECUTION (Not applicable).

END OF SECTION

SECTION 01 2000
PRICE AND PAYMENT PROCEDURES

PART 1 - GENERAL

1.01. SECTION INCLUDES

- A. Procedures for preparation and submission applications for progress payments.
- B. Documentation includes in Contract Sum and Contract Time.
- C. Change procedures.
- D. Correction of Contractor's submission based on changes.
- E. Procedures for preparation and submission application for final payment.

1.02. SCHEDULE OF VALUES

- A. See General Conditions "Payments and Completion" for additional requirements. Items are in conflict with this section, then the more restrictive requirement.
- B. Submit printed schedule on one page application and Certificate for Payment Continuation Sheet. Contractor's standard or electronic media printout will be considered.
- C. Submit Schedule includes in duplicate within 10 days after date of General Contractor agreement.
- D. For each item the Table of Contents of this Project Manual identify each line item within the specification Section. For each item provide a complete description of the item in:
 - 1. Item number
 - 2. Description of work
 - 3. Scheduled dates
- E. Include separate item for each line item, a direct proportion of the Contractor's overhead and profit.
- F. Revise schedule to list approved Change Orders, with each application for Payment.

1.03. APPLICATIONS FOR PROGRESS PAYMENTS

- A. See General Conditions "Payments and Completion" for additional requirements. Items are in conflict with this section, then the more restrictive requirement.
- B. Payment Period Submit at intervals stipulated in the agreement.
- C. Present required information in type written form.
- D. For each application and Certificate for Payment and one page Continuation Sheet including continuation sheets when required.
- E. For each item, provide a complete description of the item in:
 - 1. Item number.
 - 2. Description of work.
 - 3. Scheduled dates.
 - 4. Progress applications.
 - 5. On or in Place and Stored Materials under this application.
 - 6. Approved Change Orders.
 - 7. Total Completed and Stored to Date application.
 - 8. Percentage of Completion.
 - 9. Balance to finish.
 - 10. Retention.
- F. Execute certification of signature of authorized officer.

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- ☐ Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion completed and for stored Products.
- ☐ List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item and for.
- I. Submit three copies of each application for Payment on the date dollar value is entered. Payment amount must be protected for 90 days to the end of the month.
- ☐ Include the following in the application:
 - ☐ Transmittal letter as specified for Submittals in Section 01 0000.
 - ☐ Partial release claims from all Subcontractors and vendors.
 - ☐ Affidavits attesting to site stored products.
- ☐ When architect requires substantiation in writing, submit data substantiating dollar amounts in question. Provide one copy of data to cover letter for each copy of submitted Submittal application number and date, and line item number and description.

1.04. MODIFICATION PROCEDURES

- ☐ Architect may disallow minor changes in the original in writing on adjustment to Contract Sum or Contract Time as authorized in the Conditions of the Contract or issued in approved instructions in the form of .
- B. Construction Change Directive: Architect may issue a document, signed by owner, instructing Contractor to proceed with a change in the work, or subsequent inclusion in a Change Order.
 - ☐ The document will describe changes in the work and designate a method of determining a change in Contract Sum or Contract Time.
 - ☐ Promptly execute the change in the work.
- C. Proposed Request: Architect may issue a document which includes a detailed description of proposed change or supplement or revised Drawings and specifications, a change in Contract Time or execution of the change. Contractor shall prepare and submit a bid price quotation within 10 days unless otherwise requested.
- D. Contractor may propose a change or submit a request for change to Architect, describing the proposed change and its effect on the work, or a statement describing the reason for the change, and the effect on the Contract Sum and Contract Time or modification and a statement describing the effect on the work of separate or other contractors. Document and requested substitutions in accordance with Section 01 0000.
- E. Computation of Change in Contract amount
 - ☐ For change requested by Architect for a fixed price contract, the amount will be based on Contractor's price quotation.
 - ☐ For change requested by Contractor, the amount will be based on the Contractor's request for a Change Order as approved by Architect.
 - ☐ For predetermined unit prices and quantities, the amount will be based on the fixed unit prices.
 - ☐ For change ordered by Architect without a quotation from Contractor, the amount will be determined by Architect based on the Contractor's substantiation of costs as specified in Time and Materials.
- ☐ Substantiation of Costs: Provide information required for evaluation.
 - ☐ Provide the following data:
 - ☐ Quantities of products, labor, and equipment.
 - ☐ Taxes, insurance, and bonds.
 - ☐ Overhead and profit.
 - ☐ Justification for a change in Contract Time.
 - ☐ Credit or deletions from Contract, significant documented.
 - ☐ Support each claim for additional costs with additional information:
 - ☐ Origin and date of claim.
 - ☐ Dates and times of work performed, and .

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- ☐ c. Time records and office rates paid.
- ☐ d. Invoices and receipts for products, equipment, and subcontractors, signed and documented.
- ☐ e. For Time and Materials, submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract.
- ☐ G. Execution of Change Orders after Architect has approved the proposed Change Order, in application, the Architect will issue Change Orders for signatures of parties as provided in the Conditions of the Contract on or before.
- ☐ H. After execution of Change Order, promptly revise Schedule of values and application for Payment for the record and authorized Change Order as a separate line item and adjust the Contract Sum.
- ☐ I. Promptly revise progress schedules to reflect change in Contract Time, revise schedule to adjust times for other items affected by the change, and resubmit.
- ☐ J. Promptly enter changes in Project Record Documents.

1.05. APPLICATION FOR FINAL PAYMENT

- ☐ A. Prepare application for final Payment as specified for progress payments, identifying total adjusted Contract Sum, previous payments, and sum remaining due.
- ☐ B. Application for final Payment shall be considered entire amount due when accepted.
 - ☐ Release of procedures specified in Section 1.04.
 - ☐ Receipt of conditions when releases.
 - ☐ Architect's acceptance of corrected punch list items.

END OF SECTION



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SECTION 01 3000 ADMINISTRATIVE REQUIREMENTS

PART 1 - GENERAL

1.01. SECTION INCLUDES

- A. Preconstruction meeting.
- B. Site coordination meeting.
- C. Progress meetings.
- D. Construction progress schedule.
- E. Submittals for review, information, and project closure.
- F. Owner copies of submittals.
- G. Submittal procedures.

1.02. PROJECT COORDINATION

- A. Owner Representative Matthew B. Lopez Architect
- B. Cooperate with the Project Coordinator in location of construction areas, site, and offices and sheds, for access, traffic, and parking facilities.
- C. During construction, coordinate use of site and facilities to the Architect.
- D. Cooperate with Architect's procedures for introduction of submittals, reports and records, schedules, coordination drawings, and record of conditions and resolution of conflicts.
- E. Cooperate with instructions of the Architect for use of proper facilities and construction facilities.
- F. Coordinate field engineering and other work under instructions of the Architect.
- G. Make the following types of submittals to the Architect:
 - 1. Requests for interpretation.
 - 2. Requests for substitution.
 - 3. Shop drawings, product data, and samples.
 - 4. Test and inspection reports.
 - 5. Manufacturer's instructions and field reports.
 - 6. Applications for payment and change order requests.
 - 7. Progress schedules.
 - 8. Coordination drawings.
 - 9. Closure submittals.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.01. PRECONSTRUCTION MEETING

- A. The Architect will schedule the meeting.
- B. Attendance Required:
 - 1. Architect.
 - 2. Contractor.
 - 3. Other Subcontractors.

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- C. ☐end☐
 - 1. Designation of personnel representing the parties to Contract, Contractor, and Architect.
 - 2. Procedures and processing of all decisions, suggestions, substitutions, applications for permits, proposals, requests, Change orders, and Contract close-out procedures.
 - 3. Scheduling.
- CI. Record minutes and distribute copies within two days after meeting to participants, with one copy to Architect, participants, and those affected by decisions made.

3.02. SITE MOBILIZATION MEETING

- A. The Architect will schedule a meeting at the Project site prior to Contractor acceptance.
- B. Attendance Required
 - 1. Contractor.
 - 2. Owner.
 - 3. Architect.
 - 4. Contractor's Superintendent.
 - 5. Major Subcontractors.
- C. ☐end☐
 - 1. Use premises of Owner and Contractor.
 - 2. Owner's requirements.
 - 3. Construction facilities and controls provided by Owner.
 - 4. Temporary facilities.
 - 5. Storage and loading/unloading.
 - 6. Security and housekeeping procedures.
 - 7. Site safety program and temporary protection.
 - 8. Schedules.
 - 9. Application for permit procedures.
 - 10. Procedures for testing.
 - 11. Procedures for continuing record documents.
 - 12. Requirements for start-up occupancy.
 - 13. Inspection and acceptance of occupancy put into service during construction period.
 - 14. Communication coordination.
- D. Record minutes and distribute copies within two days after meeting to participants, with copies to Architect, participants, and those affected by decisions made.

3.03. PROGRESS MEETINGS

- A. Schedule and administer meetings to report progress of the project and discuss issues.
- B. Make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.
- C. Attendance Required: superintendent, Major Subcontractors and suppliers, Architect, as appropriate to agenda topics for each meeting.
- D. ☐end☐
 - 1. Review minutes of previous meetings.
 - 2. Review work progress.
 - 3. Field observations, proposals, and decisions.
 - 4. Identification of problems and impediments to progress.
 - 5. Review suggestions schedule and status suggestions.

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- ☐ ☐ Review site location and deliver schedules.
 - ☐ ☐ Maintenance progress schedule.
 - ☐ ☐ Corrective measures to remain protected schedule.
 - ☐ ☐ Planned progress during successful work period.
 - ☐ ☐ Coordination of protected progress.
 - ☐ ☐ Maintenance quality and standards.
 - ☐ ☐ Effect of proposed changes on progress schedule and coordination.
 - ☐ ☐ Other business meeting or
- ☐ E. Record minutes and distribute copies within two days after meeting to participants, to the copy architect, participants, and those affected decisions made.

3.04. CONSTRUCTION PROGRESS SCHEDULE

- ☐ ☐ Within two days after date the agreement shall it pre-increase schedule defining planned operations for the first two days and, to a general timeline for remainder of
- ☐ B. If pre-increase schedule requires revision after review, shall it revised schedule within two days.
- ☐ C. Within two days after review of pre-increase schedule, shall it draft proposed complete schedule for review.
- ☐ Include written certification that all contractors have reviewed and accepted proposed schedule.
- ☐ D. Within two days after final review, shall it complete schedule.
- ☐ E. Shall it updated schedule into electronic application for Permit.

3.05. SUBMITTALS FOR REVIEW

- ☐ ☐ When the items are specified in individual sections, shall it be for review
- ☐ Project data.
 - ☐ Shop drawings.
 - ☐ Samples for selection.
 - ☐ Samples for certification.
- ☐ B. Shall it to architect for review for the limited purpose of decision for construction once it is in the location given and the design concept expressed in the contract documents.
- ☐ C. Samples will be reviewed for aesthetic, color, or finish selection.
- ☐ D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 00 0000 (CONTRACT SUBMITTALS).

3.06. SUBMITTALS FOR INFORMATION

- ☐ A. When the items are specified in individual sections, shall it be for information
- ☐ 1. Design data.
 - ☐ 2. Certificates.
 - ☐ 3. Test reports.
 - ☐ 4. Inspection reports.
 - ☐ 5. Manufacturer's instructions.
 - ☐ 6. Manufacturer's field reports.
 - ☐ 7. Other types indicated.
- ☐ B. Shall it for architect's knowledge as contract administrator. No action will be taken.

3.07. SUBMITTALS FOR PROJECT CLOSEOUT

- ☐ ☐ When the items are specified in individual sections, shall it be for project closeout
- ☐ Project record documents.
 - ☐ Operation and maintenance data.

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- ☐ ☐ Warranties.
- ☐ ☐ Bonds.
- ☐ ☐ Other types as indicated.

3.08. NUMBER OF COPIES OF SUBMITTALS

- ☐ ☐ Submit copies as specified in the submittal schedule at the following times.
- ☐ B. Documents for Review
 - ☐ ☐ Schematic Sheets, not later than 10 days after issuance of the number of copies of the Contract documents.
 - ☐ ☐ Order Sheets, not later than 10 days after issuance of the copy.
- ☐ C. Documents for Information Submit one copy.
- ☐ D. Documents for Project Closeout Make one reproduction of the submittal in hard copy. Submit one electronic copy in hard copy.
- ☐ E. Samples Submit the number specified in individual specification sections one sample of the retained architect.
 - ☐ ☐ Retained samples must be returned to Contractor unless specifically stated.

3.09. SUBMITTAL PROCEDURES

- ☐ ☐ Sequential number the transmittals. Retain submittals in original order and a sequential revision number.
- ☐ B. Identify Project, Contractor, Subcontractor or supplier, pertinent drawing and detail number, and specification section number, as appropriate on each copy.
- ☐ C. Appoint Contractor's stamp, signed or initialed certifying that review, approval, verification of Products required, field dimensions, adjacent construction work, and coordination of information is in accordance with the requirements of the Order and Contract Documents.
- ☐ D. Deliver submittals to architect at business address.
- ☐ E. Schedule submittals to expedite the Project, and coordinate submittal processing times.
 - ☐ ☐ For each submittal review, make an appointment with architect for review and return the Contractor.
 - ☐ ☐ Identify locations for Contract Documents and Product or system limitations of the project to be determined success of performance once the copy is completed or.
 - ☐ ☐ Provide space for Contractor and architect review stamps.
- ☐ I. ☐ When revised for resubmission, identify changes made since previous submission.
- ☐ ☐ Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report on information to complete requirements.
- ☐ ☐ Submittals not requested must be recognized or processed.

END OF SECTION

**SECTION 01 4000
QUALITY REQUIREMENTS**

PART 1 - GENERAL

1.01. SECTION INCLUDES

- A. References and standards.
- B. Quality assurance systems.
- C. Construction.
- D. Tolerances.
- E. Testing and inspection services.
- F. Manufacturer's services.

1.02. REFERENCES

- A. ASTM C 1190 Standard Practice for Laboratories Engaged in Testing of Building Segments.
- B. ASTM C 1190 Standard Practice for Laboratories Testing Concrete and Concrete Structures for Use in Construction and Criteria for Laboratory Evaluation.
- C. ASTM C 1190 Standard Practice for Accreditation of Testing Agencies for Unit Masonry.
- D. ASTM D 1190 Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Steel and Reinforcing Steel Used in Engineering Design and Construction.
- E. ASTM E 1190 Standard Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction.
- F. ASTM E 1190 Standard Practice for Agencies Performing Nondestructive Testing.

1.03. SUBMITTALS

- A. Testing agency qualifications.
 - 1. Prior to start of work, submit agency name, address, and telephone number, and names of qualified registered Engineer and responsible officer.
- B. Test Reports after each test inspection, promptly submit copies of report to architect and to contractor.
 - 1. Include:
 - a. Date issued.
 - b. Project title and number.
 - c. Name of inspector.
 - d. Date and time of sample or inspection.
 - e. Identification of product and specifications section.
 - f. Location in the Project.
 - g. Type of test/inspection.
 - h. Date of test/inspection.
 - i. Results of test/inspection.
 - j. Contractor's Contract Documents.
 - k. When requested by architect, provide interpretation of results.
 - 2. Test reports are submitted for architect's information as contract administrator, for information for the limited purpose of assessing contractor's information given and the design concept expressed in the contract documents.
- C. Certificates when specified in individual specification sections, submit certification of the manufacturer and contractor or institution application subcontractor to architect, in quantities specified in Project Data.
 - 1. Indicate whether product conforms to or exceeds specified requirements. Submit supporting reference data, methods, and certifications as appropriate.

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- D. Manufacturer's Instructions. When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjustment, and finishing, for the owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.
- E. Manufacturer's Field Reports. Submit reports for architect's benefit as contract administrator or owner.
1. Submit report in duplicate within 60 days of completion to architect for information.
 2. Submit for information for the limited purpose of assessing condition once into information given and the design concept expressed in the contract documents.
- F. Erection Drawings. Submit drawings for architect's benefit as contract administrator.
1. Submit for information for the limited purpose of assessing condition once into information given and the design concept expressed in the contract documents.
 2. Do not indicate in appropriate or unacceptable or other subject to action by architect.

1.04. REFERENCES AND STANDARDS

- A. For products and materials specified reference to documents or documents not included in the Project Manual, is referred to as reference standards, compliance requirements, code standards, except when otherwise required requirements are specified or are required by applicable codes.
- B. Consult reference standard code release current in date of Contract Documents, except where a specific date is established by applicable code.
- C. Obtain copies of standards where required by product specification sections.
- D. Maintain copies of project site drawings, plans, and progress of the specific work until substantial completion.
- E. Should specified reference standards conflict with Contract Documents, request clarification from architect before proceeding.
- F. Neither the contract conditions, dates, nor responsibilities of the parties in Contract nor those of architect shall be altered from the Contract Documents by omission or inference otherwise in any reference document.

1.05. TESTING AND INSPECTION AGENCIES

- A. Owner will pay and pay for services of an independent testing agency to perform specified testing.
- B. Employ an independent agency in no way relies Contractor or subcontractor to perform or in accordance with requirements of Contract Documents.

PART 2 - PRODUCTS -NOT USED

PART 3 - EXECUTION

3.01. CONTROL OF INSTALLATION

- A. Monitor and control contractor suppliers, subcontractors, products, services, site conditions, and materials, to produce a work as specified.
- B. Compare with manufacturer's instructions, including each step, in sequence.
- C. Should manufacturer's instructions conflict with Contract Documents, request clarification from architect before proceeding.
- D. Compare with specified standards as in the code or the except where more stringent tolerances, codes, or specified requirements indicate other standards or are precise materials.
- E. Use a supervised persons qualified to produce required and specified work.

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- . Verify that field measurements are as indicated on shop drawings or as instructed by the Contractor.
- . Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, seismic distortion, and disturbance.

3.02. TOLERANCES

- . Monitor fabrication and installation tolerance controls products to produce acceptable or Do Not permit tolerances to occur.
- B. Compare with Contractors' tolerances. Should Contractors' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.
- C. Adjust products to appropriate dimensions/position before securing products in place.

3.03. TESTING AND INSPECTION

- . See individual specification sections for testing required.
- B. Testing Responsibilities
 - . Provide qualified personnel site. Cooperate with Architect and Contractor in performance of services.
 - . Perform specified sampling and testing of products in accordance with specified standards.
 - . Ascertain compliance with criteria and codes with requirements of Contract Documents.
 - . Promptly notify Architect and Contractor of observed irregularities or nonconformance of work or products.
 - . Perform additional tests and inspections required by Architect.
 - . Submit reports of tests/inspections specified.
- C. Limits on Testing/Inspection Responsibilities
 - . Engineer cannot release, retest, alter, or enforce on requirements of Contract Documents.
 - . Engineer cannot approve or accept incorporation of work.
 - . Engineer cannot assume liabilities of Contractor.
 - . Engineer has no authority to stop the work.
- D. Contractor Responsibilities
 - . Cooperate with Engineer's personnel and provide access to the work and to Contractor's facilities.
 - . Provide incident/expense and facilities
 - . To provide access to work to be tested/inspected.
 - . To obtain and handle samples at the site or at source of products to be tested/inspected.
 - c. To facilitate tests/inspections.
 - d. To provide storage and curing of test samples.
 - . Notify Architect and Engineer of work prior to expected time for operations requiring testing/inspection services.
 - . Arrange with Owner's Engineer and provide additional samples, tests, and inspections required by Contractor and specified requirements.
- E. Retesting required because nonconformance to specified requirements should be performed by the same Engineer on instructions of Architect. Payment for retesting will be credited to the Contractor.

3.04. MANUFACTURERS' FIELD SERVICES

- . When specified in individual specification sections, require qualified product suppliers or manufacturers to provide qualified staff/personnel to observe site conditions, conditions of services and installation, assist in erection/assembly, start-up, acceptance, test, adjust and maintain equipment as applicable, and to initiate instructions when necessary.

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- ☐ B. Report observations and site decisions or instructions given to applicators or installers that are
☐ supplement contractor control to manufacturer's written instructions.

☐ **3.05. DEFECT ASSESSMENT**

- ☐ A. Replace or repair portions of the system that cannot conform to specified requirements.
- ☐ B. If in the opinion of architect, it is not practical to remove and replace the work, architect may
☐ direct an appropriate remedial or least possible.

☐ **END OF SECTION**

**SECTION 01 4100
REGULATORY REQUIREMENTS**

PART 1 - GENERAL

1.01. SECTION INCLUDES

- . Other applicable regulatory agencies are not specifically identified.

1.02. QUALITY ASSURANCE

- . Perform as in contract once all the applicable requirements are met, and CCR Title 1, Title 2, Title 3, and Title 4.

PART 2 - PRODUCTS -NOT USED

PART 3 - EXECUTION -NOT USED

END OF SECTION

SECTION 01 5000
TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.01. GENERAL

- . See General Conditions "Use of Site" for additional requirements. Items are in conflict with this section, then the more restrictive requirement.

1.02. SECTION INCLUDES

- . Temporary facilities.
- . Temporary telephone and mobile service.
- . Temporary sanitary facilities.
- . Temporary Controls Barriers, enclosures, and fencing.
- . Security requirements.
- . Vehicle access and parking.
- . Waste removal facilities and services.
- . Project identification sign.
- . Field offices.

1.03. TEMPORARY UTILITIES

- . Provide and power the electric power, heating, water, heating and cooling, and ventilation required for construction purposes.
- . Existing facilities shall not be used.

1.04. TELEPHONE SERVICE

- . Provide, maintain, and power telephone and data services to field office at time appropriate installation.

1.05. TEMPORARY SANITARY FACILITIES

- . Provide and maintain required facilities and enclosures. Provide at time appropriate installation.
- . Maintain drain clean and sanitary condition.

1.06. BARRIERS

- . Provide barriers to prevent unauthorized entry to construction areas and to protect existing facilities and adjacent properties from damage from construction operations.
- . Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.
- . Protect non-owned vehicle traffic, stored materials, site, and structures from damage.

1.07. FENCING

- . Construction Code enforce code compliance.
- . Provide safety fence around construction site to protect vehicle and pedestrian safety.

1.08. SECURITY

- . Coordinate with owner's security program.

1.09. VEHICULAR ACCESS AND PARKING

- . Coordinate access and egress with governing authorities and owner.
- . Provide and maintain access to fire hydrants, fire instructions.

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- C. Provide means over main road for vehicle access before entering streets.
- D. Provide temporary parking areas to accommodate construction personnel when site space is not adequate, coordinate additional site parking with owner.
- E. Designate parking spaces for owner and architect use.

1.10. WASTE REMOVAL

- A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.
- B. Provide containers with lids. Dispose of waste on site as required.

1.11. PROJECT IDENTIFICATION

- A. Provide project identification sign as required by owner.
- B. In addition to Project name and other features required by the owner, list the owner, architect, Professional Consultants and Contractor.
- C. Obtain owner's and architect's approval of design prior to construction of the sign.
- D. Erect on site at location acceptable to the owner and architect.
- E. All other signs are removed without owner permission except those required by law.

1.12. FIELD OFFICES

- A. Office with toilet, hot water, electric outlets, heating, cooling equipment, and equipped with storage furniture, drinking water and drinking disposal.
- B. Provide space for Project meetings, with table and chairs to accommodate persons.

1.13. REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary utilities, equipment, facilities, materials, prior to Substantial Completion inspection.
- B. Remove underground installations to a minimum depth as indicated.
- C. Clean and repair damage caused by installation or use of temporary work.
- D. Restore existing and permanent facilities used during construction to original condition.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

SECTION 01 6000 PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.01. SECTION INCLUDES

- A. General product requirements.
- B. Transportation, handling, storage and protection.
- C. Product option requirements.
- D. Substitution limitations and procedures.
- E. Procedures for owner-supplied products.
- F. Spare parts and maintenance materials.

1.02. REFERENCES

- A. NFPA National Electric Code National Fire Protection Association.

1.03. SUBMITTALS

- A. Product Data Submit manufacturer's standard published data. Manufacturer provide identification products, codes, options, and other data. Supplement manufacturers standard data to provide information specific to this Project.
- B. Shop Drawing Submit Prepared specific for this Project.
- C. Sample Submit illustrate function and aesthetic characteristics of the product, its interior parts and attachment devices. Coordinate sample submit for interlocking with:
 - 1. For selection from standard finishes, submit samples of the finish of the manufacturers.
- D. Standard colors, textures, and patterns.
- E. Indicate finish and electric characteristics, finish connection requirements, and location of finish outlets for service for function equipment and appliances.

PART 2 - PRODUCTS

2.01. PRODUCTS

- A. Wiring Terminations Provide terminations to electric branch circuit conductor quantities, sizes, and materials indicated. Size terminations to NFPA 70, include lists for terminations.
- B. Card and Panel Provide initial card and panel including grounding connector for connection to electric wiring system. Card number length is specified in individual specification sections.

2.02. PRODUCT OPTIONS

- A. Products Specified by Reference Standards or Description Allow use of product meeting these standards or description.
- B. Products Specified by name of one or more Manufacturers Allow product name of the manufacturers noted and meeting specifications, no options or substitutions allowed.
- C. Products Specified by name of one or more Manufacturers Allow Provision for Substitutions Submit request for substitution for another manufacturer not noted.

2.03. SPARE PARTS AND MAINTENANCE PRODUCTS

- A. Provide spare parts, maintenance, and extra products types and in quantities specified in individual specification sections.
- B. Deliver to and place in location as directed within receipt prior to installation.

PART 3 - EXECUTION

3.01. SUBSTITUTION PROCEDURES

- ☐ Instructions to Bidders specify the restrictions for substituting requests for substitutions during the bidding period. Comp submit requirements specified in this section.
- ☐ B. Decrement each request for complete data substantiating compliance proposed substitution into Contract Documents.
- ☐ C. ☐ request for substitution constitutes a representation that the submitter
 - ☐ has investigated proposed product and determined that it meets or exceeds the quality of the specified product.
 - ☐ will provide the same quantity for the substitution as for the specified product.
 - ☐ will coordinate installation and take chances to alter or modify the required for the project complete within additional cost to owner.
 - ☐ will cover any additional costs or time extension which may be a consequence of the apparent.
 - ☐ will reimburse owner and architect for relief or redesign services associated with the appropriate authorities.
- ☐ D. Substitutions shall be considered when they are indicated or implied in shop drawings or product data sheets, without separate written request, or when acceptance will require revision to the Contract Documents.
- ☐ E. Substitution Submit Procedure
 - ☐ Submit request for substitution for consideration. If it is a request to one proposed substitution.
 - ☐ Submit shop drawings, product data, and certified test results attesting to the proposed product equivalence. Burden of proof is on proposer.
 - ☐ The architect will make a decision to accept or reject request.

3.02. OWNER-SUPPLIED PRODUCTS, IF ANY

- ☐ A. Owner's Responsibilities
 - ☐ Arrange for and deliver owner required shop drawings, product data, and samples, to Contractor.
 - ☐ Arrange and pay for product delivery to site.
 - ☐ On delivery, inspect products into the Contractor.
 - ☐ Submit costs for transportation, damage and replace damaged, defective, or deficient items.
 - ☐ Arrange for subcontractors warranties, inspections, and service.
- ☐ B. Contractor's Responsibilities
 - ☐ Receive owner required shop drawings, product data, and samples.
 - ☐ Receive and unload products at site inspect for completeness or damage into the owner.
 - ☐ Store, store, install and finish products.
 - ☐ Repair or replace items damaged after receipt.

3.03. TRANSPORTATION AND HANDLING

- ☐ Transport and handle products in accordance with the subcontractor's instructions.
- ☐ B. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
- ☐ C. Provide equipment and personnel to handle products and methods to prevent staining, disfigurement, or damage.

3.04. STORAGE AND PROTECTION

- ☐ Store and protect products in accordance with the subcontractor's instructions.

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- ☐ B. Store nitro seals and wires intact and sealed.
- ☐ C. Store sensitive products in weather tight, climate controlled, enclosures in an environment appropriate to product.
- ☐ D. For exterior storage uncoated products, place on sloped supports above ground.
- ☐ E. Provide bonded site storage and protection when site does not permit on-site storage or protection.
- ☐ F. Cover products subject to deterioration with waterproof sheet covering. Provide ventilation to prevent condensation and degradation of products.
- ☐ G. Store loose granular materials in solid unit sources in a well-drained area. Prevent oiling or other contamination.
- ☐ H. Provide equipment and personnel to store products in methods to prevent staining, disfigurement, or damage.
- ☐ I. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are contained in acceptable condition.

END OF SECTION



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**SECTION 01 7000
EXECUTION REQUIREMENTS**

PART 1 - GENERAL

1.01. SECTION INCLUDES

- A. Excavation, preparation, and general installation procedures.
- B. Preinstallation meetings.
- C. Cutting and patching.
- D. Scheduling and timing of the work.
- E. Cleaning and protection.
- F. Starting assemblies and equipment.
- G. Demonstration and instruction of owner personnel.
- H. Closeout procedures, except punch list procedures.

1.02. SUBMITTALS

- A. Sample of the Submit name, address, and telephone number of Engineer before starting work.
 - 1. On request, submit documentation verifying accuracy of sample.
 - 2. Submit a copy of site drawing issued by the Engineer, that the elevations and locations of the work are in conformance with Contract Documents.
- B. Cutting and Patching Submit written request in advance of cutting or alteration of the following:
 - 1. Structural integrity of the existing Project.
 - 2. Integrity of the exposed or to be exposed resistant elements.
 - 3. Efficiency, maintenance, or safety of the operation of the existing.
 - 4. Discontinuities of the exposed elements.
 - 5. To the owner or separate Contractor.
 - 6. Include in request:
 - a. Identification of Project.
 - b. Location and description of affected work.
 - c. Necessity for cutting or alteration.
 - d. Description of proposed work and products to be used.
 - e. Alternatives to cutting and patching.
 - f. Effect on the owner or separate Contractor.
 - g. Written permission of affected separate Contractor.
 - h. Date and time of the proposed execution.

1.03. QUALIFICATIONS

- A. For sample of the proposed professional engineer registered in California and acceptable to architect. Submit evidence of the contractor's Errors and Omissions insurance coverage in the form of an Insurance Certificate.

1.04. COORDINATION

- A. Coordinate scheduling, submittals, and other critical project sections with the Project Management team to ensure efficient and orderly sequence of installation of interdependent construction elements.
- B. Verify that requirements and characteristics of the operating equipment are compatible with existing facilities. Coordinate with other project sections of interdependent responsibilities for installing, connecting, and placing in service, each equipment.
- C. Coordinate space requirements, supports, and installation of electronic and electric equipment as indicated diagrammatic on Drawings. Verify routing of pipes, ducts, and

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- ☐ condition, as close as practicable place runs parallel to lines providing utility spaces
- ☐ efficient to provide access to for other installations, for maintenance, and for repairs.
- ☐ D. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring in the
- ☐ construction. Coordinate locations of fixtures and outlets with finish elements.
- ☐ E. Coordinate completion and cleanup across separate sections.
- ☐ F. After owner occupancy prepares, coordinate access to site for correction of defective work
- ☐ and perform in accordance with Contract Documents, to minimize disruption of owner's
- ☐ activities.

PART 2 - PRODUCTS

2.01. PATCHING MATERIALS

- ☐ A. Materials specified in product sections of existing products and work for patching
- ☐ and extending work.
- ☐ B. Type and quality of Existing Products Determine inspection and testing products where
- ☐ necessary, referring to existing standards.
- ☐ C. Product Substitution or proposed change in materials, submit request for substitution
- ☐ described in Section 01 00 00.

PART 3 - EXECUTION

3.01. EXAMINATION

- ☐ A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work
- ☐ Beginning new work means acceptance of existing conditions.
- ☐ B. Verify that existing substrate is capable of supporting or attachment of new work being
- ☐ applied or attached.
- ☐ C. Examine and verify specific conditions described in individual specification sections.
- ☐ D. Verify that utility services are available, of the correct characteristics, and in the correct
- ☐ locations.

3.02. PREPARATION

- ☐ A. Prepare surfaces and remove surface finishes to provide for proper installation of new work and
- ☐ finishes.
- ☐ B. Clean substrate surfaces prior to application of new substance.
- ☐ C. Seal cracks or openings of substrate prior to application of new substance.
- ☐ D. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to
- ☐ application of new substance in contact or bond.

3.03. PREINSTALLATION MEETINGS

- ☐ A. When required in individual specification sections, convene preinstallation meeting at the site
- ☐ prior to construction of the section.
- ☐ B. Require attendance of parties directly affected, or affected by, or of the specific section.
- ☐ C. Invite architect or owner in advance of meeting date.
- ☐ D. Prepare agenda and preside at meeting.
 - ☐ 1. Review conditions of installation, preparation and installation procedures.
 - ☐ 2. Review coordination of related work.
- ☐ E. Record minutes and distribute copies within two days after meeting to participants, with copies
- ☐ to architect, participants, and those affected by decisions made.

3.04. LAYING OUT THE WORK

- ☐ A. Verify locations of service drop points prior to starting work.

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- ☐ B. Promptly notify architect upon discrepancies discovered.
- ☐ C. Protect source control points prior to starting site work preserve permanent reference points during construction.
- ☐ D. Promptly report to architect the loss or destruction of any reference point or relocation required.
- ☐ E. Replace displaced source control points based on original source control Map notes within 48 hours of discovery. Notify architect in writing prior to replacement.
- ☐ F. Utilize recognized engineering source practices.
- ☐ G. Establish egress routes, lines and areas. Locate and mark all instrumentation and signage appropriate to the work.
- ☐ H. Periodic safety audits shall be conducted.
- ☐ I. Maintain a complete and accurate log of all source control points as it progresses.

3.05. GENERAL INSTALLATION REQUIREMENTS

- ☐ A. Install Products as specified in individual sections.

3.06. CUTTING AND PATCHING

- ☐ A. See General Conditions "Cutting and Patching" for additional requirements. All work shall be in accordance with this section and the more restrictive requirements.
- ☐ B. Execute cutting and patching including excavation and foundation work to complete the work, to enclose work to install proper sequenced work, to remove and replace defective or non-conforming work, to remove and replace installed work for testing when requested, to provide openings in the work for penetration of mechanical and electrical work, to execute patching to complete and adjacent work, and to fit Products together to integrate into other work.
- ☐ C. Execute work methods to avoid damage to other work, and always provide appropriate surfaces to receive patching and finishing.
- ☐ D. Employ original installer to perform cutting or repair exposed and restore resistant elements, and seal exposed surfaces.
- ☐ E. Cut rigid materials using a chainsaw or core drill. Pneumatic tools not allowed without prior approval.
- ☐ F. Restore work with new Products in accordance with requirements of Contract Documents.
- ☐ G. Fit work for tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- ☐ H. Fit penetrations through walls, partitions, ceiling, or other construction, complete sealants to fit fire rated materials in accordance with Section 05050 to match existing penetrations.

3.07. PROGRESS CLEANING

- ☐ A. See General Conditions "Cleaning up" for additional requirements. All work shall be in accordance with this section and the more restrictive and notify the architect.
- ☐ B. Maintain areas free of waste materials debris, and remove. Maintain site in clean and orderly condition.
- ☐ C. Remove debris and remove from pipe chases, penes, attics, crawl spaces, and other closed or restricted spaces prior to enclosing the space.
- ☐ D. Break down and remove clean interior areas prior to start of surface finishing, and continue cleaning to end of the project.
- ☐ E. Collect and remove waste materials, debris, and remove from site and dispose properly.

3.08. PROTECTION OF INSTALLED WORK

- ☐ A. Protect installed work and provide special protection where specified in individual specification sections.

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- B. Provide temporary and re-entrance protection for installed products. Contractors shall immediately remove to prevent damage.
- C. Provide protective coverings at doors, projections, walls, stairs, and soffits openings.
- D. Protect finished floors, stairs, and other surfaces from traffic, dirt, debris, damage, or permanent damage objects, and protection into drainage sheet materials.
- E. Prohibit traffic or storage upon unprotected or roofed surfaces. If traffic or activity is necessary within recommended protection from unprotected or roofed materials on structure.
- F. Prohibit traffic from landscaped areas.

3.09. ADJUSTING

- A. Adjust operating products and equipment to ensure safety and undisturbed operation.

3.10. FINAL CLEANING

- A. Execute final cleaning prior to Substantial Completion and prior to final acceptance.
- B. Clean interior and exterior walls, surfaces exposed to debris from temporary walls, stairs and other substances, paint transparent and glass surfaces, concrete carpeted and soft surfaces.
- C. Clean equipment and fixtures to sanitary condition into cleaning materials appropriate to the surface and materials being cleaned.
- D. Clean filters operating equipment.
- E. Clean debris from floors, attics, dropspots, and drainage systems.
- F. Clean site sweep paved areas, roof clean landscaped surfaces.
- G. Remove waste and surplus materials, rubbish, and construction facilities from the site.

3.11. TOUCH-UP AND REPAIR

- A. Upon service, materials equipment has been damaged, touchup and/or repair exposed areas in a manner acceptable to the Architect. Surface renovation and touchup shall be acceptable under same circumstances or, at the sole discretion of the Architect, complete renovation or replacement may be required.

3.12. CLOSEOUT PROCEDURES

- A. Make submissions that are required by governing or other authorities.
 - 1. Provide copies to Architect.
- B. Notify Architect when work is considered ready for Substantial Completion.
- C. Submit written certification that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's review.
- D. Correct items shown or listed in executed Certificates of Substantial Completion and complete into requirements for access to owner-occupied areas.
- E. Notify Architect when work is considered final complete.
- F. Complete items shown or determined by Architect's final inspection.

END OF SECTION

**SECTION 01 7800
CLOSEOUT SUBMITTALS**

PART 1 - GENERAL

1.01. SECTION INCLUDES

- A. Closeout procedures.
- B. Installation.
- C. Demonstration.
- D. Touchup and repair.
- E. Project record documents.
- F. Operation and maintenance data.
- G. Warranties.
- H. Spare parts and maintenance materials.
- I. Systems demonstration.
- J. Installation acceptance and owner acceptance.

1.02. SUBMITTALS

- A. Project Record Documents Submit documents to architect prior to construction or application for Permit.
- B. Operation and Maintenance Data Submit as stated in specific sections.
 - 1. For equipment, or component parts equipment put into service during construction and operated by owner, submit completed documents within ten days after acceptance.
 - 2. Submit to sets submitted documents in original within 30 days after inspection.
- C. Warranties and Bonds Submit as stated in specific sections.
 - 1. For equipment or component parts equipment put into service during construction with owner's permission, submit documents within ten days after acceptance.
 - 2. Make after submit within ten days after Date of Substantial Completion, prior to final application for Permit.
 - 3. For items for which acceptance is deemed beyond Date of Substantial Completion, submit within ten days after acceptance, listing the date acceptance is the beginning of the warranty period.

PART 2 - PRODUCTS -NOT USED

PART 3 - EXECUTION

3.01. PROJECT RECORD DOCUMENTS

- A. Maintain on site one set of the following record documents record corrections to the original:
 - 1. Drawings.
 - 2. Specifications.
 - 3. Addendum.
 - 4. Change orders and other modifications to the Contract.
 - 5. Rejected shop drawings, product data, and samples.
 - 6. Manufacturer's instruction or assembly, installation, and demonstration.
- B. Ensure entries are complete and accurate, including future reference to the Architect.
- C. Store record documents separate from documents used for construction.

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- D. Record information concurrent with construction progress. Do not prepare cross-section instructions prior to construction, clear, permanent marks. Use construction colors for different disciplines as required and where required for critical dimensions and notations should be neat and accurate code. More documents should be at parties or refer to the Architect. The Architect should approve applications for permanent fixture Contractor can show that record documents are up to date.
- E. Do not perform construction or entire required information has been recorded.
- F. Product Data/Maintain one copy of each product data submitted. More these documents to show significant variations in construction or performed in comparison with information submitted. Include variations in products delivered to the site, and from the manufacturer's installation instructions and record conditions.
- G. Specifications should be read and record of each product section description of products installed, including the following:
1. Manufacturer's name and product code and number.
 2. Product substitutions or alternates utilized.
 3. Changes made to addendum and modifications.
- H. Record Drawings and Shop Drawings should be read and recorded to record construction including:
1. Measured depths and conditions in relation to this first order data.
 2. Measured horizontal and vertical locations of underground utilities and opportunities, referenced to permanent surface or process.
 3. Measured locations of internal utilities and opportunities concealed in construction, referenced to visible and accessible features of the.
 4. Field changes to dimension and details.
 5. Details not in original Contract drawings.

3.02. OPERATION AND MAINTENANCE DATA

- A. For Each Product or System list names, addresses and telephone numbers of Suppliers and suppliers, including the source of supplies and replacement parts.
- B. Product Data/More each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inappropriate information.
- C. Drawings/Shop each product data to illustrate relations of component parts of equipment and systems, to show construction and details. Do not use Project Record Documents as maintenance drawings.
- D. Typed Texts required to supplement product data. Provide concise instructions for each procedure, incorporating manufacturer's instructions.

3.03. OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

- A. For Each Product, Applied Material, and Finish
1. Product data, including color, size, composition, and color and texture designations.
 2. Information for reordering cost of manufactured products.
- B. Instructions for Care and Maintenance/Manufacturer's recommendations for cleaning agents and methods, precautions against deterioration of cleaning agents and methods, and recommended schedule for cleaning and maintenance.
- C. Moisture protection and weather exposed products/Include product data listing applicable reference standards, color, composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.
- D. Additional information as specified in individual product specification sections.

3.04. OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

- A. For Each Item of Equipment and Each System

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- ☐ ☐ Description of unit or system, and component parts.
- ☐ ☐ Identify function, normal operating characteristics, and initial conditions.
- ☐ ☐ Include performance curves, field engineering data and tests.
- ☐ ☐ Complete nomenclature and code number for replacement parts.
- ☐ B. Provide Circuit Directories Provide electric service characteristics, controls, and connections typed.
- ☐ C. Include color coded wiring diagrams as installed.
- ☐ D. Operating Procedures Include start-up, pre-run, and routine normal operating instructions and sequences. Include re-rotation, control, stopping, shutdown, and emergency instructions. Include safety, inter, and other special operating instructions.
- ☐ E. Maintenance Requirements Include routine procedures and provide for preventative maintenance and troubleshotting/disassembly, repair, and reassembly instructions and alignment, adjustment, and cleaning instructions.
- ☐ ☐ Provide servicing and lubrication schedule, and list lubricants required.
- ☐ ☐ Include manufacturers printed operation and maintenance instructions.
- ☐ ☐ Include sequence operation controls manufacturer.
- ☐ I. Provide manufacturer's parts list, illustrations, assembly drawings, and drawings required for maintenance.
- ☐ ☐ Provide control diagrams of controls manufacturer as installed.
- ☐ ☐ Provide Contractor's coordination drawings, field color coded piping diagrams as installed.
- ☐ ☐ Provide charts complete tonnage, field location and function schedule, used to run and control diagrams.
- ☐ M. Provide list manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- ☐ ☐ Include test and alignment reports.
- ☐ ☐ Additional Requirements as specified in individual product specification sections.

3.05. OPERATION AND MAINTENANCE MANUALS

- ☐ ☐ Prepare instructions and data for personnel experienced in maintenance and operation of described products.
- ☐ B. Prepare data in the form of an instruction manual.
- ☐ C. Binders Color reinforced, three D side ring binders with durable plastic covers, three D side. When clip binders are used, correct data is retained. consistent copiers.
- ☐ D. Cover Identification Under typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS Identification Project identification of other contents.
- ☐ E. Provide typed dividers for each separate product and system, typed description of product and major component parts as applicable.
- ☐ ☐ Text Manufacturer's printed data, or typewritten data on good paper.
- ☐ ☐ Drawings Provide field reinforced punched under tab. Bind in field tabular order drawings to side of text pages.
- ☐ ☐ Arrange content of systems under section numbers and sequence of table contents of this Project Manual.
- ☐ I. Contents Prepare Table of Contents for each volume, field each product or system description identified, in three parts as follows:

CSE T SUBMIT S

- SECTI□□ □□ □□□□ □□ □□□□

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subcontractors' information, without record or meter owner has recorded benefited from the proposed portion anticipated use/service files.

1. Provide duplicate copies. Documents executed by subcontractors, suppliers and manufacturers to be countersigned by the Contractor. Provide these documents and issue the in order to ensure the correct plastic cover is used in the project.
2. Submit prior to application for Permit. The equipment put into use without owner's permission during construction, submit within 30 days after first operation. The items shall be deemed a violation of the Code of Ordinances, provide updated submit within ten days after acceptance, list the date of acceptance as start of warranty period.
3. Disclosures and limitations. Manufacturers' disclosures and limitations on product warranties do not relieve the Contractor of the warranty on the product incorporates the products, nor do they relieve suppliers, manufacturers and installers required to countersign specific warranties with the Contractor.
4. The warranty. The General Conditions of the Contract cover the Contractor's responsibility to redress defects due to workmanship and materials which appear within one year from the owner accepted Date of Substantial Completion. Warranties for more than one year, where indicated in various sections of the Specifications, shall be in the form of warranty written on the letterhead of the Contractor, subcontractor or supplier defining the work and/or supplying the item to be warranted. The work shall be per Exhibit A at the end of this section.

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EXHIBIT A -FORM OF WARRANT

SECTI□ □ □□□□□□□□ □ □RR□□T□ □□R

Buyer agrees to warrant that the product, once it is once installed, has been done in accordance with the Drawings and Specifications, and that the work is installed, and that the requirements of the drawings included in the Specifications. Buyer agrees to repair or replace and or remove work, together with and other and adjacent work and or work displaced as a result of, that the product to be defective in its workmanship or material, within a period of one year or correction period, and years or warranty period, from the date of the accepted Date of Substantial Completion of the completed structure, without charge or expense to the Buyer, to the Buyer, and or other and to the Buyer and or other and or other or neglect excepted.

In the event _____ agrees to complete the _____entitled conditions within reasonable time, not in excess than thirty days after being notified in writing by the _____, the, collective or separate, _____ shall oblige the _____ to proceed to make said defects repaired and make good at its expense, and the _____ and postage costs and charges thereare upon defendant.

Signed _____
 S____n____r____p____
 _____icense _____

Contractor license no. _____

END OF SECTION

CASE SET SUBMIT

ASBESTOS ABATEMENT

1.1 SUMMARY OF SCOPE OF WORK

- ASBESTOS ABATEMENT**
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- All work involving disturbance of ACBM's shall be conducted using work methods, and controls be in identified and as required under applicable regulations. All work shall be conducted in accordance with applicable regulations and in a manner that protects the health and safety of the general public, other trades, County residents employees, the general public, and others during the work. ACBM's shall be protected during all work operations to preclude generation of airborne dust and visible emissions.
- All notified persons shall be trained, unprotected workers or others enter an established "Regulated Area" established by the contractor, or participate in work operations or activities are not specifically trained and licensed, and all activities shall be performed in a manner that is not protected.
- The Contractor shall not be relieved of project design documents, including but not limited to construction drawings, project specifications, project addendums, and previous assessments shall report to determine locations identified and/or present ACBM, and ACCM's to be impacted in order to complete the specified scope of work under the agreement. Contractor shall not request additional compensation or extension of contract based upon their failure to accurately determine the scope of work, and based upon their review of project design documents, assessments shall, available data, and field verification activities, locations, and existing conditions affecting completion of the work.
- The Contractor shall be responsible for accurate determination of all activities and locations, and all conditions affecting their execution of the work under the contract.
- Scope of work shall include disassembly of existing existing systems, components, existing elements, and equipment to access ACBM's for purposes of removal, or to complete the required scope of work under the contract. Where required, the Contractor shall restore elements disassembled as part of the work to the satisfaction of the County residents.
- Perimeter air monitoring shall be conducted by the County residents Designated Representative during all work to ensure proper and site safety, and to ensure safety and effectiveness of work. Contractor in the performance of the work. This shall not relieve assessments of the Contractor of responsibility to perform in representative person's supervision or execution. Person's supervision shall be conducted in accordance with Title 9 CCR. Where Contractor to perform person's supervision operations to satisfaction of County residents Designated Representative, or failure to provide satisfactory results within stipulated time period shall be considered. County residents to provide independent personal air monitoring operations conducted on its' behalf, and to deduct cost of services from all bills owed to Contractor under the agreement. Costs shall include County residents Designated Representative's costs, shipping charges, and fees associated with monitoring analysis.
- County residents shall approve in writing any additional work or changes in contract price. Cost for such work shall be agreed upon by Contractor and County residents prior to initiation of further work or activities. Estimated costs shall be included and shall reflect all costs including labor, materials, insurance, disposal, overhead and profit, etc.

and others of the site of the nature of the records and proper procedures to be followed to protect the series from asbestos records.

- In compliance with Title 5 CCR, the Prime Contractor shall provide general supervision and oversight over all subcontracted asbestos abatement Contractor and shall provide oversight over all subcontracted work. Refer to 5 CCR for description of duties and responsibilities of prime contractors engaged in asbestos removal projects.

1.2 LIMITATIONS - ASBESTOS ABATEMENT

PPICBEE TO THE SECTION OF SPECIFICATION FOR ASBESTOS ABATEMENT

A. SUMMARY

This Specification is specifically intended for use on the project indicated.

- Where the term "Asbestos Abatement Contractor" is used throughout these specifications, it is meant to refer to the entity doing the asbestos and/or lead related work whether it is the Prime Contractor (Contractor) or a subcontractor.
- Any revision, revisions or case may supersede portions of this Specification. Such superseding facts become, in effect, currently "applicable" laws, regulations and good practice within the intent of this Specification.
- In case of discrepancies in this Specification, the strictest law, regulation, standard or good practice shall apply.
- Any facts or discrepancies are evident to bidders prior to submission of the bid, the same shall be brought to the attention of the County Engineer so that the necessary addendum or amendments or corrections can be issued to bidders.
- Indications of condition or condition drawings are intended to be approximate conditions. Bidder has the obligation to accurately assess quantities, condition, and accurate measurement in preparation prior to submitting a bid for the work. Scope determination shall be made during initial or subsequent site visits, permitted, review of design documents, including project construction drawings, all specification sections, addendums, and other relevant documents.
- Contractor shall not submit a claim or "change order" for their failure to accurately determine the scope of the work or based on the information of the project site, and review of relevant project documents. Contractor shall consider time, scope, delays, and other issues based on the relevant scope of the work.

B. Abbreviations and Acronyms

- **ACBM:** Asbestos Containing Building Material
- **ACM:** Asbestos Containing Material
- **APCD:** Air Pollution Control District
- **AQMD:** Air Quality Management District
- **AHERA:** Asbestos Hazard Emergency Response Act, 40 CFR Part 7
- **AIHA:** American Industrial Hygiene Association
- **ANSI:** American National Standards Institute
- **ASA:** American Standards Association
- **ASTM:** American Society for Testing of Materials
- **CFR:** Code of Federal Regulations
- **CERCLA:** Comprehensive Environmental Response, Compensation and Liability Act 42 USC 9601
- **CIH:** Certified Industrial Hygienist

DOT:	U.S. Department of Transportation
EPA:	Environmental Protection Agency
F/CC:	Fibers per cubic centimeter or fiber
FR:	Federal Register
G(C)FI:	Ground Circuit Interrupter
HEPA:	High Efficiency Particulate Air Filter with 99.97 efficiency to 0.3 microns
HVAC:	Heating, Ventilation and Air Conditioning system
IH:	Industrial Hygienist
MSDS:	Material Safety Data Sheet
OSHA:	Occupational Safety and Health Administration
NAM:	Negative Air Migration Machine
NEC:	National Electrical Code
NESHAPS:	National Emission Standards for Hazardous Air Pollutants Code of Federal Regulations Part 61
NFPA:	National Fire Protection Association
NIOSH:	National Institute for Occupational Safety and Health
COUNTY OF FRESNO:	County of Fresno
COUNTY OF FRESNO'S REPRESENTATIVE:	T. Brooks & Associates, a Division of Provost and Pritchard
PAPR:	Powered Air-Purifying Respirator
PCM:	Phase Contrast Microscope Air Sample Analysis
PLM:	Phase Contrast Microscope Bulk Sample Analysis
RCRA:	Resource Conservation and Recovery Act
SSN:	Social Security Number
TBA:	T. Brooks & Associates, Inc. a Division of Provost and Pritchard
TEM:	Transmission Electron Microscope
USC:	United States Code

C. Abbreviations and Acronyms Continued

CAC:	California Administrative Code
Cal/OSHA:	California Division of Occupational Safety and Health
CSC:	Construction Safety Orders
DOSH:	Division of Occupational Safety and Health
DHS:	Department of Health Services
GISO:	General Industry Safety Orders

1.3 DEFINITIONS – GENERAL

- Abatement: Procedure to control or remove ACM's. Includes removal, encapsulation, enclosure, repair, Remediation and restoration activities.
- Aggressive Sampling: Use of air sampling equipment such as a sampler and hose to re-entrain particulate prior to clearance sampling in a tested substantial manner to that outlined in Appendix C of the COR.
- Airlock: A system for permitting ingress and egress into and out of air containment between contained areas and an uncontaminated area, typically consisting of two contained doorways separated by a distance that is at least 6 feet so that one passes through one doorway into the airlock, remains in the doorway sufficient to strip and close the opening before proceeding through the second doorway, thereby preventing the re-entrainment.
- Air Monitoring: The process of determining the fiber content of an area where air is collected during a specific period of time as indicated in Appendix E of the COR and the COR.
- Air Clearance: "Final Air Clearances" conducted in accordance with Appendix E of the

- COR shall TEM at least once a year unless indicated otherwise.
- **Air Sampling Professional:** The professional contracted or employed by County to supervise and conduct air monitoring and analysis activities.
 - **Amended Water:** Water to which a significant has been added.
 - **Applicable Laws:** Rules, regulations and government guidelines for the protection of the environment, orders and rules as adopted by specific jurisdictions including, but not limited to, federal, state, county, city and special jurisdiction districts which include MDHPCD, DOT, EPA, OSHA and OHS.
 - **Asbestos:** The asbestos varieties serpentine, crocidolite, amphibole, chrysotile, anthophyllite, actinolite and tremolite.
 - **Asbestos-Containing Material (ACM):** Material composed of asbestos in any type and in any amount greater than or equal to amount contained in the amount as described in Appendix "A" subpart "F" 40 CFR Part 763 Section 1, Polarized Light Microscopy.
 - **Asbestos-Containing Building Material (ACBM):** Building material containing greater than 0.1% asbestos or equal to amount in or on interior structural elements or other parts of building.
 - **Asbestos-Containing Construction Material (ACCM):** Material containing asbestos in any amount between 0.1% and 0.1% or equal to.
 - **Asbestos-Containing Waste Material:** Any material which is or is suspected to be in or on a material containing it or in asbestos containing material which is to be removed or disposed.
 - **Asbestos Debris:** Pieces of CBM that can be identified as color, texture, or composition, or as dust, if the dust is determined by an accredited inspector to be ACM.
 - **Asbestos Project Manager:** An individual with sufficient experience and education, designated as County's Designated Representative and responsible for overseeing the asbestos abatement project.
 - **Authorized Visitor:** County or its Representatives, and any representative of contractor or other agency within jurisdiction over the project.
 - **Barrier:** A structure that seals off the area to prohibit the presence of others.
 - **Breathing Zone:** A sphere around the workers with a radius appropriate to the task.
 - **Category I:** ES/PS areas in which, "nonfriable ACM are resilient and covering, roofing products, decks, and pavements. These materials are in poor condition and are friable or they are subject to sanding, grinding, cutting, or abrading they are to be treated as friable material.
 - **Category II:** "Nonfriable material ACM, excluding Category I, that meets the definition the same as Category I.
 - **Ceiling Concentration:** The concentration of airborne substance that should not be exceeded.
 - **Certified Industrial Hygienist (C.I.H.):** An industrial hygienist certified in Comprehensive Practice of the American Board of Industrial Hygiene.
 - **Clean Room:** An enclosed area or room which is a part of the decontamination enclosure system with provisions for storage of worker's street clothes and clean protective equipment.
 - **Competent Person/Contractor Supervisor:** The individual or in the asbestos abatement Contractor, not the Project Owner. Individuals must have training equivalent to OSHA Contractor Supervisor. Training must be OSHA accredited training provider.
 - **Contractor:** The individual and the entity and its subcontractors and employees of the contractor and subcontractor awarded the contract. As used in this Specification, "Contractor" means, in addition to the actual license holder, any administrative or supervisory personnel authorized to act on the license holder on this project.

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are.

- **Strip:** To remove asbestos asbestos materials from nonportable facilities.
- **Structural Member:** Nonload-bearing member such as beams and load supporting walls or nonload supporting member, such as ceilings and nonload supporting walls.
- **Surfactant:** A chemically active agent added to water to improve penetration.
- **Time Weighted Average (TWA):** The average concentration of contaminant in air during a specific time period.
- **Visible Emissions:** Non-Emissions containing particulate asbestos materials that are immediately detectable without the aid of instruments.
- **Waste Transfer Airlock:** A decontamination system utilized for transferring contaminated waste from inside to outside of the enclosure.
- **Wet Cleaning:** The process of inhibiting asbestos contamination from existing surfaces and objects by using mists, mops, or other wetting devices which have been dampened with water and surfactant.
- **Work Area:** Designated rooms, spaces, or areas of the project in which asbestos abatement actions are to be undertaken or which are designated as a result of asbestos abatement actions or which are used by the asbestos abatement Contractor for ancillary operations such as offices, storage, decontamination or connection. The work area is generally the portion of the facility which is under contractor asbestos abatement Contractor during the project.
- **Worker Decontamination Enclosure:** A decontamination system consisting of a clean room, a shower room, and an equipment room separated from each other and from the work area by doors and contained doors. This system is used for worker entries to and exits from the work area and for equipment and waste pass out for so on.

1.4 REFERENCE STANDARDS - ASBESTOS ABATEMENT

- **A. Scope**
 - This subsection sets forth minimum requirements and industry standards which are included and incorporated herein for reference and to define part of the specification.
 - This subsection also sets forth those notices and permits which are known to County agencies, and which either must be applied for and received, or which must be given to government agencies before start of work.
 - Requirements include adherence to all practices and procedures set forth in applicable codes, regulations and standards.
 - Requirements include obtaining permits, licenses, inspections, releases and site identification, as well as permits, state permits and site specific requirements associated with codes, regulations and standards.
- **B. Codes and Regulations**
 - General applicable Codes and Regulations and Standards Except to the extent that they are explicit or are stringent requirements are written directly into the contract documents, applicable codes, regulations and standards of the same force and effect and are to be part of the contract documents for reference as copied directly into the contract documents, or as incorporated copies are found herein.
 - Asbestos Abatement Contractor Responsibility The Asbestos Abatement Contractor shall be responsible and liable for the compliance with all

1. The Independent Contractor is responsible for providing editing instructions and maintaining medical records of persons required by the applicable Federal, State and local regulations.

2. The Independent Contractor shall defend, indemnify, and hold harmless, its Representatives and Agents and their companies and employees, from and against all claims, damages, losses, costs, and expenses, including reasonable attorneys' fees, that may be asserted against or incurred by the Independent Contractor, its Representatives or Agents, or its employees.

□ The positions listed below are part of this specification to the extent referenced. The positions are referred to in the test basic designation on

- ☐ The Contractor shall dispose of asbestos-containing materials in an authorized licensed asbestos waste. Each individual, debarred and shall possess Contract insurance against liabilities arising as a result of the individual's subject to the contractor's remediation under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as amended, RCRA, and related state laws.
- ☐ Asbestos-removal Contractor shall be experienced in performing the asbestos-removal work associated with the project. At the request of County Counsel, the Contractor shall provide documentation of relevant experience and references.
- ☐ Asbestos-removal Contractor and Contractor shall demonstrate that they have sufficient personnel/resources to successfully complete the work under this project. Asbestos-removal Contractor and Contractor shall use only qualified subcontractors and that all subcontractors will be under bidder's control at all times in regards to training and certification, methods and materials and that the Asbestos-removal Contractor and Contractor shall retain responsibility for all work subcontractors perform in the limits required by law.

C. Submittals Prior to Start of Work

- ☐ Provide certification in the form of copies and documents submitted to:
 - ☐ California Division of Occupational Safety and Health Asbestos Certification
 - ☐ California Division of Occupational Safety and Health Lead Certification
 - c. EPA, Region IX, ESOP required
 - d. San Joaquin County Air Pollution Control District Central Region Office
- ☐ Asbestos Contractor Information Detail

☐ Experience Information	Section 00 00 00
☐ Qualified Project Personnel	Section 00 00 00
c. Medical Testing Certification	Section 00 00 00
d. Respirator Fit Test Certification	Section 00 00 00
e. Certificate of Worker's Certified Agent	Section 00 00 00
☐ Asbestos Waste Disposal Site	Section 00 00 00
- ☐ Contractor shall provide required completed Standard forms in submittal binders and equivalent to number of required submittals as required by prior design professional.
- ☐ Provide Project Schedule for anticipated removal work as required in Project General Conditions. Schedule shall indicate Setup, Removal, and Clearance Phases.
- ☐ List anticipated removal personnel, including name, date of birth, and SSN assigned to this project.
 - ☐ "Competent Person" as required by 8 CCR 1529
 - i. Asbestos Specific Training
 - ii. Experience
 - iii. Medical Testing
 - iv. Respirator Fit Testing
 - ☐ OSHA Accreditation
 - v. Employee Release Form

- ☐ ☐ For each employee who will enter in "Regulated Area":
 - i. ☐ Asbestos Specific Training
 - ii. ☐ Experience
 - iii. ☐ Medical Testing
 - iv. ☐ Respirator Fit Testing
 - ☐ OSHA Accreditation
 - vi. ☐ Employee Release Form
- ☐ Emergency Notification in Asbestos Containment Contractor Letterhead
- ☐ Name, location and EPA designation of Waste Disposal Site
- ☐ Name, address and EPA registration number of waste hauler
- ☐ Subcontractor's license is required
- ☐ MSDS sheets for all materials used require to be.
- ☐ Description of drawings
 - ☐ Containment Area
 - ☐ Negative Air System, including number, placement units and location of exhaust ports to outside the work area
 - c. ☐ Decontamination Area
 - d. ☐ Waste pass-out area
 - e. ☐ Emergency Exit
 - ☐ Location of dumpsters or containers
- ☐ Manufacturers' Data or Technical Data Sheets, including any required testing for:
 - ☐ Respirators
 - ☐ Negative Air System Components
 - c. ☐ EPA methods
 - d. ☐ Waste Water Discharge System
 - e. ☐ Compressed Air System Application
 - ☐ Encapsulants
 - ☐ Reinforcing materials Application
- ☐ Submittals of Products
 - ☐ Contractor shall provide required "submittals" in electronic form if including the following contents within the elements contained in each section.
 - ☐ Required submittals Contractor shall provide complete list of products proposed for use on the project in the form of project submittal Prepare a complete list indicating each product listed. Include the manufacturer's name and proprietary product names or each item listed. Include product data sheets on each product.
 - c. ☐ Prepare the product list in schedule of installation on each item to be installed under the following conditions
 - ☐ Related Specification Section number.
 - ☐ Generic name used in Contract Documents.
 - ☐ Proprietary name, code number and similar designations.
 - ☐ Manufacturer's name and address.
 - ☐ Suppliers name and address.

- ☐ Installer's name and address. Protected deliverable, or time span or deliverable period.
- ☐ Negative Exposure Assessment
- ☐ Asbestos Abatement Contractor shall submit a copy of any proposed "Negative Exposure Assessment" or "Exposure Assessment" for review of County's Designated Representative in the selection of the appropriate respiratory protection as required by CCR. Prior to start date, or inclement date should use appropriate respiratory protection as required by applicable regulations, anti-static time as appropriate data is generated on approved of the PM.

D. Submitting Data in Project

- ☐ Data Entry
- ☐ Data Entry Contractor Data
- ☐ Notification of its air samples taken to comply with CCR. Provide it in the forms as it during the samples were collected.
- ☐ Notification of changes in personnel resources or schedule.
- ☐ Notification of injury or accident to employees or others on the job in progress.
- ☐ Records of Site Monitors

E. Submitting of Concision of Project

- ☐ Copies of the final entry of the
- ☐ Dates of the report of the site supervisor
- ☐ Records of Site Monitors

1.6 ASBESTOS ABATEMENT - CONTRACTOR PERSONNEL

- ☐ General
 - ☐ Asbestos Abatement Contractor's employees assigned to this project shall be adequately trained and experienced to perform the work in a manner that ensure it is appropriate codes, these specifications, and good standards and industry practice.
 - ☐ The Contractor and the Asbestos Abatement Contractor shall be responsible to County for the acts and omissions of Asbestos Abatement Contractor's employees, subcontractors and their agents and employees and other persons performing in the work under the supervision or direction of the Asbestos Abatement Contractor.
 - ☐ Asbestos Abatement Contractor shall ensure strict discipline and good order of its employees and subcontract employees on the job and that person or anyone not listed in the task assigned.
 - ☐ Asbestos Abatement Contractor shall employ a competent superintendent who oversees the construction of this project. The superintendent shall represent Asbestos Abatement Contractor and accept all instructions given to the superintendent shall be considered binding as if given to the Asbestos Abatement Contractor. Superintendent shall be present at scheduled progress meetings, or unscheduled meetings when reasonable notice is given.

B. Training

- a. Asbestos abatement Contractor shall ensure that all its employees are properly trained in contact or direct asbestos-containing or asbestos contaminated materials for abatement and removal purposes, and supervisors and personnel who are involved in planning, execution or inspection of asbestos abatement projects have the required training and appropriate certification. Training shall comply with CCR rules, based on the appropriate ASHRAE standards.
- b. Training shall provide, at a minimum, information on the following topics:
 - a. The health hazards associated including the nature of various asbestos related diseases, routes of exposure, human dose response relationships, the synergistic relationship between asbestos exposure and cigarette smoking, latency periods for disease and health risks for standards.
 - b. The physical characteristics associated including fiber size, aerodynamic properties, physical appearance, and uses.
 - c. Employee personal protective equipment including the types and characteristics of respirator classes, fit testing of respirators, proper selection, inspection, donning, use, maintenance and storage of respirators, field testing the piece of face seal positive and negative pressure fitting tests, qualitative and quantitative fit testing procedures, variations between monitor and field fit factors, factors that affect respirator fit e.g. micromir, selection and use of disposable cotton, use and handling of non-flammable cotton, non-sold soles, shoes, eye protection and records.
 - d. Medical monitoring requirements for workers including required and recommended tests, reasons for medical monitoring and employee access to records.
 - e. Air monitoring procedures and requirements for workers including description of equipment and procedures, reasons for monitoring, types of samples and current standards of recommended changes.
 - f. Work practices for asbestos abatement including purpose, proper construction and maintenance of direct plastic barriers, the setup of airlocks, proper decontamination systems and waste transfer airlocks, positive ventilation systems, engineering controls, electrical and ventilation system control, proper working techniques, waste cleanup and storage and disposal procedures.
 - g. Personal hygiene including entry and exit procedures for the worker, use of showers, and prohibition of eating, drinking, smoking and cleaning in the work area.
 - h. Specific job hazards that may be encountered including electrical hazards, fire containment, enclosures, materials from Containment operation, fire and explosion hazards, sound and vibration hazards, slippery surfaces, confined spaces, heat stress and noise. Contractor shall take steps necessary to protect employees from potential hazards.
 - i. Supervisors and personnel shall, in addition, receive training in contract specifications, liability insurance and bonding, legal considerations related to abatement, estimation of respirator protection medical surveillance procedures,

EP, OS and State record keeping requirements, and specific instructions pertaining to the permit once this project.

- Required asbestos training must be current within the last twelve months prior to the start of the project. Once permittee whose training expires shall not work on the site until such time as a current certificate is provided.

C. Medical Monitoring

- Medical Monitoring must be provided in accordance with Title 8 CCR, including all related appendices.
- Asbestos abatement Contractor shall document that appropriate personnel have successfully passed medical examinations as required by OS regulations in order to wear respirator.

1.7 TEMPORARY FACILITIES AND CONTROLS - ASBESTOS ABATEMENT

A. Temporary Facilities

- Contractor to provide on-site temporary office for use by its personnel. Contractor shall be responsible for connection of electricity, phone line, or telephone service if required.
- Provide "lockable" containers at the site for the storage of tools and materials used in asbestos abatement. Contractor shall be responsible for security of container and on-site equipment contained on project site.
- Contractor shall provide portable restroom facilities for use by its workers and site personnel at the project location in the event on-site restroom facilities are not provided for use of the County employees. Contractor shall contain facilities in clean condition.

B. Water for Construction

- The asbestos abatement Contractor shall utilize water available on the subject properties unless it is a surface water under the authority of County approval. If water is not available at the site, or water needs are beyond what is available at the subject property, Contractor shall supply water from outside source and shall include cost for water, including delivery and storage in their bid for the work.

C. Electricity

- Asbestos abatement Contractor shall provide portable electric generator as required for aspects of the work to operate power tools and equipment necessary or required to complete the work under the agreement and that is available at the site. Contractor shall include cost to provide temporary electric power in their bid for the work if power is not available at site, or is inadequate based on project needs.
- All circuits within containment areas shall be locked out to prevent possible electrical shock during wet operations. Electric power sources shall be located outside of work areas.

D. Containment Materials

- The asbestos abatement Contractor shall properly care for and protect materials and equipment at the site. Personnel shall maintain materials and equipment at the site

shall be subject to the appropriate County orders.

- ☐ The Asbestos Abatement Contractor shall keep the work area clean to the satisfaction of the County orders and its Representative, and prevent disturbance or debris from the work activities and prevent release of asbestos from the work adjacent to areas or portions of the building or building exterior.
- ☐ Upon completion of the proper work and at completion of work, leave grounds in neat and clean condition and asbestos free.

E. Cleaning

- ☐ The Asbestos Abatement Contractor shall keep the work area clean to the satisfaction of the County orders, and shall prevent disturbance of components in adjacent structures, and shall remove all excess dusted debris from the work activities and prevent release of asbestos from the work area adjacent to areas or portions of the building or building exterior.
- ☐ Upon completion of the work and at completion of work, leave grounds in neat and clean condition and asbestos debris.
- ☐ Dust and Temporary Emissions shall be controlled.
- ☐ The Asbestos Abatement Contractor shall install and operate dust and emissions as required for proper execution of the work and within permits, in compliance with applicable laws.
- ☐ Barriers and Enclosures
 - ☐ Maintain all activities adequate barriers or enclosed enclosures to satisfaction of the County orders, to protect the work area, and the public from intrusion and prevent access to the work areas to the satisfaction of County orders.
- ☐ Advertisement Signs
 - ☐ Advertisement signs shall not be displayed on the property unless approved by the County orders.

I. Inspection and Testing

- ☐ Inspection of independent testing shall be selected by County orders or specified testing and monitoring analysis.
- ☐ Payment of Testing Testing shall be completed or approved by County orders Designated Representative while paid by County orders, except as otherwise identified in this specification, and shall not be included as part of the contract.
- ☐ Payment of Retesting Should the results of the monitoring test indicate that the exterior workmanship is to comply with requirements of the specifications, the work shall be redone at the Asbestos Abatement Contractor's expense until it does satisfy the requirements. The increments shall be verified as acceptable by monitoring tests and shall be paid by the Asbestos Abatement Contractor, at its expense.
- ☐ Employee Contract
 - ☐ The Asbestos Abatement Contractor shall be responsible for ensuring that its employees comply with applicable laws and perform work in safe manner. On

employees entering the work area under the influence of alcohol or drugs shall be in immediate removal from the asbestos abatement Contractor from the work site. In the event there is no question whether said employee is under the influence of alcohol or drugs, the asbestos abatement Contractor shall perform the said employee from the work site until the question is resolved by the asbestos abatement Contractor and County Counsel.

PART 2 – PRODUCTS

2.1 PRODUCT OPTIONS AND SUBSTITUTIONS - ASBESTOS ABATEMENT

- A. General
 1. The Contract is based on the materials, equipment and methods described in the Contract Documents.
 2. Deliver materials in the original packages, containers, or bundles bearing the name of the manufacturer and brand name.
 3. Store materials subject to damage from the ground, weather, theft or damage from vehicles and under cover sufficient enough to prevent damage or contamination. Repackaged materials shall be stored inside the work area until the work is completed.
 4. Damaged, deteriorated or previously used materials shall not be used and shall be removed from the worksite and disposed properly.
- B. Identification of Materials
 1. Prior to adding to the specified items, the contractor shall identify in the instructions during order and time progress the work.
 2. In the event that specified items cannot be so identified, Contractor shall identify, in writing, substitute materials and materials for appropriate County Counsel's Designated Representative. Substitute materials are not to be considered equivalent approved in writing by County Counsel's Designated Representative.
 3. Costs shall be reduced when non-specified items, when specified items cannot be identified, shall be provided by the asbestos abatement Contractor, with the cost covered as necessary and shall not be borne by County Counsel.
- C. County Counsel's Designated Representative for Asbestos Related Work
 1. County Counsel's Designated Representative shall respond in writing to the asbestos abatement Contractor within seven calendar days of receipt of the completed product list schedule. The response within this time period constitutes no objection to listed manufacturers or products, but does not constitute approval of the required that products comply with Contract Documents. County Counsel's Designated Representative shall include a list of acceptable product selections, continuing to be explanation for this action.
- D. Product Assurance
 1. Comparative options when the asbestos abatement Contractor is given the option of selection between two or more products for use on the project, the product selected shall be comparative to products previously selected, even if previously selected products were also options.

E. Product, Deliver, Store, and Handling

- ☐ Deliver, store and handle products in accordance with the manufacturer's recommended conditions, seasons and methods that prevent damage, deterioration and loss, including theft.
- ☐ Schedule delivery to initiate material storage at the site and coordinate with construction spaces.
- ☐ Coordinate delivery with installation time to ensure initial handling time for items that are fragile, hazardous, easily damaged, or sensitive to deterioration, theft and other losses.
- ☐ Deliver products to the site in the manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protection and installation.
- ☐ Inspect products upon delivery to ensure compliance with the Contract Documents, and to ensure that products are undamaged and properly protected.
- ☐ Store products at the site in a manner that facilitate inspection and ensure proper handling and containment.
- ☐ Store materials for use on the project structure in a manner that inhibit and/or prevent deterioration of the supporting construction.
- ☐ Store products subject to damage due to the elements outside ground, under cover in a weather-resistant enclosure, with ventilation adequate to prevent condensation.
- ☐ Maintain temperature and humidity within range required by the manufacturer's instructions.

2.2 PRODUCT SELECTION

- ☐ Standard Products shall be provided, provide standard products types that have been used successfully in similar situations on other projects.
- B. Product Selection Procedures Product selection is governed by the Contract Documents and governing regulations, not by previous project experience. Procedures governing product selection include the following:
 - ☐ Non-Proprietary Specifications When the Specifications list products or manufacturers that are specified and shall be incorporated in the work, that do not restrict the lowest-priced bidder to use of these products only, the lowest-priced bidder may propose an alternative product that complies with Contract requirements. Comply with Contract Document provisions governing "substitutions" to obtain approval to use such an approved product.
 - ☐ Descriptive Specification Requirements Where Specifications describe a product or service, list the characteristics required, and/or specify use of a brand or trade name, provide a product or service that provides the characteristics and otherwise complies with Contract requirements.
 - ☐ Performance Specification Requirements Where Specifications require compliance with performance requirements, provide products that comply with these requirements, and be recommended by the manufacturer for the application indicated. Whenever a performance product is specified where the product is

- Manufacturer's record and conditions shall be contained in published product literature, or on the manufacturer's certification paper or once.
- Compliance with Standards, Codes, and Regulations shall be the Specifications shall require compliance with imposed code, standard or regulation, select a product that complies with the standards, codes or regulations specified.
- References Refer to individual Specification Sections and "References" provisions in Division or references that control product selections, and all procedures required for processing such selections.

[illegible]

☐ Special Sealer Co., Incorporated is Manufactured by Moss Cincinnatis, Inc., distributed by West Coast Containers, Inc., P.O. Box 600, Edmonds, Washington, Telephone 800-955-7777. Application rate is recommended by manufacturer, or

B. Dismissal Inspection

- The Dismissal Section of the Dismissal Inspection, per contract document referenced, described in enclosed "Inspections and Testing" section is complete and has been approved by County's Designated Representative.

C. County's Designated Representative and These Specifications

- County's Designated Representative will conduct air monitoring on behalf of Contractor at its discretion.
- County's Designated Representative will conduct an initial inspection of the contract document and the contract conditions as a condition of acceptance.
- County's Designated Representative will conduct initial clearances per these specifications and on the basis of TEM and ER and other contract document conditions as a condition of acceptance.
- Contractor shall request an extension of the Contract based on delays associated with their ability to determine the scope of work in the initial operations, additional operations, or additional air clearances necessitated by their Contractors to successfully pass the initial clearance.
- Asbestos Abatement Contractor shall be responsible for all costs associated with the removal of clearances in the event the initial clearance is as determined by the County's Asbestos Consultant and the County's Designated Representative.

D. Testing Costs

- Asbestos Abatement Contractor's air sampling and laboratory analysis shall be paid by the Asbestos Abatement Contractor and shall be included in their bid for the work.
- County shall pay for all inspections and sampling done at its request unless such costs are otherwise provided for in the contract, including perimeter air sampling.
- Contractor shall request an extension of the Contract based on delays associated with their ability to determine the scope of work in the initial operations, additional operations, or additional clearances necessitated by their Contractors to successfully pass the initial clearance.

E. Release Criteria and the Release Criteria

- County's Designated Representative shall upon notice that specified operations are complete per contract document and conduct an on-site inspection to ensure that the release criteria has been completed in accordance with these specifications.
- Upon satisfactory completion of the inspection and acceptance of the County's Designated Representative, Contractor shall commence Renovation phase project.
- If the inspection does not successfully pass as determined by the County's

Owner's Representative, the Contractor shall conduct additional testing, decontamination, and air cleaning to satisfaction of County of Fresno's Representative. Upon completion of additional work, disinsections shall be repeated until County of Fresno and County of Fresno's Representative are satisfied that all work has been completed satisfactorily and complete. Contractor shall be responsible for all costs associated with additional disinsection related events caused in order to successfully meet disinsection or decontamination.

PART 3 - EXECUTION

3.1 ASBESTOS ABATEMENT: GENERAL

- A. General
 - 1. Asbestos abatement Contractor shall supply materials, equipment, insurance and disposal re: the ACM's as indicated in this Specification. Contractor shall refer to project construction drawings, specification sections and all design documents to determine all other applicable distance tests and lead containment criteria.
 - 2. Asbestos abatement Contractor shall be Certified for Asbestos by the California State Contractor's Licensing Board.
 - 3. Each employee who tests asbestos abatement Contractor assigned to this work shall be trained in accordance with the requirements of Title 8 CCR. At least one employee on each site shall successfully complete current refresher training meeting the requirements for "Competent Person" (Title 8 CCR 1529).
 - 4. All work shall be done in accordance with applicable regulations, including, but not limited to Title 8 CCR, including Federal, State, Title 8 CCR, and Title 8 CCR Part 014500PS, including all other and non other appendices as applicable.
 - 5. Asbestos abatement Contractor shall give necessary notifications according to the law, content and schedule required by applicable laws and regulations.
- B. General Procedures
 - 1. Asbestos abatement Contractor shall refer to the asbestos containment criteria indicated in Section 014500 or as Scope of work or tests abatement these specifications, and is required to complete scope work, and authorized change orders.
 - 2. Asbestos abatement Contractor shall refer to project construction drawings and, as tests shall report, and specifications regarding scope work to determine locations where ACM's are present which are to be removed in order to complete the scope work. Contractor shall not request or be awarded additional compensation for work due to their failure to adequately determine the scope of abatement work based upon review of pertinent design documents and field verification of existing condition affecting completion of the work.
 - 3. Asbestos abatement Contractor shall protect employees of County of Fresno, and others from inhaling asbestos fibers in excess of the levels established for the given re: the personnel are located and as required. Asbestos

Asbestos Abatement Contractor shall take measures to maintain airborne levels below required levels as shall be verified by independent air sampling operations conducted by County's Designated Representative.

- ☐ Asbestos Asbestos Abatement Contractor shall, during the Asbestos Abatement Project, prevent Asbestos Abatement Contractor from conducting work outside the regulated areas as herein defined. Asbestos Abatement Contractor shall erect and maintain negative pressure enclosures, and critical barriers to provide isolation of airborne fibers outside the containment area. Compliance with this requirement shall be verified by independent air monitoring, air sampling, and recording continuously.
- ☐ Asbestos Asbestos Abatement Contractor shall, if it enters into the work area, maintain authorized employees and visitors wearing appropriate respiratory protection. Employees shall be required to obtain and display photo identification badge before entering into the facility. Authorized employees and visitors shall include:
 - ☐ Asbestos Abatement Contractor's employees listed in job submittals
 - ☐ Asbestos Abatement Contractor's authorized supervisory personnel
 - c. County's Designated Representative
 - d. Employees of agencies within jurisdiction over the work
 - e. Authorized employees of County
- ☐ Asbestos Asbestos Abatement Contractor shall ensure and document that Asbestos Abatement Contractor's waste has been disposed in accordance with applicable federal, state and local laws.
- ☐ Asbestos Asbestos Abatement Contractor shall document that Asbestos Abatement Contractor's activities are in accordance with the Project Specifications, the Project Contract Documents and applicable laws and regulations governing Asbestos Abatement ACBMs.
- ☐ In addition to specific precautions required during Asbestos Abatement, Asbestos Abatement Contractor shall provide some form of environmental and personal protective devices for Asbestos Abatement Contractor's employees and any authorized visitors.
- ☐ Asbestos Asbestos Abatement Contractor shall preserve any other archaeological findings.
- ☐ Asbestos Asbestos Abatement Contractor shall not cease work on this project except at times specified in the project contract or without prior notification and approval of County and its Representative.
- ☐ Asbestos Asbestos Abatement Contractor shall not change or substitute the Asbestos Abatement Contractor Supervisor Project before obtaining prior notification and approval of County's Designated Representative.

C. Entry Work

- ☐ The Asbestos Asbestos Abatement Contractor warrants that these rules shall be applicable to the work including but not limited to the activities, locations, and types of Asbestos Abatement Contractor's activities to be performed.
- ☐ "Extra Work" may only be authorized by County, in writing. In addition, any work performed by County shall not be approved in writing without the

responsibility of the County and the Contractor shall not request compensation.

- County and the Contractor's Designated Representative shall approve in writing any addition or increase in the contract price. Costs for such work shall be agreed upon by the Contractor and County and the Contractor prior to initiation of the work. Estimated costs shall be included and shall reflect costs including labor, materials, insurance, disposal, overhead and profit, etc. and shall be in accordance with project provisions for "change orders".

D. Stop Work Orders

- County and the Contractor or its Representative may issue a STOP WORK order and suspend work in whole or in part, when in the opinion of County and the Contractor, the suspension is necessary in its best interest.
- County and the Contractor's Designated Representative may issue a STOP WORK order whenever the Asbestos Abatement Contractor's work or protective measures are not in accordance with the Specifications or applicable rules and regulations.
- An increase in isolation between the regulated area and adjacent areas shall be sufficient reason to issue a STOP WORK order.
- Air sampling inside the regulated area results in higher counts in excess of the allowed protection or if the required protection or if the required respiratory protection in use at the time of sampling shall be sufficient reason to issue a STOP WORK order.
- Excess CM debris, visible emissions, or insufficient setting of CM shall result in a STOP WORK order.
- Compacts and voids in compacts located in adjacent areas shall result in a temporary STOP WORK order. If such compacts are not the result of the Asbestos Abatement Contractor's failure to observe or comply with the Specifications or regulations, time lost on the project shall be added to the project time period.
- Visible debris outside the regulated area shall be sufficient reason to issue a STOP WORK order.
- Upon issuance of a STOP WORK order, the Contractor shall immediately halt all current respiratory protection, and methods and procedures utilized by the Asbestos Abatement Contractor shall be evaluated and necessary steps taken to reduce airborne levels to meet stipulated levels to satisfaction of County and the Contractor's Designated Representative.

3.2 SITE PREPARATION - ASBESTOS ABATEMENT

- General
 - The "Work Area", including regulated areas, equipment staging areas, and other areas set aside for the use of the asbestos abatement Contractor, are defined as during this project the responsibility of the asbestos abatement Contractor. Contractor shall maintain areas in clean condition to the satisfaction of County and the Contractor's Designated Representative.

- Asbestos Abatement Contractor has the right and obligation to control access to restricted areas. Employees of Contingent Contractor may be required to access certain areas during the project for the purposes of servicing or maintaining equipment and for emergencies. Contractor shall provide reasonable access to subcontract personnel and subcontractors to maintain and proper function of PPE respirators and protective coveralls at the site for use of subcontractors.

B. Signs and Barriers

- Perimeter barriers shall be installed around each work area and other areas used by Asbestos Abatement Contractor for storage, display equipment.
- At each access to the restricted area Asbestos Abatement Contractor shall install warning signs meeting the requirements of Title 8 CCR and all CCR, support E.

C. Security

- Asbestos Abatement Contractor shall be responsible for security of Asbestos Abatement Contractor's work area, material, equipment and supplies.
- Unless otherwise agreed to in writing, Contingent Contractor accepts no responsibility for loss of Asbestos Abatement Contractor's equipment or materials maintained at the project site.
- Asbestos Abatement Contractor shall maintain accurate department of the Asbestos Abatement project and effective dates.

3.3 WORK AREA PREPARATION - ASBESTOS ABATEMENT

A. General

- Asbestos Abatement Contractor shall post caution signs meeting the specifications of Title 8 CCR at the location and approaches to the location where airborne concentrations of asbestos may exceed the "Permissible Exposure Limit".
- Asbestos Abatement Contractor shall determine whether additional electric power or temporary power supply is necessary. Circuits feeding the work area shall be locked out and tagged. Electric power shall be brought into the work area from circuits and sources outside the containment area. Electric power and that required at the site shall be provided to the Asbestos Abatement Contractor at no additional cost to Contingent Contractor, including cost of providing temporary electric power.

B. Enclosures

- Enclosures shall be established and clearly marked with enclosure signs complying with applicable fire codes, approved by Contingent Contractor and clearly marked with duct type errors, properly labeled, or other effective designations to permit easy location from anywhere within the work area.
- Enclosures shall be secured to prevent access from unauthorized areas and stipulated enclosure.
- Enclosures shall be properly sealed with polyethylene sheeting which can be cut to permit access if needed.

C. Decontamination Area

1. General Requirements

- 1. The order decontamination enclosure system shall be provided at locations where workers enter or exit the work area.
- 2. The order decontamination enclosure system shall consist of at least a clean room, storage room and an equipment room, each separated from the other and from the work area by airlocks and a fast substantiation control to the requirements of Title 5 CCR.
- 3. Plans for construction, including a floor plan and layout, shall be submitted to County Counselor's Designated Representative for prior written approval. The order decontamination enclosure system shall be constructed at the work site simultaneously with the impervious sheeting on sides of the enclosure except for the perimeter, perimeter inside outside containment area. For commercial units, Asbestos Abatement Contractor shall submit manufacturer's data sheet.
- 4. Entrance and exit air airlocks and decontamination enclosure system components shall be contained doors consisting of two sheets of overlapping impervious sheeting. Door designs with equivalent protection and acceptable to County Counselor's Designated Representative shall be allowed.
- 5. Access between chambers in the decontamination enclosure system shall be through an airlock with at least a tight separation each contained chamber. Partitions into the clean to contain dust and the dust containment to clean the work area shall be clearly designated.
- 6. The equipment room shall be used for storage of equipment and tools at the end of shift after the area has been decontaminated using a HEPA filtered vacuum and wet cleaning techniques as appropriate.

2. Decontamination Area – Construction

- 1. Construction, whether temporary or permanent, shall be constructed to the appropriate standard in the work area, equipment and materials.
- 2. In areas where no other security against entrance is provided, the outside door to the cleanroom shall be provided with a lock or other security device. The Asbestos Abatement Contractor shall provide the provision for access into the work area for authorized representatives and visitors.
- 3. Clean room shall be sized to accommodate access to the work area. If the clean room is not sufficient size to contain storage lockers or bins for employee's clothing and respiratory equipment, such storage shall be provided in a secure area as close as possible to the entrance to the clean room.
- 4. Storage room shall contain one or more lockers as necessary to accommodate access to the work area.
- 5. Storage shall be provided with dust and cold running water.
- 6. Storage of other materials shall be stored in the work area prior to be disposed in a proper approved disposal container.
- 7. Equipment room shall be sized to permit the equipment changes and storage of equipment and materials.

3.4 WORKER PROTECTION AND DECONTAMINATION - ASBESTOS ABATEMENT

9. Employer
- a. Asbestos Abatement Contractor shall provide for employee appropriate personal protective gear and other necessary safety equipment.
 - b. Personal protective gear and safety equipment shall be inspected before each use.
 - c. In addition to requirements of this Section, Asbestos Abatement Contractor shall be required to provide additional training and safety protection as required by Contingency Plan or its Representative.
- B. Asbestos Worker Training
- a. OSHA Accredited Contractors are to be accredited as asbestos abatement workers as required by the OSHA regulation in CFR Appendix C to Subpart E, Part 84, 84.72.
 - b. State and local license holders are to be trained, certified and accredited as required by state or local code or regulation.
 - c. Train, in accordance with Title 26 CCR 0000 0000 workers in the dangers inherent in handling asbestos and creating asbestos dust and in proper work practices and personal and reproductive measures. Include but do not limit the topics covered in the course to the following:
 - i. Methods of removing asbestos
 - ii. Health effects associated with asbestos
 - d. Relationships between smoking and asbestos in producing lung cancer
 - e. Other operations that could result in exposure to asbestos
- f. Importance and instruction in the use of necessary protective controls, practices and procedures to minimize exposure including
- i. Engineering Controls
 - ii. Work Practices
 - a. Respirators
 - b. Case deepening procedures
 - c. Hygiene facilities
 - d. Protective clothing
 - e. Decontamination procedures
 - f. Emergency procedures
 - iii. Waste disposal procedures
 - iv. Purpose, proper use, fitting, instructions and limitations of respirators as required by the CFR 0000.0000.
 - v. Appropriate work practices for the work
 - vi. Requirements for education/training program
- g. Refer to Title 26, CCR 0000 0000 of the CFR 0000.0000
- n. Pressure Differential Systems
 - i. Work practices including hands on or online training
 - p. Personal Decontamination procedures
 - i. Air monitoring, personal and area

C. Medication Initiations

- Provide medical conditions or tests related to your encounter in your letter or in your Time

is elected per se. In the absence of specific airborne fiber data provide medical evaluations for workers who enter the work area for reasons. Evaluations should be initiated to meet OSHA requirements as set forth in Title 8 CCR.

D. Respirator Protection

- 1. General
 - a. Respirator Protection Program. Complete an SI form titled "Practices for Respirator Protection" and SOA or COR form and submit.
 - b. Require that respirator protection be used at times that there is any possibility of disturbance of ACM's or other intentional or accidental.
 - c. Require that a respirator be worn whenever in the work area at times, regardless of activity, during a period that starts into an operation which could cause cause airborne fibers to be released or been cleared or re-accumulated in accordance with enclosed SOA Section 4.0.
 - d. Regardless of airborne fiber levels. Require that the initial use of a respirator protection used for working in the field of fibers be a minimum efficiency respirator with a minimum efficiency of 95%.
- 2. Fit Testing
 - a. Initial Fit Testing. Provide initial fit testing of respirator protection during a respirator protection course training set up and administered by a Certified Competent Person. Fit types of respirator to be selected from an individual's own or individual use of those respirators for which training and fit testing has been provided.
 - b. On an ongoing basis, conduct fit testing of workers respirator to ensure irritant substances do not enter the respirator at a safe level.
 - c. Upon Entry to Area. Require that each time an individual's respirator is put on it be "fit checked" with a positive and negative pressure fit test in accordance with the manufacturer's instructions or SOA form and SOA and CCR.
- 3. Type of Respirator Protection Required
 - a. Provide Respirator Protection as indicated in paragraph 4.0. If the paragraph does not apply, determine the proper level of protection by dividing the expected or actual airborne fiber count in the work area by the "protection factors" given below.
 - b. The level of respirator protection to be supplied on airborne fiber level inside the respirator, at the breathing zone of the worker, at or below the permissible exposure if it is PE is the initial use of level of protection required.

E. Permissible Exposure Limit (PEL)

- 1. The Time Weighted Average (TWA) and Ceiling Concentration tests are to be conducted for the exposure should not exceed the minimum.
- 2. For purposes of this section, fibers are defined as fibers regardless of composition as counted in the SOA Reference Method RM, or ISO 1000 procedure.
- 3. The Time Weighted Average (TWA) and Ceiling Concentration tests are to be conducted.
- 4. Excursion Monitoring in the PEL and fibers are to be conducted.

4. Respirator Protection sector

Respirator Type

Protection sector

Air Purifying

00

Positive pressure respirator

High efficiency filter

Connection piece

Air Purifying

00

Positive pressure respirator

High efficiency filter

Connection piece

Powered Air Purifying (PAPR)

00

Positive pressure respirator

High efficiency filter

Connector connection piece

Type C supplied air

0000

Positive pressure respirator

Pressure demand or other

pressure positive code

Connection piece

Type C supplied air

0000

Positive pressure respirator

Pressure demand or other

positive pressure code

Connection piece

Type C supplied air

00,000

Positive pressure respirator

Pressure demand or other

positive pressure code

Connection piece equipped with

positive pressure

Sealed breathing apparatus (SCBA)

Sealed breathing apparatus (SCBA)

00,000

Positive Pressure respirator

Pressure demand or other

positive pressure code

Connection piece

5. Asbestos Abatement Contractor shall provide respirator protection for employees who enter the regulated area and that one can reasonably expect that ACM will be disturbed or that anticipated airborne levels may exceed "0.01 f/cc".

6. Respirator Protection

- a. Respirator protection shall be provided per OSHA requirements. The minimum protection required at any time within the regulated area for abatement activities, regardless of whether the work is wet, dry, or otherwise, is negative pressure, PAPR

EP filtered respirators operated in positive pressure mode.

- ☐ Type "C" air supplied respirators in positive pressure mode and mode of the pieces and EP filtered disconnect protection are required to the S.E.P. for continuous operation success completion in accordance with the Contractor shall be prepared to provide Type "C" respirator protection in those circumstances required by CCMSS.
- ☐ Compressed air systems, installed, shall be designed to provide air flows and pressures to accommodate respirator manufacturer's specifications. The compressed air systems shall have a receiver adequate capacity to allow escape of respirator wearers from confined areas in the event of a compressor failure. Compressors shall meet applicable CCMSS requirements. Compressors shall be on-line during construction and periodic inspection of the system shall be required. Documentation of compressed air system respirator protection system shall be retained on site. This documentation shall include a list of applicable components of the system, number and type of respirators that shall be used in the system. Periodic testing of compressed air systems shall ensure that systems provide air sufficient to meet the breathing air as described in Compressed Gas Association Code of Practice Specification 10.1.
- ☐ Appropriate initial respirator protection fitted on test sites. Contractor shall be based upon submission and acceptance of "Negative Exposure Assessment" and/or "Exposure Assessment by Asbestos Abatement Contractor. Failure to provide "NEA" or "EA" will result in mandatory respiratory protection as required by OSHA until such time as "NEA" is established.

I. Other Personnel Protection

- ☐ Dispersion protective clothing, including hood, gloves, and boot coverings consisting of materials impervious to asbestos fibers. The ROR equipment shall be provided to workers and authorized visitors in sites adequate to allow adequate protection of the team.
- ☐ Dispersion clothing shall be worn inside the regulated area and the contractor shall expect that CCM shall be disturbed.
- ☐ Rips or tears in dispersion clothing shall be repaired if immediate repairs required by Title 5 CCR 1500.
- ☐ The dispersion clothing shall be used for re-entry into the regulated area.
- ☐ Dispersion clothing shall be removed in the equipment room before re-entry into the regulated area.
- ☐ The protection meeting the requirements of the SI Standard shall be set, so as to meet the requirements of the SI Standard for the dispersion P.C. clothes, as necessary, shall be provided to workers and authorized visitors.
- ☐ Consideration shall be provided to appropriate workers. Dispersion clothing shall be adequately sealed to the worker to prevent self-contamination.

3.5 ENTRY AND EXIT PROCEDURES – REGULATED AREA

- A. **Enter**
 - Workers and authorized personnel enter the area after the order decontamination enclosure is set.
 - Personnel should read and be familiar with posted regulations, personal protection requirements including proper entry and exit procedures and emergency procedures. A sign sheet should be used to acknowledge that these have been reviewed and understood by personnel prior to entry.
 - Personnel enter and leave the regulated area as last sign the entry/exit log, located outside or in the clean room.
- B. **Entry**
 - Personnel should proceed first to the clean room, remove street clothes and appropriate don respiratory protection as deemed adequate for the conditions and weather and/or disposable coveralls, head covering and foot covering. Hard hats, eye protection and shoes should be fitted if required by conditions. Clean respirator and protective clothing should be provided and fitted to each person for each separate entry into the area.
 - Personnel wearing designated personal protective equipment should proceed from the clean room through the shower room and equipment room to the main area.
- C. **Exit**
 - Before leaving the area, personnel should remove the surface contamination from the outside of respirators and protective clothing by brushing and/or wet wiping procedures. Each person should then remove protective material in the designated path prior to entering the equipment room.
 - Personnel should proceed to equipment room where there are the protective equipment except respirators. Deposit disposable and weathered clothing into appropriate sealed containers for disposal.
 - Release, contaminated material, hard hats and similar gear should be stored in the equipment room when not in use in the area. Upon completion of the entry it should be decontaminated or disposed of as best as contaminated waste.
 - Still wearing respirators, personnel should proceed to the shower area, clean the outside of the respirators and the exposed face area under running water prior to removing the respirator then shower and soap to remove residual dusts contamination. Various types of respirators will require strict indication of these procedures. On a line respirator the EP filter should be disconnected in the equipment room and worn in the shower. A powered air-purifying respirator face piece should be disconnected from the filter power package and if it is not interpreted, upon entering the shower. A disposable respirator should be worn into the shower. Cartridges should be replaced or exchanged prior to entry into the area.
 - After showering and drying off, employees should proceed to the clean room and don clean disposable clothing before either re-entering the area or street clothes.

3.6 HYGIENE

- A. Asbestos abatement Contractor shall provide sanitation facilities and toilets as close as possible to the entrance to the regulated area.
- B. Eating, smoking, chewing or drinking shall be prohibited in the regulated or decontamination areas.

3.7 DEBRIS AND DECONTAMINATION - ASBESTOS ABATEMENT

- A. General
 - A. Asbestos abatement Contractor shall remove all asbestos-containing debris prior to construction and shall store the debris or cause it to be removed properly.
 - B. Debris shall be wet wiped or HEPA vacuumed.
- B. Mobile Equipment and Materials
 - A. These instructions apply to Contractor's Designated Representatives equipment and materials.
 - B. Mobile equipment and materials upon which there is evidence of asbestos-containing debris shall be cleaned before being moved from the regulated area. Asbestos abatement Contractor shall be responsible to provide instructions, equipment, or materials as necessary to complete scope work. Asbestos abatement Contractor personnel are not to engage in operations or equipment without appropriate Contractor approval.

3.8 DISPOSAL - ASBESTOS ABATEMENT

- A. General
 - A. This section describes the disposal of Regulated ACM's (RCM) Disposal includes packaging of asbestos-containing waste materials. Disposal shall be in approved and licensed to accept regulated, asbestos-containing waste.
 - B. Asbestos abatement Contractor shall be responsible for determining current applicable regulations for handling, transportation and disposal in the jurisdiction in which the work takes place.
 - C. Disposal shall be in accordance with applicable regulations of the U.S. EPA, U.S. DOT, California DGS and the applicable MDHPCD.
 - D. As the progresses, to prevent exceeding storage capacity on site, sealed and labeled containers of asbestos-containing waste shall be removed and transported to the preferred disposal location.
 - E. Disposal cost shall occur at an authorized site in accordance with regulated requirements of EPA and applicable State and local guidelines and regulations, including the California State Department of Pesticide Services, Toxic Substances Control Division.
 - F. Contractor shall utilize and provide a "Hazardous Waste Manifest for each shipment of waste defined by the State of California as hazardous waste.
 - G. Non-hazardous RCM shall be disposed as non-hazardous "Construction Debris" in California and shall be accepted by the waste. Non-hazardous debris shall be

provided for each waste shipment.

B. Handling

- ☐ Materials are to be removed as intact sections or components whenever possible.
- ☐ All materials shall be placed in sealed, impermeable containers.
 - ☐ Damage to imperviousness or plastic walls is not ordinarily allowed.
 - ☐ Where components removed intact shall be dropped in containers with impervious sheeting secured with tape for transport to the landfill and shall remain sealed until disposal.
- ☐ Asbestos-containing waste of severely damaged components (e.g., nails, screws, etc.), tin sheeting, etc. or punctured impervious sheeting shall be dropped in additional containers with impervious sheeting and placed into the drum or steel drums for disposal.
- ☐ Contractor shall seal asbestos-containing materials into an impervious lined dumpster for transport in accordance with local, state and federal regulations, and landfills accepting the waste.
- ☐ Containers shall be properly sealed in accordance with Title 5 CCR rules.
 - ☐ Containers are not pre-stenciled so the contractor, address labels including required information are to be attached.
 - ☐ Address labels are to be securely attached and placed on the upper portion of the container.
- ☐ Each waste site shall include generator information as required by federal and state regulations of each waste handling facility.

C. Waste Passout

Remove the containerized waste from the area and return the waste container passout form.

- ☐ Pre-clean materials in the equipment are to be passout safely.
- ☐ Clean exterior walls.
- ☐ Pass out the forms.
- ☐ Place in second area on the clean side of the waste passout system.

D. Preparation for Transport

- ☐ Once drums, bags and/or dropped components have been removed from the area, the materials loaded into an enclosed truck or roll-off dumpster for transportation to the landfill.
- ☐ Dumpsters or trucks shall have doors or tops that can be closed and locked to prevent windblow or other disturbance while loaded asbestos debris and avoid dispersion of asbestos fibers. During periods in which dumpster doors remain open, asbestos containing Contractor shall remain on the accredited property of the dumpster containing facility doors are open to prevent unauthorized entry. There shall be no exceptions.
- ☐ The enclosed cover over the container shall be free of debris and lined with impervious sheeting or sprayed with a material to prevent contamination from blowing or spilled containers. The sheeting shall be installed first and extend up the sides. The sheeting shall be dropped and taped into place.

- ☐ Containers shall not be placed in these containers, nor shall they be used for non-hazardous waste. Bags shall be placed, not thrown, into these containers to avoid spilling.
- ☐ Personnel handling asbestos-containing waste shall be protected by disposable clothing including head, foot and foot protection and at all times, a face piece, respirator, double gloves and respirators equipped with high efficiency filters.
- ☐ Drums shall be placed on level surfaces in the corner and placed tight together to prevent shifting, tipping. Drum structural components shall be secured to prevent shifting and drums placed on top. Do not throw containers into trash can area.

E. Transportation

- ☐ Registered ACBM's shall be taken onsite onto a public road on a registered commercial waste carrier in a registered commercial waste vehicle.
- ☐ County Assessor's Designated Representative shall be notified at least 48 hours in advance of the time of pickup of hazardous waste.
- ☐ Asbestos waste in excess of 600 pounds taken onto a public road must be accompanied by a properly completed commercial waste Manifest or other commercial Manifest.
- ☐ Commercial waste Manifest must be signed by an individual designated by County Assessor.

F. Documentation

- ☐ On a weekly or per load basis, submit copies of all manifests and disposal site receipts and receipts to County Assessor or Asbestos Remediation Manifest number is to be recorded on receipts. Each load receiving a manifest shall be labeled at the collection site nearest the project.
- ☐ Receipts are to be returned to "The Generator" within 30 days.

3.9 INSPECTIONS AND TESTING - ASBESTOS ABATEMENT

A. General

- ☐ County Assessor reserves the right to perform visual inspections and to take samples inside and outside the work area at any time during the project. Such activities shall be performed by County Assessor's Representative. The Contractor has the right to observe and to receive the results.

B. Documentation and Notices

- ☐ County Assessor reserves the right to document on positive or negative findings during visual inspections. Such findings shall be provided in writing requested by the asbestos abatement Contractor.
- ☐ Asbestos abatement Contractor has the right to receive a copy of documentation and respond in writing to any point of asbestos abatement Contractor disagrees. The decision by County Assessor's Designated Representative concerning acceptance of work or non-compliance is final. The Asbestos abatement Contractor shall provide a copy of decision and correct deficient conditions to the end of satisfaction findings to the acceptance by County Assessor.

- In case of written notice of deficiency, Asbestos Abatement Contractor shall receive and approve the notice. The signature shall represent that Asbestos Abatement Contractor acknowledges receipt of the notice and shall not be construed as agreement with the findings.

C. Disinfections

- Contaminated areas, or Contaminated areas' Designated Representatives reserve the right to allow disinfections after the remediation process, compliance with specifications and regulations, appropriate procedures, and safety after matters that are, if proper, create additional risk or inhibit the Contaminated areas.
- In disinfection
 - Asbestos Abatement Contractor shall provide the responsibility to the Contaminated areas' Designated Representative as occurs in advance of the readiness for disinfection of the containment area.
 - Contaminated areas' Designated Representative and Asbestos Abatement Contractor shall be in disinfection of the containment area. Disinfection shall be based on Scope of work as reflected in project design documents, specifications requirements, and General Accepted industry standards for cleanliness.
- c. For removal, residual termiticide can be removed by hand pressure or moderate vacuuming.

D. Air Monitoring Asbestos Abatement Contractor

- Asbestos Abatement Contractor shall conduct daily air monitoring until exposure levels are in Asbestos related area.
- Asbestos Abatement Contractor shall submit to results of air sample analysis to Contaminated areas' Designated Representative in written format. All data shall be submitted in a timely manner.

E. Air Monitoring Representative

- Contaminated areas' Representative shall conduct air monitoring inside and outside the work area as deemed necessary to represent the interests of Contaminated areas.
- Air sample inside the work area shall result in air counts greater than 0.05 f/cc, or PPR respirator in positive mode in case of 0.05 f/cc or higher protection in it. Higher respirator protection in case of the time air sample deemed necessary and sufficient reason to issue a STOP or R order.
- Air sample outside the work area shall result in air counts greater than 0.05 f/cc, or baseline level shall be deemed necessary and sufficient reason to issue a STOP or R order.
- Final clearance sampling shall be done for each containment area in which ACBM's are removed in compliance with current industry standards. Negative pressure ventilation units shall be in operation during final air testing and shall be in negative mode until Contractor receives notification from Owner's Representative that final clearance for each containment area has met specified clearance criteria.
- Analysis of final air Clearance shall be TEM and ER and etc.

□END OF SECTION 02 82 13

SECTION 02 82 14
ASBESTOS ABATEMENT FORMS

1.0 GENERAL

The following list of enclosed forms is to be utilized in connection with the project.

<u>FORM</u>	<u>DESCRIPTION</u>	<u>SUBMITTAL SCHEDULE</u>
☐ Asbestos Contractor Information Detail (Enclosed)		At Material Submittals
☐ Enclosure Information (Contractor to Provide)		Prior to Commencement
☐ Authorized Project Personnel (Enclosed)		Prior to Commencement
☐ Medical Testing Certification (Enclosed)		Prior to Commencement
☐ Respirator Fit Test Certification (Contractor to Provide)		Prior to Commencement
☐ Certificate of Worker's Acknowledgment (Enclosed)		Prior to Commencement
☐ Asbestos Waste Disposal Site (Enclosed)		Prior to Commencement
☐ Certificate of Visual Inspection (Enclosed)		Use for record disclosure

All submittals shall be approved prior to commencing work, after award.

FORM 1 ASBESTOS CONTRACTOR INFORMATION DETAIL

Contractor

Firm

Address

Organization State Corporation ☐ Partnership ☐ Individual ☐

Other persons firm in business

Previous Company names

Dates

Names and Positions of Firm Principals

Are you Bound by Company

Are you ever released to sign a contract without prior written consent

Are you ever defaulted on a contract

Does the either, the contractor or the subcontractor have a record of

Bidder are you required to submit financial information if owners request.

List projects in your side and character of work your company has completed in the last three years.

Project Name, Location

Owner Name, Address, Tel

Contract Amount

Completion Date

Consent Architect

Attach separate sheet if additional information is necessary

Are you personally participate in this project

Project Manager yrs. experience

Superintendent yrs. experience

Are you yrs. experience

Authorized signature

Title

Date

FORM 2
AUTHORIZED PROJECT PERSONNEL

I certify that the information entered on the application complies or substantially conforms to the actual facts and circumstances in the performance of the person's duties and activities as a client named Person Project.

The following information was obtained from the training, licensing and certification requirements of the Federal Government, and the State, County and City in which the person is doing business.

Attached are photocopies of the required training and licensing certificates for the drivers listed.

Employee Name

Social Security Number

[illegible]

Date

Unrestricted Signature

□□□□□□□□□□□□□□□□
C□□p□n□□□□e

I certify that the information entered on the persons' names, contact information, and contractors used in the performance of the tests and related activities for the Client on the Project was accurate and complete. I received the necessary tests as specified in the Order, Requisition or COR Ports and, and, and and administered to the the Initial Medication Questionnaire included in Appendix D of the COR and are committed to wear respirators and to perform tests and related projects.

Handwriting practice sheet with 12 rows of tracing squares.

TE Constant reserves the right to accept photocopies of Contractor's own position signed or in the certificate is said or provide the information required.

FORM 4
CERTIFICATE OF WORKER'S ACKNOWLEDGMENT

Project Name _____ Date _____

Project Address _____

Contractor's Name _____

Asbestos abatement projects can be dangerous. In asbestos abatement projects there has been increased risk of various types of cancer. In some cases and in some asbestos abatement projects, there is a chance that you will develop lung cancer is greater than that of the non-asbestos project.

Your employer's contract with the Owner for the above project requires that:

- ☐ You are supplied with the proper respirator and are trained in its use.
- ☐ You are trained in safe work practices and in the use of the equipment used on the job.
- ☐ You receive complete education/instruction in accordance with the OSHA 1910.101.

These things are to have been done at no cost to you.

Respirator Protection You must have been trained in the proper use of respirators, and instructed on the type of respirator to be used on the above referenced project. You must be able to access a copy of the written respirator protection plan and understand the proper equipment. You must be equipped at no cost with the respirator and miscellaneous cartridges, etc., to be used on the above project.

Training Course You must have been trained in the dangers inherent in asbestos abatement and related asbestos dust and in proper work procedures and personal and area protective measures. The topics covered in the course must have included the following:

- ☐ Basic characteristics of asbestos
- ☐ Health hazards associated with asbestos
- ☐ Respirator protection
- ☐ Use of protective equipment
- ☐ Pressure Differential Systems
- ☐ Work practices including work on or outside the training
- ☐ Personal decontamination procedures
- ☐ Air monitoring, personal and area

Medical Evaluation You must have had a medical evaluation within the past 12 months at no cost to you. This evaluation must have included chest x-ray, pulmonary function tests and a physical examination and chest exam.

By signing this document, you are acknowledging that the owner of the building you are working on has advised you of your rights to training and protection relative to your employer, the Contractor.

Signature _____ Sec. Sec. _____

Printed Name _____ Witness _____

FORM 5
ASBESTOS WASTE DISPOSAL SITE

Project _____ Title _____

Disposal Site _____

Site Identification _____

Site Supervisor _____

Address _____

_____ Telephone _____

Owner/Permittee _____

Address _____

_____ Telephone _____

CONTRACTOR'S CERTIFICATION

The appropriate records are enclosed, and the site noted above is and to be submitted to accept asbestos site.

Enclosed _____ Date _____

Enclosed _____

Telephone _____

Contractor's Signature _____

**FORM 6
CERTIFICATE OF VISUAL INSPECTION**

Date _____, _____
Project _____
Location _____

Project No. _____

CONTRACTOR ACKNOWLEDGMENT:

In accordance with the Project Specifications, the Contractor hereby certifies that he has personally inspected the _____ and _____ and has found no dust, debris or residue containing asbestos.

The Contractor certifies that he has completed _____ at this location as required by project documents and in compliance with applicable law.

By _____ Signature _____ Date _____, _____
Print Name _____, Project Supervisor
Contractor or _____ Signature _____

PROJECT ADMINISTRATOR CERTIFICATE:

The Project Administrator hereby certifies that he has accompanied the Contractor on his visual inspection and verifies that this inspection has been thorough and that the test results indicate and belief, the Contractor's Certification above is a true and honest one.

By _____ Signature _____ Date _____, _____
Print Name _____, Project Administrator
or _____ Signature _____ Title _____

Comments _____

Inspector Clearance Performed _____ by _____ Spones _____ on _____ PCM _____ TEM _____

END OF SECTION 02 82 14

SECTION 02 82 15

RENOVATION OPERATIONS WITH LEAD-BASED & LEAD-CONTAINING PAINT

PART 1 - GENERAL

1.0 General

1.1 Scope of Work

- 1.1.1 The Contractor under this section covers the disturbance and removal of lead-based paint and lead-containing paint during planned renovation and addition operations in within specified portions of the subject structures located at the specified site location. Lead-containing paint, primer, and surface coatings are herein identified as those which contain and detectable amount of lead in accordance with a CCR method, and a CCR method. Lead-Based Paint (LBP) is herein identified as paint which contains in excess of 0.06 parts per million (ppm) of lead as determined by a CCR method, and 0.06 ppm per Title 22, CCR Division 4, Chapter 4 and 20D guidelines.
- 1.1.2 The Contractor shall provide personnel, materials, tools, equipment, supervision, and incidentals necessary to perform the work which includes disturbance and removal of lead paint in accordance with this specification and applicable regulations. The Contractor shall coordinate with this specification, and the previous Lead Inspection Report **Attachment A** to these specifications, to determine the amount of lead-based paint and/or lead-containing painted finishes or surface coatings.
- 1.1.3 Unless indicated otherwise, the Contractor shall consider all painted surfaces and coatings which are in contact with the project as lead-containing paint and shall conduct removal operations in accordance with these specifications, and applicable local, state, and federal regulations for removal of lead-based paint and/or lead-containing finishes or surface coatings.
- 1.1.4 The project includes renovation and addition of interior areas of the subject commercial structures as described herein or in the project design documents. The Contractor shall conduct removal operations based upon review of project design documents and a site visit to observe existing conditions and effect completion of the work.
- 1.1.5 Removal of lead-based paint is to be conducted in accordance with applicable local, state, and federal regulations and statutes within jurisdiction over the work. Contractors shall coordinate with design documents to determine scope of work.
- 1.1.6 The Contractor shall utilize means and methods as herein defined and per applicable regulations to complete the specified work. Painted elements which include lead-based paint in less than "intact" condition shall be removed, or the damaged paint scraped and the surfaces sealed with primer in a manner which prevents exposure of others to the lead.

airborne lead above the Cal/OSHA prescribed levels. The Contractor shall conduct "trigger task" monitoring as prescribed by Cal/OSHA to demonstrate that proposed methods and procedures will not result in airborne levels above the OSHA "Action Level" and the "Permissible Exposure Limit".

- 1.1.1 For the purposes of the project, "disturbance" shall consist of any operation which penetrates, disturbs, or causes painted finishes to become detached or dislodged. The Contractor shall be responsible for all costs associated with stoppages, delays, and lead clearances required for their failure to accurately determine the proper lead paint disturbance as painted finishes determined or assumed to contain lead as defined herein.
- 1.1.2 Sanding, peeling, or dislodged paint generated as a result of the work, or pre-existing dislodged painted finishes to be impacted shall be removed to be collected and segregated as a separate waste stream. However, peeling, or painted finishes determined to include lead-based paint which is peeling, chipping or cracking from the substrate shall be removed prior to containment demolition operations which will disturb the lead. Sanding removed debris generated shall be disposed of as general construction debris in terms of lead content. The Contractor shall dispose of detached paint chips, lead-containing dust, RCR and mixed debris, and removed sanding elements into a BP, and removed elements generated as a result of the work as RCR and waste. Detached paint chips and lead-containing dust shall be segregated from other waste streams and consolidated into properly lined and sealed drums and disposed in accordance with applicable local, state and federal regulations.
- 1.1.3 Contractor shall collect detached paint chips and removed residue dislodged from the work area sanding components, or which existed on sanding finishes prior to start of work. The Contractor shall utilize a high efficiency particulate air HEPA vacuum to clean up residual paint chips and paint debris.
- 1.1.4 The Contractor shall conduct all operations, which include disturbance of lead-containing paint in accordance with applicable sections of the project design documents, and applicable local, state, and federal regulations.
- 1.1.5 The Contractor shall comply with all requirements of Title 5 CCR, and Title 22, Division 4, Chapter 4 during all work in and around the disturbance. Air monitoring shall be conducted during all work operations in and around disturbance appointed spaces. Containment systems shall be constructed as required by applicable regulations to minimize spread of lead-containing dust beyond the immediate work area.
- 1.1.6 In addition to specified demolition, Contractor shall remove all residual paint chips from the second floor orientation spaces surrounding the subject structure which were dislodged as a result of the work as directed by the County Engineer or County Engineer's Representative.
- 1.1.7 This section shall constitute the definition of the lead-related work as it relates to the referenced project.

1.2 Description of Work

- 1.1.1 The Contractor shall complete the work in accordance with project design documents in a manner which will contain airborne lead and does not exceed the OSHA "Action Level" and "Permissible Exposure Limit" during all work which includes disturbance remediation, remediated point, and remediation source controls on existing elements, equipment and fixtures on the subject property which are impacted during the course of the work. The Contractor shall conduct work in specified areas where disturbance remediation criteria are exceeded. Remediated areas shall be completed in compliance with these specifications and applicable local, state and federal regulations.
- 1.1.2 A minimum distance remediated point shall be performed in compliance with the CCR Rule, the CCR, Division 1, Chapter 1, and the Code of Ordinances, the State of California, Department of Public Health, Title 17, Division 1, Chapter 1, and the Code of Ordinances, state, and federal regulations relating to the distance remediated or remediation point.
- 1.1.3 Contractor shall thoroughly review project specifications, drawings and addendums to accurately determine scope of work which is to be disturbed or remediation point and source controls. In addition, Contractor shall review the lead analysis report generated by the County of Fresno's Representative to determine locations of lead remediated and remediation point to be impacted by the proposed work operations. Unless indicated otherwise, the Contractor shall consider all sources of lead point or source control and elements on existing elements, equipment, and other elements to be impacted by the work in specified areas to include remediated point, or source controls. The Contractor shall not request additional compensation or additional work orders based upon their failure to accurately determine the scope of work which includes the distance remediation point based upon comprehensive review of project specifications and drawings, and field verification of conditions, locations, and on-site conditions affecting the scope of work.
- 1.1.4 Contractor shall be responsible for determining conditions affecting proper execution of the work. Field verification shall be conducted where necessary to determine existing conditions prior to submission of bid on the work.
- 1.1.5 The Contractor shall properly dispose of all lead remediated point, defined as point not solidified or sealed, lead remediation point caps and dust, contaminated materials and PPE, and other elements of the intact remediation point. Contractor shall properly dispose of waste generated during the work based on the results of lead waste characterization conducted by the Contractor. Contractor shall include cost of waste characterizations in their bid for the work.
- 1.1.6 Contractor shall use bid on disposal of lead remediated point caps and dust generated during the work as RCR waste in accordance with the Resource Conservation and Recovery Act (RCRA) and the RCR rules as amended in 1990 and as most recently amended per the 1990 Act.

boards and Solid Waste Management. Contaminated PPE and paint thinner, excess debris and other articles and items contaminated with lead paint chips and/or lead dust shall be disposed into RCR waste. Paint thinner and oil is cleaned within use and be disposed into general construction debris.

1.1.1 Contractor shall dispose of identified components, equipment, and other elements disposed as part of the work into intact painted finishes as non-hazardous general construction debris used in waste characterization conducted by the Contractor. The Contractor shall include the cost of the waste characterization in its bid or the cost of separate waste characterization shall be provided for each waste stream.

1.1.2 Should Contractor discover suspect asbestos-containing materials to be impacted as part of the work and if not been identified in the previous source report, Contractor shall stop work and request verification from County to resume the proceeding with work under the Contract.

1.3 Experience and Workmanship

1.1.1 The Contractor perform in the work shall be properly licensed in the State of California to conduct the proposed work operations. The Contractor shall be required to provide professional related training appropriate for demolition operations with intact lead paint.

1.1.2 The Contractor perform in this work MUST be qualified with appropriate registrations covering distance lead paint. This includes permits, licenses, and certificates required to perform this type of work and related disposal requirements.

1.1.3 A "Lead Compliance Plan" per 8 CCR 1532.1, outlining the methods and controls to be used during the performance of this work shall be submitted to the County to resume as part of the submittal process and approved prior to the start of work within distance of painted finishes. A separate "Compliance Plan" shall be prepared by each contractor engaged in work on the project and includes distance lead containment plan.

1.1.4 It is the Contractor's responsibility to maintain adequate controls and perform personnel monitoring to ensure worker safety for lead related work for the duration of the project. Lead competent Contractor shall provide personnel monitoring results to County to resume's Representative within 24 hours of the start of work and before commencing.

1.4 Personal Training and Protection

1.1.1 Personnel Training

1.1.1.1 Contractor involved in lead related work as defined in this Specification must have successfully completed lead training course as required by CCR, 8 CCR, and 15 CCR, Division 1, Chapter 1. The specified training shall meet requirements

requirements based on anticipated exposure levels as described in 17 CCR 1500. The Contractor shall provide documentation of current training of workers engaged in work defined as lead "Abatement" under 17 CCR, Div. 1, Chapter 8, or if any personal air sampling is performed exceeds the Permissible Exposure Limit (PEL) of 0.1 mg/m³ of lead as dust, the contractor shall be certified by the State of California, Department of Public Health.

1.1.1. Lead Supervisor shall receive lead specific training from a certified training provider. Where required, trainer shall be certified by the State of California, CDPH.

1.1.2. The lead training shall be presented by a certified training provider. Where required, training shall be by California Department of Public Health (CDPH), Certified Lead Paint and Lead Training Provider, Accredited Lead Training Provider. Lead training, where appropriate, shall be provided by a lead "competent person" as defined by Cal/OSHA.

1.1.3. Workers and Supervisors shall receive lead training as required by CCR 1500 and Title 17 CCR Division 1, Chapter 8, to ensure that the anticipated exposure level shall not exceed the PEL. Workers and supervisors engaged in lead related work shall be represented by the training shall receive additional training as required to proceed with the work, or properly trained and certified individuals shall replace if properly trained personnel or shall receive anti-lead poisoning training and other requirements as required.

1.2. Biological Monitoring of Workers, Supervisors and Designated Personnel

1.2.1. The Contractor shall conduct biological (blood testing) on its employees engaged in work in which disturbance level in accordance with CCR 1500 requires by CCR 1500 and shall ensure it evidence that monitoring is current for all employees that will enter an regulated lead work area.

1.2.2. Worker will be required to the maintain blood lead levels as required by the CCR 1500. The Contractor shall be responsible for medical surveillance and record keeping in accordance with CCR 1500.

1.3. Initial Determination

1.3.1. The Contractor shall conduct an initial determination of the worker lead exposures for each specific task required by CCR 1500 Construction Lead Standard Title 17 CCR 1500. Exposures shall be conducted for each specific task and shall be during periods and activities that generate the dust

possible exposure level

- .□.□.□ Contractor exposure categories shall be included in the exposure monitoring.
- .□.□.□ The duration of air monitoring shall be sufficient to provide a statistical confidence level upper confidence limit that no employees are exposed above the lead “AL” or the “PEL”.
- .□.□.□ Once initial determination is completed, Contractor shall conduct monitoring to the highest degree of engineering barriers, to the state, or to the state construction administration and respiratory protection controls required by applicable regulations concerning lead work.
- .□.□.□ A copy of the Contractor’s initial determination shall be provided to the County Health’s Representative.

□.□.□ Respiratory Protection

- .□.□.□ The Contractor shall provide proper orders, training, and superintendents with proper fitted respirators approved by NIOSH and OSHA, and as determined by the results of the initial determination. Respirators are required at all times when engaged in work on this project which involves the disturbance of lead-containing painted, coated, or other surfaces, or other lead-containing materials.
- .□.□.□ Authorized visitors i.e., federal, state, and local inspectors shall provide a current health and medical report certifying that they are approved to wear appropriate respirators prior to entering on construction site.
- .□.□.□ When respirators and disposable filters are equipped, sufficient replacement filters must be provided to the Contractor for the workers and on visitors. Respirators shall be type P and be NIOSH approved.
- .□.□.□ The initial respiratory protection required for this project shall be based upon initial air monitoring results specific to this project and completion of “trigger tasks” required by 8 CCR § 5104.1.
 - Negative pressure, powered air purifying respirators, equipped with HEPA filters for airborne lead dust levels not in excess of 0.1 mg/m³ shall be PEL Base bid on use of this type of respirator.
 - Positive pressure air purifying respirator, with HEPA filters for airborne dust levels not in excess of 0.1 mg/m³ shall be PEL Base bid on use of this type of respirator.
 - Pressure demand, positive pressure, supplied air respirators for

Airborne lead dust concentrations are expected to meet or exceed 0.01 mg/m³ or 0.005 PEL.

- 4.4.4 Workers inside the EED are responsible for the proper respirator fit test and dust abatement.
- 4.4.4 Workers must be properly trained in the care, use, and maintenance of respirators.
- 4.4.4 The Contractor shall ensure that a respirator fit test is performed and passed each and every time in the dust abatement area. Evidence of current fit tests specific to each respirator brand, type, model and size shall be submitted. Includes fit testing each proposed respirator type and each employee.
- 4.4.4 All respirator protection programs must be implemented in accordance with the CCR rules.
- 4.4.4 Respirators must be replaced when the filter enters the service area or the decontamination chamber.

4.4.5 Personal Protection Equipment

- 4.4.4 Workers must wear appropriate disposal suits and gloves. A TYVEK or similar type suit must be worn. Suits must be worn inside the EED after the crew passes pre-work inspection and shall be worn in the entire crew passes final clearance inspection. All protective clothing must be worn under the suit, but these clothes must be changed before leaving the EED and shall be stored separately.
- 4.4.4 Workers must wear side shields while worn when working with a battery or sparks or heat, or protective eye wear is specified on the MSDS for that product.
- 4.4.4 Additional respirator protection supplies, such as organic vapor cartridges, must be needed when handling some coating products. Consult the MSDS for each product use during period once the work and obtain the proper filters as appropriate based upon the potentialities of exposure.

4.4.6 Personal Hygiene Practices

- 4.4.4 The Contractor shall enforce and monitor good personal hygiene practices during lead abatement. These practices include, but not be limited to, the following:
 - 4.4.4.4 Eating, drinking, smoking, cleaning up or tending, or applying cosmetics in EED. The Contractor will provide clean space, separated from the EED, for these activities.

1.4.4.4 Workers must also upon entering the work area, use facilities while provided by the Contractor consisting of, at least, running water, toilet, and an EPA bucket. Upon entering the work area, each worker must wear and dispose of gloves, shoes and drapery and pants, and collect clothes. An appropriate evidence collection station should be provided for use.

1.4.4.5 Disposable clothing such as TYVEK suits and other personal protective equipment (PPE) must be donned prior to entering the lead work area. A clean room while provided for workers to put on suits and other personal protective equipment and to store their street clothes. Disposable suits should be used once and then properly discarded.

1.4.4.6 A handwashing facility must be provided and located in close proximity to eating and drinking area. The washing station while be maintained in clean condition and drained daily, or whenever required to maintain in clean condition.

1.4.4.7 Lead monitoring data collected by the Contractor shows that employee exposure to airborne lead exceeds 0.10 mg/m³, the permissible conditions apply

- Street clothes cannot be worn into containment. Workers must wear non-sports, T-shirt shirts, or nothing under a disposable suit.
- Showers must be provided. Shower after last pass through at least a 10-minute after before returning to the public waste system. Disposable waste after should meet the requirements of the accreditation after audit district.

1.5 Definitions and Abbreviations

The following definitions apply to the work order specification

1.1.1 **AA** Abbreviated description.

1.1.2 **AC** Alternating current.

1.1.3 **ACCREDITED LABORATORY** An analytical laboratory is accredited by the American Industrial Hygiene Association, participates in the Proficiency Analytical Program (PTA) and is accredited by the State of California's Environmental Protection Accreditation program.

1.1.4 **ACCURACY** The degree to which a measurement determines an amount of lead or other component in a particular reference material

- LEAD RENOVATION**
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be completed as ordered per. The report includes information on the generator's activities during the previous calendar year. The County may request operator training, storage and disposal facilities list and prepare and submit a written report within EP's required timeframes.

BIOLOGICAL MONITORING The analysis of persons should include urine to determine the detected contamination in the body. The OSHA lead standard requires biological monitoring as part of the medical surveillance requirements.

BLANK A non-exposed sample of the media used for testing, such as a pipe or filter, which is included in the other samples to determine whether samples are contaminated with lead before samples are collected. E.g., at the location of the testing site, or whether the samples are contaminated after sample collection E.g., during transportation to the laboratory or in the laboratory.

COUNTY OF FRESNO'S REPRESENTATIVE The individual who retained the County of Fresno to oversee and implement and to provide testing services on its behalf.

CFR The Code of Federal Regulations is the basic component of the Federal Register publication system. The CFR is a codification of the requirements of the various Federal agencies.

CHARACTERISTICS EPA has identified four characteristics of hazardous waste: ignitability, corrosivity, reactivity, and toxic characteristic. Each procedure (TCP, toxicity, or extraction procedure) EPA toxicity analysis is used to identify one or more of these characteristics is classified as a hazardous waste under the Resource Conservation and Recovery Act (RCRA). See EPA Toxicity and TCP.

CLEAN ROOM A non-contaminated area or room which is part of the orders decontamination facility, with provisions for storage of orders, street clothes and clean or changed protective equipment.

CONTAINER A portable device in which a material is stored, transported, treated, disposed of, or otherwise handled.

CONTAINMENT An isolation method for protecting other workers and the environment from airborne exposures to lead dust and debris created during lead control. The areas of containment are identified around the barrier storage. The STOE containment dirt room and clean room room with negative air and a T-REE-STOE containment dirt room, storage and clean room room with negative air.

CONTAINMENT AREA An area or zone for lead containment that is defined by type, shape and physical barriers.

CONTRACTOR A business entity, public unit, or person performing the role of BP as the contract for the project.

- 1.1.00 **DF** Decontamination facility.
- 1.1.00 **DI** Draft included.
- 1.1.00 **DISPOSAL** The discarding, deposit, incineration, dumping, spinning, reeling, or placing of solid waste or discarded waste into or on land or water so that no constituent therefrom will enter the environment or be emitted into the air or discarded in containers, including ground waters.
- 1.1.00 **DISPOSAL FACILITY** A facility or part of a facility at which discarded waste is intentionally placed into or on land or water, and at which waste will remain after closure.
- 1.1.00 **DOT** Department of Transportation.
- 1.1.00 **ENCAPSULANT** A substance used as a barrier which can be applied to lead containing areas and which controls the possible release of lead from the barrier either by creating a seal or by covering the surface and/or encapsulating or penetrating into the barrier and binding its components together preventing encapsulation.
- 1.1.00 **ENCAPSULATION** Involves resurfacing or covering a surface, and sealing or covering it with a barrier, so as to prevent or control contamination and/or release of lead-containing substances.
- 1.1.00 **ENCLOSURE** See Containment Area and Barrier.
- 1.1.00 **ENGINEERING CONTROLS** Measures implemented at the worksite to physically contain, control, and/or otherwise reduce exposure to lead dust and debris. Does not include administrative and/or respiratory protection controls.
- 1.1.00 **EP** Extraction procedure.
- 1.1.00 **EPA** Environmental Protection Agency.
- 1.1.00 **EPA IDENTIFICATION** The unique number assigned to each generator or transporter or discarded waste, and each treatment, storage, or disposal facility.
- 1.1.00 **EP TOXICITY** A test, called the extraction procedure, that is designed to identify wastes in terms of extractable concentrations of particulate toxic constituents into the ground water as a result of proper management. EP toxicity is a characteristic of discarded waste. It has been replaced by TCLP as the acceptable method. See TCLP and Characteristics.
- 1.1.00 **EQUIPMENT ROOM** A contained area or room that is part of the workers' decontamination facility, with provisions for storage of contained clothing and equipment.
- 1.1.00 **EU** Exhaust Unit

1.1.00 **EXPOSURE MONITORING** is order for monitoring to establish initial to document ongoing lead exposure levels. Most be done to ensure each employee's exposure level be reasonably represented at least on basis of at least 3 hours per week.

1.1.00 **FACILITY** includes containers and, structures, other appendances, and improvements on the land, used for treating, storing, or disposing of hazardous waste. A facility may consist of several treatment, storage, or disposal operation units, e.g., one or more landfills, surface impoundments, or construction sites.

1.1.00 **FEDERAL REGISTER** is document published daily by the federal government that contains either proposed or information.

1.1.00 **FINAL INSPECTION** inspection by a certified inspector/assessor industrial hygienist, or a public health official determine whether lead contamination and clean up are complete.

1.1.00 **ft²** Square feet

1.1.00 **CF** cubic feet

1.1.00 **CFM** cubic feet per minute

1.1.00 **GENERATOR** any person who first creates a hazardous waste or any person who first does the waste subject to the Solid Waste Act, i.e., imports a hazardous waste initiates shipment of a hazardous waste from a hazardous waste treatment, storage or disposal unit TSD or a hazardous waste transfer different Department of Transportation DOT shipping descriptions applying to the into a single container.

1.1.00 **GFCI** ground fault circuit interrupter

1.1.00 **GROUND WATER** is water below the land surface in the saturation.

1.1.00 **H2O** is water

1.1.00 **HAZARDOUS WASTE** is defined in RCRA, a solid waste or construction solid wastes which, because of its quantity, concentration or physical, chemical or infectious characteristics, or

1.1.00.1 Cause, or significantly contribute to an increase in mortality or an increase in serious irreversible or incapacitating reversible, illness, or

1.1.00.1 Pose a substantial present or potential hazard to man or the environment when improperly treated, stored, transported or disposed of, or otherwise handled. As defined in the regulations, solid waste is hazardous if it meets one or more conditions

1.1.00.1.1 Exhibits a characteristic of a hazardous waste RCRA Section 300.107 (b)(1) (1).

continuent and dist end dehis, clean up and dispense and
 chance testin.

LEAD PERMISSIBLE EXPOSURE LIMIT (PEL) The limit is 0.10 micrograms per cubic meter of air in 1000 hours, time weighted average.

LOCAL EXHAUST SYSTEM s^hall be installed in a static pressure in an enclosed space to prevent fire is greater than that of the environment outside the space to prevent fire, as specified herein.

MANIFEST The shipping document, EP may be used for identifying the content, position, origin, routing and destination of goods during its transportation from the point of generation to the point of receipt, storage or disposal.

MEAN The arithmetic average of the data values. The arithmetic mean of the data values divided by the number of data values. When using an R instrument, the mean is the average of the series of periodic readings reported by the instrument.

MEDICAL REMOVAL The temporary removal of persons due to the need to end exercises defined by the Standard.

.. **mg/cm²** Milir s per se centieter

[illegible]

MIL-MiniMeter

MSDS Material Safety Data Sheet for the relevant resources contained in the citation of the chemical products.

0.0.00 **NAM** 00e00ti0e 0r 0 0c0ine

0000 **NEGATIVE AIR MACHINE (NAM, AHOG@)** 00 se00c0nt0ined 00c00
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NEGATIVE AIR PRESSURE SYSTEM consists of a system of interconnected negative pressure differential units. The system is designed to maintain a negative pressure differential between the interior and exterior of the building.

NEMA **Electric Manufacturers Association**

NIOSH National Institute for Occupational Safety and Health

OSHA Occupational Safety and Health Administration

0.00 COUNTY OF FRESNO – as used in this Specification, the County

resn is the Cont resn, resn, Cini

1.1.11 **PAPR** Powered air purifying respirator

1.1.12 **PEL** Permissible exposure limit

1.1.13 **PERMIT** An authorization license or equivalent control document issued by EPA or an authorized State to permit the removal or removals of Site C Parts and or TSDs.

1.1.14 **PRECISION** The degree of repeatability of series measurements.

1.1.15 **PSI** Pounds per square inch

1.1.16 **RCRA** Resource Conservation and Recovery Act of 1976. An amendment to the Solid Waste Disposal Act of 1976. RCRA was enacted in 1976 and is the most recent in the series of laws governing the management and Solid Waste disposal.

1.1.17 **REGULATION or RULE** A rule or part of a rule promulgated by an agency or particular application and the effect designed to implement, interpret, or prescribe the or particular describe the Federal Department's regulation or its procedure or practice requirements.

1.1.18 **REMOVAL** Wherein specified procedures necessary to remove or remove strip BP from the designated areas and to dispose of these materials at an acceptable site.

1.1.19 **REPLACEMENT** The replacement of the entire or part of the components such as windows, doors, and trim that are damaged or replaced and installed new components free of lead paint.

1.1.20 **SCRAPING** Removal of loose, peeling or chipped BP from the substrate collection debris and disposal of the debris in a container. Scraping is defined as the removal of BP from the substrate by using a hand tool or power tool to remove the BP from the surface. Scraping does not include sanding or chipping.

1.1.21 **SHOWER ROOM** A room between the clean room and the equipment or dirt room in the order decontamination unit, it is not and cold running water, soap, sponges, sponges arranged for complete showering and decontamination.

1.1.22 **SITE** The land or other area where an activity or activity is possible, located or conducted, including adjacent and used in connection with the activity or activity.

1.1.23 **SOLID WASTE** As defined in RCRA, in the case, reuse, storage in a waste treatment plant, other appropriate treatment plant or air pollution control unit and other discarded materials, including solid, liquid, semi-solid or contained liquids, materials, residues from industrial, commercial, mining and agricultural

operations and other construction activities, but does not include solid or dissolved materials in domestic sewage, or solid or dissolved materials in irrigation return flows or industrial discharges which are point sources subject to permits under the Clean Water Act, or specified cancer or reproductive materials defined in the Toxic Substances Act.

1.1.10 SPECTRUM ANALYZER (XRF) A type of Raman spectrometer which provides the operator with point source energy and intensity measurements and mass, as well as calculated lead concentration, expressed in ppm.

1.1.11 STANDARD Used in tests.

1.1.11.1 Tests established for use in remediation, such as the CSM "PE" test.

1.1.11.2 Materials to which known quantities added have been applied.

Used to estimate the accuracy and performance of the Raman spectrometer, as well as Standard Reference Materials.

1.1.12 STEL Short term exposure limit.

1.1.13 STORAGE The condition in which waste or material is stored, at the end of which the waste is treated, disposed or stored elsewhere.

1.1.14 STRUCTURAL MEMBERS Beams, cross bracing, or in the case of steel, stiffeners, joists, steel deck and list, steel decking, steel joists, steel joists, welded steel joists and other steel joists.

1.1.15 SUBSTRATE A surface upon which paint or finish has been or will be applied. Examples of substrates include wood, plaster, etched and drilled.

1.1.16 SURFACTANT (Wetting Agent) A chemical agent added to water to improve penetration.

1.1.17 TCLP Toxic Characteristic Leaching Procedure (see EPA Toxicity Test and Characteristics).

1.1.18 TIME-WEIGHTED AVERAGE (TWA) The TWA is an average, time-weighted average airborne concentration or lead per cubic meter of air which represents the employee's average exposure.

1.1.19 TLV-STEL Threshold limit value short term exposure limit.

1.1.20 TLV-TWA Threshold limit value time-weighted average.

1.1.21 TRANSPORTER A person engaged in the interstate transportation of waste within the United States, or air, rail, or water, if such transportation requires a manifest under the CFR Part 171.

1.1.22 TREATMENT Any method, technique or method, including neutralization,

In addition, the Contractor is responsible for obtaining copies of its and parent company's prior to beginning work. Copies of its list of subsidiaries to Contractor's Representative prior to the start of work and list of past projects at the project.

□.□.□ □cc□p□ti□n□□S□et□nd □e□t□ct

□□□□ The Contractor shall strictly adhere to the provisions of the
□□□□ in the C&R Sections.

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____ The Contractor shall indemnify the County, its residents and T. Brooks Associates, a Division of ProQuest and Pritcard LLP and its assigns, costs and expenses, including fines, judgments, and reasonable attorney's fees incurred either indemnified party or residents hereof in the part of the Contractor in exposing his employees, County residents, personnel, visitors, and/or in the proper or accepted practices defined in it and its content and/or the relevant federal, state or local laws, ordinances, regulations, and directives federal, state and municipal are current in effect or will become effective in the future, of the Contractor, its Subcontractors, or suppliers.

□□□ S□□□ it to C□□nt□□□resn□ for approval, a “Lead Compliance Plan” for the project in □ccrd□nce □it□ CCR □□□□. The p□n s□□□c□r □identifi□

the methods, content, personnel or section, timelines and responsible parties.

- .□.□ Submit written respiratory protection plan as required in the CCR, 1910.101(e).
- .□.□ Submit written education and consultation plan that includes the items required in the CCR, 1910.101(f).
- .□.□ Submit certifications documenting that employee information and training for lead exposure has been completed for Contractor and other affected subcontractors.
- .□.□ The Contractor shall submit the following:
 - .□.□. See the schedule.
 - .□.□. Method application and materials to be used.
 - .□.□. Test for personnel monitoring and, as appropriate, flow and three-stage containment, air pressure differential between areas and exterior.
 - .□.□. Submit names of subcontractors information including MSDS and type and brands of materials for workers protection.
 - .□.□. Drawings showing the location, position and construction of the decontamination system, waste management areas, and containment areas used to isolate the action spaces in compliance with this specification and applicable regulations.
 - .□.□. Schedule for containing filters in negative air pressure system when required in the lead exposure monitoring indicated the need for the three-stage containment system and other filtration system.
 - .□.□. Copies of lead level monitor and air flow indicator areas and type of equipment.
 - .□.□. Copies of certifications of disposal.
 - .□.□. Copies of permits.
 - .□.□. Copies of the Safety or Incident Control System accident or incident reports.
 - .□.□. All "submittals" and notices required by this section shall be provided to the County's Representative for review and approval prior to commencing operations.
 - .□.□. Contractor shall provide project "submittal" in electronic format of the Contents.

1.8 Air Monitoring Requirements

1.8.1 Initial Determination

- 1.8.1.1 The Contractor shall conduct an initial determination of employee lead exposures per tasks required by the State of California, OSHA Construction Lead Standard at CCR levels.
- 1.8.1.2 All Contractor and subcontractor employee categories shall be included in the exposure monitoring.
- 1.8.1.3 The duration of air monitoring shall be sufficient to provide a statistically confidence level upper confidence limit that no employees are exposed above the lead "AL" or "PEL".
- 1.8.1.4 The results of the initial determination shall be used to establish the degree of engineering barriers, dusts, or dusts containment, administrative and respiratory protection controls and the need for periodic exposure monitoring.
- 1.8.1.5 The results of the initial determination shall be reviewed and approved by the County Board of Supervisors' Representative.
- 1.8.1.6 Results of employee exposure or sampling shall be compared to relevant levels in place at the time of the sampling event.

1.8.2 Daily Employee Exposure Monitoring

- 1.8.2.1 Regardless of the results of the initial determination, the Contractor shall conduct daily employee exposure monitoring on not less than ten percent of the Contractor's employees, or a minimum of ten workers, representing the various tasks being performed.

Monitoring shall include those employees who are likely to receive the highest exposure and shall be representative of the remaining workers.

- 1.8.2.2 Daily monitoring of the Contractor's employees shall be performed daily by representative of employee exposure and shall not be less than seven hours duration, unless said is reduced, in which case monitoring shall represent entire shift.

1.8.3 Monitoring by County Board of Supervisors

- 1.8.3.1 County Board of Supervisors' Representative may, at its discretion conduct initial and periodic air monitoring at the outside perimeter of the project. Cost associated with sampling shall be paid by County Board of Supervisors.
- 1.8.3.2 Contractor shall conduct representative personnel sampling for each shift. Contractor to perform personnel sampling

operations to satisfaction of County of Fresno's Representative, or more to provide monitor results within 90 days of stoppin. The County of Fresno's Representative to conduct independent personair monitoring operations and to correct Contractor for cost associated operations including, but not limited to costs shipping, on-site or stoppin, and monitor analysis.

1.1.1.1 The Contractor shall be considered to have not complied with the purpose of this section. If initial or other monitor samples shall be collected on the inside the Contractor and the outside.

1.1.1.2 County of Fresno's Representative shall correct baseline and pre-deposition dust pipe samples in order to determine pre and post deposition lead levels as part of the clearance process.

1.9 Work Stoppage

1.1.1 If at anytime, County of Fresno determines that Contractor practices are violating pertinent provisions of this Contract, and/or orders, other contractors, or others, it shall immediately notify the Contractor that operations shall cease until corrective action is taken and the Contractor shall take such corrective action before proceeding with the work.

1.1.1.1 Debris caused by inappropriate Contractor practices as noted in these specifications and/or excessive concentrations shall be at the Contractor's expense. There shall be no cost to Short Term Exposure or to STEO according to the applicable Threshold or it comes for

Chemical Substances and Pesticides and Biological Exposure Indices for the Conference and Environmental and Industrial Hygienists.

1.1.1.2 If these levels are exceeded, operations shall cease until County of Fresno's Representative determines that acceptable standards are met.

1.1.1.3 If after 30 days or retro compensation will result from action taken under this clause will be recognized by County of Fresno.

1.1.1.4 In case of disagreement between the County of Fresno and the Contractor regarding the analysis and/or monitoring data initially, periodic, real, or employee exposure, the decision of County of Fresno will be recorded as final and conclusive. Differences in analytical results shall be resolved by the County of Fresno. Discrepancies shall be recorded as being substantial in agreement.

1.10 Site Security

1.1.1.1 The Contractor and surrounding areas shall be subject to some degree of unauthorized entries, and/or theft. The Contractor shall be responsible to provide tight security for all areas, storage areas and adjacent adjoining areas which shall be accessed throughout the work. All storage

are contained in records of materials including lead-based paint waste samples enclosed and labeled at times when personnel are not present to oversee the materials. Historical records containing materials samples cleared as contained records of materials in English and Spanish.

- 1.11.1.1 A minimum distance lead-based paint is to be restricted on the authorized, trained and protected personnel. These shall include the Contractor's employees and representatives, state and local inspectors and another designated individuals. A list of authorized personnel shall be established prior to the start and posted in the clean room, the order decontamination facility and in the Contractor's work trailer or temporary office.
- 1.11.1.2 Contractor shall be notified of County responses upon other authorized visitor prior to visitor entry to the site.
- 1.11.1.3 Entry into the work area of unauthorized individuals shall be reported immediately to County responses to the Contractor.
- 1.11.1.4 A log shall be maintained in the clean room, the worker decontamination system or Contractor's office. Anyone who enters an EED work area shall record name, position, time in and time out for each entry.
- 1.11.1.5 Access into the work area shall be for order decontamination system located at the work site.
- 1.11.1.6 Contractor shall ensure contractor site security during operations in order to protect equipment and equipment.
- 1.11.1.7 During the course of the entire project, the lead certified Contractor shall be available on site during the period that lead related work is occurring. Foreman shall function as the Contractor's "Competent Person" and shall be State Certified, Department of Public Health Accredited Supervisor.

1.11 Emergency Planning

- 1.11.1.1 Emergency planning and procedures shall be developed by the Contractor and approved by County responses' Representative prior to the commencement of construction project events.
- 1.11.1.2 Emergency procedures shall be in written form and prominently posted. All employees shall read and sign these procedures to acknowledge receipt and understanding of the site, location of emergency exits and emergency procedures.
- 1.11.1.3 Emergency planning shall include written notification of police, fire and emergency medical personnel, planned lead abatement activities, scheduled and unscheduled work, particularly carriers that may affect response capabilities.

- 1.11.1 Emergency planning shall include considerations for fires, explosions, toxic materials, electric hazards, loss of electric power, slips, trips and falls, confined spaces and other related injuries. Written procedures shall be developed and employee training in procedures shall be provided.
- 1.11.2 Employees shall be trained in emergency procedures in the event of workplace emergencies.
 - 1.11.2.1 In non-life threatening situations, employees injured or otherwise incapacitated shall be taken to the nearest appropriate medical facility.
 - 1.11.2.2 In life threatening injuries, proper decontamination shall be the first priority. After taking measures to stabilize the injured worker, the scene shall be secured from the workplace and proper medical treatment secured.
 - 1.11.2.3 In the event that emergency procedures are required, the Contractor shall notify the appropriate, professional personnel, the medical facility and other required persons that the injured individuals is or will be contaminated and need.
- 1.11.3 Emergency telephone numbers shall be emergency response personnel shall be prominently posted in the clean room/change area and Contractor's office or trailer, and copies provided to CDDT and RES and its Representative.

1.12 Pre-Construction Meeting

- 1.12.1 The Contractor shall attend a pre-construction meeting at the scheduled CDDT address. Attending this meeting is the responsibility of the Contractor and Subcontractors impacted by the event operations, and CDDT address's Representative.
- 1.12.2 At this meeting, the Contractor and supervisor personnel shall provide on-site direction of the lead related activities to attend and be prepared to discuss
 - 1.12.2.1 Preparation of the area
 - 1.12.2.2 Personal protective equipment including respirator protection and protective clothing
 - 1.12.2.3 Employees who will participate in the project, including definition of experience, training and assigned responsibilities during the project.
 - 1.12.2.4 Decontamination procedures for personnel, clothing and

equipment.

1.1.1.1 Lead paint removal methods and procedures to be utilized.

1.1.1.2 Required air monitoring procedures.

1.1.1.3 Procedures for handling and disposing of waste materials.

1.1.1.4 Procedures for decontamination and cleanup.

1.1.1.5 Detailed work and performance schedule.

1.1.1.6 Procedures for dealing with wet stress.

1.1.1.7 Emergency procedures.

PART 2 - PRODUCTS

2.1 General Requirements

2.1.1 All materials, tools, and equipment listed herein required shall be provided by the subcontractor.

2.2 Materials and Supplies

2.2.1 Deliver all materials in the original packages, containers, or bundles bearing the name of the manufacturer, the brand name, and meeting as required by the CCR, ASTM, or other applicable standards.

2.2.2 Store all materials that are subject to damage while in the open air or damp surfaces and under cover sufficient to prevent damage or contamination.

2.2.3 Do not use or deteriorating materials shall not be used and shall be replaced by the project. Materials that become contaminated with lead shall be disposed in accordance with applicable regulations.

2.2.4 Protective Sheetin shall be fire resistant, non-toxic, and shall be otherwise specified, in sizes to minimize the required joints.

2.2.5 Type of Coping Case in joints shall be plastic sheets and for attachment of plastic sheet to finished or unfinished surfaces shall dissipate all materials and coping shall be under dry and wet conditions, including use of the intended water.

2.2.6 Structural setting agent shall be Detergent containing a phosphoric acid solution.

2.2.7 All materials and signs shall be required by the State Regulations, the CCR, ASTM, and the CCR. All materials shall be provided for this project and be in the End Use and Spill.

2.2.3 Encapsulant Product shall be as approved.

2.2.4 Other Materials Provide other materials as specified in drawings, other materials, such as miter, nails and hardware, fabric and glue required to construct and disassemble the decontamination area and the barriers that isolate the area.

2.3 Tools and Equipment

2.3.1 Provide suitable tools for lead paint removal.

2.3.2 Type "Supplied Air System" shall contain hoses and pressure device and, supplied air respirator, if SASS certified is required to be provided for workers.

The system shall meet the criteria prescribed for SASS for supplied air respirators.

- The system shall be designed and modified so as to turn on when the worker enters in excess of 100 ppm.
- It shall be certified for use in the conditions up to 100 feet.
- Either a full face or canister piece units fitted with a EP filter or canister units are acceptable.

2.3.3 Powered Air Purifying Respirator (PAPR) positive pressure device shall be provided, portable, rechargeable battery pack and power to force contaminated air through a filter or cartridge, where the air is cleaned and supplied to the wearer's breathing zone. This respirator shall utilize HEPA filters and be either a full face or canister piece units.

2.3.4 Canister air purifying respirator shall contain a EP filter.

2.3.5 Canister air purifying respirator shall contain a EP filter.

2.3.6 Temporary electric cords and outlets shall be of approved type and connected to a source of power outside the area and protected by a ground fault circuit interrupter (GFCI).

2.3.7 All power shall be as approved. The Contractor shall provide all equipment necessary to provide power into the area and to conduct work in a safe manner.

PART 3 - EXECUTION

3.1 Work Schedule

3.1.1 The work is to be carried out during the completion of the test speed of the location where work is conducted. The Contractor shall provide all lead-related work in accordance with project schedule established for the project. In order to expedite the work, estimates and lead-related work shall

The conducted site inspections in the site content review
initiated the conducted site visits and in accordance
with COS requirements and these specifications.

- 1.1.1 per order the contract shall be performed during the stipulated period. Contractor shall cooperate with the Contractor's to expedite completion of the project.
- 1.1.2 In the opinion of Contractor it becomes necessary to add additional work or to continue the schedule for the completion of the project within the specified time, the Contractor shall immediately submit a written request to Contractor.
- 1.1.3 Site work shall proceed in accordance with project schedule in reliance of the Contractor's LEAD "Construction Plan" by Contractor's Representative.

3.2 Building Demolition Operations

- □ □ During mode of operation, the internal feedforward network continues to print, Contractor should stop after continuous stop particulate in the airborne dust emissions. Particulate emissions should be contained in wetted condition and be inhibited.
- □ □ The Contractor should conduct mode of operation in accordance with applicable Code of Standards. The Contractor should ensure that personnel are trained and wear proper PPE when outside the wetted area at all times.
- □ □ Contractor should conduct representative personnel monitoring for airborne feedforward and other aerosolized substances and distance should be maintained.
- □ □ Contractor should ensure that the feedforward is not present in the feedforward process after the feedforward is made into the feedforward representative of the feedforward.

3.3 Inspections by County of Fresno's Representative

- 1.1.1 The County of Fresno's Representative shall inspect the site preparation and construction of the site as outlined herein to ensure that work is conducted in accordance with these specifications and applicable regulations.
- 1.1.2 County of Fresno's Representative shall inspect the reclamation and revegetation on its completion to ensure that all visible seed contamination points and residue have been removed. The Contractor Shall Not Proceed until after completion of the site until such time as final inspection has been conducted and the approval and degree of cleanliness accepted by County of Fresno's Representative.
- 1.1.3 Prior to commencing operations, County of Fresno's Representative shall select the site supervisor and submit for analysis an accredited

Contractor is to read content. Stop pin locations shall be posted on site plan.

- 3.3.1 Upon completion thereof, the County Purchaser's Representative shall conduct post renovation debris condition and pipes and/or soils sampling as a condition of acceptance thereof. In post debris condition and pipe and/or soil sampling documents that lead debris detected at the specified debris condition operations are other than baseline debris, Contractor shall remove and dispose accordingly. The subject property is directed by County Purchaser's Representative to a depth that debris are at or below baseline debris and jet pipe concrete services. The Contractor shall be responsible for cost of cleaning concrete, surface, and disposal and cost of subsequent testing by County Purchaser's Representative. Contractor shall provide clean dirt to replace removed content in the site. Predefined sites are directed by County Purchaser or County Purchaser's Representative.
- 3.3.2 Inspections and/or re-inspections by the County Purchaser's Representative shall be scheduled by the Contractor at least ten (10) working days in advance.
- 3.3.3 County Purchaser's Representative will inspect the facilities as necessary to ensure compliance with these specifications.
- 3.3.4 County Purchaser's Representative is not limited by the inspection requirements as noted. In addition, spot and detail inspections by County Purchaser's Representative may occur randomly, and in no manner to determine compliance with applicable laws and project design documents.

3.4 Preparation of Work Area

- 3.4.1 Prior to Preparation
 - 3.4.1.1 Contractor shall place a 1/4" plastic sheeting on ground around base of each structure prior to commencing enclosure or removal of debris or damaged paint chips, or removal of debris or damaged paint prior to debris condition operations.
- 3.4.2 Signs
 - 3.4.2.1 The Contractor shall post signs in a visible location outside entrances and exits to the project. Identical signage shall be posted in both English and Spanish.
 - 3.4.2.2 The Contractor shall keep the signs posted until County Purchaser's Representative notifies the Contractor the specific areas successfully passed in the inspection as herein defined.
 - 3.4.2.3 The Contractor shall insure that the signage required meets the minimum description.

The sign is at least 11" x 17" and states the date and place of the lead abatement project.

The sign includes the phrase, "Caution **Deep Out**" in bold lettering at least two inches high. Signage required in **jurisdiction** **same** **posted** **required** **conditions**.

3.5 Lead Disturbance Shall Not Commence Until:

- [illegible]

3.6 Clean-Up Procedures

- 1.1.1. Generator, len, or in the distance bed is to be placed, the site should be cleaned at the end of each day's activities. Prior to beginning and control, stored materials or equipment should either be removed to a "clean area" or wrapped in polyethylene prior to start of the bed and removed from a secure area should be designated at the site of Contractor's Representative. The area should be designated for storage of detected bed containing paint chips and contaminated articles that can be properly disposed. Disposal supplies such as bags, spades, and rags should be replaced regularly and disposed according to the contract documents. During equipment, such as power and hand tools, generators, and vehicles should be cleaned regularly. Equipment should be cleaned on EP equipment and disposed of properly.
- 1.1.2. Cleanup procedures, as described herein, will be completed before the removal of the material or equipment from the plastic sheeting in tents, as the items do not have to be removed and can be in place.
- 1.1.3. Cleanup Methods and Equipment: In all operations involving distance bed and bed been completed should be cleaned, on each cleaning of the efficiency participate for EP equipment, should be met cleaning of the disposal site. The Contractor will use a garden sprayer or equipment to get materials into the bed to be cleaned. After spraying the surface, bed and drop EP equipment

sample used to collect the water from the source.

- 3.3.3 **Efficiency Particulate Air (EPA) Accredited** The Contractor must obtain training in the use of the EPA accredited from the manufacturer prior to use. The Contractor must obtain EPA accredited attachments, scales, certified crates, credit tools and other tools to be used or carried application, and service the EPA accredited routine to ensure proper operation. Caution sample taken notice the EPA is opened or after replacement or debris removal operators sample or a metal protective curtain and equipment, including Respirators when inside the EPA accredited equipment.
- 3.3.4 The Contractor must retain the services of a testing contractor to conduct representative sampling of the water from the water faucet meets the local standards of the Regional Water Quality Control Board of the filtered and disposed into the storm drain system after being filtered through a filtration filtering system. Water faucet contains over the sample content and sample disposed into RCR of the Contractor's expense.
- 3.3.5 **Removal of Plastic Sheet** Plastic sheeting must be removed from the surface sample sprayer, picked up, and EPA accredited prior to removal. The plastic sheeting sample core must be added from the corners and ends toward the middle and placed into a double bag since the plastic bag and sealed. Bags sample stored in the designated area and disposed according to these specifications.
- 3.3.6 **Final Cleanup and Inspection** The Contractor must obtain final cleanup after completion of the operation. After removal of the debris and prior to application of replacement soil. The entire area sample inspected for evidence of lead, detected paint chips and paint residue. Visible paint chips and paint residue sample EPA accredited. No dust sweeping is allowed.
- 3.3.7 The statements in this section are meant to relieve the Contractor of its responsibility to meet the final cleanup criteria as established by these contract documents or any other applicable laws or regulations.

3.7 Clearance Testing and Standards

- 3.7.1 **Final Cleanup and Inspection** The Contractor must obtain final cleanup after completion of the operation. After removal of the debris and prior to application of replacement soil. The entire area sample inspected for evidence of lead, detected paint chips and paint residue. Visible paint chips and paint residue sample EPA accredited. No dust sweeping is allowed.
- 3.7.2 **Dust samples** must be collected from a certified laboratory within 48 hours of completion of the operation. Samples must be collected from the specified location site locations. Samples sample submitted to an accredited laboratory for analysis as to lead content in accordance with these specifications.
- 3.7.3 **Dust samples** must be collected from a certified laboratory within 48 hours of completion of the operation. Samples must be collected from the specified location site locations. Samples sample submitted to an accredited laboratory for analysis as to lead content in accordance with these specifications.
- 3.7.4 **Countdown** Fresno's Representative sample submit the test results indicating that the lead level in the tested soil and concrete are less than the allowed levels.

- .□.□ If the test results indicate higher levels, the Contractor shall estimate concrete and/or rebar surface area affected and as directed by Consultant's Representative to depth sufficient to reduce lead levels to at or below baseline levels. Samples shall be stored in sealed containers for disposal. Contractor shall ensure it replaced any samples prior to removal of material to determine lead content for purposes of disposal.
- .□.□ Contractor shall replace removed surface material with clean fill and surround site. The Contractor shall ensure it cap material on basis of containment that replaced material contains less than 100 ppm lead. Surface area, replacement, grading and subsequent samples prior and on basis shall be provided at no cost to Consultant's Representative.
- .□.□ Contractor shall be responsible for all costs associated with debris, stoppages, and all costs associated with failure to meet clearance criteria for the initial prior and per order. Costs shall include cost of repeating clearance sampling, material costs, shipping, cost of Consultant's Representative, and incident costs.

3.8 Disposal of Lead Waste Material

- .□.□ The Contractor shall dispose of all lead-contaminated paint, ceiling stripper, and articles contained in ceiling stripper as RCR waste.
- .□.□ Contractor shall provide required testing to determine appropriate disposal of contaminated paint, respirators, paint, P.P.E. and other contaminated articles.
- .□.□ All lead-contaminated paint or lead-contaminated paint shall be disposed of as general construction debris. The Contractor shall comply with requirements and acceptances of lead-contaminated construction debris.
- .□.□ All lead-contaminated material shall be filtered and placed into steel drums. The Contractor shall retain the services of testing material to conduct representative sampling of material. After testing meets the standards of the local Region after approval of Contractor, in addition to state and federal agencies pertaining to material shall be filtered and disposed of into steel drums. After testing contains over the allowable content shall be disposed of as RCR waste at Contractor's expense.

END OF SECTION

SECTION 03 1000 CONCRETE FORMWORK

PART 1 - GENERAL

1.01. RELATED DOCUMENTS

- . Drawings and General provisions of Contract, including General and Supplemental Conditions and Division Specifications, apply to this section.

1.02. SCOPE

- . The work required under this section consists of concrete formwork and related items necessary and required to complete the works indicated in the Contract Documents. The Contractor shall provide materials, articles, operations or methods listed, mentioned or scheduled in the drawings and/or specified herein, including materials, equipment, and incidentals necessary and required for their completion.

1.03. DESCRIPTION OF WORK

- . Work included Provide work in accordance with the provisions of this section for concrete shown on the Drawings or required in other Sections of these Specifications.

1.04. RELATED WORK SPECIFIED ELSEWHERE

- . Related work in other Sections of the Division items associated with are included in other sections of these specifications:
 - . Erecting, tying, bracing, and other erecting operations Division
 - . Forming and Placing Reinforcing Steel Division
 - . Cast-in-Place Concrete Division
 - . Forming concrete walls and discontinue of concrete to be embedded in concrete Division
 - . Site-Cast Concrete Division

1.05. SUBMITTALS

- . General Compliance with pertinent provisions of Section.
- B. Manufacturers' data sheets of manufacturers' and installation instructions for proprietary materials including bracing, ties and accessories, and constructed work systems used.

1.06. REFERENCE STANDARDS

- . Standards Compliance with the following standards:
 - . American Concrete Institute (ACI)
 - . ACI Guide to Formwork for Concrete
 - . International Code Council (ICC)
 - . Title 12, Part 9, California Building Code (CBC) Edition
 - . West Coast Timber Inspection Bureau (WCTIB)
 - . Standard Grading Rules for West Coast Timber, 12th Edition
 - . American Portland Association (APA)
 - . Formwork Design/Construction Guide Concrete Forming

1.07. QUALITY ASSURANCE

- . Design work is the Contractor's responsibility.

PART 2 - PRODUCTS

2.01. FORM MATERIALS

- ☐ Erection forms shall be maintained on all concrete sides and stone and concrete shall be exposed. Where erection forms are used, all excavations next and adjacent to side or plain concrete directly against the excavation.

B. Forms for One-Paced Concrete

- ☐ For concrete shall be exposed in the finished work, and shall be not otherwise scheduled or specified, use one of the following materials:
 - 1" or 2" wide, 1" nominal thickness boards with slipshipped or tongue and groove edges conforming to a CIB paragraph code or STANDARD Grade Dishes or Boards schedule S.S.
 - 1" nominal thickness plywood conforming to APA Grade Plywood Class Exterior.
- ☐ For one-paced concrete where grade shall be to receive one of the other products use 1" nominal thickness plywood grade conforming to APA Grade Plywood Class Exterior.

C. Forms for Exposed Surfaces

- ☐ General concrete shall be exposed in the finished work, except where otherwise scheduled or specified, use "B.B. Plywood Class Exterior" grade plywood conforming to APA.
- ☐ Plywood for standard architectural finish, concrete surfaces to receive a "rough" finish, and surfaces to receive one of the other products schedule "B.B. Plywood Class Exterior" grade.
- ☐ Plywood for soffit architectural finish schedule "D Overlay Plyform Class 1 Exterior" grade.

D. Round Concrete Forms

- ☐ Premanufactured seamless fiber forms.
- ☐ Precision Sanded fiber form.

E. Form Ties

- ☐ Provide manufacturer, cast-in-place, reinforced or snap-on metal ties, designed to prevent warpage and to prevent spalling concrete surfaces upon removal.
- ☐ Provide ties so that portion remaining within concrete after removal of exterior parts is at least 1 inch from the outer concrete surface. Provide war ties shall be not less than 1" diameter in the concrete surface.

F. Forms Continues

- ☐ Provide continuous operation and continue compounds that shall not bend, split, stain, nor otherwise affect concrete surfaces requiring bond or adhesion, not impede the setting of surfaces to be cured with water or curing compounds.

2.02. DESIGN OF FORMWORK

- ☐ General
 - ☐ Design, erect, support, brace, and maintain all forms so that it will safely support vertical and horizontal loads that will be applied, anticipated loads that will be applied can be supported by the concrete structure. The design and engineering of the forms shall be the responsibility of the contractor.
 - ☐ Confirm vertical and horizontal to ground on all forms and in place construction that is attained adequate strength for that purpose.
 - ☐ Construct all forms so that concrete walls and structures are correct size, shape, alignment, elevation, and position.
 - ☐ Design forms to include assumed loads live load, dead load, wind load, seismic load, weight of adjacent equipment operated on all work, concrete fill, weight of concrete drop,

greater deflection, joint temperature, foundation pressures, ultimate stresses, ultimate strength, and other factors pertinent to setting of structure during construction.

- Provide shore and struts in appropriate areas and construct cap and base settlement during concrete placing operations as indicated on plans or as construction requires.
- Support the main materials of structure on bents spaced sufficient close to prevent objectionable deflection. If it deflection occurs in materials reflected in concrete surfaces exposed to view to meet the span.
- If shores placed in successive units or continuous surfaces to accurate alignment, free from irregularities, and within allowable tolerance.
- Provide cover in all areas required for anticipated deflections due to weight and pressures of concrete and construction loads.
- Provide shores sufficient to prevent excessive settlement paste during concrete placement. Solid support joints and provide support materials as required to prevent excessive end runs.

B. Tolerances and variations The Contractor shall set and maintain concrete shores to ensure that, after removal of the shores and prior to placing and finishing, no portion of the concrete shall exceed the tolerance specified. The Contractor shall be responsible for variations due to deflection, when the after results show concrete within or within after than that which has been specified. The tolerances specified shall not be exceeded in no portion of the concrete surface the specified variation for one element of the structure which be applicable when it is applied to another element of the structure to exceed its allowable variations. Except as otherwise specified herein, tolerances shall conform to ACI 308.

C. Erection of shores

- Side shores shall be placed as close as possible, and concrete placed directly against excavation when possible requested by the Contractor and reviewed by the Architect. When possible, shores is removed, provide additional concrete on each side of the initial design profiles and dimensions shown. A solid edge strips shall be provided at the top on each side of the excavation to secure reinforcement and to prevent soil from settling into the excavation. Erection of shores shall be done in a clean manner and use of materials where deposition of concrete.

PART 3 - EXECUTION

3.01. SURFACE CONDITIONS

- Examine the substrate and conditions under which work of this Section is to be performed, and correct unsatisfactory conditions which would prevent proper and timely completion of the work. Do not proceed until unsatisfactory conditions have been corrected.

3.02. FORM CONSTRUCTION

- General
 - Construct shores conforming to ACI 308, to the exact sizes, shapes, lines, and dimensions shown, and as required to obtain accurate alignment, location, grades, level, and proper finish in this structures.
 - Provide for openings, offsets, slopes, ledges, recesses, openings, relets, corners, openings, screeds, openings, enclosures, inserts, and other features required. Use selected materials to obtain required finishes.
 - Shores for openings, and construction shall conform to the installation of other trades of these materials and products must be indicated before the opportunity exists to verify the measurements and construct construction of the objects and installations, shall be constructed and located as dimensioned on the drawings. In the event that deflection from the Drawing dimensions results in problems in the field, the Contractor shall be responsible for resolution of the conditions without additional expense to the owner.

B. Fabrication

1. Fabricate shores for exposure of concrete in the form or prior to concrete surfaces.

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- Provide top parallel openin's where interior precast concrete panels are inaccessible for cleanout, for inspection before concrete placement, and for placement of concrete. Brace top parallel courses and set them to top parallel openin's on walls in inconspicuous locations as possible, consistent with design requirements. Form intersection planes to provide true, clean cut corners.
- C. Forms for Exposed Concrete**
- Forms for architectural concrete shall be designed to produce the required finish or finishes. Deflection within 1/8" (3 mm) between studs as follows: deflection of studs and others shall be limited to 1/16" (1.6 mm) times the span or as otherwise specified. Forms shall be designed to permit easy removal. Pump against the face of the concrete so that it is finished. Non-skid shoes shall be used.
- Where not required, the finish, braced finish, screeded finish, or sand blasted finish is required, forms shall be so constructed with panels, liner sheets, or precast panels and true to line, in order that the surfaces produced will require little dressing to arrive at true surfaces. Where an exposed finish is required, no dressing shall be permitted in the finishing operation.
- Where exposed surfaces, including not required the finish, are specified, the panels or other components of the concrete is cast so that order in arrangement, with joints between panels planned in acceptable relation to openin's, adjoining corners, and other architectural features.
- Where panels or exposed surfaces are separated or recessed or otherwise exposed with joints, the structural design of the forms shall provide for maintaining the ties, where possible, within the joints so that patches are not required within the panels.
- In addition to stop drooins no other required, marking drooins shall be for architectural concrete shall be so fitted for acceptance so that the joints in panels, the locations of ties, and any necessary reinforcement.
- Forms shall be released if there is no evidence of surface wear and tear or defect of the form or pair the quality of the surface. Forms shall be thoroughly cleaned and properly coated before reused.
- Forms for architectural concrete shall be so designed so that concrete is reinforced to see that there are no defects in desired elevation, alignment, panelness, or color. If during construction, any weakness develops and the use of the forms is found to be settling or distortion, the forms shall be stopped, the affected construction removed or repaired, and the forms strengthened.
- Corners and openin's in walls shall be finished with a 1/4" (6 mm) radius.
- D. Corner Treatment** Unless specified otherwise, the corners of the wall shall be finished with a 1/4" (6 mm) radius.
- E. Provision for Other Trades** Provide openin's in concrete walls for other trades. Provide and location of openin's, recesses and courses of the trade requiring schedule. Provide place and secure support items to be installed in walls.
- Cleaning and Tightening of Formwork Clean walls and adjacent surfaces to receive concrete. Remove chips, sand, silt, dust, dirt, and other debris from the concrete is placed. Retighten walls if needed after concrete placement is required to eliminate air leaks.
- Screeds Set screeds and establish levels for tops of concrete walls and define the finish on walls. Slope walls to drain where required or as indicated in drawings.
- Screenshot Supports for concrete other than precast panels and for other support of other trades, use cradle, pad, or base type which do not puncture the wall or other. Do not store materials on the wall.

- I. Edge Forms and Screeds Strips for Slabs. Set edge forms or screeds and intermediate screed strips for slabs to obtain required elevations and contours in the finished slab surface. Provide and secure bracing to support types of screeds required. Slope forms and screeds to drains and depress slabs at tie rods.

3.03. FORM COATINGS:

- A. Coat form contact surfaces with form coating compound before reinforcement is placed. Do not allow excess form coating material to accumulate in the forms or to come into contact with surfaces of concrete intended to finish concrete.

3.04. INSTALLATION OF EMBEDDED ITEMS

- A. General. Set and build into the formwork the devices and other embedded items required for other contract is attached to, or supported by, cast-in-place concrete. Use setting drawings, diagrams, instructions and directions provided by suppliers of the items to be attached thereto.
- B. Coordination. Contractors advise owner is related to the concrete, or must be supported by it so that given proper notice and opportunity to introduce and/or remove embedded items before the concrete is placed.
- C. Enclosure. Expansion joint material, water stops, and other embedded items shall be positioned accurately and supported against displacement, prior to placing concrete. Joints in sleeves, inserts, and anchor bolts shall be tied to provide adequate resistance to material to prevent the entry of concrete into the voids.
- D. Anchor Bolts. Anchor bolts shall be set to the proper depth, spaced properly and checked for location and elevation in accordance with instructions, and shall be held in position rigidly to prevent displacement before concrete is placed.

3.05. REMOVAL OF FORMS

- A. General.
 1. When repair of surface defects or finishing is required at an early age, forms shall be removed as soon as the concrete has hardened sufficiently to resist damage from removal operations.
 2. Top forms on slapping surfaces of concrete shall be removed as soon as the concrete has attained sufficient stiffness to prevent sagging. Any needed repairs or treatment required on such slapping surfaces shall be performed at once and be finished before specified curing.
 3. Side forms for openings shall be loosened as soon as this can be accomplished without damage to the concrete.
 4. Formwork for columns, walls, sides of beams, sides of slabs on grade and other parts not supporting the weight of the concrete shall be removed as soon as the concrete has hardened sufficiently to resist damage from removal operations.
 5. Forms and shoring in the formwork used to support the weight of concrete in beams, slabs, and other structural members shall remain in place until the concrete has reached the specified minimum compressive strength.
- B. Reinforcement.
 1. Reinforcing bars shall be removed as specified above, and members shall be moved only after the minimum design strength is specified on the drawings are attained. Whenever possible, earlier removal of forms and shoring shall be made to the Architect in writing, and no other supporting evidence that the safety of the structure will not be impaired.
 2. When reinforcement bars are placed in the concrete reaching specified strength, the concrete shall be preserved to allow removal of this strength when either of the following conditions has been met.
 - a. When test cylinders, field cured and placed in the concrete to represent, are removed the strength specified for reinforcement bars. Except for the field curing and the test, the cylinders shall be placed and tested as specified in ASTM C.

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- □ When the concrete has been cured for the same length of time as the one tested on
□ standard cured cylinders, it is replaced the specified strength. The length of time
□ the concrete has been cured in the structure shall be determined on a case by case
□ basis for each of the sections there, not necessarily consecutive. During which the
□ temperature shall be in contact with the concrete is 50°F and the concrete
□ has been damp or thoroughly sealed from evaporation and loss of moisture.

C. Rebar

- In rebar placement, no cutting or bars shall be used and special care shall be
□ taken in stripping. Start at top edge or vertical corner where it is possible to insert wooden
□ edges. Edges shall be done first and shall be accompanied by that tapping on
□ the plywood panels to create the base. Do not rebar the bars into a single layer after it
□ has been started at one end.
- Bars shall be left in place as much as possible to permit shrinkage of the concrete,
□ and plywood bars shall be left in place until after bars are stripped, and until
□ there is no danger of the bars in the architectural concrete due to other bars in the vicinity.

- D. Protection after stripping, Contractor shall properly protect the concrete to be exposed in the
□ this area from damage, with boards and non-staining covering paper to prevent staining,
□ spaced edges, chips, etc.

3.06. RE-USE OF FORMS

- Clean and repair surfaces of forms to be reused in the form. Split, forced, deformed or
□ otherwise damaged form shall be discarded and not be acceptable. Appropriate form
□ compound or material to concrete surfaces as specified for new formwork. When forms are reused
□ for successive concrete placement, thoroughly clean surfaces, remove fins and lint, and
□ tighten forms to close joints. Patch and secure joints to avoid leaks.

3.07. FIELD QUALITY CONTROL

- The Contractor shall notify the architect of errors prior to placing formwork concrete, and after
□ placement of reinforcement steel in the forms.
- B. Rejection of Defective Work Due to improper workmanship or deficient workmanship during
□ construction or variations in excess of the tolerances specified shall be considered first cause for
□ the rework of the work and, in addition, the concrete shall be rejected. Reconstruction of
□ forms and new concrete shall be permitted at no additional cost to the owner.

END OF SECTION

SECTION 03 2100 CONCRETE REINFORCEMENT

PART 1 - GENERAL

1.01. RELATED DOCUMENTS

- Drawings and General provisions of Contract, including General and Supplemental Conditions and Division 03 Specification sections, apply to this section.

1.02. SCOPE

- The work required under this section consists of reinforcing steel and related items necessary and required to complete the works indicated in the Contract Documents. The Contractor shall provide materials, articles, operations or methods listed, mentioned or scheduled in the drawings and/or specified herein, including materials, equipment, and incidentals necessary and required for their completion.

1.03. DESCRIPTION OF WORK

- Steel reinforcing required for reinforcement of concrete and as shown on the drawings.

1.04. RELATED WORK SPECIFIED ELSEWHERE

- Related work in other Sections of the Division items associated or are included in other sections of these specifications:
 - Portland Cement Concrete Paving Division
 - Concrete Formwork Division
 - Cast-in-Place Concrete Division
 - Concrete Unit Masonry Division
 - Structural Steel Division

1.05. SUBMITTALS

- **A. Material Certificates**
 - The contractor shall provide Material Certificates for each size, grade and weight to be used on the project. Certificates shall be in accordance with the requirements of Part 1.06, "Reference Standards" of this specification section.
 - Material Certificates shall include the name and date of origin, date of shipping to project, and shall be signed by manufacturer certifying that each material complies or exceeds the specified requirements. A Material Certificate shall be furnished to each of the materials delivered to the project, and the it shall be clearly identified in the Certificate.
- **B. Shop Drawings** shall be submitted to the Architect and the Structural Engineer for review as per the General Conditions. All fabrication shall be completed before receiving the Structural Engineer's review of Shop Drawings.
 - Shop drawings shall show bar schedules, stirrup spacing, dimensions, joint bars, and reinforcement and asseables.
 - Make Shop Drawings in accordance with ACI SP 10 or CRSI Manual Standard Practice.
- **C. Field Inspection** The field inspector shall submit the Architect with an affidavit stating that field inspections been performed in compliance with the drawings and specifications and all work has been accepted or certified orders.

1.06. REFERENCE STANDARDS

- Comply with the pertinent provisions of the following codes and standards:
 - American Society for Testing and Materials (ASTM)
 - American Standard Specification for Steel I-Beam, for Concrete Reinforcement.

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- □□□ Standard Specification for Welded Steel Reinforcing Bars, AISI, ASTM, and Concrete Reinforcing Institute.
 - c. □□□□ Standard Specification for Deformed and Plain Bar Steel Bars for Concrete Reinforcing, including Supplemental Requirements.
 - d. □□□□ Standard Specification for Steel Bars, Carbon, Hot Rolled, Specific Properties.
 - e. □□□□ Standard Specification for Cold Channeled Steel Bars for Concrete Reinforcing.
- International Code Council (ICC)
 - Title 19, Part 9, Commercial Building Code (CBC) 2003 Edition
- American Institute of Steel Construction, Inc.
 - Design Manual
 - Structural Steel Design Code Reinforcing Steel
- American Concrete Institute (ACI)
 - 308.3R Standard Tolerances for Concrete Construction and Materials.
 - SP-10 Design Manual
- c. 308.3R Building Code Requirements for Reinforced Concrete
- Concrete Reinforcing Steel Institute (CRSI)
 - Manual Standard Practice
- Wire Reinforcing Institute (RWI)
 - Manual Standard Practice

1.07. SAMPLES AND TESTS

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PART 2 - MATERIALS

2.01. REINFORCING MATERIALS

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- B. Epoxidized Reinforcing Bars—STM 1000, Class II 60 ksi tensile strength, epoxy coated, after curing and bending.
- C. Epoxy Coated Reinforcing Bars—STM 1000.
- D. Steel wire—STM 1000, plain, cold drawn steel.
- E. Welded wire fabric—STM 1000, welded steel wire fabric.
- F. Welded Deformed Steel wire fabric—STM 1000.
- G. Supports for Reinforcement—Bridges, chairs, spacers, and other devices for spacing, supporting, and tensioning reinforcing bars and welded wire fabric in place. Use wire or type supports conforming to CRSI specifications.
- H. For slabs on grade, use supports with sand plates or horizontal runners where base is vertical or incline support chairs.
- I. For exposed concrete surfaces, where chairs or supports are in contact with bars, provide supports with a plastic protective CRSI, Class 300 stainless steel protective CRSI, Class 300.
- J. Reinforcing to be welded—STM 1000 grade 60.

PART 3 - EXECUTION

3.01. GENERAL

- A. Coordinate the installation with other trades and proper reorders with placement of bars and reinforcing steel.

3.02. BENDING REINFORCEMENT

- A. Steel reinforcement should be bent or straightened in a manner that will not damage the bars or the ends of the bars should not be used.
- B. Bends for stirrups and ties should be made around a pin with a diameter not less than the thickness of the bar. Bends for other bars including bars, should be made around a pin with a diameter not less than six times the thickness of the bar, except that for bars larger than one inch, the pin should not be less than eight times the thickness of the bar. Bars should be bent cold.

3.03. PLACING OF REINFORCEMENT

- A. The minimum center to center distance between parallel bars should be the diameter for round bars, but in no case should the clear spacing between bars be less than four inches nor less than six times the diameter of the side of the coarse aggregate.
- B. Bars should be accurately placed as soon as the plans and schedule for and secured in position at intersections, using any needed wire and secure necessary supporting wires and concrete or other devices as needed to support the reinforcing steel in its position. The wooden or other supports for reinforcing should be removed. Placing bars on wires over concrete should be permitted.
- C. The concrete should be deposited until the Structural Engineer has inspected the placing of reinforcing steel and given approval and the permission to proceed with the placing of the concrete.
- D. Beams and other bars should be supported on approved wire chairs, one to be placed not more than 12" from each support and intermediate chairs to be placed not more than 12" on centers.
- E. Slab bars should be supported on approved wire chairs placed not more than 12" from each support and then not more than 12" on centers. Top bar should be supported on chairs placed not more than 12" from each support and individual chairs should be spaced not more than 12" on centers in the direction of the spacer bars.

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1. Comply with Concrete Reinforcing Steel Institute's recommended practice "Provisions for Reinforcing Bars", for details and methods of reinforcement placement and supports, and as herein specified.
2. Minimize cutting or punching of pre-reinforced concrete operations.
3. Clean reinforcement before use, rust and discolor, dirt, ice, and other materials which reduce or destroy bond with concrete.
4. Place reinforcement to obtain at least minimum clearances for concrete protection. Arrange, space, and secure tie bars and supports to hold reinforcement in position during concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.
5. Install welded wire fabric in as many panels as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Set end laps in adjacent bays to prevent continuous laps in either direction. See Drawings for specific wire details.

3.04. CONCRETE COVERAGE OF REINFORCING

- Q. In designations such as Reinforced steel or concrete and other combinations, the words are tied together, designations are to be in order, unless specifically noted. Concrete cover is given as follows
- "Where concrete is deposited directly against ground
 - "Where concrete is exposed to ground not placed in walls.
 - "For all other tied connections.
 - "Where all other connections.
 - "Where to be spirally spirally wrapped connections.
 - "For all other connections unless otherwise specified.
 - "Where in slabs on walls
 - "Where slabs over other carrier are specified

3.05. SPLICES IN REINFORCEMENT

- A. Splices in continuous reinforcement are used in slabs, beams, etc., so long as they are detailed on the Strong Floor, but in no case less than 12 diameters, 18" minimum, and the splices in adjacent bars shall not be less than 18" apart. Splices shall occur where detailed. Vertical members may be spliced at or near the floor lines unless detailed otherwise. Bars may be lapped together at splices or laps except at top reinforcement where laps or splices are definite and detailed to be separated.
- B. Splices in reinforcement in slabs, beams, and girders shall not be made at points where stress/splices shall provide sufficient lap to transfer stress between bars and end section. Where continuous cross-section changes, undisturbed bars shall be set in reinforcement support is provided, see structural details. Slope of set bars shall not exceed 4 in 12.

3.06. MISCELLANEOUS REQUIREMENTS

- c. Reinforcing steel shall be installed in accordance with the following:
- i. Reinforcing steel shall be placed where the concrete is poured and held in proper position and alignment.
 - ii. Where conditions, piping, insets, sleeves, etc., interfere with the placement of reinforcing steel, the Contractor shall consult the Structural Engineer and secure in writing, the method proposed before proceeding with the concrete.

3.07. CLEAN UP

- Q. ...debris and/or rocks resulting from the operation of this trade should be cleaned up and removed from the site as the work progresses.

PART 4 - FIELD QUALITY CONTROL

4.01. The placement of all reinforcing shall be inspected by the Project Inspector prior to

placement of concrete.

4.02. Inspection of Welded Reinforcing Bars:

- A. Inspection reports and field structure and operations should be completed by the field inspector, designated by the Architect and approved by the Division of the State Architect. Such inspectors should be trained and thoroughly experienced in inspection and reinforcement operations. The inspectors should be able to distinguish between sound and unsound reinforcement reinforcement.
- B. The field inspector should also maintain a systematic record of the work. This record should include
- ☐ Identification of the members.
 - ☐ List of defects.
 - ☐ Manner of correction of defects.

4.03. REPORTS

- . Submit reports upon completion of inspection to Project Inspector & Architect.

END OF SECTION

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SECTION 03 3000 CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01. RELATED DOCUMENTS

- . Drawings and General provisions of Contract, including General and Supplemental Conditions and Division of Specification sections, apply to this section.

1.02. SCOPE:

- . The work required under this section consists of cast in place structural concrete and related items necessary and required to complete the works indicated in the Contract Documents. The Contractor shall provide materials, articles, operations or methods listed, mentioned or scheduled on the drawings and/or specified herein, including materials, equipment, and incidentals necessary and required for their completion.

1.03. DESCRIPTION OF WORK

- . Provide cast in place concrete for foundations and structures, complete, in place, as indicated on the Drawings, specified herein, and as required for complete and proper

1.04. RELATED WORK SPECIFIED ELSEWHERE

- . Related work in other Sections: The following items associated with are included in other sections of these specifications:
 - Site Concrete Division
 - Seals for mechanical and electric utilities Divisions
 - Concrete Formwork Division
 - Ancillary and miscellaneous materials to be embedded in concrete Division and others
 - Concrete reinforcement Division
 - Under floor floor carrier Division

1.05. SUBMITTALS

- . Product Data: Submit producers or manufacturers specifications and installation instructions for materials and products. Include manufacturer test reports and other data to substantiate compliance with specifications including specified standards:
 - Cement: Submit manufacturer's Certificate of Compliance and add for cement.
 - Aggregate: Submit Certificate of Compliance and grading analysis for each aggregate proposed. Submit proposed graded grading for each material to be used.
 - Manufacturer's Certificate of Compliance and catalog sheets including instructions for use and description of application shall be submitted for each material including Epoxies, Admixtures, Crack Compounds, Chemicals, and Moisture Barriers.
 - Shop Drawings: Submit shop drawings showing location of construction and constraints other than as indicated on the drawings.
 - Test Reports: Submit reports of tests performed as required by Engineer.
 - Concrete Mix Designs: Submit proposed concrete mix designs for all types and uses of concrete. Include water-cement ratio, size of coarse aggregate, and amount of admixture. Predict the initial compressive strength, modulus of subgrade, and air content percentage.
 - Delivered Tests: Submit copies of delivered tests for concrete.
 - Sulfate Resistant Mortar.

1.06. REFERENCE STANDARDS

- A. Codes and Standards: Comply with applicable provisions of the following codes and standards:
 1. International Code Council (ICC)
 - a. Title 24, Part 2, California Building Code (CBC) 2022 Edition

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- a. American Concrete Institute (ACI)
 - a. ACI 308R Standard Practice for Selecting Proportions for Normal and High-Strength Concrete.
 - b. ACI 308R Recommended Practice for Evaluation of Strength Test Results for Concrete
 - c. ACI 308R Guide for Measuring, Mixing, Transporting, and Placing Concrete
 - d. ACI 308R Guide for Curing Concrete
 - e. ACI 308R Standard Specification for Cast-in-place Concrete
 - f. ACI 308R Standard Practice for Curing Concrete
 - g. ACI 308R Guide for Consolidation of Concrete
 - h. ACI 308.1 Building Code Requirements for Reinforced Concrete
 - i. SP-11 Manual of Concrete Inspection
- b. American Society for Testing and Materials (ASTM) The specifications and standards herein refer to the test editions, except when it is specified.
 - a. C 39 Standard Practice for Making and Curing Concrete Test Specimens in the Field.
 - b. C 39 Standard Specification for Concrete Cylinders.
 - c. C 39 Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
 - d. C 39 Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
 - e. C 39 Standard Test Method for Soundness of Concrete by Use of Sounding Rods or Mallets
 - f. C 39 Standard Specification for Ready-Mixed Concrete
 - g. C 39 Standard Test Method for Sampling Portland Cement Concrete
 - h. C 39 Standard Specification for Portland Cement
 - i. C 39 Standard Specification for Steel Materials for Curing Concrete
 - j. C 39 Standard Method of Sampling Ready-Mixed Concrete
 - k. C 39 Standard Test Method for Air Content of Ready-Mixed Concrete by the Volumetric Method
 - l. C 39 Standard Method of Making and Curing Concrete Test Specimens in the Laboratory
 - m. C 39 Standard Test Method for Potential Reactivity of Cementitious Materials (Mortar Bar Method)
 - n. C 39 Standard Test Method for Air Content of Ready-Mixed Concrete by the Pressure Method
 - o. C 39 Standard Specifications for Air-Entraining Admixtures for Concrete
 - p. C 39 Standard Specification for Acid Measuring Compounds for Curing Concrete
 - q. C 39 Standard Specification for Chloride Admixtures for Concrete
 - r. C 39 Standard Specification for Admixtures and Retarders Combined with Proportions for Use in Portland Cement Concrete
 - s. D 39 Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction on the Road and Resilient Bituminous Types
 - t. D 39 Protective Film and Sealing
 - u. E 39 Standard Test Method for Determining Moisture and Density in the Field by the Nuclear Method
- c. Provisions of American Building Code, Title 24, Part 2 are applicable to the provisions herein unless otherwise specified. In the event of a conflict, the provisions of American Building Code shall take precedence.

1.07. QUALITY ASSURANCE

- A. The Contractor shall provide Certificates of Compliance for concrete materials in accordance with the requirements of Part 1.05, "Reference Standards" of these specifications. When Certificates of Compliance cannot be provided, contractor test reports shall be provided in accordance with the requirements of Part 1.05, "Reference Standards" of these specifications.
- B. All materials and products shall be subject to inspection at the job point, and at the origin site. Material ownership not comply with any of the approved drawings, and for specifications shall be rejected.
- C. Continuous inspection shall be continued at the job point and for transit mixed concrete to check sieve analysis, moisture, check of moisture content, fine aggregate, check design mix, check cement being used, test reports, check origin, check truck, and certify quantities of materials placed in each layer track.
- D. Continuous job point inspection shall be provided by the Structural Engineer in responsible charge, subject to appropriate enforcement agency, when the concrete pour can show that it complies with the requirements of ASTM C, Sections 1 and 2, and has a current certificate from the National Ready Mixed Concrete Association or other agency acceptable to the enforcement agency. The certification shall indicate that the pour was properly placed and recorded.
- E. When continuous job point inspection is provided, the following requirements shall apply:
 1. Qualified technician shall be testing and recording the first pour at the start of the day.
 2. Licensed field master to positively identify materials as to quantity and certify each pour.
 3. Batch tickets, including quantities and weights shall accompany the mix and shall be transmittal to the inspector record on truck driver with mix identified thereon. The mix shall be placed in the batch ticket identification file in the inspector's office. The inspector shall record, approve, identify, mix, its mix, time, receipt, and appropriate location deposit in the structure and transmit it to the appropriate record to the enforcement agency.

1.08. TESTS AND SAMPLES

- A. If Certificates of Compliance for materials are not provided, the approved Engineering Testing agency shall perform the tests as herein after required. The Contractor shall furnish the testing engineer with all samples as is required for the tests. Tests shall be paid for by the owner.
- B. Test cement as per applicable referenced specification under which it is furnished. Cement shall be sampled either at origin site. Free access shall be given to samples where concrete materials are stored, proportioned or mixed and equipment and methods used shall be subject to inspection, test and approval. Do not use cement until approved. Retest before using cement if it has been stored, after 100 days in bags, or after 90 days after being tested. Ordinarily, use no cement until after it has passed both 28 and 90 day tests. Structural Engineer shall approve 28 day tests, providing it is a product of a reputable manufacturer and is standing in production. 90 day tests shall be required. Reuse cement delivered to site, after 100 days under test to be consistent. There shall be at least one test for each 1000 cubic yards of cement. Cement from approved test bins is acceptable providing certified tests reports are furnished.
- C. Test aggregate as per ASTM, C 136. Fine aggregate shall be tested for specific properties per ASTM, C 136. Tests shall be paid for by the owner.
- D. COMBUSTIBLE
 1. Strength Tests: Combinders During or Before Provide for test purposes a set of binders each taken from each batch. In fraction thereof, or each batch pour, binder is less, concrete placed. Test one at 28 days and at 90 days. Make and cure test binders as per ASTM, C 136. Care specimens under appropriate conditions except that Structural Engineer shall require curing under field conditions when there is a possibility of curing within 28 days or where strengths at less than 28 days are important. Test binders as per

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- per ASTM, C1063. Standard does tests samples at 100 days. When concrete strengths proper consistency, id tests can be discontinued.
- 1. If strength tests indicates that the specified compressive strengths at 100 days, Structural Engineer reserves right to order concrete in proportion or other content of concrete, or not, for re-portioning samples and/or require core tests on that portion of the slab wherein the concrete is used. The owner supplies the molds for further tests and the Contractor supplies accessories.
 - 2. Core tests as per ASTM, C1063 shall be secured on the testing material under the direction of the Architect or Structural Engineer. For compressive tests the core specimens will show the compressive strength specified, the concrete will be deemed defective and samples removed and replaced or de-strengthened in any other acceptable to the Architect and Structural Engineer.
- E. Split Test In field, determine consistency of samples per ASTM, C1063. The samples will include pits or pins in

PART 2 - PRODUCTS

2.01. CEMENT

- ☐ A. Cement standards and Portland Cement composition of ASTM C 150 Type II.
☐ B. Use of one and cement in exposed concrete.
☐ C. Do not use cement recycled in cement containers.
☐ D. Use cement in sequence of receipt of shipment.

2.02. CONCRETE AGGREGATES

- A. Concrete aggregates should conform to ASTM C 33. The sieve used in the sieve analysis should be 4.75 mm (No. 40).
- B. Fine aggregates fine aggregates should consist of sized particles and fine sand, stone and durable particles. Fine aggregate should be graded finer than 75 microns (No. 200) sieve and 75 microns (No. 200) sieve to coarse and open coarse aggregate should meet the requirements of the specification.
- C. Coarse aggregate: Coarse aggregate should consist of clean, hard, well-graded, sound crushed rock or sized stone, or combination thereof, which does not contain in excess of five percent of dust, fines, clay, or material passing through No. 200 sieve, or more than ten percent of dust, fines or other deleterious material. It should be free from organic matter or other deleterious substances. No pieces should be over 19 mm (3/4 in) in excess of 10% and the maximum size the coarse aggregate should be considered to be 19 mm (3/4 in).
- D. Aggregate should be graded from the quarter inch to the 19 mm (3/4 in) size. The coarsest gradation should be such that the percentage of dust, fines and coarse aggregate should be within the limits established by the specification.

GRADING OF COMBINED AGGREGATES

Percentage by Weight			
Sieve Number of Size in Inches	1-1/2" Max.	1" Max.	3/4" Max.
Passing a 1-1/2"	95-100		
Passing a 1"	75-90	90-100	
Passing a 3/4"	55-77	70-90	90-100
Passing a 3/8"	40-55	45-65	60-90
Passing a No. 4	30-40	31-47	40-60
Passing a No. 8	22-35	23-35	30-45
Passing a No. 16	16-30	17-35	20-35
Passing a No. 30	10-20	10-23	13-23

Passing a No. 50	2-8	2-10	5-15
Passing a No, 100	0-3	0-3	0-5

- E. Storage and Measures entomine and coarse aggregate stored and measured separately. In case the nominal size aggregate concrete is greater than the inch, that portion running between the quarter inch, and three quarters inch, stored and measured separately from the redefined fine coarse aggregate.
- F. The nominal size aggregate concrete shall be no larger than the narrowest dimension between sides forms, the depth beams, or the minimum clear spacing between individual reinforcement bars or wires, and/or beams, individual tendons, or ducts. Maximum size aggregate concrete shall be no larger than one and one-half inches, except for pipes or less in thickness, in which case nominal size shall be 1/2 inch.

2.03. WATER

- G. After storage clean, and free from dirt, acid and inorganic contents shall be used after, unless or after tests and sampling to ASTM C 1064.

2.04. ADMIXTURES

- H. Additives for concrete shall be used and when approved by the Structural Engineer, SSPD and the Testing Laboratory. Submit complete Manufacturer's data for consideration.

2.05. HARDENING SEALER

- I. Where indicated dust proofing or order of materials shall be applied as per Manufacturer's specifications.
- J. Sealer Manufacturers "Sealard", M Construction Chemicals Inc., or approved equivalent.

2.06. ABRASIVE GRIT

- K. Abrasive grit, where indicated shall be crushed in grains of 1/2 inch grit.

2.07. CURING MATERIAL

- L. Curing Materials Provide the following:
- Reinforced paper type, Siscrete or other, or Architect approved equivalent.
 - Fluid Membrane or in Curing Compound or bitumen to ASTM C 1064, Type 1 Class 1 unless other type accepted to Architect. Moisture loss not more than 1.000 g/m² or less. When applied at 1.000 g/m².
 - Sealer Products Subject to compliance with requirements, products shall be incorporated in the form include, but are not limited to, the following:
 - "Masterseal" Master Builders.
 - "Clear Seal" C. Form.
 - "Sportcrete" The Bore Co.
 - "Seal-Seal" Sonneborn-Contec.
 - "Rapid" Protec Industries.
 - "Sealcoat" Clear" R. Meadows.
 - "Sealcoat" Clear" R. Meadows.
 - "MCM Core" M Construction Chemicals Inc.

2.08. BONDING

- M. Bonding Compound/Polymer concrete or acrylic case, re-etching type.
- N. Sealer Products Subject to compliance with requirements, products shall be incorporated in the form include, but are not limited to, the following:
- "Eidcrete" Garsen Products.
 - "Formaid" C. Form.
 - "Sncrete" Sonneborn-Contec.

- d. "Crucic Bondcrete" The Brice Co.

2.09. EPOXY

- d. Epsilon desires STM C to contain criteria suitable for use in driver development sources. Provide criteria "Type", "Order", and "Class" to suit project requirements.
- e. The following Products Subject to compliance it requires, products which are incorporated in the code include, but are not limited to, the following:
 - f. "Epsilon".C. com.
 - g. "Sierra" or "Imad" Sierra Code Inc Corp.
 - c. "Pitc and Bond Epsilon" The Bone Co

2.10. SPECIAL FLOOR HIGH STRENGTH ADDITIVE

0. Concrete masons of this class, specializing in concrete and "setting" concrete masons to be finished with a net of concrete orderer were shown in the drawings and listed in the order this schedule, so receive "Master Builders Mastercraft" certificate, in the concrete class.

2.11. EXPANSION JOINT FILLER AND SEALANT

- c. Generator and sequencer shall be per Division 16. Not indicated in Division 16 provide as indicated below.
- d. After installation, non-electronic, pre-wired door closer, connect to STM D , as "electronic" or as site Coordinator approved device
- e. Sequence were indicated elsewhere in, provide performance as Same as Same Static Point unit sequencer approved device, placed as per manufacturer's specifications, cover selected or reject.

2.12. DRYPACK

- . Dr p c r eddin stee e rin p ites nd d si s s e ne p rt ce ent t t p rts
c ncrete s nd e. ent ter s e st s ficient t e r e i

2.13. NONSHRINK GROUT

- [illegible]

2.14. STORAGE OF MATERIALS

- [illegible]

2.15. STRENGTH REQUIREMENTS

- . Concrete strength compressive strength at the end of curing shall not less than 90% of design strength per square inch for site concrete, not less than 4000 psi for precast, cast, and cast-in-place, and not less than indicated elsewhere on drawings and in these specifications.

2.16. CONCRETE STRENGTH, PROPORTIONS AND DESIGN

The structural concrete will be proportioned and designed to develop the stipulated initial 28 day compressive strength at the earliest possible age within the specified proportions of the materials and after the total water content incorporated therein. Cement content shall be as shown in Table 1. Mixes shall be designed under Method A as described in Table Section 1. Contractors shall provide other mix designs under the provisions of Method B and Method C as described in Table Section 1 and as reproduced in paragraph 1 and 2 of this section. On structural concrete slabs on grade shall be initial 28 day compressive strength of 2000 psi. Initial 28 day compressive strength per yard shall be used providing the water-cement ratio shown in the table below can be obtained in obtaining a concrete mix unless otherwise specified or required on the Drawings.

B. Concrete shall be mixed to the specified size required on the drawings, shall produce concrete developing strength not less than that required on the drawings or these specifications and shall be the same as specified and after per sack cement as follows:

Permissible assumptions as to

Aggregate Max. Size	Minimum sack of cement per yard of concrete	Water-Cement ratio in gals. per sack of cement maximum	min. ultimate 28 day compressive strength in lbs. per sq. inch
3/4"	5.0 Unreinforced slabs on grade	7.5	2000 Unreinforced slabs on grade
	5.7	7.5	2000
	6.5	6.75	2500
	7.1	6	3000
1-1/2"	5.3	7.5	2000
	5.8	6.75	2500
	6.6	6	3000

C. Compressive Strength of concrete shall develop compressive strengths called for after the initial 28 day compressive strength. Sample concrete shall be taken from the places in accordance with the requirements of paragraph "C" of Section 1. In no case will it be to obtain this strength, the owner shall be responsible for further tests of the portion of the concrete represented as such sample and the Contractor shall be responsible, and should the failure still appear, the Contractor shall be and properly replace the concrete at no cost to the owner.

D. Method B Designed Mix Concrete mixes shall be based upon previous proven mixes and material tests shall be recognized testing agency. The design of concrete mixes shall be based on the initial 28 day strength of the concrete as shown in the design of the structure and shall be into consideration of the strength of the mix and the durability of the concrete. Mixes shall contain the initial 28 day cement quantities noted on the Drawings.

E. When strengths in excess of 3000 psi per square inch are required, or when intermediate or special mixes are not shown in record specifications or per drawings are used, or additives are used to reduce the cement content, Method C shall be used to determine the mix.

F. Method C Pre-Tested Mixes When mixes other than those specified under Methods A and B or intermediate or special mixes are used, pre-mix tests of the concrete shall be made unless the Engineer or Architect, based upon tests and controls previously established, specifies mixes to this requirement. Such tests shall be made of recognized testing agency. The average strength of the concrete mixes as tested in the laboratory shall provide a 10 percent higher strength than the assumed to except that the increased need not exceed 3000 psi per square inch.

G. Where design criteria in Section 1 shall provide for the use of splitting tensile strength of concrete as a modifier, material tests shall be made in accordance with ABC Standards to establish the same to correspond to the specified mix.

H. Tensile splitting tests of concrete shall not be used as a basis for acceptance.

- I. The content is less than that specified in the Table or Method B or Method C, the concrete section point list continues inspected on accepted Testin after the cost of such inspection will be paid by the owner and allocated to the Contractor.
- ☐ Introduction will be provided if permitted.
- ☐ Miscellaneous points or errors, non-scrub, etc., as approved, shall be in accordance with approved contractor's instructions.

2.17. RELATED MATERIALS

- [illegible]

PART 3 - EXECUTION

3.01. PREPARATION FOR PLACING CONCRETE

- A. Rebar is placed in accordance with the design and specifications. The rebar is placed in the concrete and the concrete is poured. The rebar is placed in the concrete and the concrete is poured. The rebar is placed in the concrete and the concrete is poured.
- B. Concrete should be placed in the form and reinforced with steel. The concrete should be placed in the form and reinforced with steel. The concrete should be placed in the form and reinforced with steel.
- C. The rebar, stirrups, and inserts should be placed in the concrete and the concrete should be poured. The rebar, stirrups, and inserts should be placed in the concrete and the concrete should be poured. The rebar, stirrups, and inserts should be placed in the concrete and the concrete should be poured.

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- D. Except in freezing weather, wet floors in sufficient time in advance appropriate to cause cracks and prevent excessive settlement or frost heave.
- E. Provide runways or other means for loaded equipment to contact concrete to deposit points. Do not use equipment used to deposit concrete over reinforcement and not support runways on reinforcement.

3.02. PIPES AND CONDUITS

- A. Pipes, other than conduits for electric circuits, shall not be embedded in structural concrete except as shown on the structural plans. When placed in slabs, conduits shall be located within the middle of the slab. A conduit shall be placed between the reinforcing steel and the bottom of the slab. A conduit placed in a concrete slab shall be on outside diameter greater than one third of the thickness of the slab. A conduit shall be embedded in a slab that is less than 12 inches thick except for exceptions.
- B. Pipes and conduits shall pass through slabs through slabs in a manner that is not to impair the strength of the structure. The Contractor shall see that adequate sleeves are provided where concrete is placed.

3.03. CLEANING FORMS AND EQUIPMENT

- A. Before concrete is placed equipment for mixing and transporting the concrete shall be cleaned, degreased, and ice shall be removed from the place to be occupied by the concrete. It shall be thoroughly wetted except in freezing weather, or dried.

3.04. MIXING

- A. **Mixing**
 - A. The capacity of the mixer shall be such that it will handle one or more batches. It shall be split into batches in the permitted, except when materials are weighed. At no time shall the mixer be loaded beyond its capacity. The capacity of the mixer shall be the rated capacity as given in the manufacturer's catalog, provided that a quantity of the rated capacity can be thoroughly mixed in the prescribed time period, and further provided that there is no loss of ingredients during the mixing. Each batch shall be mixed not less than 90 seconds after ingredients are in the mixer and until the entire mass is uniform and homogeneous. It shall be completely discharged before the mixer is reloaded.
 - B. The peripheral speed of concrete mixing drums shall be approximately 100 feet per minute. The mixer shall be equipped with an automatic time action the discharge contrived to start the time clock on the down stroke of the material slip or on the closing of the upper gate.
- B. **TRANSIT MIXED CONCRETE.** Transit mixed concrete shall conform with ASTM C 94.
 - A. The concrete plant must comply with the requirements of ASTM C 94.
 - B. Quantities of materials used in transit mixed concrete shall be continuously checked or measured by a concrete plant inspector subject to the Architect and Engineer. The cost of concrete plant inspection shall be paid by the owner and deducted from the Contract amount. If the authorization of the Architect, concrete plant inspection shall be paid under either of the following conditions:
 - A. The concrete plant complies with the requirements of ASTM C 94, Sections 1 and 2, and has a current certificate from the National Ready Mixed Concrete Association. The certification shall indicate that the plant has automatic batching and recording capabilities. The plant must be equipped with an automatic batcher in which the batching cycle, except for the weighing and introduction of admixture, is completed in 60 seconds or less.
 - B. When concrete plant inspection is required, the following requirements shall apply: The Architect or Structural Engineer in cooperation with the testing agency shall prepare a method for quality control. A minimum of three sets of test cylinders shall be taken and tested for each cubic yards of concrete or fraction thereof. The quantities of materials shall be certified by a licensed field estimator. The quality of the materials shall be verified by the testing agency.

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- All concrete components shall be made of qualified person designated to the architect shall supervise the work at the job point, often directed. Cast concrete shall be done in the same manner except in case of a material is rejected as such, in which event the next day and subsequent days until acceptable material is restored shall be paid for at the owner and according to the Contractor.
- Transit mixed concrete shall be placed in period not less than ten minutes at a peripheral speed of approximately 100 to 120 cubic feet per minute and in which shall be continued until discharge is completed. At least three minutes after the end of period shall be at the end. Transit mixers shall be equipped with water measuring devices consisting of either accurate calibrated water tanks or water meters. Transit mixed concrete shall be placed in the position within one and one-half hours after the first added to the job or before hydration begins.
- The inspector shall provide the work ticket and shall identify the work before accepting the work. He shall keep a daily record of the work, identifying each truck, its load, the time of receipt and the location of the concrete placed.

3.05. TRANSPORTATION OF CONCRETE

- . Concrete sometimes hardened in the interstices of the deposit as rapid as practice of
 methods of concrete present the separation of the ingredients.

3.06. PLACING CONCRETE

0. Under no circumstances shall concrete that has partitioned or sectioned be deposited in the form. Concrete shall be deposited in the forms as near as practicable in its composition to avoid mixing. It shall be so deposited as to contain, until the completion of the unit, an approved steel reinforcement surface. In placing concrete in walls or thin sections of consideration shall be given to openings in forms, element tracks, ties or other approved devices, which are used to deliver the concrete to be placed in a manner that prevents segregation and accumulation of unconsolidated concrete on the forms or reinforcement until the concrete is set. Such devices shall be installed so that concrete will not drop vertically free from concrete surfaces it exceeds level in height. When concrete placement is once started, it shall be carried on as continuous operation until the section is completed between predetermined construction joints.
- B. Concrete shall be placed under water except as specified otherwise and under the supervision of the Structural Engineer.
- C. Place concrete against open undisturbed clean surfaces, free from dust, ice, mud or oil.
- D. Compaction
- a. Place concrete in forms not over 6' deep compact each layer by mechanical internal vibration equipment supported on and spreading, radding, or tamping is directed. Do not use brooms to transport concrete inside forms. Use broom finish is not permitted. Internal vibrators shall contain a speed not less than 3,000 rpm per minute when submerged in concrete. Contractor shall contain at least one spare vibrator as relief.
 - b. If vibration time is necessary to produce satisfactory consolidation without causing segregation. Do not insert vibrator into lower courses too close down to set. Apply vibrator at uniform spaced points not further apart than diameter effectiveness of cone.
- E. Bonding and Protection Before depositing new concrete on or against concrete that has set, thoroughly roughen and clean existing surfaces with wire brush and hose particles. Retention of old concrete on existing surfaces will not be allowed. Place new concrete before work is attained initial set. Give continuous construction joints of fresh concrete cast place and line concrete in same proportion as concrete to be placed immediately adjacent to inclose old concrete therefor if it is except reduce proportion of coarse aggregate.
- F. Record Book Place entered record shall be kept at the job site at all times and date of placement of concrete in each portion of the structure. Such record shall be open to the inspection of the Structural Engineer.
- G. Cold Weather Placement Unless otherwise approved, if concrete and place when mean temperature is at least 40°F, or placing at lower temperatures, when permission to pour is

obtained, test materials otherwise prepare so that action and action can proceed as specified. Provide means for continuing concrete at initial or subsequent or after placing action appropriate methods proposed for continuing materials and protecting concrete. Do not disassemble, clean or other materials into concrete to prevent free flow or use accelerating agents except when necessary to pour concrete in existing or proposed element to be placed approved accelerators or be introduced into the concrete in approved or the architect. Curing compound is not permitted.

3.07. CONSTRUCTION AND EXPANSION JOINTS

A. Construction Joints

1. Typical details and proposed locations of construction joints are indicated on the plans. Joints not indicated on the plans shall be made and located, with the permission of Structural Engineer, as to best insure the strength of the structure and accordance to the typical details. The surface of construction joints shall be cleaned and roughened by reworking the entire surface and exposing clean aggregate, solid and bedded in order of trial, in accordance with the approved procedure.
2. The contact surface must be thoroughly cleaned by chipping or sand blasting the entire surface not earlier than five days after initial pour or when approved method that will assure exposure and shall be thoroughly exposed within the surface not less than two days before the concrete is placed depending on setting time of concrete. After and deteriorated materials shall be removed from the surface and after clear and drained from surface.
3. In the event that the contact surface becomes coated with earth, sand, etc., after being cleaned, the entire surface shall be cleaned and re-cleaned as and as to other effective means.
4. Joint cooperation shall be not over 12" in any horizontal direction. Place concrete continuously to produce a monolithic unit. Permit joints to be placed in concrete unless otherwise directed by the Structural Engineer. Locate construction joints, where required, near mid point spans for slabs, beams, or girders, unless beam intersects girder at center, in which case set joints in girder distance equal to twice beam width and the provision for shear at inclined reinforcement. Make joints in columns or piers at underside of deepest beam or girder from interior. Pour columns, piers or walls continuously and at least two hours before the concrete is placed thereon.
5. Place girders, beams, and slabs in one operation. In cases involving door or window openings terminate the individual pours at opening top or bottom. Terminate other lifts per structural requirements or as directed. Make provisions for continuous successive pours as specified under Bonding, detailing paragraph 10.

B. Expansion Joints

1. Construct expansion joints as indicated and approved. Do not run reinforcement, corner protection angles, or other fixed details, embedded in or bonded into concrete continuously through expansion joint unless specifically detailed.
2. Joints between slabs on earth, where indicated, shall be provided expansion joint strips, with incut depth as indicated on drawings and specified herein.
3. Finish concrete so edges show expansion joints neat and smooth rounded edges.

3.08. CONCRETE SLABS ON GRADE

- A. When reinforcement and pipes are properly supported, and drains, outlet pipes and other items this in accordance with the surface of the slab are placed to correct levels and screeds are set, the Contractor shall notify the architect that the work is ready for inspection. Upon completion of the inspection and the approval of the architect, the pouring of the concrete shall commence. The event of the concrete being poured shall be continuous upon the next day of placement unless otherwise to proper finish the slab pour completed.
- B. Interior walls on grade shall be constructed in accordance with the architect's report. See Drawings for specific details and requirements at specific locations. After the subgrade compacted and ready for use install in 4" granular material on top of carrier and 4" clean sand. The underlayment of carrier shall be installed by Carpenter or other

Contractor. To minimize the possibility of damage to the upper barrier the Contractor shall place electric conduits in the bed within 1" and immediately after setting. The Contractor shall inform Structural Engineer and Architect of all works before the first pour of concrete.

C. Concrete shall be deposited in the forms between screeds as rapid as possible, (within 90 seconds) after the sand to prevent distortion of the surface of the screeds, reinforcement, or embedded items. Screeds shall be poured immediately adjacent to other screeds.

D. Screeding shall be immediately after completion of the concrete surface preparation of the screed and top pins shall be screed faces smooth. Smooth spots to be filled in and the surface shall be screeded to finish plane.

E. Concrete shall be topped with approved grid top per section not less than 1/8" above inches shall be depressed the area immediately around the joint of the grid, then shall be added to other screeds as required later.

F. The surface shall be placed with a hard pass mat to be in place of the lines and to distore for finishing.

G. Surface Tolerance Surface shall be true to plane within 1/8" in 10 feet as determined by a straightedge placed on the surface in any direction.

H. Pits shall be required where drains occur.

3.09. PROTECTION AND CURING

A. General

1. Immediately after placing and finishing, protect concrete surfaces from loss of moisture or at least seven days. Erect protection from loss of moisture after no more than one day of curing methods, where applicable to the type of curing method.

a. Before curing or continuing spray.

b. Before curing surfaces with water in periods paper.

c. Before curing concrete.

2. Do not use equipment curing on surfaces required to receive additional concrete or concrete repair on cement finishes that are to receive dust proofing, curing treatments, or other surface treatments, except as shall be determined to be compatible with the Architect.

3. Erect water curing or deepening concrete surface continuing wet or ponding, or continuing spraying or curing surface with approved water saturated curing cloth as 1" and or sand or sand or one or more other means. Saturate concrete exposed surfaces with water to maintain stipulated curing period where it is required in place during curing period, keep the surface wetted with clean water to reduce cracks and to prevent shrinkage in forms and opening. During deep periods, maintain water curing routine, except use an appropriate water to keep forms or curing in place.

B. Other Surfaces and Stairs

1. Within 48 hours after introduction, install finished cement for surfaces that are curing and non-curing cement finished stair treads, risers, platforms and landings keep a list of all work with water curing, and in order of priority to the most practical means of curing continuing with water curing. Where curing is protection anti-cracking and other reasons for these shall be determined. Where the curing is required, do not apply it until the surface is dried after curing period completion.

2. Prevent use of equipment on the cement finished surfaces or at least 48 hours after completion of curing. Where necessary use of equipment for additional work period. Use protection in placing concentrated loads on surfaces of concrete as required by the structural.

3.10. PATCHING AND DEFECTIVE CONCRETE

1. Immediately after work is stripped, patch in all defective and non-cured areas. Where concrete is too weak to be patched, or if depth of defects is greater, perpendicular to surface. The patching shall be placed including areas at least 1" wide entire surrounding area at least prior to placing patching mortar.

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B. Prepare mortar as per the proportions as used for concrete except replace coarse aggregate with sufficient quantity of fine cement or portland cement so that portion of mortar when dry will be to surrounding concrete.

C. Prepare mortar for repairs of Portland cement and sand with sufficient water to produce a strong consistency and apply immediately to the surface, working it into the portion of mortar.

D. Deep water in mortar joints or in holes. Retain per mortar joint or hole add mortar to stand for one hour prior to use during which time it should be placed to prevent setting. Compact mortar thoroughly into place, screed to level, patch smooth, finish with surrounding surface, remove it undisturbed for one to two hours to permit initial curing, then finish to a smooth finish.

E. Where patches exceed 4" deep, trim and set as specified after which the opening to within 4" of surface. After sufficient curing time has elapsed proceed with patching as described. Deep patches set for five days.

F. Where holes are in concrete or holes are in masonry, holes should be filled with mortar unless indicated otherwise in the drawings. For holes passing entire thickness of wall, use patcher type device on or after device to force mortar through to bottom of hole. Good patcher hole on outside when hole is filled completely, strike excess mortar with trowel into surface. Mortar is not passing entire thickness of wall, it is not to be patched, it is to be filled with mortar. Strike off with trowel, and excess mortar is to be removed.

G. In general, in order to detect defects or to be repaired, use of cement mortar, as specified above, with permission of the architect, for the defects are serious or affect the strength of the structure, or if patching does not satisfactorily restore the quality and appearance of the surface, cement or Concrete should be used. The cost of such work shall be paid for by the owner and deducted from the contract price.

H. ACCEPTANCE OF CONCRETE STRUCTURE

1. Examination of test results

a. Test results for standard loaded and standard cured test cylinders should be examined separately for each specified concrete in design.

b. For examination of potential strength and shrinkage, each specified in design should be represented by at least five tests.

c. Acceptance of Concrete: The strength of concrete is considered satisfactory when as the series of tests of three consecutive strength tests results are not less than the specified strength, and no individual strength test results are less than the specified strength.

d. Investigation of Strength Test Results: The strength of concrete of loaded test cylinders may be the initial or the ultimate compressive strength assumed in the design, the proportions of the concrete in the reinforcement portion of the structure should be adjusted so as to give concrete the assumed initial or strength. The design concrete in place should be tested at the time of curing.

e. Cores should be taken at representative places throughout the structure as designated by the Engineer.

f. Cores of at least 4 in. in diameter should be obtained and tested in accordance with ASTM C43. If the concrete in the structure is under service conditions, the cores should be air dried to a temperature of 70 to 80 F, relative humidity less than 90 percent, for 48 hours before test and should be tested dry. If the concrete in the structure is under service conditions, the cores should be tested after a moisture conditioning in accordance with ASTM C43.

g. The cores should be tested as required for cylinders.

h. At least three representative cores should be taken from each member or area of concrete in place that is considered potentially deficient. In the testing, one or more of the core samples evidence of being deficient shall be considered sufficient to require replacement of the structure, it should be replaced.

i. Concrete in which is represented by core tests should be considered adequate if the average of three cores is equal to at least 90 percent of the required compressive

stress and no sinϑe core is less than 10 percent of the required compressive strength. Final acceptance is subject to Architect's favorable review.

- Core samples should be cored into an epoxy resin binder and placed into epoxy mortar as described in Paragraph 1000. Repair should not be visible in finished work. Final acceptance is subject to Architect's favorable review.
- The extent of repair of defective concrete where the structural concrete structure is affected should be determined by the Structural Engineer and the SPSDP.

3.11. FINISHES

4. Report this scored and det^{ns} r ntes n dr^{ns}.

3.12. CONCRETE SLAB FINISHES

- A. Steel reinforcement is placed interior finish surface according to steel reinforcement operations, the first and second trade in is to be performed when the concrete is ordered sufficient to support the finishers on three boards. The third trade in is to set the setting of the concrete and the surface is to be finished to true, hard, polished finish. Interior finish to receive covering is to be according to steel reinforcement operations as specified.
- B. A good flat finish is to be placed concrete to the specified to three concrete surface screed to straight edge to be in surface to required line, as indicated when concrete is still green, not ordered sufficient to bear finishers weight, not surface to good flat to true, finish, plane to no coarse concrete visible. Distinguishing surface after is not permitted.
- C. When Interior Ceiling finish is to be set at least 1" thick, after screeding when concrete is still green, after surface after has disappeared not later than 10 minutes after placing coarse. Mix is to be the part Part and cement, the part line concrete and 4 parts coarse aggregate. Fine aggregate is to pass 100" mesh sieve, not over 100" mesh sieve, not over 100" mesh sieve. Grade coarse aggregate is to be 100" mesh, not over 100" mesh in sieve. After smooth it exceed 100 mesh per cent sack. Screed finish to true even surface and trade is to set. Do not mix or trade surface when finish is set or support after finish set sufficient to run under roller, the second trade in, finishing.
- D. Concrete orderer, Distributor application orderer to concrete works noted on the RFI finish Schedule. Core works to be completed in 24 hours after concrete is completed. Application orderer is per 100 contractors directions application at least to 100 contractors at least 100 hours between coats. Use the same orderer to cover not over 100 sq. ft. after finish coat is completed and begins to dry the surface to be finished after, finish is still visible after 24 hours to receive excess white crystalline deposit.
- E. Cleaning when after proper covering is received from works, clean surface to be finished by approved grade in seed dress. When cleaned and dried protect surfaces with a painting and after 100. Should there be red in on deep stains, efflorescence or encrustations on after on works to be finished does not receive, receive these with wire brush or steel and clean after.

3.13. FINISHES FOR SURFACES OTHER THAN CONCRETE SLABS

0. Exposed Concrete to be Painted, Stained or finished. Surface of concrete shall be finished and cured. Pins and joints shall be ground and grinding shall be completed as soon as possible after rebar placement.
- B. Cleaning and curing operations shall be undertaken until the entire job is completed. Cleaning operations shall be to the satisfaction of the Engineer.
- C. In the opinion of the Architect, the surface of the concrete shall be of sufficient quality to receive the finish, or the concrete is destined or otherwise not intended, he shall require the use of the cleaning and curing method or methods the Contractor shall be responsible for in his proposal.
1. Minor Part Portland Cement and minor parts fine sand and bit sufficient to produce a good finish to the consistency of putty. At the surface of the concrete sufficient to prevent absorption of water from the brick and apply the brick with strokes or spread on with a complete thin or medium and trowel. Immediately after applying the brick, mix the surface with a coarse or other suitable mix, so that the surface is of a fine brick is still plastic, the surface shall be finished with a smooth roller and rebar on the excess brick.

This finishing should be done at the time when brot should be placed and cured or depressions. Let the surface to dry thoroughly, and then roll it across with a drop to complete the dried brot.

- There should be no visible in brot roll in after this roll in. The entire cleaning operation or brot roll should be completed the day it is started. If brot should be in the operation. After the entire brot roll has been brot cleaned, no visible dirt spots or streaks that roll in should be piped into the brot side one brot roll in after, but the roll in the brot should be sufficient to clean the brot the concrete. This operation should be included as part of the brot cleaning.

3.14. CLEANING UP

- . Debris and/or roll in resulting from the operations of this trade should be cleaned up and rolled into the site as the brot progresses.

PART 4 - FIELD QUALITY CONTROL

4.01. GENERAL:

- . Concrete materials and operations should be tested and inspected as the brot progresses. Care to detect and defective brot or materials should be in the brot present after reflection when a defect is discovered nor should it be the Engineer or in acceptance.
- B. Inspection and testing should be performed in accordance with requirements of Title 10, Part 1, CBC.
- C. The Engineer and the Division of the State Engineer should have the right to order the testing of materials used in concrete construction to determine if they are of the quality specified.

4.02. TESTING AND INSPECTION

- . General: The required inspection services should be performed by the project inspector. The necessary testing services should be performed by a testing agency acceptable to the architect.
- B. Inspection Requirements: The project inspector should be at the site during the placing of concrete and perform the following duties:
 - . Review plans and specifications and meet with the Contractor to discuss requirements.
 - . Review and check test the contractor's proposed materials for compliance with the drawings and specifications.
 - . Determine that all tests of materials have been made and results are in hand.
 - . Keep records of all tests and inspections.
 - . Observe bars and placement of reinforcement steel, embedded items, and joints.
 - . Inspect the construction and rebar placement, use of brot and brot.
 - . Inspect the curing, placement, consolidation, finishing, curing, protection, repair, and placement of the concrete.
 - . Review the contractor's plan for stripping and rebar removal.
 - . Record on significant construction methods on completed forms, sheets, or plans.
 - . A record should be kept on the brot of the time and date of placing concrete in each portion of the structure. Such record should be kept until the completion of the structure and should be open to the inspection of the Division of the State Engineer.
 - . Obtain licensed weigh master's certificates for all concrete deliveries to verify quantities of materials.
- C. The required testing services should be performed by the inspection agency designated.
 - . All testing and inspection agencies should meet the requirements of ASTM E 1063.
 - . Precast Construction Testing
 - . Sample and test concrete for compliance. Secure production samples of materials at points, stockpiles, and at the point of placement during the course of the brot and test for compliance with the specifications.

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- Review and/or conduct test the contractor's proposed materials for compliance with the drawings and specifications.
- Obtain the contractor's certificate of compliance and submit for cement. In the meantime, secure and test samples of cement. One sample of cement shall be taken for each batch of cement, except that when used in precast concrete products there separate bins of precast cement are not required, and samples shall be taken for each shipment of cement placed in the bin, with not less than one sample being taken for each day's pour and each sample shall be separately tested.
- Review proposed designs and provide opinion as to suitability.
- c. Provide records of tests and inspections.
- d. Batch Plant Inspection: The quality and quantity of materials used in transit of precast concrete and batched concrete shall be continuously inspected at the location where materials are delivered by a specially approved inspector.
- Conduct strength tests of the concrete during construction in accordance with the minimum procedures.
- Secure composite samples in accordance with ASTM C 403. Each sample shall be obtained from a different batch of concrete on a random basis, including any selection of the test batch after a number selected at random where composite cement concrete placement.
- Mold and cure three specimens from each sample in accordance with ASTM C 403 and definitions from the requirements of this Standard shall be recorded in the test report.
- c. Test specimens in accordance with ASTM C 403. Three specimens shall be tested at each day for acceptance and one specimen tested at each day for information. The acceptance test results shall be the average of the strengths of the three specimens tested at each day. If one specimen in a test fails to show evidence of proper setting, curing or testing, it shall be discarded and the strength of the remaining cylinder shall be considered the test result. Should any specimens in a test show any of the above defects, the entire test shall be discarded. When a compressive strength concrete is used, the specimens shall be tested at the ages indicated in the contract documents.
- d. Make at least one strength test of set cylinders for each of cubic yards of structural concrete or each grade of concrete used and there shall be at least one test for each day's placement of each grade of concrete used. Provide at least one strength test for each cubic yard of concrete placed or each day's work.
- e. In a given project, if the total volume of concrete is such that the recommended testing shall provide less than five strength tests of set cylinders for a given class of concrete, tests shall be made from at least five random selected batches or from each batch if fewer than five batches are used.
- Determine sample of concrete sample for each strength test and ensure consistency of concrete appears to vary in accordance with ASTM C 403.
- Determine air content of concrete sample for each strength test in accordance with either ASTM C 403 or ASTM C 403.
- Determine temperature of concrete sample for each strength test.
- Determine air temperature at placement time. When the ambient temperature rises above 60°F, a complete record shall be kept of concrete temperatures and protection given to concrete during placement and curing.
- Inspect concrete curing, curing and delivery operations.
- Provide additional testing and inspection required because conditions in materials or proportions requested by the contractor.
- Provide additional testing of materials or concrete occasionally at their own expense or inspection to meet specification requirements.

4.03. REPORTS:

- Project Inspector
 - Report Form as Verified Reports per Title 19, Part 1, CBC.
 - Architect shall verify materials or work not conforming to project specifications.

[illegible]

Q Provide reports on test results or inspection services provided to Project Inspector, Contractor, Architect, and Engineer. Test reports shall include the exact location in the project of the defect represented by test results deposited. Reports shall state tests shall include details of location on structure and criteria specimens prior to testing.

Q Provide Project Inspector, Contractor, and Engineer with the following criteria to compare with project specifications.

□. The contractor shall submit to the Engineer the concrete materials data and the concrete mix designs proposed for use.

☐ The Contractor shall provide and maintain an adequate program of quality control, inspection, production methods, and responsibility to assure compliance with the project documents.

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c. Provide and maintain the same use of the testing equipment and facilities in same storage and proper caring of concrete test specimens in the project site for the first 28 days required by ASTM C31.

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SECTION 03 5416 HYDRAULIC CEMENT UNDERLAYMENT

PART 1 - GENERAL

1.01. SECTION INCLUDES

- Hydraulic cement underlayment and surface preparation.

1.02. RELATED SECTIONS

- Section 03 0000 Cast-in-Place Concrete

1.03. REFERENCES

- ASTM International
 - ASTM C 109/C 109M Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (in. or mm) for Cylindrical Specimens
 - ASTM C 109/C 109M Standard Specification for Portland Cement.
 - ASTM C 115 Standard Terminology Relating to Hydraulic Cement.
 - ASTM E 119 Standard Test Methods for Fire Tests of Building Construction and Materials.
 - ASTM C 158 Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Surfaces (in. or mm) by Calcium Chloride.

1.04. SUBMITTALS

- Submit under provisions of Section 03 0000 Administrative Requirements.
- Product Data Manufacturer's data sheets on each product to be used, including:
 - Preparation instructions and recommended conditions.
 - Storage and handling requirements and recommended conditions.
 - Installation methods.

1.05. QUALITY ASSURANCE

- Manufacturer qualifications Minimum of 10 years experience in manufacturing similar products.
- Installer qualifications Minimum of 10 years experience installing similar products.

1.06. PRE-INSTALLATION MEETINGS

- Convene minimum of two weeks prior to starting work on this section.

1.07. DELIVERY, STORAGE, AND HANDLING

- Deliver and store products in manufacturer's unopened packaging in a dry area and in manufacturer's identification container for installation.
- Handling and use of materials to avoid damage.

1.08. PROJECT CONDITIONS

- Maintain environmental conditions (temperature, humidity, and ventilation) within its recommended range for optimum results. Do not install products under environmental conditions outside of manufacturer's recommended limits.

1.09. SEQUENCING

- Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

PART 2 - PRODUCTS

2.01. MANUFACTURERS

- A. Acceptable Manufacturer MPEI products, which is located at 1000 E. Newport Center Rd., Deerfield Beach, FL 33441. The MPEI Test Laboratory is located at 1000 E. Newport Center Rd., Deerfield Beach, FL 33441. The MPEI Test Laboratory is located at 1000 E. Newport Center Rd., Deerfield Beach, FL 33441.
- B. Acceptable Manufacturer MPEI products, which is located at 1000 Francis Street, P.O. Box 1000, Deerfield Beach, FL 33441. The MPEI Test Laboratory is located at 1000 E. Newport Center Rd., Deerfield Beach, FL 33441. The MPEI Test Laboratory is located at 1000 E. Newport Center Rd., Deerfield Beach, FL 33441.
- C. Requests for substitutions will be considered in accordance with provisions of Section 2.01. Product Requirements.

2.02. HYDRAULIC CEMENT UNDERLAYMENTS

- A. Perforance, Setting, and Curing of Cement Underlayment. The cement underlayment shall be applied to the substrate in a thickness of 1 to 2 inches. The cement underlayment shall be applied to the substrate in a thickness of 1 to 2 inches. The cement underlayment shall be applied to the substrate in a thickness of 1 to 2 inches.
- B. Perforance Requirements. The cement underlayment shall be applied to the substrate in a thickness of 1 to 2 inches. The cement underlayment shall be applied to the substrate in a thickness of 1 to 2 inches. The cement underlayment shall be applied to the substrate in a thickness of 1 to 2 inches.
- C. The cement underlayment shall be applied to the substrate in a thickness of 1 to 2 inches. The cement underlayment shall be applied to the substrate in a thickness of 1 to 2 inches. The cement underlayment shall be applied to the substrate in a thickness of 1 to 2 inches.
- D. The cement underlayment shall be applied to the substrate in a thickness of 1 to 2 inches. The cement underlayment shall be applied to the substrate in a thickness of 1 to 2 inches. The cement underlayment shall be applied to the substrate in a thickness of 1 to 2 inches.
- E. Reinforcement of Cement Underlayment. The cement underlayment shall be applied to the substrate in a thickness of 1 to 2 inches. The cement underlayment shall be applied to the substrate in a thickness of 1 to 2 inches. The cement underlayment shall be applied to the substrate in a thickness of 1 to 2 inches.

PART 3 - EXECUTION

3.01. EXAMINATION

- A. Examine substrates, with Installer present, for conditions affecting perforance of the cement underlayment.
- B. Proceed with application of cement underlayment only after unsatisfactory conditions have been corrected.

3.02. PREPARATION

- A. General Preparation and Clean Substrate. The cement underlayment shall be applied to the substrate in a thickness of 1 to 2 inches. The cement underlayment shall be applied to the substrate in a thickness of 1 to 2 inches. The cement underlayment shall be applied to the substrate in a thickness of 1 to 2 inches.
- B. Concrete Substrates. Mechanical repair, according to the Manufacturer's written instructions, of cracks, voids, efflorescence, curing compounds, and release agents, dust, dirt, grease, oil, and other contaminants that affect the bond of the cement underlayment.

- Sealant Moisture Barrier.

- C. Metastates Mechanical, according to manufacturer's written instructions, rest, wear, and other contents that will impair underment and. Application resistant coating to the underment is recommended in critical underment.
- D. Adhesion Tests After substrate preparation, test substrate for adhesion to the underment according to manufacturer's written instructions.

3.03. APPLICATION

- A. General Mix and apply underment components according to manufacturer's written instructions.
 - Close doors to traffic during underment application and for time period after application recommended in critical underment.
 - Coordinate application components to provide optimal adhesion to substrate and between coats.
 - At substrate expansion, isolation, and other openings, sealant must be applied to continue to the underment.
- B. Apply primer over prepared substrate at manufacturer's recommended spreading rate.
- C. Apply underment to produce uniform, dense surface.
 - Apply thinner coat to protect surface.
 - Center edges to the adjacent wall elevations.
- D. Cure underment according to manufacturer's written instructions. Prevent contamination during application and curing processes.
- E. Don't install covering over underment until after time period recommended in critical underment.
- F. Apply surface sealer at rate recommended by manufacturer.
- G. Remove and replace underment areas that evidence cracking and/or substrate, including areas that exhibit "blowing" sound when tapped.

3.04. PROTECTION

- Protect underment from concentrated and random loads for remainder of construction period.

END OF SECTION

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SECTION 05 1000 STRUCTURAL STEEL

PART 1 - GENERAL

1.01. RELATED DOCUMENTS:

- A. Drawings and General Provisions of Contract, including General and Supplemental Conditions and Division 5 Specification sections, apply to this section.

1.02. SCOPE:

- A. The work required under this section consists of structural steel and related items necessary and required to complete the works indicated in the Contract Documents. The Contractor shall provide materials, articles, operations or methods listed, mentioned or scheduled in the drawings and/or specified herein, including material, materials, equipment, and incidentals necessary and required for their completion.

1.03. DESCRIPTION OF WORK

- A. Extent of structural steel is shown on drawings, including schedules, notes and details to show size and location of members, typical connections, and type of steel required.
- B. Structural steel is to be defined in American Institute of Steel Construction "AISC" Code of Standard Practice" and as otherwise shown on drawings.
- C. Source of materials and fabrication procedures are subject to inspection and tests in shop, and field, conducted by a qualified inspection agency. Such inspections and tests shall not relieve Contractor of responsibility for providing materials and fabrication procedures in compliance with specified requirements.
 - a. Promptly remove and replace materials or fabricated components which do not comply.
- D. Design Members and Connections Details shown are typical; similar details apply to similar conditions, unless otherwise indicated. Field dimensions at site govern possible fit and connection details in the work.
 - a. Promptly notify architect of design members and connections for comparison of structure are not clearly indicated or potential interferences are detected. Prompt notification is required.

1.04. RELATED WORK SPECIFIED ELSEWHERE

- A. Miscellaneous Metal Fabrications Division 5
- B. Metal Deck Division 5
- C. Concrete Division 5
- D. Masonry Division 5

1.05. SUBMITTALS

- A. Product Data Submit producer's or manufacturer's specifications and installation instructions for materials and products. Include material test reports and other data to show compliance with specifications including specified standards.
 - a. Structural steel fabricator's including certified copies of reports covering chemical and physical properties.
 - b. Material strength tests fabricator's including notes and orders and related data.
 - c. Structural steel prior paint.
 - d. Surface resistant paint.
- B. Shop Drawings Submit shop drawings prepared under supervision of a registered professional engineer, including complete details and schedules for fabrication and erection of structural steel members, procedures and drawings. Submit two copies of shop drawings on bond paper one copy of which returned to owner. Contractor shall provide sufficient copies of the returned set for distribution to all parties.

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- ☐ Prior to performing detailing, review conditions for interferences and verify dimensions and erect to achieve proper fit. Obtain architect annotations and request clarification instructions.
 - ☐ Include details joints, connections, corner, edges, and other pertinent detail. Indicate welds standard per AWS and AWS standards, and specify size, length, and type needed.
 - ☐ Provide setting drawings, templates, and directions for installation according to drawings and other documents to be installed as per other sections.
- C. Shop drawings shall be submitted to the Structural Engineer for review as per the General Conditions. Fabrication shall be completed before receiving the Structural Engineer's review of Shop Drawings. When the Structural Engineer has reviewed the shop drawings the Contractor shall be distribution to interested parties, including the copy of the Bidding Inspector.
- ☐ Indicate necessary information for fabrication, erection and painting of structural steel per AWS Specifications.
- D. Test Reports Submit copies of reports of tests conducted on shop and field welded and welded connections. Include data on type of tests conducted and test results.
- E. Sources Submit certified copies of test reports conducted on registered professional engineer, supervision and inspections of these plates and anchor bolts to receive structural steel and inspections and inspections for other members. Indicate discrepancies between actual installation and contract documents.

1.06. QUALITY ASSURANCE

- ☐ Codes and Standards Comply with provisions mentioned, except as otherwise indicated or specified.
 - ☐ AISC "Code of Standard Practice for Steel Buildings and Bridges".
 - ☐ Paragraph 1.1.1 of the above code is hereby modified by deletion of the following sentence "This approval constitutes the owner's acceptance and responsibility for the design of welded connections designed by the fabricator as part of the preparation of these shop drawings".
 - ☐ AISC "Specifications for the Design, Fabrication, and Erection of Structural Steel for Buildings", including "Code of Standard Practice" and Supplements thereto as issued.
 - ☐ AISC "Specifications for Structural Steel Buildings" (using ASTM A 36 and A 572 Gr 50) approved by the Research Council on Rectangular and Built-up Structural Steel Engineering Foundation.
 - ☐ American Institute of Steel Construction "Structural Steel Code of Steel".
 - ☐ ASTM A 36 "General Requirements for Deformed Steel Plates, Shapes, Sheet Piling and Bars for Structural Use"
 - ☐ Title 19, Part 1, California Building Code, 2001 Edition
- ☐ Welding connections for members shall resist, carry, collect, or distribute seismic forces shall meet the requirements of the AISC STRUCTURAL EDITION COMMITTEE POSITION STATEMENT on SEISMIC EARTHQUAKE EDITION ISSUES, dated 1994, 1995. This requirement specifies includes a requirement for ductility of welded connections and applies to shop and field welding. Members and connections are typically welded to the members and connections, columns welded to beams, and other and members in the field welded to the members and extend across the dimension of structure. Power source for welding shall be constant voltage type when recommended by the electrode manufacturer.
- ☐ Inspections for welding of structural steel processes and welding operators in accordance with AWS "Standard Certification Procedure".
 - ☐ Provide certification that welders to be employed in project have satisfactorily passed AWS certification tests.
 - ☐ Welders shall be certified for each electrode type as required.
 - ☐ Recertification of welders is required, retesting of the Contractor's responsibility.

1.07. TESTING AND INSPECTION

- A. Steels cannot be fabricated, delivered to site, nor used until it has been tested, and has been approved by the Architect, the Structural Engineer, or the representative of the Testing Laboratory selected by the Architect or the Structural Engineer to do the tests.
- B. Reports certifying that materials and workmanship conform with the Contract Drawings and Specifications shall be submitted to testing laboratories per General Conditions.
- C. If the steel can be identified as heat or electric steel and is accompanied by mill certificates and test reports, chemical analysis shall be used subject to the approval of the Structural Engineer, provided the tension and the bend test is made for each heat or section of part there shall be chemical analysis for chemical analysis.
- D. When the material cannot be identified or its source is questioned and it is anticipated that there is a need for the end use results, the set of physical tests shall be made for each heat or section of part there shall be chemical analysis. Additional tests shall be made when deemed necessary.
- E. Costs of tests shall be borne by the owner as per the General Conditions.
- F. Test specimens shall be taken and placed under the direction of the Architect, the Structural Engineer or the representative of the Testing Laboratory selected by the Architect or Structural Engineer to do the tests. Specimens shall be confined to dimensions called for in the "Standard Specifications for Structural Steel for Bridges and Buildings", A.S.T.M. Designation 36. The expense of taking and confining test specimens shall be borne by the Contractor.
- G. Complete independent inspection of steel shall be made when required by the Architect or Structural Engineer.
- H. When ordered by the Structural Engineer, inspection of shop and field fabrication shall be made by a proper qualified person or testing laboratory who shall submit to the Structural Engineer reports certifying that the material and workmanship conform to the approved plans and specifications.

1.08. DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to site at such intervals to insure uninterrupted progress.
- B. Deliver enclose joints and enclose devices, which are to be embedded in cast-in-place concrete or cast-in-place in place time to not delay work.
- C. Store materials properly to access for inspection and identification. Keep steel members dry, ground, using pallets, platforms, or other supports. Protect steel members and packaged materials from erosion and deterioration.
- D. Do not store materials on structure in a manner that will cause distortion or damage to members or supporting structures. Repair or replace damaged materials or structures as directed.

PART 2 - PRODUCTS

2.01. MATERIALS

- A. Metals, General or fabrication shall be of the quality exposed to the, use of materials shall be of the quality and free of surface defects including pitting, rust and scale on surfaces, roller marks, rolled trade names and roughness. Reel steel shall be of the quality of grinding, or grinding and grinding, prior to cleaning, treating and application of surface finishes. All materials shall be new.
- B. Steel Materials shall be made of either open heart or electric furnace process and shall conform to the Standard Specifications for Structural Steel for Bridges and Buildings, A.S.T.M. Designation 36.
 1. Structural Steel Channels, Angles and Plates - ASTM A 36.
 2. Structural Steel Wide Flanges - A 36 T Sections - ASTM A 36.
 3. Structural Section - SS - S - Rectangular Tubes - ASTM A 36 - R. B.
 4. Structural Section - SS - Round Tubes - ASTM A 36 - R. B.

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- Steel Pipe—STM 0 00, Type E or S, Grade B or STM 0 000
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- Steel C 0stin 0s—STM 0 00, Grade 0 0000, 0 0ed 0 0 stren 0t c 0r 0n steel 0
- 0 0edded Std 0 Type S 0 0r Connect 0rs—STM 0 000, Grade 0 000 or 0 000, c 0d 0 0ised c 0r 0n steel 0 0it 0 0i 0nsi 0ns c 00 p 0in 0 0it 0 ISC S 0cifi 0ti 0ns.
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2.02. FABRICATION

1. Fabrication and erection shall comply with the test edition of "Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings" of the American Institute of Steel Construction, and the following requirements:
- a. Store, handle, erect and support materials so that they are not damaged or distorted.
 - b. Defects or damages shall be corrected before erection. If defects cannot be corrected in the field, the materials shall be returned to the shop or new parts furnished as directed at no additional cost to the owner.

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- Make airtight connections to true pipes. Fit gasketing surfaces close. Bring gasketed parts into close contact.
- Connections not shown conform to the current ASCE Standards.
- B. Shop fabrication and gasket preparation and gasket pre-structure details in shop to the best extent possible. Fabricate items in accordance with ASCE Specifications and as indicated on this shop drawing. Provide cover in structural details as indicated.
- C. Proper fit and fitment of gaskets or field gasketing, fabricate or deliver sequence of gasketing to expedite erection and minimize field handling of gaskets.
- D. Where this is required, complete gasketing, including bedding joints, before start of this operation. Provide this surface gasketing exposed in the structure free of joints, joints, and other defects.
- E. Connections and or other shop connections, as indicated.
- Bolted connections, except where welded connections or other connections are indicated.
- Provide gasketed threaded fasteners for principal connections, except where finished joints are indicated.
- Provide finished threaded fasteners for non-principal connections secondarily in place of joints to provide joints including joints, joints, and other joints in place of joints in joints and joints to provide joints to facilitate erection.
- Gasketed Bolted Construction Install gasketed threaded fasteners in accordance with ASCE "Specifications for Structural Joints Using ASTM A 308 or A 307 Bolts" (RCRBS)
- Welded Construction Complete with S Code for procedures, appearance and finish details, and methods used in correcting bedding joints. Coordinate joints to ensure inspection details.
- I. Gasket and field joint sections and methods of construction to produce true finished joints.
- See Connectors Prepare steel surfaces as recommended by manufacturer for connectors. Shop field steel connectors, spaced as shown, to the joints and joints in composite construction. Use gasket end bedding gasketed steel connectors in accordance with manufacturer's printed instructions.
- Gaskets or other gaskets Provide gaskets required for securing other parts to structural steel in place, and for passing other parts through steel in place, as shown on this shop drawing.
- Provide threaded nuts welded to joints, and other specified items as indicated to receive other parts.
- M. Cut, drill or punch holes perpendicular to other surfaces. Do not use cut holes or enlarge holes in main. Drilling in bearing plates.

2.03. SHOP PAINTING

- A. Enable each point delivered to shop and in origin-seeded containers, ordered by container's name and brand identification. Use print as prepared on container bit in training or other activities. Execute printing on drawings, tree root, rest, scale, and released non-printing in temperature over time.
- B. Stop point structure except those elements or portions of elements to be added in concrete or mortar. Print element added steel is partitioned on exposed portions and initial element added trees on.
- C. Do not print sources which are to be added or strengthened into friction type connections.
 - D. Do not print sources which are scheduled to receive sprayed fireproofing.
 - E. Support costs apply to source which are inaccessible after case or erection. Change cost second cost distinguish it from first.

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- C. Surface Preparation After inspection and before shipping, clean steel must be painted. Remove loose rust, loose paint, and spatter, sand or remove deposits. Clean steel in accordance with Steel Structures Painting Council SSPC and the following:
- SP-1 "Solvent Cleaning".
 - SP-2 "Hand Tool Cleaning".
 - SP-3 "Power Tool Cleaning".
 - SP-4 "White Metal Blast Cleaning".
 - SP-5 "Commercial Blast Cleaning".
 - SP-6 "Broom Blast Cleaning".
 - SP-7 "Clean White Blast Cleaning".
- D. Painting of Fabric After surface preparation, apply structural steel primer paint in accordance with manufacturer's instructions and it rate to provide dry film thickness not less than 1.0 mils. Use painting methods which result in maximum coverage joints, corners, edges and exposed surfaces.
- E. Field Painting Spot paint joints, field welds, and serious corrosion to shop paint if paint is used for shop completed paint as follows:
- Exterior non-steel and steel in completed structure where coat is approved in accordance, good type.
 - Steel in completed structure and steel exposed to elements if coat is approved in accordance, good type.

PART 3 - EXECUTION

3.01. ERECTION

- A. Erection includes setting columns, girders, and erection of structural steel as required in this section. Set column girders on leveling nuts to level and to accurate elevations. No open ends are not permitted. Do not per manufacturer's recommendations. Do not correct field errors by turning. Put in or level steel to level joints, welded connections should be made and put in. After steel is level and put in to tolerance, give special attention to steel and in during construction to avoid overloading. When necessary to correct and/or Structural Engineer instructions when criticisms are made in this record.
- B. Sources of properly registered professional engineer or and source for accurate erection of structural steel. Check elevations on concrete and on shore leveling surfaces, and locations on anchor bolts and similar devices, before erection and proceeds, and report discrepancies to architect. Do not proceed with erection until corrections have been made, or until compensation adjustments to structural steel have been agreed upon with architect.
- Measurements of the Contractor's responsibility and the responsibility for the correctness, control, accuracy and erection of the work to be done to the existing conditions and details of the building.
- C. Temporary Scaffolding and Bracing Provide temporary scaffolding and bracing for all steel connections sufficient strength to bear imposed loads. Remove temporary members and connections when permanent members are in place and in connections are made. Provide temporary bracing to provide proper alignment of structures as erection proceeds.
- The structural steel is to be carried up true and plumb, and temporary bracing is to be introduced wherever necessary to take care of loads to which the structures are subjected, including erection equipment and the operation of the same. Temporary bracing should be left in place as long as it is required for safety.
- D. Temporary Pinning Provide temporary pinning, bracing patterns, and rafter as necessary to erect and steel complete work.
- E. Construction Methods Wherever plates and other members, erection equipment or other methods are carried out the time during its erection, proper provisions should be made to limit the stresses resulting from such construction methods.
- Setting Bases and Bracing Plates Clean concrete and on shore leveling surfaces and on red iron or other members and remove them to the proper and to surfaces. Clean all the surface of the base and bracing plates.

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- [illegible]

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- ☐ diaphragm, " " use electric arc welded studs in strict accordance with
☐ instructions and specifications.
☐ S. Reinforced sections, except for minor details shall be cast.
☐ T. Annealed Steel section, where used, shall be properly annealed.
☐ U. Top and Bottom flanges of welded steel beams, welded connections, and
☐ welded plates shall be painted. Appropriate exposed areas shall be painted with
☐ appropriate paint.
☐ V. Appropriate or spruce provide initial drying thickness of 1/2 inch.

3.02. BOLTS

- [illegible]

3.03. WELDING

- A. Welding components of the requirements of Part 4, Section 4000 and 4000 Standards of the Code.
- B. Electric welding in shop and field operations are demonstrated and certified to the unit, retest and other tests in the, certification and other positions.
- C. Manufacturers for steel construction under three sixteen inch increase in thickness of the code and operations are the pre-determined tests except to the Structural Engineer.
- D. Welding is done on electric arc welding process as specified arc. Welding rod is used and the electrode is used, as specified in the code and in the generator to the Series rods is constructed in the Electric Code, or the other greater than inches in diameter. Welding is done direct current arc welding is approved. Generator is provided with suitable devices to regulate speed, to the constant current output and to the electric in constant current and arc the other setting of the controller to the capacity sufficient to overcome line drop and to the electrode welding is short as the operator can and in no case exceed the diameter of the electrode.
- E. The inner Electric inner shield welding process is used for the shop and field tests. The welding is done with the inner of the Shielder of the inner of the D.C. Generator, Reverse Polarity, as in the "S.M.M." wire electrodes. The tests are placed in accordance with the inner Electric Specifications. The welding operators are experienced and pre-determined to the test specimens of the other tested meet the strength and welding requirements of the Structural Steel of the Code of the requirements of Section 4000 of the Code.
- F. Sources to be welded are the other of the arc welding, clapping, or the other, the other, etc.
- G. In case of the and the welding, the component parts are welded together as sufficient of the other of the other to keep parts straight and in close contact.
- H. Most of the space between pieces to be welded is the other of the other and the other of the other to be welded is the other of the other.
- I. But the welding is the penetration of the tests is specified in the D.C. Re. edition of the AMERICAN ELECTRIC SOCIETY.
- J. The other greater than inches of the other of the other and the other greater than inches of the other of the other of the other, the other of the other of the other is the other of the other of the other.

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- L. Inspected or measured edges square clipped clean before welding and then welded.
- M. After depositing, welds square placed into wire braces and supports under section, so tightness could be tested free from undercuts or overlaps, freed from porosity and inclusions, and disinspection of edges and ends permits and test mints to indicate good fusion fit, and penetration into case joints. Defective welds or parts are welds square cut off and replaced.
- N. Used "Rough" plates square used in better test welds square" or greater toughness. Re-use rough plates were recommended current recommendations for welding processic mints.

3.04. QUALITY CONTROL

- The Owner's Testing and Inspection agency will inspect all stressed welded connections and welded connections and perform tests and prepare test reports.
- B. Test and evaluate and interpret tests and state in each report whether test specimens comply with requirements, and specify state deficiencies therefor.
- C. Contractor shall coordinate and provide access for testing and test pieces where structural steel is being fabricated or produced so that required inspection and testing can be accomplished.
- D. Test and evaluate inspect structural steel point before shipment, after, direct resources right, at the time before acceptance, to reject a structural component if specified requirements.
- E. Correct deficiencies in structural steel or other inspections and contractor test reports where indicated to be not in compliance with requirements. Additional tests will be performed, at Contractor's expense, as may be necessary to determine non-compliance or origin of defect and as may be necessary to comply with corrected work.
3. **Stress Welded Connections** Inspect or test in accordance with AISC specifications.
4. **Stress Welded** Inspect and test during erection of structural steel as follows:
 - a. Certified welders and conduct inspections and tests as required. Record types and locations of defects and in each Record of work required and performed to correct deficiencies.
 - b. Perform visual inspection of welds.
 - c. Perform tests as follows, using procedure most appropriate to conditions being verified. Contractor shall use one or more of the following procedures for verification of welds: penetration tests, and or use one or more of the following procedures for verification of other welds:
 - i. Visual Penetration Inspection (VT) E 1.
 - ii. Magnetic Particle Inspection (MPI) E 1.1 performed on root pass and on finished weld. Cracks or flaws indicate misalignment or penetration not acceptable.
 - iii. Radiographic Inspection (RT) E 1.2 and (RT) E 1.3 initial and final "as-welded" condition.
 - iv. Ultrasonic Inspection (UT) E 1.4.
5. **Welded Connections** Inspect in accordance with AISC specifications.
6. **Welded** Inspect and test during erection of structural steel as follows:
 - a. Certified welders and conduct inspections and tests as required. Record types and locations of defects and in each Record of work required and performed to correct deficiencies.
 - b. Perform visual inspection of welds.
 - c. Perform tests as follows, using procedure most appropriate to conditions being verified. Contractor shall use one or more of the following procedures for verification of welds: penetration tests, and or use one or more of the following procedures for verification of other welds:
 - i. Visual Penetration Inspection (VT) E 1.
 - ii. Magnetic Particle Inspection (MPI) E 1.1 performed on root pass and on finished weld. Cracks or flaws indicate misalignment or penetration not acceptable.
 - iii. Radiographic Inspection (RT) E 1.2 and (RT) E 1.3 initial and final "as-welded" condition.
 - iv. Ultrasonic Inspection (UT) E 1.4.

☐

3.05. CLEANING UP

☐

- ☐. All debris and/or materials resulting from the operations of this trade shall be cleaned up and removed from the site as the work progresses.

☐

☐

END OF SECTION

SECTION 05 4000 COLD FORMED METAL FRAMING

PART 1 - GENERAL

1.01. DOCUMENT PRIORITY

- A. The intent of this section is to supplement the structural drawings in areas not covered by those drawings. If there is a conflict between this section and the structural drawings or Schedules, the drawings shall control. Bring any discovered conflicts to the attention of the Architect, in writing. If there is a conflict, the statement "unless otherwise noted indicated" appears on the structural drawings, it shall mean "unless otherwise noted indicated" on the structural drawings" and does not refer to this section.

1.02. SECTION INCLUDES

- A. Cold formed steel stud exterior framing in.

1.03. REFERENCES

- A. ASTM A 601/A 601M Standard Specification for Zinc Coated (Aluminized) Continuously Annealed Iron and Steel Products.
- B. ASTM A 601/A 601M Standard Specification for Steel Sheet, Zinc Coated (Aluminized) or Zinc-Iron Alloy Coated (Aluminum) by the Hot Dip Process.
- C. ASTM C 800 Standard Specification for Cold-Formed Transverse and Cold-Formed Steel Studs, Runners, Tracks, and Bracing or Bridging or Screws Application of Panels, Panels, Panels and Metal-Plaster Bases.
- D. AISI S 300 Structural Engineering Code (Steel Engineering Engineering Society).
- E. SSPC Paints and Inorganic Primers Type I, "Inorganic," and Type II, "Organic" (Society for Protective Coatings) Part of Steel Structures Painting Manual, Part 1.

1.04. SUBMITTALS

- A. See Section 01 0000 Administrative Requirements, for submittal procedures.
- B. Product Data Provide data on standard framing members describe materials and finish, product criteria, limitations.
- C. Manufacturer's Installation Instructions Indicate special procedures, conditions requiring special attention.

1.05. QUALITY ASSURANCE

- A. Manufacturer's Company specification in connection with the types of products specified in this section, and it is in line with three years of completed experience.
- B. Installer's Company specification in performance of the work of this section it is in line with three years of completed experience.

PART 2 - PRODUCTS

2.01. FRAMING MATERIALS

- A. Studs and Tracks ASTM C 800 studs are to connect to the punched pre-drilled spaced track in a track in a track and a part of the ceiling.
- B. The end depth is indicated on the drawings.
- C. The material is in accordance with ASTM A 653/A 653M G90/Z275 coating.

2.02. ACCESSORIES

- A. Bracing, Bracing, Bridging, Cold-formed sheet steel thickness determined for conditions encountered in this to a track in a track.
- B. Plates, Bolts, Clips, Cold-formed Sheet Steel thickness determined for conditions encountered in this to a track in a track.

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C. Tackling Primer for Unfinished Surfaces SSPC Paint 00, Type I Inorganic.

2.03. FASTENERS

A. Self-Drilling, Self-Tapping Screws, Bolts, Nuts and Washers STM 0 0000 000M, not dip
finished to 0 0 000 0.

B. Concrete Devices Power Actuated.

C. Welding in concrete after S.D.

PART 3 - EXECUTION

3.01. INSTALLATION OF STUDS

A. Install components in accordance with manufacturer's instructions.

B. Construct corners using initial stud-free studs. Install studs at openings, door and
window frames.

C. Install studs attached in one piece. Splicing studs is not permitted.

D. Coordinate placement installation in multiple stud spaces before installation after erection.

E. Install intermediate studs before and between openings to fill out stud spacing.

A. Provide detection once in stud track, direct bearing orientation in frame at non
bearing frame.

A. Install in between studs for attachment of electronic and electric devices, and to prevent
stud rotation.

A. Tackling field studs and dapped finished surfaces at primer.

END OF SECTION

SECTION 05 7313 DECORATIVE METAL RAILINGS

PART 1 - GENERAL

1.01. SCOPE:

- A. Pre-engineered glass and stainless steel railing systems and related items necessary to complete the work indicated on the drawings and/or described in the specifications. The Contractor shall provide materials, articles, materials, operations or methods listed, mentioned or scheduled on the drawings and/or specified herein, including materials, equipment, and incidentals necessary and required for their completion.
- B. Railings, general and special conditions including division one specifications apply to this section.

1.02. DESCRIPTION OF WORK

- A. Extent of work indicated on drawings, including basic units and type of units required.

1.03. RELATED WORK SPECIFIED ELSEWHERE

- A. Structural Steel Division
- B. Miscellaneous Metal Fabrications Division
- C. Concrete Division
- D. Reinforcing Division
- E. Insulation Concrete Division

1.04. SUMMARY

- A. Section Includes
 - 1. Glass and plastic supported railings.
- B. Related Requirements
 - 1. Section "Miscellaneous Rough Carpentry" for wood framing and railing.
 - 2. Section "Non-Structural Metal Framing" for metal framing and railing.

1.05. DEFINITIONS

- A. Railings, boards, panels, and similar devices used for protection occupants of open-sided areas and for pedestrian guidance and support, disconnection, or protection.

1.06. COORDINATION AND SCHEDULING

- A. Coordinate selection of shop primers with topcoats to be applied over them. Confirm with painter and contractor's written instructions to ensure that shop primers and topcoats are compatible.
- B. Coordinate installation of railings. Furnish setting drawings, templates, and directions for installing anchors, including sleeves, concrete inserts, anchor bolts, and items of interference, that are to be embedded in concrete or masonry. Deliver items to Project site in time for installation.

1.07. PREINSTALLATION MEETINGS

- A. Preinstallation Conference/Construct conference at Project site.

1.08. ACTION SUBMITTALS

- A. Submit for compliance with Basis of Design products are provided, Submit for compliance with the required Product Data submit. Ensure compliance with requirements included in Section "Submit Procedures."
- B. Product Data for the railing.

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- ☐ ☐ Manufacturers product lines conforms assebled from standard components.
- ☐ ☐ Brackets, Encourinenceent, and paint products.
- ☐ C. Shop Drawings include plans, elevations, sections, and attachment details.
- ☐ D. Detailed Design Submit for installed products indicated to comply with performance once requirements and design criteria, including analysis designed and sealed with the qualified professional engineer responsible for their preparation.

1.09. QUALITY ASSURANCE

- ☐ ☐ Provide the following upon request:
 - ☐ ☐ Identification Data for professional engineer.
 - ☐ Manufacturer's Signed or Manufacturer's stainless steel products certified that products furnished comply with requirements.
 - ☐ Product Test Reports Based on evaluation of comprehensive tests performed on the qualified testing agency, according to ASTM E 119 and ASTM E 119.
 - ☐ Preconstruction test reports.
 - ☐ Evaluation Reports for post-installed anchors, from ICC-ES.

1.10. FIELD CONDITIONS

- ☐ ☐ Field Measurements for vertical dimensions and other construction conditions with reference to field measurements before erection and indicate measurements on Shop Drawings.
- ☐ B. ☐ Measurements for anchors and rebar shall be taken from construction site elevations to fixed rebar. This information to be recorded on the shop drawings.
- ☐ C. ☐ Coordinate erection schedule with construction progress to avoid delay or conflict.

PART 2 - PRODUCTS

2.01. MANUFACTURERS

- ☐ ☐ Basis of Design Product Subject to compliance with requirements, provide product indicated on Drawings or comparable product on the same basis:
 - ☐ ☐ DI Reinforcing Systems, Inc.
 - ☐ ☐ Bostons Bostons Co., Inc.
 - ☐ ☐ C. R. Lawrence Co., Inc.
 - ☐ ☐ Bostons Bostons Co.
- ☐ B. Product Options in accordance with Drawings and in Specifications establishes requirements for systems test static effects and performance characteristics. Test static effects are indicated on dimensions, arrangement, attachment, and profiles components and assemblies as they relate to situations, to the anchor, and to adjoining construction. Performance characteristics are indicated on criteria subject to certification on one or more methods, including structural analysis, preconstruction testing, field testing, and in-service performance.
 - ☐ ☐ Do not intend test static effects, as added safety or architect, except with architect's approval. Modifications are proposed, submit comprehensive explanation data to architect for review.

2.02. PERFORMANCE REQUIREMENTS

- ☐ ☐ Detailed Design Engineer or qualified professional engineer, as defined in Section 01050 "Structural Requirements," to design rebar, including attachment to adjoining construction.
- ☐ B. ☐ General Engineering rebar to withstand structural loads indicated, determine appropriate design reinforcing stresses according to criteria based on the following:
 - ☐ ☐ Steel 60 percent minimum of yield strength.
 - ☐ ☐ Stainless steel 60 percent of yield strength or 60 percent of tensile strength, as listed in "Mechanical Properties" in AISC Manual Part 5, "Structural Properties of Steel."

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- C. Struts or Perforated Reinforcements, including attachment to adjoining construction, shall resist the effects of axial loads and the bending loads and stresses within it in its end under conditions indicated.
- a. Axial and Top Reinforcement shall
 - a. Uniform load shall be applied in one direction.
 - b. Concentrated load shall be applied in one direction.
 - c. Uniform and concentrated loads need not be assessed to act concurrently.
 - d. Initial loads
 - a. Concentrated load shall be applied perpendicular to one of its flanges.
 - b. Initial and other loads need not be assessed to act concurrently.
 - e. Unsupported Reinforcement Support each section of top reinforcement in its own free end of the panels or other beams so top reinforcement in place in one panel is.
- D. The Moment Resisting or other elements shall be designed and service temperature changes acting on exterior reinforcement preventing cracking, opening joints, overstraining components, wire connections, and other detrimental effects.
- a. Temperature Change shall be, as designed, of, or other stresses.

2.03. METALS, GENERAL

- A. Metasources, GeneralProduce criteria sit sources, it set ors, rter ors, red trade nes, stins, discorations, or e is es.
- B. Brackets, ones, and ncorsS e et and inis es supported ris nless tterise indic ed.
- C. Intern e ers s e stiness steen n or ed t e in te e possi it orst.

2.04. STAINLESS STEEL

- A. Tactin $\rightarrow$ STM $\rightarrow$ $\rightarrow$ $\rightarrow$, $\rightarrow$ r $\rightarrow$ de MT $\rightarrow$ $\rightarrow$
- B. Pipe $\rightarrow$ STM $\rightarrow$ $\rightarrow$ $\rightarrow$ $\rightarrow$ $\rightarrow$ M, $\rightarrow$ r $\rightarrow$ de TP $\rightarrow$ $\rightarrow$
- C. C $\rightarrow$ stin $\rightarrow$ s $\rightarrow$ STM $\rightarrow$ $\rightarrow$ $\rightarrow$ $\rightarrow$ $\rightarrow$ M, $\rightarrow$ r $\rightarrow$ de C $\rightarrow$ $\rightarrow$ $\rightarrow$ C $\rightarrow$ $\rightarrow$
- D. Sheet, Strip, Plate, and $\rightarrow$ $\rightarrow$ B $\rightarrow$ rs $\rightarrow$ STM $\rightarrow$ $\rightarrow$ $\rightarrow$ $\rightarrow$ $\rightarrow$ STM $\rightarrow$ $\rightarrow$ $\rightarrow$ $\rightarrow$ $\rightarrow$ M, T $\rightarrow$ pe $\rightarrow$ $\rightarrow$
- E. B $\rightarrow$ rs and S $\rightarrow$ apes $\rightarrow$ STM $\rightarrow$ $\rightarrow$ $\rightarrow$, T $\rightarrow$ pe $\rightarrow$ $\rightarrow$

2.05. STEEL AND IRON

- A. Thin STM is made of M and red STM is .
- B. Bars are tied, crown steel cap in it STM is M, red .

2.06. GLASS AND GLAZING MATERIALS

- [illegible]

2.07. FASTENERS

- A. ☐ **Stener Material** ☐ **ness** ☐ **ter** ☐ **ise** ☐ **indicated**, provide the ☐ **in** ☐
☐ **Dis** ☐ **i** ☐ **or** **Met** ☐ **s** ☐ **T** ☐ **pe** ☐ **st** ☐ **i** ☐ **n** ☐ **e** ☐ **s** ☐ **t** ☐ **e** ☐ **n** ☐ **e** ☐ **r** ☐ **s**.
- B. ☐ **Steners** ☐ **or** ☐ **nc** ☐ **or** ☐ **i** ☐ **n** ☐ **t** ☐ **o** ☐ **ter** ☐ **C** ☐ **on** ☐ **s** ☐ **t** ☐ **r** ☐ **u** ☐ **c** ☐ **t** ☐ **i** ☐ **o** ☐ **n** ☐ **s** ☐ **t** ☐ **e** ☐ **r** ☐ **u** ☐ **c** ☐ **t** ☐ **i** ☐ **o** ☐ **n** ☐ **s** ☐ **r** ☐ **e** ☐ **q** ☐ **u** ☐ **i** ☐ **r** ☐ **e** ☐ **d** ☐ **o** ☐ **u** ☐ **s** ☐ **r** ☐ **e** ☐ **q** ☐ **u** ☐ **i** ☐ **r** ☐ **e** ☐ **d** ☐ **o** ☐ **u** ☐ **s** ☐ **r** ☐ **e** ☐ **q** ☐ **u** ☐ **i** ☐ **r** ☐ **e** ☐ **d** ☐ **o** ☐ **u** ☐ **s** ☐ **r** ☐ **e** ☐ **q** ☐ **u** ☐ **i** ☐ **r** ☐ **e** ☐ **d** ☐ **o** ☐ **u** ☐ **s** ☐ **r** ☐ **e** ☐ **q** ☐ **u** ☐ **i** ☐ **r** ☐ **e** ☐ **d** ☐ **o** ☐ **u** ☐ **s** ☐ **r** ☐ **e** ☐ **q** ☐ **u** ☐ **i** ☐ **r** ☐ **e** ☐ **d** ☐ **o** ☐ **u** ☐ **s** ☐ **r** ☐ **e** ☐ **q** ☐ **u** ☐ **i** ☐ **r** ☐ **e** ☐ **d** ☐ **o** ☐ **u** ☐ **s** ☐ **r** ☐ **e** ☐ **q** ☐ **u** ☐ **i** ☐ **r** ☐ **e** ☐ **d** ☐ **o** ☐ **u** ☐ **s** ☐ **r** ☐ **e** ☐ **q** ☐ **u** ☐ **i** ☐ **r** ☐ **e** ☐ **d** ☐ **o** ☐ **u** ☐ **s** ☐ **r** ☐ **e** ☐ **q** ☐ **u** ☐ **i** ☐ **r** ☐ **e** ☐ **d** ☐ **o** ☐ **u** ☐ **s** ☐ **r** ☐ **e** ☐ **q** ☐ **u** ☐ **i** ☐ **r** ☐ **e** ☐ **d** ☐ **o** ☐ **u** ☐ **s** ☐ **r** ☐ **e** ☐ **q** ☐ **u** ☐ **i** ☐ **r** ☐ **e** ☐ **d** ☐ **o** ☐ **u** ☐ **s** ☐ **r** ☐ **e** ☐ **q** ☐ **u** ☐ **i** ☐ **r** ☐ **e** ☐ **d** ☐ **o** ☐ **u** ☐ **s** ☐ **r** ☐ **e** ☐ **q** ☐ **u** ☐ **i** ☐ **r** ☐ **e** ☐ **d** ☐ **o** ☐ **u** ☐ **s** ☐ **r** ☐ **e** ☐ **q** ☐ **u** ☐ **i** ☐ **r** ☐ **e** ☐ **d** ☐ **o** ☐ **u** ☐ **s** ☐ **r** ☐ **e** ☐ **q** ☐ **u** ☐ **i** ☐ **r** ☐ **e** ☐ **d** ☐ **o** ☐ **u** ☐ **s** ☐ **r** ☐ **e** ☐ **q** ☐ **u** ☐ **i** ☐ **r** ☐ **e** ☐ **d** ☐ **o** ☐ **u** ☐ **s** ☐ **r** ☐ **e** ☐ **q** ☐ **u** ☐ **i** ☐ **r** ☐ **e** ☐ **d** ☐ **o** ☐ **u** ☐ **s** ☐ **r** ☐ **e** ☐ **q** ☐ **u** ☐ **i** ☐ **r** ☐ **e** ☐ **d** ☐ **o** ☐ **u** ☐ **s** ☐ **r** ☐ **e** ☐ **q** ☐ **u** ☐ **i** ☐ **r** ☐ **e** ☐ **d** ☐ **o** ☐ **u** ☐ **s** ☐ **r** ☐ **e** ☐ **q** ☐ **u** ☐ **i** ☐ **r** ☐ **e** ☐ **d** ☐ **o** ☐ **u** ☐ **s** ☐ **r** ☐ **e** ☐ **q** ☐ **u** ☐ **i** ☐ **r** ☐ **e** ☐ **d** ☐ **o** ☐ **u** ☐ **s** ☐ **r** ☐ **e** ☐ **q** ☐ **u** ☐ **i** ☐ **r** ☐ **e** ☐ **d** ☐ **o** ☐ **u** ☐ **s** ☐ **r** ☐ **e** ☐ **q** ☐ **u** ☐ **i** ☐ **r** ☐ **e** ☐ **d** ☐ **o** ☐ **u** ☐ **s** ☐ **r** ☐ **e** ☐ **q** ☐ **u** ☐ **i** ☐ **r** ☐ **e** ☐ **d** ☐ **o** ☐ **u** <

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- ☐ Provide Pictures attached to online screens or exposed listeners unless otherwise indicated.
- ☐
- D. Post-installed anchors/stener systems sit or are in contact with other than or related to the design load, according to information report accepted to authorities within jurisdiction, used in ICC-ES ECR or ICC-ES ECR.
- ☐ Material Interior applications Carbon Steel Components Inc pitted to components STM B or STM or STM or STM, Class Design, unless otherwise indicated.
- ☐ Material Exterior applications and Core Stainless Steels Indicated or Rep stainless steels, STM or STM, and nuts, STM or STM.

2.08. MISCELLANEOUS MATERIALS

- [illegible]

2.09. FABRICATION

- A. Engineer or fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and enclosure, not less than that required to support structural loads.
- B. Assemble railings in the shop to pretest extent possible to anticipate field spacing and assemble same. Disassemble units in cases necessary for shipping and handling conditions. Clear all units for reassembly and coordinated installation. Use connections that maintain structural integrity joined pieces.
- C. Cut, drill and punch metal plates clean and accurate. Reuse scraps and reuse edges to provide appropriate steel unless otherwise indicated. Reuse shop or fabricator's end laps exposed surfaces.
- D. Mark accurately to line and locate into accurate holes and surfaces.
- E. Fabricate connections that provide exposed to weather in a manner to exclude water. Provide deep holes where water can collect. Locate deep holes in inconspicuous locations.
- F. Cut, reinforce, drill and tap as indicated to receive finish hardware, screws, and similar items.
- G. Mechanically Connect members with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flat, smooth, rigid, uniform joints.
 - a. Fabricate splice joints for field connection using an approved structural design details in accordance with standard spacing method.
- H. Mark channels in direction as follows:
 - a. As detailed.
- I. Bend members in fits to produce uniform curvature for each condition required in cross section member throughout entire length without cracking, twisting, cracking, or otherwise deformation exposed surfaces components.
- J. Close exposed ends of railings members into predrilled end fittings.
- K. Brackets, angles, fittings, and enclosures Provide brackets, angles, gusset plates, fittings, and enclosures to interconnect railing members to other members indicated.
 - a. Cut brackets and fittings fastened to plaster or masonry board partitions, provide cross resistant fibers, or other means to transfer loads to masonry or minimizes to structural supports and to prevent bracket or fitting rotation and cracking of masonry.

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- ☐ Provide inserts and tier concrete devices or connection joints to concrete or as nr
- ☐ or provide concrete devices capable of withstanding loads imposed on joints.
- ☐ Coordinate concrete devices with supporting structure.

2.10. GLAZING PANEL FABRICATION

- [illegible]

2.11. GENERAL FINISH REQUIREMENTS

- A. Protect electronic files on exposed sources from data or application stripping, temporary protective covering or removal.
- B. Appearance conditions of articles or portions in some piece are not acceptable. Conditions in appearance of different pieces are acceptable if they are within one appropriate range approved S&P's. Conditions in appearance after components are acceptable if they are within the range approved S&P's and are assessed or instructed to initiate contrast.
- C. Provide exposed listeners with this information on appearance, including color and texture, as follows.

2.12. STAINLESS-STEEL FINISHES

- ☐ A. Surface Preparation: Remove all dirt and debris, and stretch lines, or bend into this.
- ☐ B. Poured finishes: Find and position sources to produce uniform finish, free of cross scratches.
- ☐ C. Directional Satin Finish:

PART 3 - EXECUTION

3.01. INSTALLATION, GENERAL

- [illegible]

3.02. RAILING CONNECTIONS

- . Expansion instructions expansion instructions at locations indicated are not further port then required to occur at date time of event. Provide slip print instructions see extending increases extend and in either side, listen instructions see section the side, and date print print in increases post.

3.03. ANCHORING POSTS

- . Anchor posts to wet surfaces with anchors, one type, or other type as required in conditions, connected to posts and to wet supporting members as follows:
 - . For steel reinforcement, attach posts as indicated in drawings designed and engineered for this purpose.
 - . For stainless steel reinforcement, weld anchors to posts and attach to wet supporting surfaces.

3.04. INSTALLING GLASS PANELS

- . Post-Supported Glass Reinforced Plastic Panels: Install in accordance with manufacturer's written instructions and other requirements in other Part 0 articles. Erect posts and other wet reinforcement components, then set and install glass panels. Do not cut, drill or alter glass panels in the field. Protect edges from damage.

3.05. FIELD QUALITY CONTROL

- . Testing and Enclosure: Perform a qualified testing agency to perform tests and inspections and to prepare test reports. Permit for these services to be done on site.
- B. Erection and Testing Method: Testing and enclosure and select completed reinforcement as follows:
 - . Test results that are representative of different reinforcement designs and conditions in the completed work.
 - . Test results according to ASTM E 119 and ASTM E 119 for compliance with performance requirements.
- C. Repair and replace reinforcement where test results indicate that the design does not comply with specified requirements unless they can be repaired in a manner satisfactory to architect and compliance with specified requirements.
- D. Perform additional testing and inspection, at Contractor's expense, to determine compliance or replaced or additional work with specified requirements.

3.06. CLEANING

- . Clean reinforcement and stainless steel reinforcement in accordance with other and shop, rinsing with clean water, and wiping dry.
- B. Clean copper reinforcement according to manufacturer's written instructions in a manner that does not damage and impair finish of adjoining approved surface.
- C. Clean and polish glass as recommended in writing by manufacturer. As soon as exposed surfaces in enclosure are protected from further damage before date scheduled for inspections that establish date of substantial completion.
- D. Clean and polish reinforcement and shop components and then wiping dry.

3.07. PROTECTION

- . Protect finishes and reinforcement from damage during construction period with temporary protective covering approved by reinforcement manufacturer. Remove protective covering at time of substantial completion.
- B. Restore finishes damaged during installation and construction period so no evidence remains of correction work. Return items that cannot be replaced in the field to the shop for replacement after repairs and reinstallation of entire unit, or provide new units.

END OF SECTION

**SECTION 06 4100
CUSTOM CABINETS**

PART 1 - GENERAL

1.01. SECTION INCLUDES

- A. Specified cabinet units.
- B. Countertops.
- C. Cabinet hardware.

1.02. REFERENCES

- A. BIMBA American Edition Standard for Cabinet Hardware-Bidders and Manufacturer's Association of SIIBIMA.
- B. AS Association Address, Contact, Reprene Reader-Specifications and Standards.
- C. The American Architectural Standards Society test edition.

1.03. SUBMITTALS

- A. See Section 01 00 00 Administrative Requirements, for submission procedures.
- B. Shop Drawings-Indicate materials, component profiles and elevations, assembly methods, joint details, fastening methods, access restrictions, hardware location and schedule finishes.
- C. Product Data-Provide data for hardware accessories.

1.04. QUALITY ASSURANCE

- A. Perform work in accordance with SPS, Pre-qualify.

1.05. DELIVERY, STORAGE, AND PROTECTION

- A. Protect units from moisture damage.

1.06. ENVIRONMENTAL REQUIREMENTS

- A. During and after installation under this section, maintain the same temperature and humidity conditions in adjoining spaces as indicated after acceptance.

1.07. WARRANTY

- A. Provide warranties required by Section 01 00 00 (C) SET SUBMITTALS.
- B. Provide free defects, including but not necessarily limited to, deformation, door or drawer proper ejection of standards for period of years from date of substantial completion.

PART 2 - PRODUCTS

2.01. PLASTIC LAMINATED CASEWORK

- A. Construction-Stone or glass, glass, Type I.
- B. Exposed surfaces, unless otherwise indicated, shall be pressure laminate in the main grades. Color to be selected by architect from manufacturer's standard palette.
 - A. Oriented Surfaces-Panels 1/4" nominal thickness.
 - B. Post-formed Surfaces-Panels 1/4" nominal thickness.
 - C. Vertical Surfaces-Panels 1/4" nominal thickness.
 - D. Indicate exposed edges, including edges of doors and drawers when open, with plastic laminate, except as otherwise indicated.
- C. Semi-Exposed Surfaces

COSTUM CBIETS

- [illegible]

2.03. LAMINATE MATERIALS

- . **Monitors**
 - **Graphic Corp.**
 - **Ision International Inc**
 - **Substitutions** See Section **Product Requirements**.

[illegible]

☐. **Owner Provide cabinet hardware and access** Provide cabinet hardware and access associated with projector or projector, except for units that are specified as "door hardware" in other sections of these specifications.

☐. **Finish** Unless otherwise indicated.

☐. **Cabinet Door Hardware**

- ☐ **Finishes** Once painted, standard, semi-gloss.
- ☐ **Paint** Fire, white.

☐. **Drawer Hardware**

- ☐ **Slides**
 - ☐ **PencilDrawer** Accuride 1000 series.
 - ☐ **BoxDrawer** Up to 8" Deep Accuride 1000 series.
 - ☐ **BoxDrawer** 8" and Deeper and **File Drawer** Accuride 1000 series.
- ☐ **Paint** Fire, white.

☐. **Accessories** Where indicated, provide standard pin type or disc type pins or discs at 16" on center, unless indicated otherwise.

- ☐ **Door and Single Drawer** 1000 series.
- ☐ **Projection** 1000 series.

☐. **See Supports** Where specified is indicated as "standard", provide standard recessed standards and brackets type needed to support sees at 16" on center or 24" per sq. ft. minimum.

☐. **Miscellaneous Hardware** Provide other hardware as indicated or otherwise required for complete and function installation.

A. Sketch the case for the deletion site in units of si and t per it possible to find openings.

B. Copy the plastic in the in the it of the in the pattern.

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- C. When necessary to cut and fit on site, provide materials with appropriate allowance for cutting. Provide trim for skirting and site skirting.
- D. Apply plastic membrane in the joints in an uninterrupted sheets consistent with manufacturer's sizes. Fit corners and joints with reinforced concrete fasteners. Seal the seams. Seal the counter joint with a suitable sealant.
- E. Provide details for incorporated items. Detail locations of details from on-site dimensions. Seal details.

PART 3 - EXECUTION

3.01. EXAMINATION

- A. Verify adequate foundation and support from below.
- B. Verify location and sizes of utility rooms in associated with the project's section.

3.02. INSTALLATION:

- A. Install the floor joists, beams, truss and struts with no distortions. Seal as required in the concrete slabs.
- B. Seal and cut joints in the foundation and re-inforce concrete slabs or repair damaged joints in the slabs.
- C. The use of sealants shall be kept to a minimum and when used shall conform to the requirements of the IAT SELECTIONS section.
- D. Enclose the exterior to enclose the exterior in a direct attached to the substrate. Seal to the ground, stripping and the exterior concrete fasteners and the foundation is required for a complete installation except where pre-installed exterior fastener heads are required.
- E. Use the finished joints for exposed joints, countersink and the exterior concrete slabs, and the exterior foundation is more transparent than is indicated.
- F. Case the installation of distortion of the doors and drawers of the openings proper and be accurate aligned. Adjust the doors and drawers in openings and to provide unencumbered operation. Complete the installation of the doors and drawers as indicated. Maintain the sequence of the exterior foundation case to the transparent finish.
- G. Countertops shall be secured to the units and other support systems as indicated.

3.03. FINISHED WORK:

- A. Confirm the sealant to the lines and seals and free of surface defects, such as voids or cracks, bubbles, cracks, etc., and be ready for the exterior finish section.
- B. Confirm the sealant to the tolerance requirements of the referenced standards.
- C. Door and drawer faces shall be aligned vertically and horizontally and shall be installed after.
- D. Door and Drawer parts shall be aligned with door and drawer edges and with each other.
- E. Other items shall be free of debris and dust from the exterior section.

END OF SECTION

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**SECTION 06 6000
PLASTIC FABRICATIONS**

PART 1 - GENERAL

1.01. RELATED DOCUMENTS

- . Drawings and General provisions of Contract, including General and Supplemental Conditions and Division Specifications sections, apply to this section.

1.02. SUMMARY

- . Section Includes
 - Solid surface countertops.
 - Solid surface accessories.
 - Solid surface end spaces.

1.03. SUBMITTALS

- . Product Data for countertop materials and sinks.
- B. Shop Drawings for countertops, Sinks materials, finishes, edge and accessories profiles, methods of joining, and details for plumbing fixtures.
 - Shop locations and details of joints.
 - Shop direction of direction of pattern, if any.
- C. Samples for Initial Selection for each type of material exposed to view.
 - Countertop material includes sample.
 - Solid trim, includes any.
- D. Case for Submittals
 - Maintenance Data for solid surface countertop materials to include in maintenance manuals. Include Product Data for core products used or recommended for installation and names, addresses, and telephone numbers of sources for products.

1.04. QUALITY ASSURANCE

- . Manufacturer's specifications. Shop test reports for all orders of custom fabricated countertops similar to that required for this Project, and these products are of record as successful in service performance.
- B. Installer's specifications for countertops.
- C. Provide the following upon request
 - Notification Data for manufacturer

1.05. FIELD CONDITIONS

- . Field Measurements of dimensions of countertops and field measurements after these cabinets are installed that the countertop fabrication is complete

1.06. COORDINATION

- . Coordinate locations of utilities that will penetrate countertops or accessories.

PART 2 - PRODUCTS

2.01. SOLID SURFACE COUNTERTOP MATERIALS

- . Solid Surface Materials are engineered plastic resin composite into ICP SS.
 - Basis of Design Product Subject to compliance with requirements, provide product indicated in Drawings or comparable product of the same or better quality
 - E. I. de Pont de Nemours and Company
 - Corian Corporation.
 - Clear Choice Ltd.
 - Solid Surface Clear Choice, Inc.

PLASTIC BRICKTILES

- SECTI□□ □□ □□□□ □□ □□□□

2.03. INSTALLATION MATERIALS

- . desired Product record ended solid source criterion indicator.
 - . desired source point to the testin and product requirements of the Commission Department of Public Affairs "Standard Method for the Testin and Evaluation of the Organic Chemical Emissions from Indoor Sources using Environmental Chambers."

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- B. Sequent for Countertops Comp into applicator requirements in Section 00 0000 "Joint Seams."

PART 3 - EXECUTION

3.01. EXAMINATION

- A. Examine substrates to receive solid surface material countertops and conditions under which countertops will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of countertops.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02. INSTALLATION

- A. Install countertops to tolerance within inch in feet, but not exceed inch difference between planes of adjacent units.
- B. Fasten countertops to screen in corner blocks using units into underside of countertop. Predrill holes for screws as recommended by manufacturer. Fill adjacent spaces and, using adhesive in corner to attach countertop, and seal to comply with manufacturer's written instructions. Carefully dress joints so that, remove surface scratches, and clean entire surface.
- C. Fasten sockets to cabinets to screen in corner blocks using cabinets. Seal as needed to join sockets in edge plane.
- D. Secure countertops to sockets with adhesive according to solid surface material manufacturer's written instructions. Fill adjacent spaces and, using adhesive in corner to attach countertop, and seal to comply with manufacturer's written instructions. Carefully dress joints so that, remove surface scratches, and clean entire surface.
- E. Bond joints with adhesive and drop cloth as countertops are set. Measure countertops adjacent to joints to prevent adhesive seeps.
- A. Install edge spines in kerf in countertop edges at joints. Fill with adhesive before inserting spines and remove excess immediately after minimum units are drawn into position.
- B. Comp units to top of framing, supports, or edge of other to ensure that countertops are properly joined and joints are as specified and.
- C. Install spaces and end spaces as desired to around countertops with adhesive. Measure countertops and spaces adjacent to joints to prevent adhesive seeps.
- D. Install props to join and countertops with adhesive. Measure countertops and spaces adjacent to joints to prevent adhesive seeps. Fasten to screen in corner. Predrill holes for screws as recommended by manufacturer.
- E. Complete joints not finished in shop. Measure countertops adjacent to joints to prevent damage while cutting. Make cuts to accurate fit items to be installed, and trim edges to finished surfaces unless leveling is required for clearance. Use edges smooth to prevent snipping.
- A. Sealed edges of joints in particular sockets as starting into finish.
- I. Apposement to tops of as specified into Section 00 0000 "Joint Seams."

END OF SECTION

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SECTION 07 2100 BATT INSULATION

PART 1 - GENERAL

1.01. SECTION INCLUDES

- Batt insulation in second ceiling construction.

1.02. REFERENCES

- ASTM C 568 Standard Specification for Mineral Fiber Blanket Thermal Insulation for Cold Roof Construction and Manufactured Building Test Release.
- ASTM E 227 Standard Test Method for Surface Burning Characteristics of Building Materials Test Release.

1.03. SUBMITTALS

- See Section 00 0000 Administrative Requirements, for submittal procedures.
- Product Data Provide data on product characteristics, performance criteria, and product limitations.
- Manufacturer's Installation Instructions include information on specific environmental conditions required for installation, and installation techniques.
- Manufacturer's Certificate of Compliance products meet or exceed specified requirements.

1.04. ENVIRONMENTAL REQUIREMENTS

- Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

PART 2 - PRODUCTS

2.01. BATT INSULATION MATERIALS

- Batt Insulation ASTM C 568 preformed glass fiber batts with a minimum density of 1.5 lb/ft³ (24 kg/m³) and a minimum thickness of 1.5 inches (38 mm).
 - Thermal Resistance R-Value indicated on drawings.
 - Manufactured.
 - Surface Burning Characteristics meet spread of flame 0.45 or less, and tested in accordance with ASTM E 84.
 - Manufacturer:
 - Owens Corning Fiberglas.
 - Johns Manville.
 - Owens Corning Corp.
 - Substitutions See Section 00 0000 Product Requirements.

PART 3 - EXECUTION

3.01. EXAMINATION

- Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation and adhesive.

3.02. BATT INSTALLATION

- Install insulation in accordance with manufacturer's instructions for the specific conditions.
- Install in second ceiling spaces without gaps or voids. Do not compress insulation.
- Trim insulation neatly at spaces. Insulate discipline gaps and voids.
- Fit insulation tightly in cavities and tightly to exterior side of mechanical and electric services within the plane of the insulation.

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□ E. Secure insulation joints within wall spaces to eliminate settling prior and subsequent to
□ completion.

□ F. Tape sealant ends, capped joints, and tears or cuts in membrane.

3.03. PROTECTION OF FINISHED WORK

□ G. Do not permit installed insulation to be damaged prior to its completion.

□ **END OF SECTION**

SECTION 07 6200 SHEET METAL FLASHING AND TRIM

PART 4 - GENERAL

4.01. RELATED DOCUMENTS

- Drawings and General provisions of the Contract, including General and Supplemental Conditions and Division 07 Specification Sections, apply to this Section.

4.02. SUMMARY

- Section Includes
 - Fabricated roof/drainage sheet metal fabrications.
 - Fabricated metal slope roofsheet metal fabrications.
 - Fabricated sheet metal fabrications.
- Related Requirements
 - Section 07 0000 "Miscellaneous Roofing Carpenter" for wood rafters, eaves, and eave trim.
 - Section 07 0000 "Interior Expansion Joint Cover Assemblies" for constructed expansion joint cover assemblies for interior walls, doors, and ceilings.
 - Section 07 0000 "Exterior Expansion Joint Cover Assemblies" for constructed expansion joint cover assemblies for exterior window walls, soffits, and parapets.

4.03. COORDINATION

- Coordinate sheet metal flashing and trim around and seal all sides and locations of penetrations to be installed, and joints and seals in adjacent materials.
- Coordinate sheet metal flashing and trim installation with administrative and other trades, joints, and seals to provide waterproof, secure, and noncorrosive installation.

4.04. PREINSTALLATION MEETINGS

- Preinstallation Conference/Contract conference at project site.
 - Review construction schedule, permit requirements, installer's personnel, equipment, and facilities needed to complete progress and avoid delays.
 - Review specifications, roof/drainage, roof penetration flashing, equipment eaves, and condition before construction to affect sheet metal flashing and trim.
 - Review requirements for insurance and certificates applicable.
 - Review sheet metal flashing observation and repair procedures after flashing installation.

4.05. ACTION SUBMITTALS

- Product Data/Manufacturer's product.
 - Include construction details, material descriptions, dimensions, individual components and profiles, and finishes for each constructed product and accessory.
- Shop Drawings/Sheet metal flashing and trim.
 - Include plans, elevations, sections, and attachment details.
 - Detail fabrication and installation methods, expansion joint locations, and sealed details. Distinguish between sloped and flat assemblies.
 - Include identification of material, thickness, weight, and finish for each item and location in Project.
 - Include details for eave, including profiles, slopes, seals, and dimensions.
 - Include details for lining, supporting, and securing, including support and spacing of fasteners, cleats, clips, and other attachments. Include pattern details.
 - Include details for penetration points and assemblies.
 - Include details for expansion joints and expansion joint covers, including sloped direction of expansion and contraction for fixed points.
 - Include details for roof penetration flashing.

PRODUCTS

- SECTI□□ □□ □□□□ □□ □□□□

4.07. QUALITY ASSURANCE

- D. IM 00pr000s istin00Mn00ct0re and inst00c0pin0s r000ed0e 00s0n0s t00t 0re listed in IM Approvals' "RoofNav" and approved for windst0r c0ssific0ti0n, C0ss 0000. Identifi00 0teri0s 0it0n00e 0000ric0r and desi0n 00pr00ed 00 IM 00pr000s.

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- E. SPRI and Design Standards Manual components recorded in the tests tested according to SPRI ES and code resistance in the design pressure.
- Design Pressure is indicated in Drains.

- . Tiered Moments connects the tiered moments from the client and service temperatures to present conditions, opening points, overstressing components, where point sets, where connections, and other detrimental effects. Base conditions on service temperatures are the basis for the set point and notification set points.
- . Temperature Change does the client does the, the tiered sources.

5.02. SHEET METALS

- Q. ☐ ener~~g~~Pr~~o~~tect ~~ec~~nic~~o~~nd ~~t~~er~~h~~in~~i~~ses ~~h~~e~~p~~osed s~~r~~ices ~~i~~n ~~d~~e ~~o~~pp~~o~~in~~i~~stripp~~e~~, te~~p~~r~~o~~pr~~o~~te~~c~~t~~i~~e ~~i~~n ~~e~~re s~~i~~ppin~~i~~.

5.03. UNDERLAYMENT MATERIALS

- Sealant is a thermoplastic resin that is applied to the prepared cavity and cured by light or heat. It is used to fill the cavity and restore the tooth's function and appearance. Sealant is a preventive measure to protect the tooth from decay and is applied to the smooth surfaces of the tooth. It is a thin, clear, plastic-like material that is painted onto the tooth and then hardened. Sealant is a preventive measure to protect the tooth from decay and is applied to the smooth surfaces of the tooth. It is a thin, clear, plastic-like material that is painted onto the tooth and then hardened.

- Temperature of STM D passes after test in seconds.

- B. Slip Sheet Resin-sided ☐ in paper, ☐ in ☐ s. ☐ ini ☐.

5.04. MESCELLANEOUS MATERIALS

- g. ☐ **Energy Provider** identifies and types ☐ **stoppers, solder, protective coatings, seals, and other** ☐ **discipline** ☐ **the** ☐ **site** ☐ **s** ☐ **required** ☐ **for** ☐ **complete** ☐ **sheet** ☐ **et** ☐ **in** ☐ **and** ☐ **tri** ☐ **inst** ☐ **in** ☐ **stitution** ☐ **and** ☐ **s** ☐ **rec** ☐ **ended** ☐ **in** ☐ **in** ☐ **struct** ☐ **er** ☐ **pri** ☐ **or** ☐ **s** ☐ **heet** ☐ **et** ☐ **in** ☐ **in** ☐ **struct** ☐ **red** ☐ **ite** ☐ **in** ☐ **ness** ☐ **et** ☐ **er** ☐ **ise** ☐ **ind** ☐ **ic** ☐ **ated**.

- B. Sander

- ☐ ☐ inc.Cotted ☐ ☐ ni.ed.Stee~~STM B~~ ☐ ☐ r.de Sn~~00~~, ☐ percent tin ☐ and ☐ percent e.d ☐ ☐ r.de Sn~~00~~, ☐ percent tin ☐ and ☐ percent e.d.

- C. Se_____Type_____Press_____re_____sensi_____tivity, _____percent s_____tands, p_____p_____is_____t_____t_____ene c_____p_____and se_____t_____type
 _____it_____re_____se_____p_____per _____c_____in_____. Provide per_____nent_____e_____stic, n_____ns_____, n_____nt_____fic, n_____st_____in_____t_____pe
 _____inc_____ide _____and _____inc_____t_____ic_____.

- D. Eristeric Sequent STM C, eristic preneteposside sieneper seenttype, orde, class, and Se classificationns required to seentns in sheet et ssin and tri and re in ertit.

- E. Bit in's C₀tin C₀d applied sp₀te si₀n cc₀rdin₀t STM D₀00.

5.05. FABRICATION GENERAL

- [illegible]

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B. Fabrication Tolerances Fabricate sheet metal joints and trim that is capable of installation to tolerance within 1/8 inch in feet on slope and location lines indicated on Drawings and within 1/8 inch offset within inches and within cent feet on profiles.

C. Expansion Provisions Provide expansion to expansion exposed metal and trim.

a. Expansion joints interfaces welded joints, not less than 1 inch deep, filed into continuous concealed joint joints.

b. Use lapped expansion joints on where indicated on Drawings.

D. Seamt joints are where, none expansion type joints are required, and provide proper installation per standard seamt according to cited sheet metal standard.

E. Fabricate cleats and attachment devices from same materials accessible being anchored or from composite, noncorrosive metal.

a. Fabricate cleats and attachment devices as required as required as cited sheet metal standard and per M of Property Class Prevention Data Sheet for application, not less than thickness metal in secured.

b. Seams fabricate non joint seams into metal seams. Tin edges to be sealed, and solder.

c. Seams fabricate non joint seams into metal seams. For seams and seams to exterior seamt unless otherwise required as seamt of manufacturer for intended use. Riset joints where necessary for strength.

I. Seams for joint in fabricate non joint seams into metal seams. For seams and seams into epse seamer. Riset joints where necessary for strength.

a. Do not use graphite pencils to draw sketches.

5.06. LOW-SLOPE ROOF SHEET METAL FABRICATION

a. Cop flashing Counterflashing Fabrication Provide to piece of metal cop flashing, consisting of upper receiver portion and lower portion extending over the cop position flashing, unless otherwise specified or indicated.

a. Cop flashing Counterflashing Fabrication of Top Piece

a. Fabricate the receiver portion into outer edge folded into double and turned down one inch, unless otherwise indicated, and as follows:

- 1) At walls faced with metal siding or pre-formed metal panels, extend the receiver portion into the wall as indicated, and terminated with edge folded over support.
- 2) At parapet, extend the receiver portion over wood blocking as indicated.
- 3) At parapet, extend the receiver portion as indicated and form the upper edge to engage the double fold of coping

b. For the upper edge of the lower portion of metal cop flashing to engage in the double and receiver portion, bent to provide spring action against the base flashing, and the outer edge folded back into and up cop position base flashing not less than 1/2 inch.

c. Cop ends are to be in the portions of metal cop flashing not less than 1/2 inch. Fold or solder corner joints. Return ends of rounded into relet or over

5.07. WALL SHEET METAL FABRICATION

a. Penetration Flashings in Frame Construction Fabricate lead, solder, and solder flashings to extend 1/2 inch beyond penetration. For lead and solder into into into, end down. Fabricate from the main metal.

a. Galvanized Steel, 1/8 inch thick.

PART 6 - EXECUTION

6.01. EXAMINATION

a. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, substrate, and other conditions affecting performance of the work.

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- Perimeter piling to requirements or installation tolerances as illustrated.
- Perimeter substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
- Perimeter diaphragm resistant barriers have been installed over section or section substrate to prevent air infiltration or water penetration.

□ B. Proceed with installation only after environmental conditions have been corrected.

6.02. UNDERLAYMENT INSTALLATION

- A. Seamed Reinforced Sheet Underlayment Installation Seamed Reinforced Sheet Underlayment, primed free. Prime substrate immediately underlayment on contractor. Comply with all performance restrictions underlayment on contractor or installation code prior or installing underlayment at all temperatures. Apply single layer to shed water, with end laps not less than 6 inches staggered 6 inches between courses. Overlap side edges not less than 6 inches. Roll laps and edges into roller. Cover underlayment within 48 hours.

□ B. Apply slip sheet, primed free, over underlayment before installing sheet or etchings and trim.

6.03. INSTALLATION, GENERAL

- A. General Enclosure Sheet or etchings and trim and other components shall be protected in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, sealants, and other accessories items as required to complete sheet or etchings and trim system.

- A. Install sheet or etchings and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure as shown, welds, and sealant.
- A. Install sheet or etchings and trim to fit substrates and to resist in tertiary performance. Perimeter slopes and dimensions as shown to be covered before installation sheet or etchings.
- A. Space cleats not more than 6 inches apart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.
- A. Install exposed sheet or etchings and trim with limited ditching, and free expansion and contraction.
- A. Thermal coating on sheet or etchings and trim is not permitted.
- A. Do not use graphite pencils to mark or etch surfaces.

□ B. Metal Protection Where dissimilar metal contact occurs, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with zinc-rich coating or other permanent separation as recommended on sheet or etching on contractor or cited sheet or etching standard.

- A. Coat concealed side uncoated metal in contact with stainless steel sheet or etchings and trim with zinc-rich coating where metal and trim contact wood, masonry, or other construction.
- A. Underlayment shall be installed sheet or etchings and trim directly on ceiling or other substrates, install underlayment and cover with slip sheet.

□ C. Expansion Provisions Provide for thermal expansion on exposed metal and trim. Space all elements with 1/8 inch or more gap between elements within 6 inches of corner or intersection.

- A. Form expansion joints at interfaces of different metals, not less than 1 inch deep, filled with sealant concealed within joints.
- A. Use capped expansion joints only where indicated on Drawings.

□ D. Fasteners Use fastener sizes that penetrate substrate not less than recommended on fastener on contractor to achieve a minimum of permanent resistance.

□ E. Conceal fasteners and expansion provisions where possible in exposed areas and locate to minimize possibility of damage. Cover and seal fasteners and anchors as required for tight installation.

□ A. Sealants as required for tertiary construction.

- A. Use sealant-filled joints unless otherwise indicated. Filled joints shall be made with sealers not less than 1 inch into sealant. Form joints to complete concealed sealant.

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- [illegible]

6.04. ROOF FLASHING INSTALLATION

- [illegible]

6.05. WALL FLASHING INSTALLATION

- A. energe instoos eet et oos s in o to intercept and e code penetr tin o distre
 ccordin o cited sheet et ost and rd oness tterise indic ted. Coordin te inst oon in o
 oos s in o it inst oon in oos oos penin c o p nents sc o s oind oos, d oors, and oosers.
- B. o penin oos s in o in o re e Construct ion Inst oon c ontin oos eed, si o o o, and si o i o r
 oos s in o s t e t end o inc es e o o d oos oos penin oos.

6.06. ERECTION TOLERANCES

- [illegible]

6.07. CLEANING AND PROTECTION

- A. Clean exposed surfaces as soon as possible to prevent contamination and deterioration.
- B. Clean and neutralize spills immediately. Clean up spills as soon as possible.
- C. Clean up spills as soon as possible.
- D. Remove temporary protective coverings and strip the floor as soon as possible and replace the floor as soon as possible. Clean up spills as soon as possible and replace the floor as soon as possible. Maintain the floor as soon as possible and replace the floor as soon as possible.

On a given date, the institution is between 00 and 00 days, set mint orders for percent
of the current economic distribution of the institution at a given date. Do not insto-
separate type mints at the percent

SECTION 00 0000 00 0000

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- ☐ E. Replace sheet piling in and try that pile been damaged or that pile deteriorated
- ☐ and successful repair on this project or similar in repair procedures.
- ☐

Replace sheet piling in and try that pile been damaged or that pile deteriorated and successful repair on this project or similar in repair procedures.

SECTION 00 00 00 00 00 00

**SECTION 07 7200
ROOF ACCESSORIES**

PART 7 - GENERAL

7.01. RELATED DOCUMENTS

- . Drawings and General provisions of the Contract, including General and Supplemental Conditions and Division 07 Specification Sections, apply to this Section.

7.02. SUMMARY

- . Section Includes
 - . Roofcups.
 - . Equipment supports.

7.03. COORDINATION

- . Coordinate roof and installation of roof accessories with roofline of structure and base flashing and interlocking and adjoining construction to provide a waterproof, weathertight, secure, and noncorrosive installation.
- B. Coordinate dimensions with roofline in relation to Slop Drains equipment to be supported.

7.04. ACTION SUBMITALS

- . Submit for compliance with Basis of Design products are provided, Submit for compliance with the following required Product Data submit and Samples submit. Ensure compliance with requirements included in Section 07 0000 "Submit Procedures."
- B. Product Data for each type of roof accessory
 - . Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- C. Slop Drains and roof accessories.
 - . Include plans, elevations, detail details, and attachments to other work. Indicate dimensions, materials, and special conditions. Distinguish between painted and field exposed work.
- D. Detailed Design Submit for roofcups equipment supports indicated to comply with performance requirements and design criteria, including analysis designed and sealed by the qualified professional engineer responsible for their preparation.
 - . Detail detailing, securing, and flashing of roofcups mounted items to roof structure. Indicate coordination requirements with roofline of structure.
 - . Wind Restraint Details Detail description and attachment wind restraints. Submit enclosure details and indicate quantity, diameter, and depth of penetration into roof.

7.05. INFORMATIONAL SUBMITALS

- . Coordination Drawings (Roof plans, drain to slope, and coordination penetrations and roof mounted items. Submit the following:
 - . Size and location of roof accessories specified in this Section.
 - . Method of attachment of roof accessories to roof structure.
 - . Other roof mounted items including mechanical and electrical equipment, ductwork, piping, and conduit.
 - . Required clearances.
- B. Sample warranties or manufacturer's special warranties.

7.06. CLOSEOUT SUBMITALS

- . Operation and Maintenance Data for roof accessories to include in operation and maintenance manuals.

7.07. WARRANTY

- a. Specified Warranty on Painted Finishes Manufacturer's standard and in accordance with manufacturer agrees to repair finishes or replace accessories that show evidence of deterioration or deterioration of applied finishes within specified warranty period.
 - a. Reproofer finishes Deterioration includes, but is not limited to, the following:
 - i. Corrosion or more than one unit been tested according to ASTM D 1171.
 - ii. Cracking in excess of 1/8" or more been tested according to ASTM D 1171.
 - c. Cracking, chalking, peeling, or more apparent to adhere to more than one unit.
 - d. Finish Warranty Period shall be the date of Substantial Completion.

PART 8 - PRODUCTS

8.01. PERFORMANCE REQUIREMENTS

- a. General Performance Requirements accessories shall withstand exposure to weather and resist thermal induced movement without warping, racking, leaning, or fastener disengagement due to defective manufacture, installation, or other defects in construction.
- B. Detailed Design Envelope is provided by professional engineer, as defined in Section 01050 "Structural Requirements," to design accessories and equipment supports to comply with wind performance requirements, including comprehensive engineering analysis by a qualified professional engineer, as in performance requirements and design criteria indicated.
- C. Wind Restrict Performance is indicated on Drawings.

8.02. ROOF CURBS

- a. Roof Curbs Internally reinforced concrete units capable of supporting superimposed live and dead loads, including equipment loads and other construction indicated on Drawings, during construction on roof structure, and capable of meeting performance requirements to be used for mechanical fastened and sealed corner joints, structural sides, interior and exterior, and stepped interior and exterior raised toe thickness construction, and interior and exterior deck and interior and exterior perimeter detail.
- B. Side Coordinate dimensions to roofline in relation to Slop Drawings are equipment to be supported.
- C. Material indicated galvanized steel sheet, 22 gauge min. thick.
- D. Construction
 - a. Core Profile Manufacturer's standard Profile as indicated on Drawings compatible with roofline system.
 - b. On raised or pitched roofs, use deck and interior and exterior perimeter detail to conform to roof profile.
 - c. Fabricate curbs to initial level and include inches above roofline surface unless otherwise indicated.
 - d. Top Surface Seal top edge, with roof slope access to be sealed with pin and deck and interior and exterior.
 - e. Installation of roofline is to be in accordance with manufacturer's standard installation.
 - f. Inner Slope Material core, with manufacturer's standard thickness and finish.
 - g. Interior roofline installed and not to be on top of roofline under top of roofline on side of curb, continuous around curb perimeter.
 - h. Wind Restrict Straps and Base shall be attached to Provide wind restrict straps, sealed strap connectors, and base shall be attached to roof structure at perimeter curb, inside and spacing required to meet wind uplift requirements.
 - i. Pattern Cap Core partition structure is not covered by equipment, provide weatherproof pattern cap around roofline and interior and exterior covered with equipment feet of same type, thickness, and finish as required for curb.
 - j. Metal Counterflange Manufacturer's standard, reinforced, fabricated stainless steel and finish as curb.

8.03. EQUIPMENT SUPPORTS

- A. Equipment Supports: Internally reinforced perimeter R.I. type equipment supports comprise supports in superimposed live and dead loads between structural supports, including equipment loads and other construction indicated on Drawings, spanning between structural supports. Equipment meeting perimeter requirements shall be welded or mechanically fastened and sealed corner joints, integral metal can't, and integrally formed structure continuous at bottom.
- B. Size: Coordinate dimensions with room in addition to Shop Drawings for equipment to be supported.
- C. Material: Incorporated galvanized steel sheet, unless indicated.
- D. Construction:
 - 1. Corrugated Manufacturer's standard composite with reinforcing steel.
 - 2. Installation: Install in accordance with manufacturer's standard installation.
 - 3. Inner: Same material as equipment support, per manufacturer's standard thickness and finish.
 - 4. Other: Contractor installed continuous board nailers shall include on top where equipment supports or under top where on side occur, continuous board support perimeter.
 - 5. Wind Restrict Straps and Base: Where attached. Provide wind restrict straps, welded strap connectors, and base where attached to roof structure at perimeter occur inside and spacing required to meet wind uplift requirements.
 - 6. Pattern: Coped where partition equipment support is not covered by equipment, provide certified pattern cop welded steel reinforcement plate and covered with steel sheet of same type, thickness, and finish as required for core.
 - 7. Metal: Center in Manufacturer's standard, reinforced, indicated as steel or aluminum finish as equipment support.
 - 8. On roofed or pitched eave areas, the deck continuous at perimeter shall be covered to conform to roof profile.
 - 9. Fabricate equipment supports to finish of ceiling unless indicated otherwise.

8.04. METAL MATERIALS

- A. Galvanized or Aluminized Steel Sheet: ASTM A 660 or A 661, per coating designation and finish specified or field painting where indicated.
 - 1. Exposed Coated: Galvanized or Aluminized steel sheet coating process to comply with ASTM A 660 or A 661. Prepare, pretreat, and apply coating to exposed steel surfaces to comply with coating and resin per manufacturer's written instructions.
 - 2. Top Coat: Where primer is not used, the system consisting of primer and topcoat or color topcoat containing not less than 90 percent P.D. resin by weight.
 - 2. Concealed: Galvanized or Aluminized steel sheet or hot-dipped galvanized or polyester-coated finish consisting of primer coat and topcoat, with a finish of standard finish thickness per specification.

8.05. MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, protective coatings, sealants, and other accessories items required per manufacturer or complete installation.
- B. Wood: Where specified, use, pressure treated wood where preservatives are required and use, except where to authorities within jurisdiction, containing no arsenic or chromium, and comply with the P.D. Code less than 10 percent increase in price.
- C. Underlayment:
 - 1. Seamed: Perin, 1/8" Teperature Sheet: Minimum 1/8" thick 1/8" thick, consisting of slip resistant polyethylene top surface mounted to underlayment SBS modified asphalt adhesive, with release paper permanently applied. Provide primer when recommended by manufacturer.

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- [illegible]

8.06. GENERAL FINISH REQUIRMENTS

- [illegible]

PART 9 - EXECUTION

9.01. EXAMINATION

- ☐ A. Engineer should state, describe, and conditions, it is not present, to determine conditions, dimensions, and other conditions affecting performance once the work is done.
- ☐ B. Engineer should state is sound, dry, safe, clean, stable or drainage, and secure enclosed.
- ☐ C. Engineer dimensions or openings or accessories.
- ☐ D. Proceed with installation and after installation conditions have been corrected.

9.02. INSTALLATION

- [illegible]

9.03. REPAIR AND CLEANING

- ☐ ☐ nited Sources Cien tied eds, ☐ ted c nnecti ns, and ☐ rded res nd rep ir
☐ ni dn cc rdin t STM ☐ M.

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- ☐ B. Touch up mactracapried surfaces ito cccptiie prier red or ied pntin according to Section 00 0000 "Eterior Pntin."
- ☐ C. Clean eposed surfaces according to onnctrer's written instructions.
- ☐ D. Clean mcecess seents.
- ☐ E. Repice rccessories tot eeen ddd ed or tot cnnat e successully repired in this tcccp or siior inor repir pcedres.
- ☐

SECTION 07 8400 FIRESTOPPING

PART 1 - GENERAL

1.01. RELATED DOCUMENTS

- . Drawings and General Provisions of the Contract, including General and Supplemental Conditions and Division 7 Specification Sections, apply to this Section.

1.02. SUMMARY

- . This Section includes firestopping for the following:
 - . Penetrations through fire-resistance-rated walls and partitions including rooftop openings and openings containing cables, pipes, ducts, conduits, and other penetrating items.
 - . Penetrations through solid concrete barriers and construction enclosing rooftop enclosed areas including rooftop openings and openings containing penetrating items.
 - . Sealed joints in fire-resistance-rated construction.
 - . Related Sections of the Division 7 Sections contain requirements that relate to this Section.
 - . Section 07 8400 "Bolt Installation" for steel installation and accessories.
 - . Section 07 8400 "Joint Sealants" for non-fire-resistance-rated joint sealants.

1.03. SYSTEM PERFORMANCE REQUIREMENTS

- . General Provide firestopping systems that are produced and installed to resist the spread of fire, according to requirements indicated, and the passage of smoke and other gases.
- . Rated Through Penetration Firestop Systems Provide through penetration firestop systems to ratings indicated, as determined per ASTM E 119, not less than that achieved or exceeding the fire resistance rating of the construction penetrated.
- . Rated Through Penetration Firestop Systems Provide through penetration firestop systems to ratings, in addition to ratings, as determined per ASTM E 119, where indicated and where systems protect penetrating items exposed to contact with adjacent materials in occupied areas. Rated assemblies are required where the following conditions exist:
 - . Where firestop systems protect penetrations located in construction containing doors required to meet a fire performance rating.
- . Fire-Resistant Joint Sealants Provide joint sealants to fire resistance ratings indicated, as determined per ASTM E 119, not less than that achieved or exceeding the fire resistance rating of the construction in which the joint occurs.
- . For firestopping exposed to fire, traffic, moisture, and possible abuse, provide products that do not deteriorate when exposed to these conditions.
- . For piping penetrations for process and wet pipe sprinkler systems, provide moisture-resistant through penetration firestop systems.
- . For penetrations in insulated piping, provide through penetration firestop systems not requiring re-insulation.
- . For firestopping exposed to fire, provide products with a spread index less than 10 and smoke developed index less than 100, as determined per ASTM E 84.

1.04. SUBMITTALS

- . General Submit the following according to Conditions of Contract and Division 7 Specification Sections:
 - . Product data for each type of product specified.
 - . Certification of firestopping manufacturer that products supplied comply with core conditions controlling use of volatile organic compounds (VOCs) and are not toxic to building occupants.

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- D. Shop drawings detailing materials, installation methods, and relationships to adjoining construction or exterior penetration firestop system, and each end construction condition penetrated and end penetration item. Include firestop design designation of qualified testing and inspection agency evidencing compliance with requirements for each condition indicated.
- E. Submit documentation, including instructions, from a qualified testing and inspection agency that is applicable to exterior penetration firestop construction for construction and penetration items.
- F. Product certificates signed by manufacturers of firestopping products certifying that their products comply with specified requirements.
- G. Product test reports from, and based on tests performed by, a qualified testing and inspection agency evidencing compliance with firestopping with requirements based on comprehensive testing of current products.
- H. Qualification data for firms and persons specified in "Qualification Assurance" article to demonstrate their capabilities and experience. Include list of completed projects with project names, addresses, names of architects and owners, and other information specified.

1.05. QUALITY ASSURANCE

- A. Fire Test Response Characteristics Provide firestopping that complies with the minimum requirements and those specified under the "System Performance Requirements" article.
- B. Firestopping tests are performed by a qualified testing and inspection agency. A qualified testing and inspection agency is one, or more oversee, or another agency performing testing and inspection services for firestop systems that is acceptable to authorities having jurisdiction.
- C. Exterior penetration firestop systems are identical to those tested per ASTM E 119 under conditions where positive flame pressure differentials at least 1.0 psi inch after is contained at a distance 10.0 inch from the fire test series surrounding the penetration item in the test case. Provide rated systems comply with the minimum requirements.
- D. Exterior penetration firestop system products are classified in order of qualified testing and inspection agency.
- E. Exterior penetration firestop systems correspond to those indicated in reference to exterior penetration firestop system designations listed in their "Fire Resistance Directory," or more oversee, or another approved qualified testing and inspection agency.
- F. Fire Resistant Joint Sealant systems are identical to those tested for fire response characteristics per ASTM E 119 under conditions where the positive flame pressure differentials at least 1.0 psi inch after, as measured 1.0 inch from the face exposed to flame fire. Provide systems comply with the minimum requirements.
- G. Fire Resistance Ratings Joint Sealants as indicated in reference to design designations listed in their "Fire Resistance Directory" or another qualified testing and inspection agency.
- H. Joint sealants, including each of materials, are classified in order of qualified testing and inspection agency.
- I. Information on drawings referring to specific design designations for exterior penetration firestop systems is intended to establish requirements for performance based on conditions that are expected to exist during installation. On changes in conditions and designated systems require the architect's prior approval. Submit documentation showing that the performance approved substitutions equals or exceeds that of the systems to be replaced and are acceptable to authorities having jurisdiction.
- J. Installer Qualifications Employ an experienced Installer who has completed firestopping that is similar in material, design, and extent to that indicated for Project and that has performed successfully.
- K. Single Source Responsibility Obtain exterior penetration firestop systems for each end of penetration and construction condition indicated from a single manufacturer.

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- ☐ Provide firestop products containing no detectable asbestos as determined by the method specified in CCRR Part 200, Support 4, Appendix 4, Section 4, "Priorized Joint Microscopy"
- ☐ M. Coordinating or coordinating construction openings and penetration items to ensure that designed or approved penetration firestop systems are installed per specified requirements.

1.06. DELIVERY, STORAGE, AND HANDLING

- A. Deliver direct-ship products to Project site in original, unopened containers or packages if it intact and evidence containers shows identifying product and container date of manufacture and no other sensitive, applicable classified testing and inspection agencies classification or origin applicable to Product certification and identification instructions are effective present criteria.
- B. Store and handle direct-ship materials to prevent their deterioration or damage due to moisture, temperature changes, contamination, or other causes.

1.07. PROJECT CONDITIONS

- . En dr in ent C on d i t i o n s D o n t i n s t r e s t o p p i n g e n d e n t s s o s t r a t e p e r t o r e s
r e o u t s i d e i t s p e r m i t t e d i n s t r e s t o p p i n g o n o c c u r r e n c e s o r e n s o s t r a t e s a r e n e t d e t o
r i n , r e s t , c o n d e n s a t i o n , o r o t h e r c a s e s .
- B. C e n t i t i o n e n t i t e i n s t r e s t o p p i n g p e r i n s t r e s t o p p i n g o n o c c u r r e n c e s i n s t r u c t i o n s n o t r e e n s
o r , o t h e r t h i s i s i n d e e d , o r c e d i r c u m s t a n c e s .

1.08. SEQUENCING AND SCHEDULING

- . Do not cover up those first-appeal instances that immediately cancelled the order construction authorities within jurisdiction, if required, the evidenced the institution.

PART 2 - PRODUCTS

2.01. FIRESTOPPING, GENERAL

- [illegible]

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- E. **Excess Subject to Purchase Rights** Products that contain incorporated in the product, are not limited to, the following:
- Endtetric, Gate Sequent
 - Excessed, Treco Inc.
 - Endtetric, Gate Coplands
 - Excessed Series, International Protective Continents Corp.
 - Excessed ST Series, International Protective Continents Corp.
 - Intescent Gate Sequent
 - Metacore, The Rectorse Corporation.
 - Fire Barrier CP B Core, M Fire Protection Products.
 - Intescent Patt
 - Pensint Intescent Patt, Ener Electric Co.
 - Excessed SP Patt, International Protective Continents Corp.
 - Fire Barrier Modere Patt, M Fire Protection Products.
 - Intescent Strip
 - D Coren Fire Strip Intescent Strip Core, D Coren Corp.
 - CS Intescent Strip, Iiti Construction Chemicals, Inc.
 - Fire Barrier SStrip, M Fire Protection Products.
 - Mixed in Copland
 - S Directe Copland, United States Ops Co.

2.02. MIXING

0. For those products requiring identification prior to application, compare it to the manufacturer's directions or accurate proportioning characteristics, after determining type of identification equipment, selection of mixer speeds, identification containers, identification time, and other procedures needed to produce first-pour products consistently. Compare it to other options performed once characteristics are application indicated.

PART 3 - EXECUTION

3.01. EXAMINATION

- D. E_____ine s____strates _____nd c_____nditions, _____it's Inst_____er present, _____r c____pi_____nce _____it re____re_____ents _____openin_____c_____n_____t_____ions, penetrat_____in ite____s, s____strates, _____nd t_____er c_____nditions _____fectin_____per_____r_____once _____directppin_. D_____not pr_____ceed _____it's inst_____t_____ion _____nti_____ons _____tis _____ct_____r_____c_____nditions _____be _____een c_____orrected.

3.02. PREPARATION

- Source Cleanroom Clean out openings and joints in edifice prior to installing firestoppping to complete it's receding conditions in firestoppping in contractor and the minimum requirements
- Recessed fireproof materials from surfaces opening and joint substrates and fire penetrating items that could interfere with adhesion of firestoppping.
- Clean opening and joint substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond and firestoppping. Recessed loose particles removed in clean operation.
- Recessed distance and fire release agents from concrete.
- Prime and Prime substrates were receding in firestoppping in contractor as in toot in contractor's receding products and methods. Confirm primers to be resins based and not oil based and irrigation into exposed surfaces.
- Masonry Type use of masonry type to prevent firestoppping from contacting adjoining surfaces that interfere in exposed open competition and fire and toot could otherwise be permanently stained or damaged so as to contact or fire cleanout methods used to recessed surfaces from firestoppping.

- ☐ Criteria s. Re sse type s s n s it is p ssie t d s i t t dist r n i rest ppin s se
- ☐ it s str tes.

3.03. INSTALLING THROUGH-PENETRATION FIRESTOPS

- A. Generate a C++ program to the "System Permissions Required" article in Port 0 and the target penetration test platform's installation instructions and documents pertaining to products and applications indicated.
- B. Install and configure the operating system and other accessories types required to support the operating system and in the position needed to produce the cross-section of scopes and depths required to achieve the ratings designated for target penetration test systems. After installing the operating system, replace the components in the operating system and other accessories not indicated as per the component components of the test system.
- C. Install the operating system for target penetration test systems or proven techniques to produce the target results.
- D. Complete the tasks and duties required to open, install, accessories, and penetration tests.
- E. Apply the operating system and adhere to the strategies required to open and penetration tests.
- F. For the operating system that is exposed after completion of this task produce a list of unique sources that are misconfigured in this case.

3.04. INSTALLING FIRE-RESISTIVE JOINT SEALANTS

- A. Generate a printout of the "System Parameters" article in Part 1 of the STM C 0000, and of the section on connector's installation instructions and drawings pertaining to products and applications indicated.
- B. Install mint wires to provide support assemblies during application and at position required to produce the cross section as scopes and depths of installed segments relative to mint widths that allow optimum segment placement capability and deep fire resistance rating required.
- C. Install segments on proven techniques that result in segments direct contact and setting mint substrates, complete within recesses provided for each mint configuration, and providing uniform, cross section as scopes and depths relative to mint widths that optimum segment placement capability. Install segments at the same time mint wires are installed.
- D. Touch on segments immediately after segment application and prior to the time of curing begins. For so called, uniform leads configuration indicated or required to produce fire resistance rating, as seems to exist in the pockets, and to ensure contact and adhesion of segments on sides of mint. Remove excess segment from surfaces adjacent to mint. Do not use tools or agents that dislodge segments or adjacent surfaces or are not approved as segment manufacturer.

3.05. FIELD QUALITY CONTROL

- [illegible]

3.06. CLEANING

- . Clean the access limit criteria and segments adjacent to openings and joints as appropriate
□ methods and limit cleaning criteria approved by the contractors firestopping products
□ and products in fire opening and joints occur.
- B. Protect firestopping during and after curing period from contact with contaminated substances
or from the dust resulting from construction operations or other causes so that they are not
deterioration or due to the time of substantial completion. In spite of such protection, dust

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- If deterioration occurs, cut out and replace damaged or deteriorated firestopping in accordance
- and install new materials to produce firestopping comparable in its specified requirements.

□ **END OF SECTION**

SECTION 07 9000 JOINT SEALANTS

PART 1 - GENERAL

1.01. RELATED DOCUMENTS

- A. Drawings and General Provisions of Contract, including General and Supplemental Conditions and Division 0 Specification Sections, apply to this Section.

1.02. SUMMARY

- A. This Section includes joint sealants for the following locations:
 - 1. Exterior Joints in Vertical Surfaces and nontraffic horizontal surfaces as indicated below:
 - a. Control and expansion joints in cast-in-place concrete.
 - b. Control and expansion joints in unit masonry.
 - c. Joints between different materials listed above.
 - d. Perimeter joints between materials listed above and frames of doors and windows.
 - e. Control and expansion joints in ceiling and overhead surfaces.
 - f. Other joints as indicated.
 - 2. Exterior Joints in Horizontal Surfaces as indicated below:
 - a. Control, expansion, and isolation joints in cast-in-place concrete slabs.
 - b. Joints between different materials listed above.
 - c. Other joints as indicated.
 - 3. Interior Joints in Vertical Surfaces and horizontal nontraffic surfaces as indicated below:
 - a. Control and expansion joints on exposed interior surfaces of exterior walls.
 - b. Perimeter joints of exterior openings where indicated.
 - c. Vertical control joints on exposed surfaces of interior unit masonry and concrete walls and partitions.
 - d. Perimeter joints between interior surfaces and frames of interior doors, windows.
 - e. Perimeter joints of other features.
 - f. Other joints as indicated.
 - 4. Interior Joints in Horizontal Surfaces as indicated below:
 - a. Control and expansion joints in cast-in-place concrete slabs.
 - b. Other joints as indicated.
- B. Related Sections of the following Sections contain requirements that relate to this Section:
 - 1. Division 0 Section "Exterior Insulation and Finish Systems - Class PB" for exterior systems.
 - 2. Division 0 Section "Masonry and Sheet Metal" for sealing joints related to masonry and sheet metal roofing.
 - 3. Division 0 "Glass and Glazing" for sealants used in glazing.
 - 4. Division 0 Section "Acoustic Drapery" for sealing concealed perimeter joints of acoustic partitions to reduce sound transmission.
 - 5. Division 0 Section "Tile" for sealing tile joints.

1.03. SYSTEM PERFORMANCE REQUIREMENTS

- A. Provide elastomeric joint sealants that have been produced and installed to standards and contain no harmful and direct contaminants that cause staining or deterioration of adjacent substrates.

1.04. SUBMITTALS

- A. General Submit the following in accordance with Conditions of Contract and Division 0 Specification Sections.
 - 1. Product data from manufacturers for each joint sealant product required.

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- C. Certificates from manufacturers must be submitted attesting that their products comply with specific requirements and are suitable for the use indicated.
- D. Product test reports for each type must be submitted indicating compliance with requirements specified.

1.05. QUALITY ASSURANCE

- A. Inspector Qualifications Employ an experienced Inspector who has completed must submit applications showing in detail design, and extent to that indicated for Project that will be required in construction and record access in service performance.
- B. Single Source Responsibility for Joint Sealant Materials Obtain must submit materials from a single manufacturer for each different product required.

1.06. DELIVERY, STORAGE, AND HANDLING

- A. Deliver Materials to Project site in original unopened containers or packages in accordance with manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for application of materials.
- B. Store and Handle Materials in compliance with manufacturer's recommended conditions to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.07. PROJECT CONDITIONS

- A. Environmental Conditions Do not proceed with installation must submit under the following conditions:
 - a. When ambient and substrate temperature conditions are outside the limits permitted by must submit manufacturer.
 - b. When must submit substrates are wet.
- B. Joint Drying Conditions Do not proceed with installation must submit under must submit conditions are less than required by must submit manufacturer for application indicated.
- C. Joint Substrate Conditions Do not proceed with installation must submit under conditions containing copious interfering dirt or debris are removed from must submit substrates.

PART 2 - PRODUCTS

2.01. MATERIALS, GENERAL

- A. Compatibility Provide must submit, must submit, and other related materials that are compatible with one another and with must submit substrates under conditions of service and application, as demonstrated by must submit manufacturer based on testing and field experience.
- B. Colors Provide color approved must submit to comply with the following:
 - a. Provide selections of color architect from manufacturer's standard color cards for products type indicated.

2.02. ELASTOMERIC JOINT SEALANTS

- A. Elastomeric Sealant Standard Provide manufacturer's standard chemical curing elastomeric sealants that comply with ASTM C and other requirements indicated, including those requirements referenced for Type, Grade, Class, and Uses.
- B. Multiport One-Part Retention Sealant for Use of Type M, Grade 0S, Class 00, and Compmin in the following requirements for Uses:
 - a. Uses: T, M, 0, and, as applicable to must submit substrates indicated, 0.
- C. One-Part One-Part Retention Sealant for Use of Type S, Grade 0S, Class 00, and Compmin in the following requirements for Uses:
 - a. Uses: T, M, 0 and, as applicable to must submit substrates indicated, 0.
- D. One-Part One-Part Retention Sealant for Use of Type S, Grade 0S, Class 00, and Compmin in the following requirements for Uses:
 - a. Uses: T, M, 0 and, as applicable to must submit substrates indicated, 0.

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- E. OnePart Porecrete Retention Seament or Use T Type S, Grade P, Class 00, and compaining it the main requirements or uses
- a. Uses T, M, 0 and, 0s applicat to mint substrates indicated, 0.
0. 00000e Products Subject to compiance it requirements, esteric seaments 00ic 0 0e incorporated in the 0 0r include, 0t are not 00ited to, the main
- a. MultiPart 00ns 0 Retention Seament or Use T
 - a. "D00tr00" 0 Pec00 Corp.
 - a. "S000stic 0P 0" 0S00ne00rn B00din0 Pr00cts Di0, Re0h0rd C0e0ic0 Pr00cts Inc.
 - c. "D00eric" 0 Tre0 c0, Inc.
 - a. OnePart 00ns 0 Retention Seament or Use T
 - a. "000e 00" 0 Tre0 c0, Inc.
 - a. "Cymonic"; Tremco, Inc.
 - c. "D00tr00" 0 Pec00 Corp.
 - d. "S000stic 0P 0" 0S00ne00rn B00din0 Pr00cts Di0, Re0h0rd C0e0ic0 Pr00cts, Inc.
 - a. OnePart 00ns 0 Retention Seament or Use T
 - a. "000e 00" 0 Tre0 c0, Inc.
 - a. "0R000 0re0p0n" 0 Pec00 Corp.
 - c. "S000stic S0 000S00ne00rn B00din0 Pr00cts Di0, Re0h0rd C0e0ic0 Pr00cts, Inc.
 - a. OnePart Porecrete Retention Seament or Use T
 - a. "000e 00" 0 Tre0 c0, Inc.
 - a. "0R000 0re0p0n" 0 Pec00 Corp.
 - c. "S000stic 000S00ne00rn B00din0 Pr00cts Di0, Re0h0rd C0e0ic0 Pr00cts, Inc.

2.03. SOLVENT-RELEASE-CURING JOINT SEALANTS:

0. ButSeament Manufacturer's standard one part, nonsol, solvent release curing, polymerized 000seament compaining it 0S TT S000000 or Type I and 0r 000ted 00 00 00 00 percent solids to be nonsolining, paintable, and 00e 0t 0000e tie 000 000s or less.
- B. 00000e Products Subject to compiance it requirements, solvent release curing mint seaments 00ic 0 0e incorporated in the 0 0r include, 0t are not 00ited to, the main
- a. ButSeament
 - a. "C0e0 C00000" 0 B0stic0 C0nstr0cti0n Pr00cts Di0
 - a. "BC0000" 0 Pec00 Corp.
 - c. "PTI 000" 0 Pr0tectic0 Tre0t0 ents Inc.
 - d. "Tre0 c0 ButSeament" 0 Tre0 c0 Inc.

2.04. LATEX JOINT SEALANTS:

0. 0cr0icE0 0si0n Seament Manufacturer's standard one part, nonsol, 0ide0 resistant, 0cr0icE0 0si0n seament compaining it 0STM C 000, 0r 000ted to be painted and rec0 0ended 0r e00sed applicati0ns 0n interi0r and 0n pr0tected e0teri0r 0cati0ns in000in0 mint 00e0 ent 000t 0 0re t000 p0s 0r 00 00s 0 percent.
- B. Silic0ne E0 0si0n Seament Manufacturer's standard one part, nonsol, 0ide0 resistant, silic0neE0 0si0n seament compaining it 0STM C 000 and 0STM C 000, 0r 000ted to be paintable and rec0 0ended 0r e00sed applicati0ns 0n interi0r and 0n pr0tected e0teri0r 0cati0ns in000in0 mint 00e0 ent 000t 0 0re t000 p0s 0r 00 00s 00000 percent.
- C. 00000e Products Subject to compiance it requirements, 0te0 mint seaments 00ic 0 0e incorporated in the 0 0r include, 0t are not 00ited to, the main
- a. 0cr0icE0 0si0n Seament
 - a. "0C000" 0 Pec00 Corp.
 - a. "S0000c" 0S00ne00rn B00din0 Pr00cts Di0 0 Re0h0rd C0e0. Pr0d., Inc.
 - c. "Tre0 c0 0cr0ic 00te0 000" 0 Tre0 c0 Inc.

- Silicone Emission Sealant
- "Permanence Plus Silicone Sealant" DOW Corning Corp.

2.05. ACOUSTICAL JOINT SEALANTS

- Acoustical Sealant Manufacturer's standard non-sag, paintable, non-staining latex sealant compatible with ASTM C 1191 and the following requirements:
 - Product is effective in reducing airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies per ASTM E 99.
 - Product has a wide spread and a good deformed ratio as tested per ASTM E 99.
- B. Acoustical Sealant for Concealed Joints Manufacturer's standard, non-draining, non-hardening, non-sagging, non-staining, non-sag, synthetic rubber sealant recommended for sealing interior concealed joints to reduce transmission of airborne sound.
 - Qualifying Products Subject to compliance with requirements, acoustical joint sealants that will be incorporated in the following include, but are not limited to, the following:
 - Acoustical Sealant
 - 1) "SHEETROCK Acoustical Sealant," United States Gypsum Co.
 - 2) "AC-20 FTR Acoustical and Insulation Sealant," Pecora Corp.
 - 3) "Tremco Acrylic Latex 834"; Tremco Inc.
 - Acoustical Sealant for Concealed Joints
 - 1) "BA-98," Pecora Corp.
 - 2) "Tremco Acoustical Sealant," Tremco, Inc.
 - 3) "Tremco Acrylic Latex 834"; Tremco Inc.

2.06. JOINT SEALANT BACKING

- General Provide sealant backings and tape that are non-staining, compatible with joint substrates, sealants, primers and other joint fillers and are approved for applications indicated by sealant manufacturer based on field experience and manufacturer testing.
- B. Plastic Joint Fillers Preferred, compressible, resilient, non-staining, non-draining, non-expanding strips made of plastic material indicated below and size, shape, and density to control joint depth and otherwise contribute to producing optimum sealant performance.
 - Either open cell polyethylene foam or closed cell polyethylene foam, subject to appropriate sealant manufacturer.
- C. Band Breaker Tape Polyethylene tape or other plastic tape is recommended sealant manufacturer for preventing sealant from adhering to rigid, inelastic joint filler materials or joint surfaces that could prevent proper adhesion of sealant to joint substrate. Provide sealant residue tape where applicable.

2.07. MISCELLANEOUS MATERIALS

- Primer Materials recommended for joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined by preconstruction joint sealant substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces Chemical cleaners acceptable to manufacturer of sealants and sealant backing materials, free of residues or other substances capable of staining or bonding in or on joint substrates and adjacent nonporous surfaces, and are suited to produce optimum adhesion of sealants to joint substrates.
- C. Mastic Type Non-staining, non-sagging material compatible with joint sealants and surfaces adjacent to joints.
- D. Joint Fillers for Concrete Perimeter Provide joint fillers of thickness and width indicated.
 - Bituminous Joint Filler Preferred strips of composition noted below, compatible with ASTM D 1065.
 - Asphalt is not to be used.

PART 3 - EXECUTION

3.01. EXAMINATION

- . Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint condition, installation tolerances, and other conditions affecting joint sealant performance. Do not proceed with installation of joint sealants until conditions have been corrected.

3.02. PREPARATION

- . Surface Cleaning Clean all joints in a dedicated area installed joint sealants to comply with record conditions of joint sealant manufacturer and the manufacturer's requirements.
 - . Remove all foreign materials that could interfere with adhesion of joint sealant, including dust, paints, oil, grease, or other contaminants, protective coatings tested and approved for sealant adhesion and compatibility with sealant manufacturer's joint sealants, oil, grease, water, dirt, and dust.
 - . Clean concrete, masonry, and other surfaces with appropriate methods, and remove all loose material, including sand, dirt, and other debris, by methods such as sandblasting, grinding, or other methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove all loose particles resulting from cleaning operations by vacuuming or blowing out joints with compressed air.
 - . Remove laitance and other release agents from concrete.
 - . Clean metal, glass, porcelain, and other surfaces with appropriate methods, and remove all loose material, including dirt, oil, grease, and other contaminants, by methods such as sandblasting, grinding, or other methods to produce a clean, sound substrate, or other residues capable of interfering with adhesion of joint sealants.
- . Joint Priming Prime joint substrates where indicated or where recommended by joint sealant manufacturer based on preconstruction joint sealant substrate tests or prior experience. Apply primer to comply with joint sealant manufacturer's record conditions. Confine primers to areas of joint sealant and do not allow spillage or migration onto adjoining surfaces.
- . Masking Tape Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise could be permanently stained or discolored by direct contact or by cleaning methods required to remove sealant sealers. Remove tape immediately after finishing of joint sealant.

3.03. INSTALLATION OF JOINT SEALANTS

- . General Comply with joint sealant manufacturer's printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.
- . Sealant Installation Standard Comply with record conditions of ASTM C 1191 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- . Elastic Sealant Application Standard Comply with record conditions of ASTM C 1191 for use of joint sealants in elastic applications as applicable to materials, applications, and conditions indicated.
- . Installation of Sealant Bead Install sealant bead in accordance with the manufacturer's requirements.
 - . Install joint fillers of type indicated to provide support for sealant during application and at position required to produce the cross-section shapes and depths of installed sealants relative to joint widths that allow optimum sealant placement capability.
 - . Do not leave gaps between ends of joint fillers.
 - . Do not stretch, twist, puncture, or tear joint fillers.
 - . Remove all excess joint fillers that have been placed prior to sealant application and replace with dry material.
 - . Install and order type between sealants where filler rods are not used between sealants and joint fillers or backfill.
- . Installation of Sealants Install sealants by proven techniques that result in sealants directed continuously and uniformly into joint substrates, completely filling recesses provided for each joint condition, and providing uniform, cross-section shapes and depths relative to joint widths.

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that allow optimal sealant placement capability. Installments at the same time sealant
occasions are installed.

- . Topping Seams shall be edited after sealant application and prior to the setting or
curing begins, toppings to the surface, and leads to configuration indicated, to
eliminate air pockets, and to ensure contact and adhesion of sealant into sides joint. Re-
cess sealants from surfaces adjacent to joint. Do not use topping agents that disperse sealants
or adjacent surfaces or are not approved sealant manufacturer.

- . Provide concrete joint configuration per figure in ASTM C 110, unless otherwise
indicated.

- . Use of skin type to protect adjacent surfaces recessed topped joints.

- . Provide recessed joint configuration, per figure in ASTM C 110, recess depth and at
locations indicated.

3.04. CLEANING

- . Clean recess sealants or sealant seeps adjacent to joints as progresses or methods
and site cleaning materials approved by manufacturer of joint sealants and products in
field joints occur.

3.05. PROTECTION

- . Protect joint sealants during and after curing period from contact with contaminating substances
or from damage resulting from construction operations or other causes so that there is no
deterioration or damage at time of substantial completion. In despite such protection, damage
or deterioration occurs, cut out and re-apply damaged or deteriorated joint sealants in edited
so that and installations of repaired areas are indistinguishable from original work.

END OF SECTION

SECTION 08 1100 STEEL DOORS AND FRAMES

PART 1 - GENERAL

1.01. RELATED DOCUMENTS:

- . Drawings and General provisions of Contract, including General and Supplemental Conditions and Division Specifications sections, apply to this section.

1.02. DESCRIPTION OF WORK:

- . Extent of standard steel doors and frames is indicated and scheduled on drawings.
- . Finish schedule is specified elsewhere in Division 1.

1.03. QUALITY ASSURANCE:

- . Provide doors and frames comply with Steel Door Institute "Recommended Specifications Standard Steel Doors and Frames" (SDI) and as herein specified.
- . Test types Secure test types for finish schedule supplier for specified schedule and continuing locations.
- . Fire door assemblies shall be installed in accordance with the provisions of CBC Section 10B and of the CBC code.

1.04. SUBMITTALS:

- . Product Data Submit manufacturer's technical product data substantiating that products comply with requirements.
- . Shop Drawings Submit door schedule related to the opening identification sheets shown on the drawings. Include details of each frame type, ejections and door design types, conditions of opening, details of construction, extent of reinforcement and type and location of frame anchors and opening, and fire rating locations.
 - . Provide schedule doors and frames with same reference numbers for details and openings as those on contract drawings.
- . Samples Obtain one color sample for architect selection samples, if sample is in, each color and texture selected for manufactured doors and frames.

1.05. DELIVERY, STORAGE AND HANDLING:

- . Deliver shall be delivered and crated to provide protection during transit and in storage. Provide additional sealed plastic wrapping for manufactured doors.
- . Inspect shall be delivered upon delivery for door. Minor damages shall be repaired provided reinstalled items are approved in respects to new door and accepted to architect otherwise, reject and replace damaged items as directed.
- . Store doors and frames at building site under cover. Place units on minimum 4" thick wood blocking. Use nonoriented plastic or canvas covers to protect doors and frames from weather. Use proper storage and handling practices. Do not store doors and frames in direct sunlight. Provide spaces between stored doors to provide for circulation.

PART 2 - PRODUCTS

2.01. ACCEPTABLE MANUFACTURERS:

- . Acceptable Manufacturers Subject to compliance with requirements, manufacturers of steel doors and frames shall be incorporated in the schedule and are not limited to, the following:
 - . Ceco Corp.
 - . Carries Mfg., Inc.
 - . Steelcraft Division of Ericson Standard Co.

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- ☐ ☐ Rep~~o~~ic B~~i~~ders Pr~~d~~ucts C~~r~~p.~~.~~S~~o~~s. Rep~~o~~ic Stee~~e~~

2.02. MATERIALS:

- A. Hot Rolled Steel Sheets and Strip C or D is applicable to carbon steel, pickled and oiled, cold rolled and hot rolled, and hot rolled and cold rolled.
- B. Cold Rolled Steel Sheets C or D is applicable to carbon steel, cold rolled and hot rolled, and hot rolled and cold rolled.
- C. Supports and Anchors are applicable to not less than 1/4 inch thick galvanized sheet steel.
- D. Inserts, Bolts and Fasteners Manufacturer's standard units, cold rolled and hot rolled, C or D is applicable.
- E. Shop Applied Paint
- A. Primer Rust inhibitive enamel paint, either air drying or drying, suitable as a base for specified finish paints.

2.03. STANDARD STEEL DOORS:

- ☐ Provide etching types and sizes indicated in Table 1 or as indicated in schedules.
- B. Compare ISI and SDF requirements as follows:
- ☐ Interior Doors-SDF, Grade II, Medium, Initial and Final stages.
 - ☐ Exterior Doors-SDF, Grade III, Extra Medium, Medium, and Final stages.
- C. Sanded Red Doors were shown or scheduled, provide doors which have been specified as sand red color type, tested in accordance with STM E 1, and classified in accordance with STM E 1.
- ☐ Unless otherwise indicated, provide doors with sand ratings STC 10 or better.

2.04. STANDARD STEEL FRAMES:

- Q. Provide details of doors, transoms, windows and other openings, types and sizes as shown on drawings and schedules. Check consistency, unless otherwise indicated. Indicate how the indicated unit is steel noted below
- Q. Indicate how it is fitted and added corners, round spots
 - Q. How exterior how is the steel
 - Q. How interior how is the steel
- B. Door Silencers Drivestops to receive silencers on strike how is shown in how.
- C. Poster boards Provide how the steel poster boards or other pieces, added to how, it is shown in how or where or other details is not construct how are operation and to use interior openings.

2.05. FABRICATION, GENERAL:

- A. Corrode the steel and remove units to be rigid, next in appearance and free from defects, or repair or replace. Wherever practicable, fit and assemble units in manufacturer's plant. Clearly identify individual units to permit identification of units assembled before shipment, to assure proper assembly at project site. Comply with all SDC and SDI requirements.
- B. Interim Construction Manufacturer's standard concrete, polystyrene, polystyrene, unitized steel, vertical steel stiffeners, or rigid inner liner core with internal sand and denser on inside face sheets where appropriate in accordance with SDC standards.
- C. Clearances must be more than 1/4 inch at joints and heads must be more than 1/4 inch at joints.
- D. Corrode the exposed faces and doors from uncoated steel.
- E. Case top and bottom edges of exterior doors is inter-protect door construction or in addition to initial in-protect inserted steel channels.
- F. Corrode the faces, concealed stiffeners, reinforcement, edge channels, doors and partitions from either coated or uncoated steel with protective options.

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- Exposed fasteners unless otherwise indicated, provide countersunk Phillips heads or exposed screws and nuts.
- Finish and/or Preparation Prepare doors and frames to receive painted and concealed finish and/or in accordance with the finish and/or Schedule and templates provided by door and frame supplier. Complete application requirements shall be in accordance with the door and frame preparation for finish.
- Reinforce doors and frames to receive surface applied finish. Drilling and tapping for surface applied finish shall be done at project site.
- Create finish as indicated in Section 05 00 00 "Finish Carpentry"
- Stop Painting
- Clean, treat, and paint exposed surfaces of steel door and frame units, including painted surfaces.
- M. Clean steel surfaces of rust, grease, dirt, and other foreign materials before application of paint.
- Apply paint in prime paint when consistency to provide uniform finished surface ready to receive finish paint.
- Finish Stops Mini or 1/2 inch steel
 - Provide non-recessed stops on outside exterior doors for glass, windows, and other panels in doors.
 - Provide screw applied recessed stops on inside windows, windows, and other panels in doors.

PART 3 - EXECUTION

3.01. INSTALLATION:

- General Install and/or steel doors, frames, and accessories in accordance with the shop drawings, manufacturer's data, and as herein specified.
- Positioning Complete provisions of SDI "Recommended Erection Instructions for Steel Doors", unless otherwise indicated.
 - Except for frames located at corners and at door installations, place frames prior to construction of enclosing walls and ceilings. Set frames accurately in position, plumb, aligned, and braced secure against movement. Anchors are set. After construction is completed, remove temporary bracing and spreaders leaving surfaces smooth and undisturbed.
 - In set steel partitions, install least 4 anchors per foot of line and strike lines. In closed steel partitions, attach anchors to studs with tapping screws.
- Door Installation
- Set set doors accurately in frames, within clearances specified in SDI.

3.02. ADJUST AND CLEAN:

- Prime Coat Touchup of mediate after erection, sand smooth on rusted or damaged areas of prime coat and apply touchup according to the manufacturer's primer.
- Final Adjustments Check and readjust operation of finish and/or items, leaving steel doors and frames undisturbed and in complete and proper operating condition.

END OF SECTION



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SECTION 08 2000 WOOD DOORS

PART 1 - GENERAL

1.01. RELATED DOCUMENTS

- . Drawings and General Provisions of Contract, including General and Supplemental Conditions and Division Specifications sections, apply to this section.

1.02. SUMMARY

- . Section Includes
 - Solid core doors with wood veneer MDI and plastic laminate faces.
 - Factory finished solid doors.
 - Factory fitted solid doors to frames and factory fabricated for hardware.

1.03. SUBMITTALS

- . Product Data for each type door. Include details of core and edge construction, hinges, and trim for openings. Include factory finish specifications.
- B. Shop Drawings Indicate location, size, and wood core door selection and door construction details not covered in Product Data and the following
 - Dimensions and locations of doors.
 - Dimensions and locations of hinges and frames for hardware.
 - Dimensions and locations of details.
 - Hangers.
 - Requirements for veneer or finish.
 - Doors to be factory finished and finish requirements.
 - Fire protection ratings for fire rated doors.
- C. Samples for verification
 - Plastic laminate, includes color of surface, for each color, texture, and pattern selected.
 - Frames for door openings, includes color of finish, for each material type, and finish required.

1.04. DELIVERY, STORAGE, AND HANDLING

- . Components requirements referenced standard and manufacturer's written instructions.
- B. Pack doors individually in cardboard cartons and wrap handles and doors in plastic sheeting.
- C. Mark each door on top and attach radio tag to opening number used on Shop Drawings.

1.05. FIELD CONDITIONS

- . A. Environmental conditions Do not deliver or install doors until spaces are enclosed and dehumidified, wet room spaces is complete and dry, and HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during re-order construction period.
- B. Environmental conditions Do not deliver or install doors until spaces are enclosed and dehumidified, wet room spaces is complete and dry, and HVAC system is operating and maintaining temperature between 60 and 80 degrees and relative humidity between 60 and 80 percent during re-order construction period.

1.06. WARRANTY

- . Specific Warranty Manufacturer agrees to repair or replace doors that within 12 months or 12 months ship within specified warranty period.
 - Items include, but are not limited to, the following
 - Hinges, knobs, cap, or fasteners are taken into account in the manufacturer's section.
 - Temperature core construction in face veneers exceeding 1.00 inch in 1.00 inch span.

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- ☐ ☐ Current systems include installation and this in turn will be required due to repair or replacement of defective doors.
- ☐ ☐ Current Period for Solid Core Interior Doors is installation

PART 2 - PRODUCTS

2.01. MANUFACTURERS

- . Source citations □ t□in □ s□ d□ r□ sin□ □ n□ct□er.

2.02. FLUSH WOOD DOORS, GENERAL

- [illegible]

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- Edge Construction not in styles, provide in the edge construction it is provided
screen in composition and split resistance. Composition specified requirements for
expected edges.

2.03. VENEER-FACED DOORS FOR TRANSPARENT FINISH

- . Interior Solid Core Doors □
 - □rde□Cost□ □rde □ □ces□
 - Mtc□et□een □eneer □e□es□Sip □ □tc□
 - □sse□ □□ □eneer □e□es □n Door □ces□B□nce □ □tc□
 - R□□ Mtc□Pr□ide door □ces □c□ p□t□e c□rr and □r□n □t□n e□c□ sep□r□te r□□□ □r □re□ □□□□d□n□
 - E□□sed □ertic□□nd Top Ed□es□□□ e□pecies □s □ces □r □ c□ p□t□e□ species □ed□e Type □.
 - C□re□P□rt□e□□□rd Str□ct□r□c□□ p□s□te □□ □er.
 - C□nstr□ct□n□□□□e□ p□ies. St□ies and r□is □re □□nded t□ c□re, t□en entire □nit □s □□r□s□e p□□ned □e□re □eneer□n□. □□ces □re □□nded t□ c□re □s□n□ □ □□t p□ress.
 - □ DM□ I.S.□□ Per□r□ □nce □rde□E□tr□ □e□□□ D□t□

2.04. DOORS FOR OPAQUE FINISH

- [illegible]

2.05. PLASTIC-LAMINATE-FACED DOORS

- ☐ Interior Solid Core Doors ☐ Insert drawers in design
- ☐ ☐ Under Cabinet.
- ☐ Plastic in the process of pressing decorative in the cabinet EM or S.
- ☐ Colors, Patterns, and Finishes indicated.
- ☐ Exposed Vertical and Top Edges are rounded edges for staining to all faces.
- ☐ Core Particle Board Structural composite per.
- ☐ Construction of piles. Stiles and rails are bonded to core, then entire unit is oversize pined where pieces and crossbands are applied. Pieces are bonded to core using glue press.
- ☐ DM J.S. Per once order Entry Room Data

2.06. LIGHT FRAMES AND LOUVERS

- [illegible]

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- B. Laminated Beams for door openings in fire-rated doors. Manufacturer's standard laminated beams of suitable species and grades and approved for use in doors fire protection rating indicated. Include concealed fasteners and clips where required for opening size and fire protection rating indicated.
- C. Metal plates for door openings in fire-rated doors. Manufacturer's standard galvanized or painted steel plates of suitable thickness and approved for use in doors fire protection rating indicated.
- D. Metal plates
- Bore Type fasteners inserted.
 - Metal plate of suitable thickness and approved for use in doors fire protection rating indicated.
- E. Metal plates for fire-rated doors. Metal plates of suitable thickness and approved for use in doors fire protection rating indicated.
- Metal plate of suitable thickness and approved for use in doors fire protection rating indicated.

2.07. FABRICATION

- Fabricate doors to suit door opening sizes indicated. Complete to clearance requirements as referenced in standard or listing unless otherwise indicated.
- Complete to P1 requirements for fire-rated doors.
- B. Fabricate doors for hardware that is not surface applied. Fabricate hardware to complete to D1 or D2. Complete to hardware schedules, door frame Schedules, B.M. and door frame details.
- Coordinate with hardware fabricators in order to determine dimensions and finish of hardware.
 - Metal structure of door frame and hardware to be installed for pairs of fire-rated doors.
- C. Transom and Side Panels fabricate of suitable panels of suitable construction, exposed surfaces, and finish as specified for associated doors. Finish of transoms and top edges of associated doors same as door styles.
- Fabricate door and transom panels of suitable material, solid or laminated, of suitable material. Provide hardware installed spring bolts for concealed attachment into door frame.
- D. Openings for door and transom openings for doors.
- Door openings for openings of suitable dimensions and profile indicated.
 - Openings for openings in doors indicated to be installed. Complete to application requirements in Section 0000 "Finish".
 - Openings for openings in prepared openings.

2.08. FACTORY FINISHING

- Fabricate complete to referenced standard or listing. Complete finishing, including fitting doors for openings and fabricating for hardware that is not surface applied, as indicated.
- Finish of doors, edges, edges of doors, and hardware. Stains and finishes of doors, edges, edges of doors, and hardware.
- B. Fabricate finish doors that are indicated to receive transparent finish.
- C. Transparent finish
- Bore Type.
 - Finish of DM or TR conversion finish or DM or TR conversion paint.
 - Staining of doors or frames.
 - Sealing of doors.

PART 3 - EXECUTION

3.01. EXAMINATION

- A. Examine doors and installed door frames, with Installer present, before opening doors.
 - 1. Verify that installed frames comply with indicated requirements for type, size, location, and sizing characteristics and have been installed with clearances and proper seals.
 - 2. Reject doors with defects.
- B. Proceed with installation only after installation conditions have been corrected

3.02. INSTALLATION

- A. Order/reorder installation, see Section 05 00 00 "Finish Carpentry."
- B. Installation Instructions: Install doors to comply with manufacturer's written instructions and referenced product standard, and as indicated.
 - 1. Install fire-rated doors according to NFPA 80.
 - 2. Install second draft control doors according to NFPA 80.
- C. Accept/Reject Doors: In frames for finish clearance at eache.
- D. Accept/Reject Doors: Restore finish before installation fitting or painting is required at Project site.

3.03. ADJUSTING

- A. Operation: Repair or replace doors that do not swing or operate freely.
- B. Finish: Replace doors that are damaged or that do not comply with requirements. Doors to be repaired or refinished in accordance with requirements and show no evidence of repair or refinishing.

END OF SECTION



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**SECTION 08 3100
ACCESS DOORS & FRAMES**

PART 1 - GENERAL

1.01. RELATED DOCUMENTS

- . Drawings and General provisions of the Contract, including General and Supplemental Conditions and Division 08 Specification Sections, apply to this Section.

1.02. SUMMARY

- . Section includes access doors and frames for walls and ceilings.

1.03. ALLOWANCES

- . Access doors and frames are part of an access door and frame allowance.

1.04. ACTION SUBMITTALS

- . Submit for compliance with the Basis of Design products are provided, Submit for compliance with the specified in the required Product Data sheets and Samples submit. Ensure compliance with requirements included in Section 08 0000.
- B. Product Data for each type of product.
 - . Include construction details, fire ratings, material descriptions, dimensions and individual components and profiles, and finishes.
- C. Samples for each type of access door and frame and for each finish specified, complete assemply in the same sizes in size.
- D. Product Schedule for access doors and frames. Use same designations indicated on Drawings.

PART 2 - PRODUCTS

2.01. PERFORMANCE REQUIREMENTS

- . Fire Rated Access Doors and Frames assemply meets compliance with the test that are listed and tested with qualified testing agency, for fire protection ratings indicated, according to the test or the test.

2.02. ACCESS DOORS AND FRAMES

- . Provide Access Doors into Concealed spaces
 - . Manufacturers Subject to compliance with requirements, include manufacturers of the products that will be incorporated into the project include, but are not limited to, the following:
 - . Baccardis.
 - . Industries, Inc. division of the Action Construction Products Corp.
 - c. Corp Associates, Inc.
 - d. Marsens Manufacturing Company
 - e. MicroComercial Products Corp. or part of Comex, Inc.
 - . Astron, Inc.
 - . Description of the door and its frame into concealed space for open and installation and concealed frame.
 - . Uncoated Steel Sheet for Door in the same inch, or same, unpainted.
 - . Stainless Steel Sheet for Door in the same inch, or same, or finish.
 - . Frame Material same material and thickness as door.
 - . Frame and access door frame, be operated.
- B. Recessed Access Doors into Concealed spaces

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- Manufacturers Subject to compliance with requirements, including manufacturers herein products that will be incorporated into the project include, but are not limited to, the following:
 - Baccus Doors.
 - Industries, Inc. division of the Action Construction Products Group.
 - c. OneWire Manufacturing Corp.
 - d. Sensens Manufacturing Company
 - e. MicroCore Emergency Products Group or part of Core, Inc.
 - Astron, Inc.
- Description: Door will be recessed into the floor and installed in the wall and ceiling.
- Uncoated Steel Sheet or Door will be in the wall and ceiling, or door, unpainted.
- Stainless Steel Sheet or Door will be in the wall and ceiling, or door, unpainted.
- Steel and Steel Core Steel, unpainted.

2.03. FIRE-RATED ACCESS DOORS AND FRAMES

- Fire Rated, Fire Access Doors will be installed in the wall and ceiling.
 - Manufacturers Subject to compliance with requirements, including manufacturers herein products that will be incorporated into the project include, but are not limited to, the following:
 - Baccus Doors.
 - Industries, Inc. division of the Action Construction Products Group.
 - c. Corp Associates, Inc.
 - d. Astron, Inc.
 - Description: Door will be in the wall and ceiling, or door, unpainted, and installed in the wall and ceiling.
 - Fire Resistance Rating will be less than that of the construction.
 - Uncoated Steel Sheet or Door will be in the wall and ceiling, or door, unpainted.
 - Stainless Steel Sheet or Door will be in the wall and ceiling, or door, unpainted.
 - Steel and Steel Core Steel, unpainted, or door, unpainted.

2.04. MATERIALS

- Steel Plates, Shapes, and Bars ASTM A 36 or A 572.
- B. Steel Sheet uncoated or electrocoat, ASTM A 36 or A 572, or cold rolled steel sheet or strip to comply with ASTM A 36 or A 572, Core Steel CS exposed.
- C. Stainless Steel Sheet, Strip, Plate, and Bar ASTM A 304, Type 304 Rebar to be tested and die tests and stretch tests, or bend into this.
- D. Core Enclosures Steel or other materials door will be.
- E. Inserts, Bolts, and Anchor Fasteners will be dip galvanized steel according to ASTM A 304 or A 307 or ASTM A 308.

2.05. FABRICATION

- General: Provide access door and frame assemblies constructed as interlocks ready for installation.
- B. Metal Surfaces: Metal surfaces exposed to the interior of the project, provide materials with a smooth, flat surface without welds. Do not use materials with exposed pitting, seams, cracks, roller marks, rolled trade marks, or roughness.
- C. Doors and Frames: Provide doors and frames with a smooth surface. Provide continuous, attached end devices and fasteners as required to secure access doors to types supports indicated.
 - For concealed hinges will be drilled, provide edge trim or lips panels secure attached to perimeter surfaces.

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- D. Recessed Access Doors shall be approved to provide recess for application applied this. Reinforce panels required to prevent cracking. Provide access sleeves for electric meter and install in place of this.
- a. For recessed doors into plaster in the provide sealant in expanded metal attached to door panel.

2.06. FINISHES

- A. Complete all MMS "Metal Finishes Manual" Architectural and Metal Products" for recommended conditions for application and design in this.
- B. Protect mechanical finishes on exposed surfaces from damage by application of stripping, temporary protective covering before stripping.
- C. Appearance finished of surface conditions in some piece are not acceptable. Conditions in appearance of components are acceptable if they are within the range of approved Samples and are assessed or installed to initiate contrast.
- D. D. Painted Finishes Complete all coating of manufacturer's written instructions for cleaning, conversion coating, and application and curing this.
- a. Select Primed application of manufacturer's standard, lead and cadmium free, and primer in a edited after surface preparation and pretreatment.
- E. Stainless Steel Finishes
- a. Surface Preparation Remove all dirt and stretch lines, or bend into this.
- b. Polished Finishes of this. Grind and polish surfaces to produce mirror finish, free of cross scratches.

PART 3 - EXECUTION

3.01. EXAMINATION

- A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance once the work is done.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02. INSTALLATION

- A. Complete all of manufacturer's written instructions for installing access doors and frames.

3.03. ADJUSTING

- A. Adjust doors and hardware, after installation, for proper operation.

END OF SECTION

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SECTION 08 4100 ALUMINUM STOREFRONTS AND ENTRANCES

PART 1 - GENERAL

1.01. SECTION INCLUDES

- A. Aluminum framed storefronts

1.02. REFERENCES

- A. MMCA Code Book Code and Condition Architectural Code in the Shop to Site Application Architectural Manufacturers Association
- B. MMCA Code Book
- C. MMCA Code Book
- D. ASTM E 997 Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors under Static Air Pressure Difference
- E. ASTM E 1886

1.03. PERFORMANCE REQUIREMENTS

- A. System Internal Drainage Drain to the exterior or to a deep drainage network on the exterior into drains, condensation occurring in window frame and glazing gasket occurring within system.
- B. Thermal Movement Anticipate exterior components from manufacturers stock systems will have been designed to provide for expansion and contraction resulting from different temperature range design.
- C. Wind Load Anticipate exterior components from manufacturers stock systems will have been tested in accordance with ASTM E 997 to withstand at least design wind load.
- D. Water Resistance The test specimen will be tested in accordance with ASTM E 997. There shall be no leakage at a minimum static air pressure differential of 15 psf. Press defined in MMCA Code Book.

1.04. SUBMITTALS

- A. See Section 01 0000 Administrative Requirements, for submittal procedures.
- B. Product Data Provide component dimensions describe components within scope of, include and fasteners, glass and insulating details.
- C. Shop Drawings Indicate system dimensions, framed opening requirements and tolerances, expected relative to air, expansion and contraction joint location and details, and field condition required.
- D. Manufacturers Certificate Certify that the products supplied meet or exceed the specified requirements.

1.05. QUALITY ASSURANCE

- A. Manufacturer is specified to establish quality and design intent. Another standard system will be similar and equivalent nature will be acceptable when differences do not materially detract from design concept or intended performance, as noted elsewhere in project.
- B. Field Measurement Determine possible, take field measurements prior to preparation of shop drawings and installation, to ensure proper fitting of components, proceed with installation and coordinate installation tolerances as necessary when field measurements indicate deviation.

1.06. DELIVERY, STORAGE, AND PROTECTION

- A. Deliver, store, and handle materials per this section as recommended by MMCA Code Book and as required to protect materials from damage, soiling, and other conditions detrimental to the product, its appearance and function.

1.07. WARRANTY

- A. See Section 05 0000 Closeout Submittals, for additional requirements.
- B. Correct defective work within the repair period after Date of Substantial Completion.
- C. Provide the repair manufacturer warranty against excessive deterioration of materials.
Include provision for replacement units of excessive siding, ceiling, or floor.

PART 2 - PRODUCTS

2.01. MANUFACTURERS

- A. Pioneer Company, Inc Product Triplex.
- B. Substitutions See Section 05 0000 Product Requirements.

2.02. COMPONENTS

- A. Minimum Extrusions minimum end to end per required minimum store front manufacturer for strength, corrosion resistance, and application of required finish and not less than 0.070" wall thickness of end location for the pin hole and compound into ASTM B 209 minimum end to end.
- B. Fasteners minimum, non magnetic stainless steel for other materials to be noncorrosive and compatible into minimum end to end, triplex, end to end, and other components.
- C. Anchors, Clips, and Accessories minimum, non magnetic stainless steel, or zinc coated steel or iron compound into ASTM B 209 or SC severe service conditions or other suitable zinc coating provide sufficient strength to withstand design pressure indicated.
- D. Reinforcing Members minimum, non magnetic stainless steel, or zinc coated steel compound into ASTM B 209 or Type SC severe service conditions, or zinc coated steel or iron compound into ASTM B 209 or SC severe service conditions or other suitable zinc coating provide sufficient strength to withstand design pressure indicated.
- E. Sequent or sequents required within indicated store front system, provide per manufacturer for mint size and content.
- F. Tolerances Reference to tolerances for flatness and other cross section dimensions of store front members are not indicated in compliance with the minimum Standards and Data.

2.03. FINISHES

- A. Pioneer Periodic Maintenance, Maintenance, Architectural Class I Color Finish Continuity Color and Drift Bronze.
- B. Temporary Materials as required minimum manufacturer for application.

2.04. FABRICATION

- A. Fabricate components into minimum clearances and spacing around perimeter of assembly, set within installation and dynamic movement of perimeter seal.
- B. Accurate fit and secure joints and corners. Make joints tight, uniform, and weatherproof.
- C. Prepare components to receive anchor devices. Fabricate anchors.
- D. Coat concealed fasteners that will be in contact with ceiling entities or materials or dissimilar metals into minimum point.
- E. Arrange fasteners and attachments to conceal them.
- F. Reinforce minimum end to end for imposed loads.
- G. Finish minimum end to end to fasteners that will be exposed in completed assembly.
- H. Temporary surfaces cut during fabrication so that no notations in assembly is visible in completed assembly, including finished edges.

PART 3 - EXECUTION

3.01. EXAMINATION

- . Verify dimensions, tolerances, and extend attachment into other area.

3.02. INSTALLATION

- . Install systems in accordance with manufacturer's instructions.
- . Attach to structure to permit sufficient adjustment to comply with construction tolerances and other irregularities.
- . Provide minimum attachment and supports to permit hanger system to adjust to structure.
- . Minimize supports and keep free of obstruction or twist. Maintain clear dimensions tolerances, within 1/8" of adjacent area.
- . Provide clear indication where components penetrate or disrupt existing installation.
- . Install systems in. Top ends and edges secure to adjacent structure and other fixed.
- . Coordinate attachment and sequencing of air and vapor barrier materials.
- . Place across installation in side spaces of perimeter enclosure to maintain continuity of barrier.
- . Install in accordance with Section 05 00 00 00 00, as in addition extend required to achieve performance criteria.
- . Install perimeter sealant in accordance with Section 05 00 00 00 00 I/T SEALS.

3.03. ERECTION TOLERANCES

- . Maximum variation from Plan shall not exceed 1/8" in any one direction or 1/4" in any one direction per 10 ft, whichever is less.
- . Maximum Misalignment of Top and Bottom Members shall not exceed 1/8" in any one direction.

3.04. CLEANING AND PROTECTION

- . Remove protective materials prior to installation of all surfaces.
- . Use down surfaces with solution and detergent in order to clean, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Use surfaces clean.
- . Remove excess sealant and extend acceptance to sealant manufacturer.
- . Take up in order to protect applied finish replace components that cannot be satisfactorily repaired.
- . Protect finished areas from damage.

3.05. FINISHED WORK:

- . Minimum storage shall be to lines and levels indicated with adequate provisions for other expansion/contraction.
- . Exposed surfaces shall be clean and free of defects and with smooth or dried edges concealed or finished to match adjacent surface finish.
- . Other areas shall be free of debris and damage from other trades section.

END OF SECTION



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SECTION 08 7100 HARDWARE

PART 1 - GENERAL

1.01. RELATED DOCUMENTS:

- . Drawings and General Provisions of Contract, including General and Supplemental Conditions and Division Specification sections, apply to the corresponding section.

1.02. DESCRIPTION OF WORK:

- . Definition "Bidders provide" includes items shown on drawings and schedules and are required for sliding doors, except specialties finish and non-finish hardware specified in the same section as the door and door frame.

- B. Extent finish hardware required is indicated on drawings and in schedules.

- C. Types finish hardware required include the following:

- Latches
- Lock cylinders and keys
- Lock and trim sets
- Bolts
- Pull pulls
- Cylinders
- Miscellaneous door control devices
- Protection plates
- Sash stripping for interior doors

- D. Silencers included into frame or set of doors are specified on door frames elsewhere in Division.

1.03. QUALITY ASSURANCE:

- . Manufacturer of each type of hardware and lock sets, latches, cylinders, etc. shall be the manufacturer, or its selected agent, as shown on product comparison sheets.

- B. Supplier recognized architect finish hardware supplier, or its representative, shall be an authorized agent in the project's vicinity for a period not less than 1 year, and shall, or its representative shall, be an experienced architect hardware consultant who is available, at reasonable times during the course of the work, for consultation about project hardware requirements, to owner, architect and contractor.

1.04. SUBMITTALS:

- . Product Data Submit manufacturer's technical product data for each item of hardware in accordance with Division section "Submittals". Include letter in introduction of the necessity to submit compliance with requirements, and include instructions for installation and for maintenance operation parts and finish.

- B. Hardware Schedule Submit hardware schedule in proper order to schedule at end of section. Coordinate hardware with doors, frames and related hardware ensure proper size, thickness, finish, function and finish hardware. Include the following information:

- Type, size, function, size and finish of each hardware item.
 - Name and manufacturer of each item.
 - Fasteners and other pertinent information.
- c. Location hardware set cross referenced to indications on Drawings and on door plans and in door and frame schedule.
- d. Explanation of conditions, sizes, codes, etc. contained in schedule.
- e. Maintaining instructions for hardware.
- Door and frame sizes and materials.

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1.05. PRODUCT HANDLING:

- A. Take care if the package separator, if it identifies information related to the information recorded, and include basic information instructions if it is a package.
- B. Package information is the responsibility of the supplier. As a carrier is received, the supplier must verify the information, sort and replace in containers clearly marked with appropriate codes set number to the set numbers approved and recorded. The codes are identical sets of the package in some container.
- C. Information must be represented by the supplier and the supplier must ensure that the information is correct.
- D. Delivery information package items at the proper times to the proper locations (shop or project site) or institution.
- E. Provide secure handling for the delivered to the project, not to be installed. Control and information package items are not to be edited, replaced, so that completion of the information be delivered to the package issues, not to be and after installation.

PART 2 - PRODUCTS

2.01. SCHEDULED HARDWARE:

- . Requirements for design, code, function, finish, size and other distinctive qualities of each type of finish and/or is indicated in the finish and/or Scedae at the end of this section. Products are identified by color and/or designation numbers of the finish.
- . Manufacturer's product descriptions of one or more manufacturers is listed for each and/or type required for purposes of establishing finish and/or requirements. Provide either the product designated, or color and/or products of the manufacturer's color code or other requirements including those specified elsewhere in this section.

2.02. MATERIALS AND FABRICATION:

- A. ☐ **Generators**
- B. ☐ **And** ☐ **and** ☐ **Drum** in its ☐ **same** ☐ **direction** ☐ **as** ☐ **in** ☐ **or** ☐ **and** ☐ **each** ☐ **door** ☐ **is** ☐ **ornish** ☐ **each** ☐ **ite** ☐ **or** ☐ **door** ☐ **is** ☐ **proper** ☐ **instation** ☐ **and** ☐ **operation** ☐ **and** ☐ **or** ☐ **each** ☐ **ent** ☐ **is** ☐ **same**.
- C. ☐ **Manufacturer's** ☐ **the** ☐ **Plate** ☐ **Do** ☐ **not** ☐ **use** ☐ **Manufacturer's** ☐ **products** ☐ **if** ☐ **each** ☐ **or** ☐ **Manufacturer's** ☐ **name** ☐ **or** ☐ **trade** ☐ **name** ☐ **displayed** ☐ **in** ☐ **visible** ☐ **location** ☐ **and** ☐ **it** ☐ **re** ☐ **each** ☐ **name** ☐ **represents** ☐ **except** ☐ **in** ☐ **connection** ☐ **it** ☐ **re** ☐ **each** ☐ **and** ☐ **is** ☐ **otherwise** ☐ **except** ☐ **to** ☐ **direct**.
- ☐ **Manufacturer's** ☐ **identification** ☐ **is** ☐ **per** ☐ **mitted** ☐ **on** ☐ **its** ☐ **each** ☐ **conders** ☐ **in**.
- D. ☐ **Base** ☐ **Metals** ☐ **Produce** ☐ **and** ☐ **or** ☐ **units** ☐ **each** ☐ **is** ☐ **each** ☐ **and** ☐ **in** ☐ **each** ☐ **indicated**, ☐ **sin** ☐ **Manufacturer's** ☐ **stand** ☐ **is** ☐ **each** ☐ **position**, ☐ **te** ☐ **per** ☐ **and** ☐ **ordness**, ☐ **in** ☐ **no** ☐ **case** ☐ **or** ☐ **each** ☐ **is** ☐ **each** ☐ **and** ☐ **in** ☐ **each** ☐ **indicated**, ☐ **sin** ☐ **Manufacturer's** ☐ **stand** ☐ **is** ☐ **each** ☐ **position**, ☐ **te** ☐ **per** ☐ **and** ☐ **ordness**, ☐ **in** ☐ **no** ☐ **case** ☐ **or** ☐ **each** ☐ **is** ☐ **each** ☐ **and** ☐ **in** ☐ **each** ☐ **indicated**, ☐ **sin** ☐ **Manufacturer's** ☐ **stand** ☐ **is** ☐ **each** ☐ **position**, ☐ **te** ☐ **per** ☐ **and** ☐ **ordness**, ☐ **in** ☐ **no** ☐ **case** ☐ **or** ☐ **each** ☐ **is** ☐ **each** ☐ **and** ☐ **in** ☐ **each** ☐ **indicated**, ☐ **sin** ☐ **Manufacturer's** ☐ **stand** ☐ **is** ☐ **each** ☐ **position**, ☐ **te** ☐ **per** ☐ **and** ☐ **ordness**, ☐ **in** ☐ **no** ☐ **case** ☐ **or** ☐ **each** ☐ **is** ☐ **each** ☐ **and** ☐ **in** ☐ **each** ☐ **indicated**, ☐ **sin** ☐ **Manufacturer's** ☐ **stand** ☐ **is** ☐ **each** ☐ **position**, ☐ **te** ☐ **per** ☐ **and** ☐ **ordness**, ☐ **in** ☐ **no** ☐ **case** ☐ **or** ☐ **each** ☐ **is** ☐ **each** ☐ **and** ☐ **in** ☐ **each** ☐ **indicated**, ☐ **sin** ☐ **Manufacturer's** ☐ **stand** ☐ **is** ☐ **each** ☐ **position**, ☐ **te** ☐ **per** ☐ **and** ☐ **ordness**, ☐ **in** ☐ **no** ☐ **case** ☐ **or** ☐ **each** ☐ **is** ☐ **each** ☐ **and** ☐ **in** ☐ **each** ☐ **indicated**, ☐ **sin** ☐ **Manufacturer's** ☐ **stand** ☐ **is** ☐ **each** ☐ **position**, ☐ **te** ☐ **per** ☐ **and** ☐ **ordness**, ☐ **in** ☐ **no** ☐ **case** ☐ **or** ☐ **each** ☐ **is** ☐ **each** ☐ **and** ☐ **in** ☐ **each** ☐ **indicated**, ☐ **sin** ☐ **Manufacturer's** ☐ **stand** ☐ **is** ☐ **each** ☐ **position**, ☐ **te** ☐ **per** ☐ **and** ☐ **ordness**, ☐ **in** ☐ **no** ☐ **case** ☐ **or** ☐ **each** ☐ **is** ☐ **each** ☐ **and** ☐ **in** ☐ **each** ☐ **indicated**, ☐ **sin** ☐ **Manufacturer's** ☐ **stand** ☐ **is** ☐ **each** ☐ **position**, ☐ **te** ☐ **per** ☐ **and** ☐ **ordness**, ☐ **in** ☐ **no** ☐ **case** ☐ **or** ☐ **each** ☐ **is** ☐ **each** ☐ **and** ☐ **in** ☐ **each** ☐ **indicated**, ☐ **sin** ☐ **Manufacturer's** ☐ **stand** ☐ **is** ☐ **each** ☐ **position**, ☐ **te** ☐ **per** ☐ **and** ☐ **ordness**, ☐ **in** ☐ **no** ☐ **case** ☐ **or** ☐ **each** ☐ **is** ☐ **each** ☐ **and** ☐ **in** ☐ **each** ☐ **indicated**, ☐ **sin** ☐ **Manufacturer's** ☐ **stand** ☐ **is** ☐ **each** ☐ **position**, ☐ **te** ☐ **per** ☐ **and** ☐ **ordness**

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lesser than specified for the applicable hardware units or applicable ANSI series standard for each type hardware item and that the ANSI series for this designation indicated. Do not misinterpret "optional" criteria or methods for those indicated, except as otherwise specified.

- E. Listeners Provide hardware as indicated to connect to provided templates, generate prepared for offline screen installation. Do not provide hardware which has been prepared for self-applying sheet etch screens, except as specifically indicated.

- F. Screening screens for installation, that each hardware item. Provide Pumps attached screens except as otherwise indicated. This is exposed to be exposed under any condition screens to be attached hardware this or, if exposed in screens other than to be attached this as each other as case as possible, including "prepared for print" in screens to receive printed this.

- G. Provide concealed listeners for hardware units which are exposed when door is closed, except to extent not standard units of the type specified are provided that concealed listeners. Do not use templates for installation where not used or not on the opposite side is exposed in other than, except where it is not feasible to demonstrate reinforcement the door. In such cases, provide screens for each template or use self-screen listeners.

- H. Tools and Maintenance Instructions for Maintenance as a complete set as specified tools and maintenance instructions as needed for owner's continued adjustment, maintenance, and repair and replacement of this hardware.

2.03. HINGES, BUTTS AND PIVOTS:

- A. Templates Except for hinges and pivots to be installed entire into recess into solid doors and frames, provide that template produced units.

- B. Screens as Pumps attached or offline screens for installation units, except as Pumps attached or solid screens for installation units into solid. This screen leads to be attached surface hinges or pivots.

- C. Pin Pins Except as otherwise indicated, provide pin pins as follows:

<u>Steel</u> hinges	Steel pins.
<u>Stainless</u> hinges	Stainless steel pins.
<u>Aluminum</u> hinges	Aluminum, non-ferrous pins.
<u>Tips</u>	that attach and attach in place, finished to be attached.
<u>Other</u> hinges	Provide other hinges indicated.
<u>Size</u>	as required for proper operation of the " " in the .
<u>Finish</u>	in the finish surface as per ASTM C100.

2.04. LOCK CYLINDERS AND KEYING:

- A. General Supplier must meet that owner to provide the requirements and obtain the instructions in writing.

- B. Review the requirements with the owner and provide the type required master, grand master or grand master, either new or integrated into owner's existing system.

- C. Equip with the manufacturer's standard pin for the cylinders "E" type as provided as construction master key system with keys for keys and cylinder use in during construction.

- D. Master Construct the cylinder ports with cross-section, stainless steel or nickel-silver.

- E. Complete with the owner's instructions for the master key and, except as otherwise indicated, provide individual change key for each key which is not designated to be used with the group of related keys.

- F. Deliver keys to owner's representative. Provide instructions to keys with the key. Deliver the key per the owner's "DO NOT DISCLOSE".

- G. Material Provide keys as necessary for the

- H. Complete as a complete key for each master key or each master system and grand master key for each grand master system.

2.05. LOCKS, LATCHES AND BOLTS:

- A. Strikes Provide manufacturer's standard exposed strike or recessed strike or recessed strike extended to protect edge, finished to match hardware set.
- B. Lock Turns Provide 1" minimum turn torque and 1" minimum turn torque.
- C. Bolt Ends Minimum of 1/2" diameter rods, bronze or stainless steel, minimum 12" long rod for doors up to 7'0" in height.
- D. Lock Set Specify lock set, "D" series units as specified. 1" lock set except where specified otherwise. Refer design schedule "Roses" to SCD Section 05100 for details.

2.06. CLOSERS AND DOOR CONTROL DEVICES:

- A. Size Specify lock set except as otherwise specified indicated, comply with the manufacturer's recommended size door control unit, depending on size door, exposure to weather and anticipated wear and tear.
- B. Access Free Motion Closers Where applicable, provide closers for doors required to be accessible to the public and handicapped, provide adjustable units comply with ADA and provisions for door opening force and delayed action closing.
- C. Door Poles Provide finished poles for door poles for door closers. Finish door pole to match hardware sets.

2.07. DOOR TRIM UNITS:

- A. Fasteners Provide manufacturer's standard exposed fasteners for door trim units and plates, and similar units either machine screws or self-tapping screws.
- B. Decorative Edge Trim Stainless steel, not more than 1" nor less than 1/2" square in section, door dimension.
- C. Decorative Protection Plates Machine or painted, not more than 1" less than door width on top side and not more than 1" less than door width on bottom side, as indicated.
- D. Metals Stainless steel, 1/4" thick, SCD Section 05100.

2.08. WEATHERSTRIPPING:

- A. General Except as otherwise indicated, provide continuous weatherstripping at each edge of exterior door leaf. Provide type, size, and profiles shown or specified. Provide non-composite fasteners as recommended by manufacturer for application indicated.
- B. Replaceable Seal Strips Provide in those units where resilient or adhesive seal strip is easily replaceable and readily available from stock or contained by manufacturer.
- C. Provide appropriate resilient insert and weatherstripper strips source applied as noted on schedule.

2.09. HARDWARE FINISHES:

- A. Provide finish finishes for hardware units at each door or opening, to the greatest extent possible, and except as otherwise indicated. Reduce differences in color and texture as much as commercially possible where the base material or material in process is different or individual units are exposed at the same door or opening. In general, finishes to the manufacturer's standard finish for the metal and color and texture.
- B. Provide finish finishes for hardware as noted on the architect.
- C. Provide finish finishes, including thickness, position or coating, color, position, hardness and other qualities comply with the manufacturer's standards, but in no case less than specified for the applicable units or referenced standards.
- D. The designations used in schedules and elsewhere to indicate hardware finishes are the industry-recommended standard commercial finishes, except as otherwise noted.

PART 3 - EXECUTION

3.01. INSTALLATION:

- A. Mount cordere units at "Recommended Locations for Borders Cordere for Standard Steel Doors and Frames" of the Door and Cordere Institute, except as specifically indicated or required to comply with determining requirements, and except as otherwise directed by architect.
- B. Install cordere units in compliance with the manufacturer's instructions and recommended conditions. Careful cutting and fitting is required to install cordere into or into surfaces which are later to be painted or finished in another way, coordinate rework, storage and reinstallation or application of surface protections with finishing as specified in the Division sections. Do not install cordere until finishes have been completed on the substrate.
- C. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
- D. Drill and countersink units which are not factory prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.

3.02. ADJUST AND CLEAN:

- A. Adjust and check each operating unit, cordere and ecodeor, to ensure proper operation or function of each unit. Replace units which cannot be adjusted to operate freely and smoothly as intended for the application code.
- B. Clean adjacent surfaces prior to cordere installation.
- C. Inspect adjacent surfaces prior to cordere installation is code more than one month prior to acceptance or occupancy of space or area, return to the contractor the necessary prior to acceptance or occupancy and the finished and adjusted cordere units in space or area. Clean operating units as necessary to restore proper function and finish of cordere and doors. Adjust door control devices to compensate for misoperation of code.
- D. Instruct owner's personnel in proper adjustment and maintenance of cordere and cordere finishes, during the finished cordere.
- E. The maintenance schedule includes cordere to be furnished and installed under this Section. Permitted conditions and furnish additional and/or accessories as required to provide complete installation with continuous operation proper.
 - a. Items on attached schedule are from the manufacturer's. Do not substitute without appropriate architect.
 - b. Pins, Bolts..... Owner
 - c. Catches and catches..... Schedule
 - d. Catches..... Owner
 - e. Setting Screws..... Per code
 - f. Door Stops..... LIES
 - g. Door Protection..... LIES

3.03. HARDWARE SCHEDULE

- A. See drawings for cordere schedule.

END OF SECTION

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PART 1 - GENERAL

B. ☐ ☐ ☐ in ☐ c ☐ p ☐ ☐ nds ☐ nd ☐ ccess ☐ ries.

Q. SI units in the Standard or Set of Materials used in Bindings, Set of Perforance Specifications and Methods Test Results

B. STM C Standard Specification for Dense Esthetic Composite Sets, Setting Blocks, and Spacers

C. Molar Mass of Monomers in the Composite

D. SM-M Set of Monomers in the Composite

[illegible]

A. See Section 1000 and Instructional Requirements, or submit procedures.

B. Product Description: Provide structure, process and environment characteristics, site conditions, special and/or instructional requirements.

C. Spaces: Submit to spaces and increase in size, assess units, submit in condition.

A. Performance in accordance with _____ and _____ Sent _____ in _____ methods.

B. Fire resistance rated fire _____ Provide fire _____ products that are identical to those tested per _____ and are _____ and listed _____ are _____ and inspection _____ except _____ to _____ jurisdiction.

C. Fire Protective Rated _____ Ec _____ per _____, _____ the _____ in _____ and rated fire protective _____.

D. Fire Protective _____ Products or Door _____ Products identical to those tested per _____, _____ and _____.

E. Installer _____ _____ _____ in _____ in the _____ is section _____ _____ _____ _____ experience.

□. Don't install in an environment temperature is less than 5 degrees □.

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- B. Maintain initial ambient temperature before, during and after installation according to code books.

1.07. WARRANTY

- A. See Section 01 00 00 Closeout Specifications, for additional requirements.
- B. Provide the manufacturer's warranty to include coverage for sealed glass units and sealant, interpenetration of water, and replacement cost.

PART 2 - PRODUCTS

2.01. FLAT GLASS MATERIALS

- A. Lead glass see Section 01 00 00.
- B. Wired glass Type II patterned and wired glass, net Glass transparent, suitable for mounting complying with ANSI Z97.1; 1/4" thick; of form and mesh pattern indicated below
 - 1. Polished wire glass or wired, polished to sides, Mesh 10 dia and
 - 2. Polished wire glass or wired, polished to sides, Mesh 10 square
 - 3. Patterned wire glass or patterned and wired, Mesh 10 dia and
- C. Unwired fire rated glass
 - 1. Fire rated glass ceramic fire rated glass manufactured by Pippin Electric Glass Company, Ltd., and distributed by Technic Glass Products
 - 2. Fire rated, sintered glass ceramic fire rated glass manufactured by Pippin Electric Glass Company, Ltd., and distributed by Technic Glass Products

2.02. GLAZING COMPOUNDS

2.03. GLAZING ACCESSORIES

- A. Setting Blocks neoprene, to set Score diameter hardness, ASTM C 100 Option I. Density 1.10 g/cm³ or less, suitable for setting or initial set in place in the joint to set in place and then set and dry.
- B. Glazing Gaskets Resilient silicone extruded shape to set in channel in set of ASTM C 100 Option I Block.

2.04. SOURCE QUALITY CONTROL AND TESTS

- A. Test samples in accordance with ASTM C 100.

PART 3 - EXECUTION

3.01. EXAMINATION

- A. Verify that openings are correct sized and within tolerance.
- B. Verify that surfaces within channels or recesses are clean, free of obstructions that would impede distal contact, gaps are clear, and ready to receive glazing.

3.02. PREPARATION

- A. Clean contact surfaces of solvent and pipe dry.

3.03. INSTALLATION- EXTERIOR/INTERIOR DRY METHOD (GASKET GLAZING)

- A. Place setting blocks at points indicated on drawings and corners.
- B. Rest glazing on setting blocks and press against fixed stop with sufficient pressure to compress to contact.
- C. Install the glazing stops with sufficient pressure to compress to contact.

3.04. CLEANING

- A. Remove glazing materials from this surfaces.
- B. Remove debris after it is complete.

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C. Clean glass and adjacent surfaces.

3.05. PROTECTION OF FINISHED WORK

- After installation, mark: pane with an 'X' using reflective plastic tape or posted and not to reflect glass in or reflective glass units.

END OF SECTION

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**SECTION 09 2900
GYPSUM BOARD ASSEMBLIES**

PART 1 - GENERAL

1.01. SECTION INCLUDES

- A. Metal stud framing in.
- B. Acoustic insulation.
- C. Ceiling grid.
- D. Gypsum board.
- E. Joint treatment and accessories.
- F. Textured finish system.

1.02. REFERENCES

- A. ASTM C 36/C 36M Standard Specification for Gypsum Board.
- B. ASTM C 79/C 79M Standard Specification for Treated Core and Untreated Core Gypsum Section Board.
- C. ASTM C 110 Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
- D. ASTM C 117/C 117M Standard Specification for Water-Resistant Gypsum Backing Board.
- E. ASTM C 118 Standard Specification for Installation of Steel Framing Members to Receive Screws Attached Gypsum Panel Products.
- F. ASTM C 119 Standard Specification for Application and Finishing Gypsum Board.
- G. ASTM C 120 Standard Practice for Use of Seams in Acoustic Applications.
- H. ASTM C 121 Standard Specification for Steel Drill Screws for the Application Gypsum Panel Products or Metal Plaster Bases.
- I. Gypsum Application and Finishing Gypsum Board Gypsum Association.
- J. Gypsum Fire Resistance Design Manual Gypsum Association.

1.03. SUBMITTALS

- A. See Section 01 00 00 Administrative Requirements, for submittal procedures.
- B. Product Data Provide data on metal framing, gypsum board, accessories, joint finishing system, and acoustic insulation and seams.
- C. Samples Prepare a sample to each of the finishes specified and notify the architect for review. The samples selected sample samples specified to receive the finish. The architect reserves the right to make minor adjustments in the finish without incurring additional costs.
- D. These samples, when accepted by the architect, will become the standard for samples specified to receive similar finish.

1.04. QUALITY ASSURANCE

- A. Perform in accordance with ASTM C 110. Compartment requirements shall comply with fire rated assemblies.
- B. Applicant qualifications Compartment specified in performance in the project is section with minimum three years experience.

1.05. REGULATORY REQUIREMENTS

- A. Comply to applicable code or fire rated assemblies as indicated on drawings.

PART 2 - PRODUCTS

- . □□ps□□ B□□rd□
 - . □□P □□ps□□ C□rp.
 - . □□ti□n□□□□ps□□ C□
 - . □□nited St□tes □□ps□□ C□
 - . P□□c□ □□ps□□ C□
 - . S□□stituti□ns□See Section □□ □□□□ □Pr□d□ct Re□□ire□ents.

- . On the `in` or `in` `State` `Components` `STM` `Control` sheet, size and properties indicated.
 - . `Std` `C` `scoped` `it` `in` `red` `ices`.
 - . `Runners` `scoped`, `sized` `t` `o` `the` `stds`.
 - . `errin` `its` `scoped` `sections`, `in` `the` `dept` `3/4` `inc`.

- ☐ Standard ops STM C MC sides to initie ints in pceends s re c t.
☐ Thickness inc
☐ Edes T pered.
- ☐ Fire Rated ops STM C MC Type , or r rated sides to initie ints in pceends s re c t.
☐ Thickness inc
☐ Edes T pered.
- ☐ Moisture Resistant ops Backin Board STM C MC ends s re c t.
☐ Thickness inc
☐ Edes T pered.
- ☐ ops Selectin Board STM C MC distre resistant and fire resistant typesides to initie ints in pce after repeat paper lcesends s re c t.
☐ Thickness inc
- ☐ Cementitious Backer Board i densit, ss firer reinforced, inc tic
☐ Type inc ide, coated ss firer type or ints and cers.
- ☐ Case Resistant Panel r c Case Resistant ops Board, STM C, Type, as nctured P ops Corporation
☐ Thickness inc
☐ Edes T pered.
- ☐ Sound Redcin ops STM C MC Type , or r rated sides to initie ints in pceends s re c t.
☐ Thickness inc
☐ Edes T pered.

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- ☐ E. Joint Materials STM C shall and is required ended all joints shall be in accordance with project conditions.
- ☐ F. Treated Finish Materials shall be used for all woodwork.
- ☐ G. Stairs STM C shall be of the type and material specified in the project specifications.
- ☐ H. Concrete to Steel Tie wire, nails, screws, and other fasteners, type and size to suit application to rigid secure materials in place.

PART 3 - EXECUTION

3.01. EXAMINATION:

- ☐ A. Examine substructure to verify dimensions construction details or notes, preset anchors, cast-in anchors, and structural steel in place. If installation present, for compliance with requirements for installation tolerances and other conditions affecting performance once structural construction. Do not proceed with installation until satisfactory conditions have been corrected.

3.02. PREPARATION:

- ☐ A. Ceiling Anchors Coordinate installation of ceiling suspension with installation of structural steel to ensure that inserts and other structural anchor provisions have been installed to receive ceiling anchors in a manner that will develop their full strength and at spacing required to support ceiling.

3.03. INSTALLATION OF STEEL FRAMING, GENERAL:

- ☐ A. Steel Framing Installation Standard Install steel framing in to comply with STM C and with STM C requirements that apply to the installation.
- ☐ B. Install applicable equipment in, on, and around the terminations in the room and for support of fixtures, equipment services, electrical, and other, toilet accessories, furnishings, and similar construction to comply with details indicated and with requirements of applicable code and manufacturer, which shall include, but not be limited to "Approved Construction Methods" published by United States Steel Corp.
- ☐ C. Isolate steel framing from building structure to prevent transfer of vibration imposed on structural member, at locations indicated or to comply with details shown on Drawings.
 - ☐ a. Isolate edges of suspended ceiling from building structure or adjacent ceiling perimeter or penetration of structural elements.
 - ☐ b. Isolate partitions and other framing from adjacent structure.
- ☐ D. Do not bridge building expansion and contractions with steel framing or framing members independent of the sides joints with framing or framing members as indicated.

3.04. INSTALLATION OF STEEL FRAMING FOR SUSPENDED AND FURRED CEILINGS:

- ☐ A. Secure runners to structural support or connecting directly to structure where possible, otherwise connect to cast-in concrete inserts or other anchor devices or fasteners as indicated.
- ☐ B. Do not connect or suspend steel framing from ducts, pipes or conduit.
- ☐ C. Keep runners and braces clear of ducts, pipes and conduit.
- ☐ D. Support suspended steel framing with runners used for support.
- ☐ E. Install suspended steel framing in components in sizes and at spacing indicated but not less than that required or referenced steel framing installation standard.
 - ☐ a. Wire runners shall be installed in the center of the span.
 - ☐ b. Corrugated Channels Main Runners shall be installed in the center.
 - ☐ c. Rigid corrugated channels main members shall be installed in the center.
- ☐ F. Installation Tolerances Install steel framing in components for suspended ceiling so that the cross members or grid suspension members are located within the indicated tolerances in the longitudinal and transverse between parallel members.
- ☐ G. Wire tie or clip main members to main runners and to other structural supports as indicated.

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- Grid Suspension System attach perimeter track or angle where grid suspension system meets vertical surfaces. Mechanically in a line and cross bracing members to each other and attach to it into track.

3.05. INSTALLATION OF STEEL FRAMING FOR WALLS AND PARTITIONS:

- Install runners, tracks, walls, ceilings and structures and components where applicable drawn standard system meets other construction.
- Installation Tolerances Install steel framing and bracing members so that fastening surface does not create a torque or induce any plane stresses adjacent framing.
- Extend partition framing adjacent to structural supports or structures where suspended ceilings, except where partitions are indicated to terminate at suspended ceilings. Continue framing over doors and openings and frame around ducts penetrating partitions where ceiling to provide support for applicable loads.
- Terminate partition framing at suspended ceilings where indicated.
- Install steel studs and bracing in sizes and at spacings indicated, not less than that required for referenced steel framing installation standard.
 - For single layer construction add inches on center.
- Install steel studs so that angles point in the same direction and apply boards can be installed in the direction opposite to that of the angle.
- Frame door openings to comply with details indicated, with blocking and with applicable permitted recording conditions apply board on manufacturer. Attach vertical studs at ends with screws either directly to angles or to wall anchor clips on door frames. Install runner track section over cripple studs and lead and secure to wall studs.
 - Extend vertical studs to suspended ceilings and attach to underside of floor or roof structure where.
- Frame openings other than door openings to comply with details indicated or if none is indicated, in same manner as required for door openings and install in same size as openings to which framing required where door leads.

3.06. APPLICATION AND FINISHING OF GYPSUM BOARD, GENERAL:

- Apply Board Application and Finishing Standards Install and finish apply board to comply with ASTM C 840.
- Expose end joints as far as center of studs and ceilings as possible, and stagger not less than 6 inches in alternate courses standard.
- Install ceiling boards across framing in the manner which initiates the number of end joints, and place adjacent end joints in the center of the ceiling. Stagger end joints at least 6 inches.
- Install partition boards in manner which initiates the number of end joints or joints the entire where possible. At staircases and similar areas, install boards orient with end joints staggered over studs.
- Install exposed apply board with face side out. Do not install perfect, double or drop boards. Butt boards together with a tight contact at edges and ends with not more than 1/8" open space between boards. Do not force into place.
- Exposed either edge or end joints over supports, except in orient applications or where intermediate supports or apply board application is provided behind end joints. Position boards so that the edges meet, tapered edges against tapered edges and flat or beveled ends against flat or beveled ends. Do not place tapered edges against cut edges or ends. Stagger vertical joints over different studs on opposite sides of partitions.
- Attach apply board to steel studs so that leading edge or end of each board is attached to open unsupported edge of stud where first.
- Attach apply board to supply entrance and ceiling provided for additional support at openings and corners.

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- I. Spit Coat masonry exterior doors or solid core wood doors, exterior doors and doors over windows side. Apply spit coat of each masonry anchor clip fast before inserting board into frame.
- J. Core Contraints and expansion joints at locations indicated, fit space between edges of boards, prepared to receive trim accessories.
- K. Cover the Faces of steel stud partition room in fit gaps board in concealed spaces between ceilings, etc. except in cases where clips are properly placed internally.
 - a. Except where concealed application is indicated or required for sound, fire, air or smoke ratings, cover the face of each placed fit scraps not less than 1/8" thick and 1/4" wide to not less than 10 percent of each face.
 - b. Fit gaps board around ducts, pipes, and conduits.
 - c. Where partitions intersect open concrete columns, cut gaps board to fit profile of columns and cover the face of each side joint or segment.
- L. Isolate perimeter non-structural partitions at structural elements. Provide 1/4" inch to 1/2" inch space and trim edge of 1/4" lead edge trim. Sealants fit acoustic sealant.
- M. Where sound rated drywall construction is indicated, see construction of perimeters, constraints and expansion joints, openings and penetrations fit continuous lead acoustic sealant including lead at each face of partitions. Comply with ASTM C 106 and manufacturer's recommendations for location of edge trim, and use sound transmission loss around or through construction, including sealing partitions with acoustic ceilings.
- N. Space fasteners in gaps boards in accordance with referenced gaps board application and manufacturer's and manufacturer's recommendations.

3.07. METHODS OF GYPSUM DRYWALL APPLICATION:

- A. Single Layer Application Install gaps board as follows:
 - a. On ceilings apply gaps board prior to partition board application to the greatest extent possible.
 - b. On partitions apply gaps board orient to unless otherwise indicated and provide sheet joints of 1/4" minimum end joints.
- B. Double Layer Where drywall is used for tins set ceramic tile and similar rigid applied finishes, install gaps board as follows:
 - a. In "dry" areas install gaps board as follows: apply tapered edges tapered and finished to produce a flat surface.
- C. Single Layer Fastening Methods apply gaps board to supports as follows:
 - a. Fasten fit screws.
- D. Direct Bonding to Substrate Where gaps board is indicated to be directly adhered to a substrate other than studs, joists, framing members or base layer gaps board, comply with gypsum board manufacturers' recommendations, and temporarily brace or fasten gypsum board until fastening is complete.

3.08. INSTALLATION OF GLASS MAT UNITS

- A. Attach Glass Mat Units to substrate in a manner acceptable to the glass mat units manufacturer and Exterior Insulation and Finish System's manufacturer.

3.09. INSTALLATION OF DRYWALL TRIM ACCESSORIES:

- A. General Where feasible, use the same fasteners to anchor trim accessories as required to fasten gaps board to the supports. Otherwise, fasten flanges to comply with manufacturers' recommendations.
- B. Install exterior corner beads at exterior corners.
- C. Install exterior edge trim Where edge gaps board is indicated to be exposed or semi-exposed, and except where plastic trim is indicated. Provide type of trim to receive joint compound except where "P" lead sealant is indicated.
 - a. Install corner beads drywall construction to the exterior construction and secure them can be attached to the interior supporting substrate.

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- ☐ ☐ Installed where trim can not be installed after ops board.
- ☐ D. Install Contraints at locations indicated, or if not indicated, at spacing and locations required by referenced ops board application and this standard and approved state architect or disinterested.

3.10. FINISHING OF DRYWALL:

- ☐ ☐ General Joint treatment of ops board joints with directions indicates corner bead, edge trim, and constraints penetrations, stener beads, surface defects.
- ☐ B. Prep Joints and rounded or beveled edges, inch, finish setting type joint compound.
- ☐ C. Apply Joint tape at joints between ops boards, except where trim accessories are indicated.
- ☐ D. Finish ops board application in the main joint compound in coats that include pre-
finish penins in case, and sand between coats and after last coat.
 - ☐ 1. Bedding and First Coat Reddish drin type purpose or taping compound.
 - ☐ 2. Second Coat Reddish drin type purpose or taping compound.
 - ☐ 3. Finish Third Coat Reddish drin type purpose or taping compound.
- ☐ E. Partitions in the third coat and sanding on concealed drin construction which is indicated for drin in the or which requires finishing to achieve fire resistance rating, sand rating or to act as air or smoke barrier.

3.11. APPLICATION OF TEXTURE FINISH:

- ☐ ☐ Surface Preparation and Primer Prepare and prime drin and other surfaces in strict accordance with texture finish manufacturer's instructions. Apply primer to surfaces to achieve texture finish.
- ☐ B. Finish Application Mix and apply finish to drin and other surfaces indicated to receive finish in strict accordance with manufacturer's instructions to produce uniform texture of finish architect's sample without stored spots or other evidence of application, and free of application patterns.
 - ☐ Texture applied to walls should have a "orange peel" appearance.
- ☐ C. Remove the texture droppings or overspray from door frames, windows and other adjoining area.

3.12. PROTECTION:

- ☐ ☐ Provide the protection and maintain conditions, in a manner suitable to Installer, which ensures ops board construction being without damage or deterioration at time of substantial completion.

PART 4 - FIELD QUALITY CONTROL

4.01. EXAMINATION

- ☐ ☐ Verify that project conditions are appropriate for work of this section to commence.

4.02. FRAMING INSTALLATION

- ☐ ☐ Method in the compound with ASTM C and manufacturer's instructions.
- ☐ B. Studs Space studs as indicated.
 - ☐ Extend stud into the ceiling to structure as indicated. Maintain clearance under structure to allow for egress to avoid deflection transfer to studs. Provide extended ceiling runners.
- ☐ C. Openings Reinforce openings as required for weight loads or operable panels, finish not less than double the studs at the ends.
- ☐ D. Corrins for fire Rating Installation required for fire resistance ratings indicated and to be required.
- ☐ E. Blocking Installation for support of panels, toilet partitions, cabinets, toilet accessories, and wardrobe. But for screw steel channels to studs.

4.03. ACOUSTIC ACCESSORIES INSTALLATION

- A. Acoustic Installation Place tight fit in spaces, around cut openings, behind and around electric and electronic outlets in partitions, and tight to items passing through partitions.
- B. Acoustic Sealant Installation
 - 1. Install per ASTM C 1191
 - 2. Place to fill gaps continuous on substrate before installation perimeter in all directions.
 - 3. Place continuous bead at perimeter before base layer is applied.
 - 4. Seal around penetrations including, pipe, ducts, and recessed areas.

4.04. GYPSUM BOARD INSTALLATION

- A. Compare with ASTM C 1177. Install to initiate tight end joints, especially in diagonal disjunct locations.
- B. Single Layer Non-Rated Installation Board in a best economic direction, joint ends and edges occur in one direction.
- C. Single Layer Fire-Rated Installation Board Vertical, joint edges and ends occur in one direction.
- D. Double Sheet Installation Vertical, joint edges at top and ends occur in one direction.
- E. Ceiling Backing Board Installation Methods, in accordance with manufacturer's instructions.
 - 1. Use Resistant Panel Install per manufacturer's instructions.
 - 2. Installation on Metal in place screws or attachment methods.
 - 3. Moisture Protection Treat cut edges and ends in a moisture resistant paper board, and exterior paper suit board to sealant.

4.05. INSTALLATION OF TRIM AND ACCESSORIES

- A. Corner Beads Install external corners, using best practices.
- B. Edge Trim Install locations where paper board joints dissipate materials.

4.06. JOINT TREATMENT

- A. Finish paper board in scheduled areas in accordance with details defined in ASTM C 1177 and as scheduled detail.
- B. Finish joints and corners once entities are in place.

4.07. TEXTURE FINISH, IF ANY

- A. Apply this texture continue to edges as spray applies in accordance with manufacturer's instructions and to all approved surface.

4.08. TOLERANCES

- A. Moisture Variation Minimized Paper Board Surface Free of moisture in all areas in all directions.

4.09. FINISH LEVEL SCHEDULE

- A. Ceiling finish this ceiling concealed area.
- B. Ceiling finish areas and areas behind cabinet.
- C. Ceiling is scheduled to receive textured finish.
- D. Ceiling is and ceiling scheduled to receive flat or eggshell paint finish.
- E. Ceiling is and ceiling scheduled to receive semi gloss or gloss paint finish.

END OF SECTION



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PART 1 - GENERAL

□. Dr□□in□s and Gener□pr□visi□ns □□t□e Contr□ct, inc□din□ Gener□□nd Supp□ent□r□ Conditions and Dis□isi□ □□ Specifi□iti□ S□ecti□ns, app□t□t□is S□ecti□n.

□. Section Includes □

- ### B. Required Requirements

- ❑ Section 00 0000 "Joint Selements" or section representing, contraction, control, and isotherm in the sources.
- ❑ Section 00 0000 "Ops Board" or process, after resistant cover board.

□. ☐ **ener** ☐ **De** ☐ **initions** ☐ **in** ☐ **the** ☐ **SI** ☐ **series** ☐ **the** ☐ **inst** ☐ **itution** ☐ **stand** ☐ **ards** ☐ **and** ☐ **in** ☐ **SI** ☐ **app** ☐ **to** ☐ **or** ☐ **to** ☐ **this** ☐ **Section** ☐ **unless** ☐ **other** ☐ **wise** ☐ **specified**.

- [illegible]

☐ Preinstitution Conference Conduct conference at Project site.

4. Review requirements in 1015.00 for strategies and for preparation of other trades.

[illegible]

- B. Product Director e-commerce product.

- C. Sopp Dröin is Sopp cöctiöns ööcö type ööie önd öie pötern. Sopp öidö's, detö's, önd ööctiöns ööepösiön, cöñtröctiön, cöñtrö önd isöötiön öints in öie sööströtes önd öisöed öie sööices.

- #### D. Support verification

- Site units, equipment and position title and recruitment and this is required.
□ Basic title in current and patterns, provide this meets equipment and.

TIME

- SECTI□□ □□ □□□□ □□ □□□□

1.07. QUALITY ASSURANCE

- ## 4. Instructional implications

- B. Provide the minimum open request

- C. Institutional Methodologies refer to an increase in either dimensions or some institutionalized technique in a system to control people and other related institutional control activities.

- D. Manipulate the properties of the selected objects under the Properties palette and to demonstrate aesthetic effects and set the object standards for the series and execution.

- ## 1.08. DELIVERY, STORAGE, AND HANDLING

- Q. Deleter and store procedures are in different containers it seems on Oracle and does not interact in the same. Can you point requirements in SQL or the interface processes.

- B. Store the end ce entities criteria in eated p r s, under c er, and in dr cti n.

- C. Store _____ rates _____ here _____ and _____ required _____ characteristics _____ be _____intained, and _____intention _____be _____ided.

- D. Store food materials in unopened containers and protected from freezing.

□. Endrpoint itations Don't insttue nticnstrcti n in spces is c pte and
□ □ dent te pte re and □ □ idit cnditi ns re □ □ intined t te ees indic ted in
re reenced stnd rds and □ □ nct rers ritten inst rcti ns.

PART 2 - PRODUCTS

2.01. MANUFACTURERS

- A. Source identifications for Tile in the schedule and color of this tile single source or producer.
 - 1. Tile in the schedule and color of this tile same production run and consistent finish appearance and physical properties for each continuous run.
- B. Source identifications for Setting and Grouting Materials
 - 1. Tile ingredients shall include for each mortar, adhesive, and grout component from single manufacturer and each separate from single source or producer.
 - 2. Tile setting and grouting materials, except for non modified Portland cement and separate, from single manufacturer.
 - 3. Tile interlocking edge and crack isolation edge, except for sheet products, from manufacturer of setting and grouting materials.
- C. Source identifications for other Products in each of the following products specified in this Section from a single manufacturer
 - 1. Solid surface materials resins.
 - 2. Interlocking edge.
 - 3. Crack isolation edge.
 - 4. Cementitious backer units.
 - 5. Metal edge strips.

2.02. PRODUCTS, GENERAL

- A. CSI Ceramic Tile Standard Provide the test complies with CSI standard for types, compositions, and other characteristics indicated.
 - 1. Provide the compliance with Standard Code requirements unless otherwise indicated.
- B. CSI Standards for Tile Installation Materials Provide materials compliance with CSI standard, CSI standards referenced in other Part articles, CSI standards referenced in TC standard methods specified in the installation schedules, and other requirements specified.
- C. Dynamic Coefficient of Friction Provide the installed on smooth surfaces with dynamic coefficient of friction indicated as determined by testing identical products per CSI standard DCofF Test procedure.
 - 1. Dynamic Coefficient of Friction not less than 0.04.
- D. Control Bending the editing color variations within ranges, and the in color and package size units taken from the package size same range in colors as those taken from other packages and of the approved Samples.
- E. Maintain the color of the tiled tile, provide acceptable tiled tile asseables as standard with manufacturer unless otherwise indicated.
 - 1. Where tile is indicated for installation in solid or in porous materials in wet areas, do not use acceptable tiled tile asseables unless the manufacturer specifies in writing that this type of tile is suitable for installation indicated and has record of successful in service performance.

2.03. TILE PRODUCTS

- 1. TBD

2.04. THRESHOLDS

- A. Solid Surface Material Thresholds shall include solid thresholds formed plastic resin compliance with CSI SS.
 - 1. Type Standard Type.
 - 2. Colors and Patterns as selected by Architect from manufacturer's literature.

2.05. TILE BACKING PANELS

- A. Specified in Section 05 0000 "Covers Board."

2.06. WATERPROOF MEMBRANE

- A. General Manufacturer's standard product that complies with CSI Section 05 and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by the manufacturer.
- B. Corrugated Polyethylene Sheet impregnated, corrugated polyethylene placed on both sides of non-reinforced concrete slab.
 - 1. Products Subject to compliance with requirements, provide the following:
 - a. Corrugated Polyethylene Sheet.
 - b. Reinforcement mesh.

2.07. CRACK ISOLATION MEMBRANE

- A. General Manufacturer's standard product that complies with CSI Section 05 or standard performance and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by the manufacturer.
- B. Corrugated Polyethylene Sheet impregnated, corrugated polyethylene placed on both sides of non-reinforced concrete slab.
 - 1. Products Subject to compliance with requirements, provide the following:
 - a. Corrugated Polyethylene Sheet.
 - b. Reinforcement mesh.

2.08. SETTING MATERIALS

- A. Medium Bed, Modified Dry-Set Mortar Comply with requirements in CSI Section 05. Provide product that is approved by the manufacturer for application thickness specified include:
 - 1. Provide prepackaged, dry mix or prepackaged dry, redispersible, in concrete or acrylic additive to fabric concrete to be added at Project site.
- B. Improved Modified Dry-Set Mortar Finest CSI Section 05.
 - 1. Provide prepackaged, dry mix or prepackaged dry, redispersible, in concrete or acrylic additive to fabric concrete to be added at Project site.
 - 2. For applications, provide mortar that complies with requirements for non-sagging mortar in addition to the other requirements in CSI Section 05.

2.09. GROUT MATERIALS

- A. Water-Reducing Epoxy Grout CSI Section 05, with a water content of 10% or less.
 - 1. Provide product capable of standing in continuous and intermittent exposure to temperatures up to 100 and 150 degrees, respectively, and certified by the manufacturer for intended use.

2.10. MISCELLANEOUS MATERIALS

- A. Tracer Underlayment's and Patching Compounds include, Portland cementitious or non-cementitious provided or approved by the manufacturer for the setting materials or installations indicated.
- B. Metal Edge Strips include or expanded, sealed to substrate and setting thickness, metallic or composite metal P.C. or neoprene base, designed specifically for various applications stainless steel, ASTM A 304, 304 Series exposed edge material.
- C. Tie Cleaner or neoprene cleaner capable of removing sand residue without staining and protect surfaces, specifically approved for materials and installations indicated and protect manufacturers.

2.11. MIXING MORTARS AND GROUT

- A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.
- B. Add materials, water, and additives in accurate proportions.
- C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts conforming to the optimum performance characteristics for installations indicated.

PART 3 - EXECUTION

3.01. EXAMINATION

- A. Examine substrates, walls, and conditions before tile is installed, after installation present, and compliance after requirements for installation tolerances and other conditions affecting performance after tile is on.
- 1. Verify that substrates for setting tile are in accordance with specifications that are incompatible with the setting materials, including curing compounds and other substances that contain soap, oil, or silicone and comply with tolerance requirements required by CSI documents for installations indicated.
- 2. Verify that concrete substrates for tile are installed after to inset or other comply with source finish requirements in CSI documents for installations indicated.
- 3. Verify that surfaces that received a steel reinforcement have been mechanically scarified.
- 4. Verify that protrusions, bumps, and ridges have been removed according to grinding.
- 5. Verify that installation conditions, enclosures, recessed outlets, electrical and mechanical units, and similar items located in or behind the tile have been completed.
- 6. Verify that joints and cracks in the substrates are coordinated with the joint locations and not coordinated, adjust joint locations in consultation with architect.
- B. Proceed with installation and after installation conditions have been corrected.

3.02. PREPARATION

- A. Cracks, holes, and depressions in concrete substrates for tile are installed after to inset or other to trim the edge and patching compound specific to the setting material manufacturer.
- B. Where indicated, prepare substrates to receive a waterproofing or applied or reinforced or other that complies with CSI documents and is sloped according to the drain.
- C. Before the application of mortar preparations, verify that the tile has been factory graded and packaged so the joints taken from the package show some range of colors as those taken from other packages and to the approved samples. If not factory graded, either return to the manufacturer or blend tiles at Project site before installation.

3.03. CERAMIC TILE INSTALLATION

- A. Comply with TCBO's "Standard for Ceramic, Glass, and Stone Tile Installation" or TCBO installation methods specified in the installation schedules. Comply with parts of the CSI documents series "Specifications for Installation of Ceramic Tile" that are referenced in TCBO installation methods, specified in the installation schedules, and apply to types of setting and grouting materials used.
- 1. For the minimum installations, follow procedures in the CSI documents series for tile installation standards for providing a percent of other coverage.
- 2. Tile must be set in wet areas.
- 3. Tile must consist of tiles of 12 inches or larger.
- c. Tile must consist of grouted tiles.
- B. Extend the wall into recesses and under or behind equipment and fixtures to the complete covering without interruptions unless otherwise indicated. Terminate or connect at obstructions, edges, and corners without disrupting pattern or joint alignments.
- C. Occur at wall intersections and returns. Perform cutting and drilling of the tile without creating visible surfaces. Carefully grind cut edges of the setting material, finish, or joint materials or straight finished joints. If the cause of electrical outlets, piping, fixtures, and other penetrations so plates, covers, or covers over the tile.
- D. Provide manufacturer's standard trim slopes where necessary to eliminate exposed tile edges.
- E. Where accent tile differs in thickness from field tile, the setting bed thickness so that tiles are flush.

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0. Joint Pattern Provide joint pattern unless otherwise indicated. Provide joint pattern and center tie leads in all directions in each space or in each member. Provide tie pattern to initiate the use of pieces that are less than 1000 mm tie. Provide number and joint widths unless otherwise indicated.
 1. Joint tie patterned in sheets, provide joints between the sheets some joints are in the sheets some joints between sheets are not apparent in finished work.
 2. Where dimensions on wall, base, post, or trim are specified or indicated to be some size, join joints.
 3. Where ties are specified or indicated to be some other type of ties dimensions on wall, base, post, or trim, join joints unless otherwise indicated.
1. Joint widths unless otherwise indicated, install tie into the member in joint widths.
 1. Jointed joint tie joint inc.
 2. Perimeter Tie joint inc.
2. Joint tie pattern to dimensions indicated or to next joint tie second dimensions indicated.
3. Expansion Joints Provide expansion joints and other secondary joints, including control contraction, and isolation joints, where indicated. Joint joints during installation setting criteria, joint leads, and tie. Do not set joint joints after installation.
 1. Where joints occur in concrete structures, locate joints in the surfaces directly tie.
4. Metal Edge Strips Install sections indicated.

3.04. WATERPROOFING INSTALLATION

- A. Instructions are written in a high-level, human-readable language and are executed by the computer's processor. The instructions are written in a high-level, human-readable language and are executed by the computer's processor. The instructions are written in a high-level, human-readable language and are executed by the computer's processor.
- B. Instructions are written in a low-level, machine-readable language and are executed by the computer's processor. The instructions are written in a low-level, machine-readable language and are executed by the computer's processor. The instructions are written in a low-level, machine-readable language and are executed by the computer's processor.

3.05. CRACK ISOLATION MEMBRANE INSTALLATION

- A. Instructions are written in the program itself. Since instructions to produce the program are written in the program, the program is called a self-replicating program.
- B. Instructions are written in the program, but the instructions are not written in the program itself. The instructions are written in a separate file or set of files, and the program reads these instructions to produce the program.

3.06. ADJUSTING AND CLEANING

- [illegible]

3.07. PROTECTION

- A. Protect installed tie rods with drop paper or other leakage containment during construction period to prevent staining, damage, and wear. Immediately installed tie rod contractor, apply coat of neoprene protective cleaner to completed tie rods and wires.
- B. Protect mat and electric rod tied wires for at least seven days after grouting is completed.
- C. Before final inspection, remove protective coatings and rinse neoprene protective cleaner from tie surfaces.

3.08. INTERIOR CERAMIC TILE INSTALLATION SCHEDULE

A. Interior Floor Installations, Concrete Slab

- a. Ceramic Tile Installation TC or TC with thinset mortar on concrete.
 - 1. Ceramic Tile Type TBD.
 - 2. Thinset Mortar Medium bed, modified dryset mortar.
 - c. Grout Ceramic tile epoxide grout.
- b. Ceramic Tile Installation TC or TC with thinset mortar on interlocking concrete.
 - 1. Thinset Mortar prebed modified dryset mortar.
 - 2. Grout Ceramic tile epoxide grout.
- c. Ceramic Tile Installation TC or TC with thinset mortar on crack isolation membrane.
 - 1. Thinset Mortar prebed modified dryset mortar.
 - 2. Grout Ceramic tile epoxide grout.

B. Interior Wall Installations, Wood or Metal Studs or Corrugated

- a. Ceramic Tile Installation TC or TC with TC or TC with thinset mortar on ceiling tiles or interlocking ceiling board.
 - 1. Thinset Mortar prebed modified dryset mortar.
 - 2. Grout Ceramic tile epoxide grout.
- b. Ceramic Tile Installation TC or TC with TC or TC with thinset mortar on glass block, interlocking resistant glass block board.
 - 1. Ceramic Tile Type TBD.
 - 2. Thinset Mortar prebed modified dryset mortar.
 - c. Grout Ceramic tile epoxide grout.

END OF SECTION



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SECTION 09 5100 ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.01. RELATED DOCUMENTS

- . Drawings and General provisions of the Contract, including General and Supplemental Conditions and Division 05 Specification Sections, apply to this Section.

1.02. SUMMARY

- . Section includes acoustic panels and exposed suspension systems for interior ceilings.
- . Products furnished, but not installed under this Section, include anchors, clips, and other ceiling attachment devices to be cast in concrete.

1.03. PREINSTALLATION MEETINGS

- . Preinstallation Conference/Contract conference at Project site.

1.04. ACTION SUBMITTALS

- . Submit to Compliance for Basis of Design products are provided, Submit to Compliance for products specified in the required Product Data sheets and Samples submitted. Ensure compliance with requirements included in Section 05 0000 "Additional Instructions/Requirements."
- . Product Data for each type of product.
- . Samples for verification of each component indicated and for each exposed finish required, prepared on Samples as specified. Indicate:
 - Acoustic Panels/Set including the Samples for each type, color, pattern, and texture.
 - Exposed Suspension System Members, Molding, and Trim/Set including the Samples for each type, finish, and color.

1.05. INFORMATIONAL SUBMITTALS

- . Coordination Drawings/Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated into each other, as input from installers of the items indicated:
 - Ceiling suspension system members.
 - Structural members to which suspension systems will be attached.
 - Method of attachment of members to existing structure.
 - Furnish details for cast-in-place anchors, clips, and other ceiling attachment devices whose installation is specified in other Sections.
 - Corridor channels or other supplemental support for non-fire rated where conditions do not permit installation of other fire rated ceiling.
 - Size and location of initial access panels for acoustic panels.
 - Items penetrating finished ceiling and ceiling-mounted items including:
 - Lighting fixtures.
 - Diffusers.
 - c. Pipes.
 - d. Speakers.
 - e. Sprinklers.
 - Access panels.
 - Perimeter molding.
 - Minimum Drawing Scale/Minimum inch/foot.

1.06. CLOSEOUT SUBMITTALS

- . Maintenance Data/Details to include in Maintenance Manual.

1.07. MAINTENANCE MATERIAL SUBMITTALS

- . Furnish electronic materials, from the supplier product run, that include products installed and that are packaged into protective covering or storage and identified into bags describing contents.
 - . Acoustic Ceiling Units inside panels 100 percent quantity installed.
 - . Suspension System Components quantity 100 percent exposed component 100 percent quantity installed.
 - . Grid Down Clips 100 percent quantity installed.
 - . Impact Clips 100 percent quantity installed.

1.08. QUALITY ASSURANCE

- . Provide the following upon request
 - . Notification Document testing agency
 - . Product Test Reports for each acoustic panel ceiling, or tests performed by manufacturer and witnessed by a qualified testing agency
 - . Evaluation Reports for each acoustic panel ceiling suspension system and anchor and fastener type, from ICC-ES.
 - . Field quality control reports.
- B. Mockups: Bidder to prepare sections of code under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
 - . Bidder to prepare typical ceiling details shown in Drawings.
 - . Approved mockups does not constitute approval of details from the Contract Documents contained in mockups unless Architect specific approval of details is written.
 - . Subject to compliance with requirements, approved mockups to be completed prior to start of construction.

1.09. DELIVERY, STORAGE, AND HANDLING

- . Deliver acoustic panels, suspension system components, and accessories to Project site and store them in a secure enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.
- B. Before installing acoustic panels, permit them to acclimate to temperature and stabilized moisture content.

1.10. FIELD CONDITIONS

- . Environmental conditions: Do not install acoustic panel ceilings until spaces are enclosed and dehumidified, wet room spaces is complete and dry, and ceiling is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
 - . Pressurized Positive Pressure Ventilation system or not less than 10 fans be required in acoustic panel ceiling installation.

PART 2 - PRODUCTS

2.01. MANUFACTURERS

- . Source qualifications: Obtain each type acoustic ceiling panel and its supporting suspension system from single source from single manufacturer.

2.02. PERFORMANCE REQUIREMENTS

- . Ceiling products submit to the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Acoustic Ceiling Emissions from Indoor Sources in an Environmental Chamber."
- B. Seismic Performance: Suspended ceiling system must meet the effects of earthquake motions determined according to the SCS-SEI as amended by the CBC Section 1600.

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- C. Surface Barring Characteristics: Comply with ASTM E 1063 testing and approved testing agency. Identify products with appropriate brands applicable testing agency.
- 1. Minimum Spread Index Class according to ASTM E 1063.
 - 2. Surface Deformed Index 100 or less.
- D. Fire Resistance Ratings: Comply with ASTM E 119 testing and approved testing agency. Identify products with appropriate brands applicable testing agency.
- 1. Indicate design designations and use of the listing number approved testing agency.

2.03. ACOUSTICAL PANELS

- A. Acoustic Panel Standard: Provide manufacturer's standard panels according to ASTM E 1116 and designated type, size, pattern, acoustic rating, and total reflectance unless otherwise indicated.

2.04. METAL SUSPENSION SYSTEM

- A. Metal Suspension System Standard: Provide manufacturer's standard, direct hung, metal suspension system and accessories according to ASTM C 800 and designated type, structural classification, and finish indicated.
- B. Identify, Cut, Coped, Dimpled, Steel Suspension System Main and cross runners room sized and conditioned steel pre-painted, electrocoat, zinc coated, or hot dip galvanized, and continuous designations with prefinished finish include electrocoat finishes.
- 1. Structural Classification according to system.
 - 2. End Condition of Cross Runners according to type.
 - 3. Finish Designation, finish.
 - 4. Cop Material: Conditioned steel.
 - 5. Cop Finish: Painted finish.

2.05. ACCESSORIES

- A. Attachment Devices: Size for the times the design and indicated in ASTM C 800 and, Table 1, "Direct hung," unless otherwise indicated. Comply with seismic design requirements.
- 1. Anchors in Concrete: Anchors type and material indicated, embed, into holes or holes for attachment anchors type indicated and into coped into system, into wall, into, and embed into the times that is posed ceiling construction, as determined by testing according to ASTM E 488 or ASTM E 488 as applicable, conducted and approved testing and inspection agency.
 - 2. Tape Cast in place post-installed expansion Post-installed bonded anchors.
 - 3. Corrosion Protection: Corrosion steel components zinc painted according to ASTM B 695, Class SC 1 mild service condition.
 - 4. Power-actuated fasteners in Concrete: Fastener system type suitable for application indicated, specified for corrosion resistant materials, into clips or other accessory devices for attachment anchors type indicated and into coped into system, into wall, into, and embed into the times that is posed ceiling construction, as determined by testing according to ASTM E 488, conducted and approved testing and inspection agency.
- B. Wire Anchors, Braces, and Ties: Provide wires as follows:
- 1. Zinc-coated, Carbon Steel wire: ASTM A 641 and ASTM A 641, Class 1 zinc coating, soft temper.
 - 2. Size:
 - a. Anchor Wire Size: 1/4 inch diameter or 3/8 inch diameter wire.
 - b. Seismic Bracing Wire Size: 1/4 inch diameter or 3/8 inch diameter wire.
 - c. Steel Setback Wire Size: 1/4 inch diameter or 3/8 inch diameter wire.
- C. Anchor Rods: Mild steel, zinc coated or protected with rust-inhibitive paint.
- D. Cold-Drawn Clips: Manufacturer's standard cold-drawn.
- E. Seismic Clips: Manufacturer's standard seismic clips designed to secure acoustic panels in place during seismic event.

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- Seismic Stud/Joist Bracing Manufacturer's standard perimeter stud/bracing designed to resist seismic forces.
- Seismic Struts Manufacturer's standard compression struts designed to resist seismic forces.
- Clean Room Gas Set System were indicated, provide manufacturer's standard system, including manufacturer's standard gas set and related devices, types, sizes, and retention clips, designed to seal the clean room and maintain positive pressure in clean room.

2.06. METAL EDGE MOLDINGS AND TRIM

- Rolled, Sheet Metal Edge Moldings and Trim Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that comply with seismic design requirements for sheet metal systems and materials, and covers that used in exposed areas of suspension system runners.
- B. Edge moldings shall be installed in accordance with details and suspension systems indicated and attached and construction of exposed runners unless otherwise indicated.

PART 3 - EXECUTION

3.01. EXAMINATION

- Examine substrates, areas, and conditions, including structural integrity to verify acoustic panel/ceiling attachment or, if not, if installation present, or compliance with requirements specified in this and other Sections that affect ceiling installation and enclosure and if requirements for installation tolerances and other conditions affecting performance of acoustic panel/ceiling.
- B. Examine acoustic panels before installation. Reject acoustic panels that are wet, distorted, or damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02. PREPARATION

- Measure each ceiling area and establish exact acoustic panels to determine order of installation at opposite edges of each ceiling. Install finishless transition strips at borders unless otherwise indicated and comply with manufacturer's recommendations for reflected ceiling panels.
- B. Locate openings for penetrations centered on the penetration details.

3.03. INSTALLATION

- Install acoustic panel/ceiling in accordance with ASTM C 1191 and manufacturer's written instructions.
 - Fire-Rated Assemblies Install fire-rated ceiling systems in accordance with tested fire-rated design.
 - Seismic Design Requirements Install in accordance with the following:
 - ASTM E 1886 for Seismic Design Categories D, E, and F.
- B. Suspend ceiling hangers from ceiling structural members and as follows:
 - Install hangers parallel and free from contact with installation or other objects within ceiling plenum that are not part of supporting structure or ceiling suspension system.
 - Suspend hangers only where required and, if permitted, use fire-resistance-rated ceilings, to resist construction-related resistance to horizontal forces of bracing, counters pulling, or other equipment/electrical loads.
 - Where voids exist and after construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension system hangers, install appropriate suspension hangers and hangers in other appropriate or equipment devices.
 - Secure fire hangers to ceiling suspension hangers and to supports using either of the following methods: Connect hangers directly to structure or to inserts, e.g. screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise interfere with fire, corrosion, or electrical performance.

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- Secure all, on-site, concrete and rod anchors to structure, including intermediate beams in beams, all attachment inserts, edge screws, or other devices that are secure and appropriate for the structure to which anchors are attached and the type anchor installed. Install anchors in a manner that will not cause them to deteriorate or interfere with, corrosion, or related temperatures.
 - Do not support ceilings directly from permanent attachments or other deck joisten anchors to cast-in-place anchor inserts, post installed mechanical adhesive anchors, or power actuated fasteners that extend through rods into concrete.
 - Open steel rods in does not permit installation anchor fires at spacing required, install corrosion channels or other support elements support or attachment anchor fires.
 - Do not attach anchors to steel decks.
 - Do not attach anchors to steel decked attachment anchors to structural beams.
 - Space anchors not more than 48 inches o.c. unless otherwise supported directly from anchors unless otherwise indicated provide anchors not more than 48 inches from ends of each beam.
- C. Secure rod in fires to ceiling suspension beams and to supports with a minimum of four tie bolts. Suspend rod in structure beams as required for anchors, without attachment to permanent attachments, steel deck, or steel decks. Joisten rod in into concrete with cast-in-place or post installed anchors.
- D. Install the rod in and tie type indicated at perimeter acoustic ceiling area and where necessary to concealed acoustic panels.
 - Apply acoustic sealant in a continuous ribbon concealed on all perimeter areas of rod in before tie are installed.
 - Score attachment rod in to substrate at intervals not more than 48 inches o.c. and not more than 4 inches from ends. Miter corners accurately and connect secure.
 - Do not use exposed fasteners, including pop rivets, on rod in and tie unless otherwise noted on drawings.
- E. Install suspension system runners so they are secure and securely interlocked with one another. Remove and replace dented, bent, or lined beams.
- F. Install acoustic panels with rounded edges and fit accurately into suspension system runners and edge rod in. Score and cut panels at borders and penetrations to provide precise fit.
 - Arrange direction of patterned acoustic panels as follows:
 - As indicated on reflected ceiling plans.
 - For suspended panels, install panels with edges flush with the bottom of suspension system runners and rod in.
 - For recessed panels on suspension system runners, install panels with bottom flush with the top surface of runner angles.
 - For recessed panels on suspension system beams with rounded edges, install panels with recessed edges in the contact with suspension system surfaces and panel edges flush with bottom of runners.
 - Paint cut edges of panels in a recessed after installation to cover exposed panel surfaces using a continuous recessed in a thin or this purpose of acoustic panels in contact.
 - Install seismic clips in areas indicated space according to panel manufacturer's written instructions unless otherwise indicated.
 - Wood Down Clips Space 48 inches o.c. on cross runners.
 - Install ceiling panel fastener system in areas indicated, seal edge panel and tie as recessed panel manufacturer's written instructions.
 - Protect lighting fixtures and air ducts according to requirements indicated for fire resistance rated assembly.

3.04. ERECTION TOLERANCES

- Suspended Ceilings Install in and cross runners level to tolerance shown in feet, not in millimeters.

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- B. Monitor and Trim Installed Joists and trim to substrate and reattach ceiling suspension system to tolerance specified in detail, non-compliance.

3.05. FIELD QUALITY CONTROL

- A. Special Inspections shall monitor and verify that all specified special inspector to perform the following special inspections:
- 1. Periodic inspection during the installation of suspended ceiling grids according to SCS/SEI 1.
- B. Testing shall monitor and verify that all specified testing agency to perform tests and inspections.
- C. Perform the following tests and inspections on completed installations of acoustic/pneumocellulose joists and anchors and fasteners in successive stages and when installation of ceiling suspension systems on each floor has reached 50 percent completion, but no panels have been installed. Do not proceed with installations of acoustic/pneumocellulose joists for the next level until test results for pre-qualified completed installations of acoustic/pneumocellulose joists show compliance with requirements.
- 1. In each test area, testing agency will select one pre-qualified pre-qualified fasteners and post installed anchors used to attach joists to concrete and will test the for tensile strength. It will also select one pre-qualified post installed anchors used to attach joists to concrete and will test the for tensile strength.
 - 2. When testing discloses fasteners and anchors that do not comply with requirements, testing agency will test those anchors not previously tested until pass consecutively and then will resume initial testing sequence.
- D. Acoustic/pneumocellulose joists, anchors, and fasteners will be considered defective if they do not pass tests and inspections.
- E. Prepare test and inspection reports.

3.06. CLEANING

- A. Clean exposed surfaces of acoustic/pneumocellulose joists, including trim, edge joists, and suspension system members. Comply with manufacturer's written instructions for cleaning and touch-up in this document.
- B. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanent condition in the evidence code code.

END OF SECTION

**SECTION 09 6500
RESILIENT FLOORING**

PART 1 - GENERAL

1.01. SECTION INCLUDES

- A. Resilient tile flooring.
- B. Resilient sheet flooring.
- C. Resilient base.
- D. Installation accessories.

1.02. REFERENCES

- A. ASTM E 1191 Standard Test Method for Critical Radiant Flux of Floor Covering Systems using Radiant Heat Energy Source.
- B. ASTM D 1891 Standard Specification for Resilient Floor Base.
- C. NFPA 285 Standard Method of Test for Critical Radiant Flux of Floor Covering Systems using Radiant Heat Energy Source and Fire Protection Association.

1.03. SUBMITTALS

- A. See Section 01 0000 Administrative Requirements, for submission procedures.
- B. Product Data Provide data on specified products, describing physical and performance characteristics including sizes, patterns and colors and installation instructions.
- C. Selection Samples Submit to architects color and material set for architect's initial selection.
- D. Verification Samples Submit three samples. Include in size illustration color and pattern for each resilient flooring product specified.
- E. Shop Drawings Submit each type including: floor joints, sections, details, edges, corners, door thresholds, enclosure partitions, built-in furniture, cabinets, and closets.
 - 1. Show details of special patterns.
- F. Certifications Submit a certification signed by the manufacturer and installer stating that the resilient flooring has been installed as specified and in accordance with fire test response characteristics.
- G. Maintenance Data Include maintenance procedures recommended by manufacturer and suggested schedule for cleaning, stripping, and reapplication.

1.04. DELIVERY, STORAGE, AND PROTECTION

- A. Protect room during work and store materials on end.
- B. Organize materials to protect products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Resilient Sheet flooring materials not less than 10 linear feet or 100 square feet or section thereof in room and in warehouse or each type, color, and pattern including installed.

1.05. ENVIRONMENTAL REQUIREMENTS

- A. Maintain temperature in storage area between 60 degrees F and 80 degrees F.
- B. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 60 degrees F to achieve temperature stability. Thereafter, maintain conditions of 60 degrees F.

1.06. QUALITY ASSURANCE

- ☐ Installer qualifications qualified installer employees orders for this Project are competent in techniques required of an installer for resilient sheet flooring installation and setting method indicated.
- ☐ Employee installer employees orders for this Project are trained or certified on resilient sheet flooring or installer for installation techniques required.
- B. Provide the following upon request:
 - ☐ Qualification Document Installer

PART 2 - PRODUCTS

2.01. MATERIALS - TILE FLOORING

- ☐ Substitutions See Section 05 40 00 Product Requirements.
- B. ☐ Installation Solid finished color and pattern throughout thickness, and:
 - ☐ Critical Radiant Heat (CR) Minimum 0.005 Btu per square centimeter, when tested in accordance with ASTM E 119, or NFPA 253.
 - ☐ Manufacturers:
 - ☐ Forstron Product Classic TruTone, color as selected by architect.
 - ☐ Substitutions See Section 05 40 00 Product Requirements.

2.02. MATERIALS – BASE

- ☐ Resilient Base ASTM D 4041, Type TS rubber, reinforced fiber set St B, C, and is:
 - ☐ Critical Radiant Heat (CR) Minimum 0.005 Btu per square centimeter, when tested in accordance with ASTM E 119, or NFPA 253.
 - ☐ Weight 100 lbs/sq yd
 - ☐ Thickness 1/8" inch
 - ☐ Finish Satin.
 - ☐ Color Color as selected from manufacturer's standards.
 - ☐ Accessories Preformed external corners, and end stops.
 - ☐ Manufacturers:
 - ☐ Bore Mercer Flooring Products, Inc.
 - ☐ Substitutions See Section 05 40 00 Product Requirements.

2.03. MATERIALS – VINYL SHEET FLOORING WITH BACKING

- ☐ Product Standard ASTM D 4041.
 - ☐ Type I Binder Content Type I, initial binder content 60 percent.
 - ☐ Sheet Thickness 1/8" inch
 - ☐ Sheet Thickness standard with manufacturer.
 - ☐ Backing Class Class 1
- B. ☐ Reinforcing Embedded.
- C. ☐ Sheet Widths standard with manufacturer.
- D. ☐ D. Seamless Installation Method Cyclic tested.
- E. ☐ E. Colors and Patterns as selected by architect from manufacturer's standard colors

2.04. ACCESSORIES

- ☐ Transition Detail and Patching Compounds precast, Portland cement based or modified polymeric cement based and option provided or approved by resilient sheet flooring manufacturer for applications indicated.
- B. ☐ Adhesives Water resistant type recommended by manufacturer and adhesive manufacturer to suit resilient sheet flooring and substrate conditions indicated.

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- ☐ Adhesives compatible with the testing and product requirements of the Commercial Department Public Health "Standard Method for the Testing and Evaluation of Chronic Chemical Emissions from Indoor Sources in Environmental Chambers."
- C. Seal Installation Accessories
 - ☐ Ceiling Binding Compound Manufacturer's product or ceiling binding sealant.
 - ☐ Ceiling Binding Compound suitable for the testing and product requirements of the Commercial Department Public Health "Standard Method for the Testing and Evaluation of Chronic Chemical Emissions from Indoor Sources in Environmental Chambers."
- D. Interlocks/Cover Base Accessories
 - ☐ Cover Strip/increase radius provided or approved resilient sheet flooring in Contractor.
 - ☐ Cop Strip/Score Set, Liner, or Rubber Cap provided or approved resilient sheet flooring in Contractor.
- E. Moldings and Edge Strips/Score Material in
 - ☐ After the Covered Base Plastic.
 - ☐ Sealer and other Types recommended by flooring in Contractor.

PART 3 - EXECUTION

3.01. EXAMINATION

- ☐ A. Permitted concrete sources are read or resident instruction testing or store emission rate and initialization instructions if test results are not within its recommended resident instruction manufacturer and adhesive properties manufacturer.
- ☒ B. Permitted required masonry jointed utilities are in correct location.

3.02. PREPARATION

- Prepare substrates according to resilient mortar or manufacturers written instructions to ensure adhesion of resilient sheet mortar.
 - Remove substrate ridges and gaps. Fill in all spots, cracks, joints, holes, and other defects with suitable filler to achieve smooth, flat, hard surface.
 - Permitted substrates are dry and free according compounds, sealers, and conditioners.
 - Remove substrate contaminants and other substances that are incompatible with adhesives and that contain soap, oil, dirt or silicone. Using mechanical methods recommended by resilient mortar or manufacturer. Do not use solvents.
 - Moisture and Adhesion Test—Perform tests recommended by resilient mortar or manufacturer. Proceed with installation and after substrate moisture test in range on pass scale recommended by manufacturer in writing, not less than four days before tiling.
 - Moisture Test—Proceed with installation and after substrates pass testing according to resilient mortar or manufacturers written recommendations, not less stringent than the following:
 - Perform relative humidity test using in situ process according to ASTM D 903. Proceed with installation and after substrates show a minimum 80 percent relative humidity level.
 - If after moisture tests exceed stated limits, appropriate retarder or moisture vapor emission controls specified.
 - Cracks, holes, and depressions in substrates will trim more deeply and patching compound remove gaps and ridges to produce a uniform and smooth substrate.
 - Appropriate measures required to prevent "bleed through" or interference with adhesives or substances that cannot be removed.
- B. Do not install resilient mortar until it is the same temperature as the space where it is to be installed.
 - At least 48 hours in advance of installation, place mortar and installation materials into spaces where they will be installed.

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- C. If editable before installation, sweep and vacuum clean substrates to be covered by resilient flooring.

3.03. INSTALLATION -TILE FLOORING

- A. Install in accordance with manufacturer's instructions.
- B. Mix tile and three containers to ensure same conditions are consistent when tile is placed.
- C. Mix tile and container to ensure same conditions are consistent when tile is placed.
- D. Spread thinset adhesive to permit installation of tiles before initial set.
- E. Set flooring in place, press with roller to attain embedment.
- F. Lay flooring with joints and seams parallel to grid lines to produce symmetrical pattern.
- G. Where floor finishes are different on opposite sides of door, terminate flooring under centerline of door.
- H. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.
- I. Score flooring to walls, columns, cabinets, door outlets, and other openings to produce tight joints.
- J. Install flooring in recessed door access covers. Maintain floor pattern.

3.04. INSTALLATION -BASE

- A. Use thickest joints possible and fit joints tight and square vertical.
- B. Fit joints tight and square vertical. Maintain uniform dimension between joints.
- C. Miter interior corners. At exterior corners, use pre-molded joints. At exposed ends, use pre-molded joints.
- D. Install base on solid backing. Bond tight to wall and door frames.
- E. Score and fit to door frames and other interruptions.

3.05. CLEANING

- A. Remove excess adhesive from floor, base, and door frames immediately.
- B. Clean, sweep and vacuum resilient flooring products in accordance with manufacturer's instructions.

3.06. PROTECTION OF FINISHED WORK

- A. Protect traffic on resilient flooring for 24 hours after installation.

END OF SECTION

SECTION 09 8433
ACOUSTICAL WALL PANELS

PART 1 - GENERAL

1.01. RELATED DOCUMENTS

- . Drawings and General Provisions of the Contract, including General and Supplemental Conditions and Division 00 Specification Sections, apply to this Section.

1.02. SUMMARY

- . Section includes supply and installation of acoustic wall panels tested for acoustic performance, including the following:
 - . Sound absorbing components.

1.03. DEFINITIONS

- . RC Noise Reduction Coefficient.
- B. Sound Absorption Coefficient.

1.04. REFERENCES

- . American Society for Testing and Materials (ASTM)
 - . ASTM E 84 Standard Test Method for Surface Burning Characteristics of Building Materials.
 - . ASTM C 425 Standard Test Method for Sound Absorption and Sound Absorption Coefficients of the Reflection Room Method.
 - . ASTM E 1116 Standard Practices for Measuring Test Specimens During Sound Absorption Tests

1.05. PREINSTALLATION MEETINGS

- . Preinstallation Conference/Contract conference at Project site.

1.06. ACTION SUBMITTALS

- . Submit for compliance with all Basis of Design products are provided, Submit for compliance with all the submitted in the required Product Data sheets and Samples submitted. Ensure compliance with requirements included in Section 00 0000 "Submit Procedures."
- B. Product Data for each type of product.
 - . Include metric, acoustic, performance, core material, and mounting indicated.
- C. Samples for verification of the submitted products:
 - . 6"x6" Sample, not necessarily required to show complete pattern repeat, and the material used for the core, and any specified treatments applied. Mount and face metric.
 - . Performance indicated Samples showing edge profile, corner, and finish.
 - . Core Material indicated Sample at corner.
 - . Mounting Devices indicate Samples.

1.07. INFORMATIONAL SUBMITTALS

- . Coordination Drawings/Elections and other details, drawn to scale, on which the following items are shown and coordinated with each other, including the installers of the items indicated:
 - . Electric outlets, switches, and other outlets.
 - . Items penetrating or covered by units including the following:
 - . Mounting details.
 - . Air outlets and inlets.
 - c. Speakers.
 - d. Doors.

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e. Sprinklers.

f. Access panels.

1.08. CLOSEOUT SUBMITTALS

- Maintenance Drawings: Each type shall include in the maintenance manuals. Include specific instructions for written cleaning and staining instructions.

1.09. MAINTENANCE MATERIAL SUBMITTALS

- Manufacturer's literature: Provide product literature for all products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1.10. QUALITY ASSURANCE

- Provide the following upon request:
 - Product Certificates of each type unit.

B. Substitutions

- Manufacturers: Provide acoustic panels from a single manufacturer.
- Installers: The installer shall have demonstrated experience in projects of comparable size and complexity.

1.11. DELIVERY, STORAGE, AND HANDLING

- Comply with specific and unit manufacturers' written instructions for handling and storage of the material and provide the necessary equipment, storage, and handling.
- Deliver materials and units in unopened bundles and store in the temperature-controlled drop ceiling or in a climate-controlled area.

1.12. FIELD CONDITIONS

- Environmental conditions: Do not install units until spaces are enclosed and the ceiling, floor, and walls are complete and dry, and the ceiling is complete, and the ambient temperature and humidity conditions are maintained at the levels indicated on the Project Open Occupied for its intended use.
- Protection: Do not install units until protection is provided on surfaces to receive the units.
- Air quality: Protect units from exposure to airborne odors, such as tobacco smoke, and install units under conditions free from odor contamination of ambient air.
- Field Measurements: Verify unit locations and clearances, openings and penetrations, and field measurements before installation, and indicate the same on Shop Drawings.

1.13. WARRANTY

- Specific Warranty: Manufacturer agrees to repair or replace units and components that within the warranty period.
 - Warranty includes, but are not limited to the following:
 - Acoustic performance.
 - Structural, staining, distortion, or reassembly of panels.
 - Warranty Period: The warranty period shall be the same as the manufacturer's warranty.

PART 2 - PRODUCTS

2.01. MANUFACTURERS

- Acoustic Structures, Inc., 1000 Central Expressway, Suite 100, Menlo Park, CA 94025. Phone: (650) 321-1111. Website: www.acousticstructures.com
- Substitutions: See Section 01 00 00 Product Requirements.

2.02. PERFORMANCE REQUIREMENTS

- A. Units shall provide the testing and product requirements of the Commission Department of Public Affairs "Standard Method for the Testing and Evaluation of the Chronic Toxic Effects of Industrial Sources" in Enforcement Orders."
- B. Fire Test Response Characteristics units shall provide "Source Burning Characteristics" or "Fire Protection Contribution" Sample Properties, or both, as determined by testing identical products of the under testing and inspecting acceptance to authorities within jurisdiction.
- 1. Source Burning Characteristics Class 1 per ASTM E 119 or 117 testing and identical testing acceptance. Identical products of the appropriate or ders applicable testing acceptance
 - 1. 100% Spread Index or less.
 - 2. Sample Developed Index or less.
 - 2. Fire Protection Contribution Class provide acceptance criteria and authorities within jurisdiction can test according to the Product Method B Procedure or Product

2.03. SOUND-ABSORBING WALL UNITS

- [illegible]

2.04. FABRICATION

- A. Standard Construction Case: Contractors shall use standard construction unless otherwise indicated. It shall be in accordance with the specifications, drawings, and approved order of construction. It shall be in accordance with the specifications, drawings, and approved order of construction.
- B. Edge Reinforcement: The reinforcement shall be in accordance with the specifications, drawings, and approved order of construction. It shall be in accordance with the specifications, drawings, and approved order of construction.
- C. Core Reinforcement: The reinforcement shall be in accordance with the specifications, drawings, and approved order of construction. It shall be in accordance with the specifications, drawings, and approved order of construction.

PART 3 - EXECUTION

3.01. EXAMINATION

- A. Explain metric, metriced units, sources, uses, and conditions of compliance with requirements, institutional differences, and other conditions affecting unit performance.
- B. Proceed with institution in other institutional conditions have been corrected.

3.02. INSTALLATION

- A. Installs in locations indicated. Unless otherwise indicated, installs into vertical surfaces and edges parallel, top edges aligned in alignment into other units, faces flat, and scribed to fit adjoining components at corners and at penetrations.
- B. Complete into manufacturer's written instructions for installation units (single type continuous devices indicated). Mount units securely to supporting structure.
- C. Finish color pattern and grain as indicated on Drawings.

3.03. INSTALLATION TOLERANCES

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B. Prior to the start of the work, the contractor shall provide a written notice to the owner, in writing, of the anticipated start date of the work.

3.04. CLEANING

A. Clean the work area and remove debris and materials.

B. Clean the work area and remove debris and materials according to the manufacturer's written instructions.

END OF SECTION

**SECTION 09 9000
PAINTS AND COATINGS**

PART 1 - GENERAL

1.01. SECTION INCLUDES

- A. Surface preparation.
- B. Field application of paints and other coatings.
- C. Painting of Pipework Identification
- D. See Schedules of Work to be finished, at end of Section.

1.02. REFERENCES

- A. ASME A 18.1 (Schedule for the Identification of Pipework Systems) latest Edition
- B. ASTM A 957 (Standard Terminology for Paint, Coatings, Materials, and Applications)
- C. ASTM D 1535 (Standard Test Methods for Direct Moisture Content Measurement of and in Base Materials) Reapproved
- D. ACE IMP (Industrial Maintenance Painting) ACE International current edition.
- E. SSPC (PM) Steel Structures Painting Manual, 1994, and Painting Practice Society for Protective Coatings, Third Edition.
- F. SSPC (PM) Steel Structures Painting Manual, 1994, Systems and Specifications Society for Protective Coatings, Second Edition.

1.03. SUBMITTALS

- A. See Section 01 0000 Administrative Requirements, for submittal procedures.
- B. Product Data Provide data on finishing products.
- C. Samples for Color Selection Submit one manufacturer's standard color palette for architect's selection.
- D. Samples Submit three painted samples, illustrating selected colors for each color and system selected or its specified coats specified. Submit on separate card, labeled in size.
- E. Submit three samples enclosed separately in this for owners' approval
- F. Manufacturer's Instructions Indicate special surface preparation procedures.
- G. Maintenance Data Submit data on cleaning, touchup, and repair of painted and coated surfaces.

1.04. QUALITY ASSURANCE

- A. Manufacturer Qualifications Company specified in or contractor in the Products specified in this section or its in the three years documented experience.
- B. Applicator Qualifications Company specified in or contractor in the Products specified in this section or its in the three years' experience.

1.05. REGULATORY REQUIREMENTS

- A. Conform to applicable code for use, safety and environmental requirements for products and finishes.

1.06. DELIVERY, STORAGE, AND PROTECTION

- A. Deliver products to site in sealed and labeled containers inspect to verify acceptance.
- B. Container Label Include manufacturer's name, type of paint, brand name, at number, brand code, color, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

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- C. Paint Materials Store at minimum ambient temperature 40 degrees and 80 degrees and 80 degrees, in tented area, and as required on manufacturer's instructions.

1.07. ENVIRONMENTAL REQUIREMENTS

- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required on the paint product manufacturer.
- B. Provide lightning electrodes secured adjacent to substrate surface.

1.08. EXTRA MATERIALS

- A. See Section 05 0000 Product Requirements, for additional provisions.
- B. Supply within one week of construction where directed.
- C. One extra container of material in addition to the manufacturer's supply.

1.09. WARRANTY

- A. Coatings services included under this section shall at the end of one year, be re-applied free of all serious fading, and variations, including surface cracking. All materials shall have their origin and reference at the end of one year, and there shall be no evidence of cracking, staining, peeling, scaling, cracking, streaks or stains at the end of this period. It shall be the contractor's responsibility to supply and labor to remove the surface dirt and to protect painting and deterioration effects.

PART 2 - PRODUCTS

2.01. MANUFACTURERS

- A. Paints
 - 1. Sherwin Williams
 - 2. Benjamin Moore
 - 3. Scerbin Industries Co.
 - 4. Dunn Edwards.
- B. Substitutions See Section 05 0000 Product Requirements.

2.02. PAINTS AND COATINGS -GENERAL

- A. Paints and Coatings Required, except for decorative coatings. Prepare pigments
 - 1. To a soft paste consistency, capable of being readily and uniformly dispersed to a uniform coating.
 - 2. For good flow and drying properties.
 - 3. Capable of drying or curing free of streaks or spots.

2.03. PAINT SYSTEMS -EXTERIOR

- A. Paint Type PE (Masonry, opaque, flat, or Gloss)
 - 1. One coat of Color-Tec acrylic masonry.
 - 2. One coat of Color-Tec II acrylic paint.
- B. Paint Type PE (Terrazzo Metals, unpainted, flat, or Gloss)
 - 1. One coat of Eternal-Prime Ester primer.
 - 2. See manufacturer's data for Paint and Sealant.
- C. Paint Type PE (Terrazzo Metals, Painted, or Gloss)
 - 1. Two coats of Eternal-Prime Ester Primer.
 - 2. See manufacturer's data for Paint and Sealant.
- D. Paint Type PE (Unpainted Metals, flat, or Gloss)
 - 1. One coat of Eternal-Prime Metal Primer.
 - 2. See manufacturer's data for Paint and Sealant.
- E. Paint PE (Brick Masonry, Rigid Micro-Sealer, or Gloss)
 - 1. One coat of Color-Tec acrylic masonry.
 - 2. One coat of Color-Tec II acrylic paint.

2.04. PAINT SYSTEMS -INTERIOR

- A. Paint Type Plaster Concrete, opaque, solid, flat
 1. One coat of Primer Primer Sealer.
 2. Sealant/Tint coats of Primer and Sealant.
- B. Paint Type Plaster Metals, unpried, solid, flat
 1. One coat of Epoxy Primer Ester primer.
 2. Sealant/Tint coats of Primer and Sealant.
- C. Paint Type Plaster Metals, Pried, solid, flat
 1. Topcoat of Epoxy Primer Ester primer.
 2. Sealant/Tint coats of Primer and Sealant.
- D. Paint Type Plaster Metals, solid, flat
 1. One coat of Epoxy Primer Ester primer.
 2. Sealant/Tint coats of Primer and Sealant.
- E. Paint Type Plaster Concrete, Epoxy Coating
 1. Topcoat of Epoxy Solid Epoxy Coating into broadcast sand.
- F. Paint Type Plaster Gypsum Board, solid, flat
 1. One coat of Primer Primer primer.
 2. Sealant/Tint coats of Primer and Sealant.
- G. Paint Type Plaster Gypsum Board, tinted, flat
 1. One coat of Coating of Tinted Tinted Primer.
 2. Epoxy/Tint coats of Epoxy and Epoxy.
- H. Paint Type Plaster -Gypsum Insulation coats, acrylic, flat
 1. One coat of Coating of Tinted Tinted Primer.
 2. Sealant/Tint coats of Primer and Sealant.
- I. Paint Type Plaster -Masonry
 1. One coat of Coating of Tinted Tinted Primer.
 2. Sealant/Tint coats of Primer and Sealant.

2.05. ACCESSORY MATERIALS

- A. Accessory Materials include: oil, turpentine, paint thinners and other materials not specified indicated not required to achieve the finishes specified on the project.
- B. Patching Material to be used.
- C. Primer and Coating Material to be used.
- D. Sand or other materials.

PART 3 - EXECUTION

3.01. EXAMINATION

- A. Verify that surfaces are ready to receive the product as instructed on the product manufacturer.
 - B. Estimate the surface condition to be finished prior to commencement of work. Report on condition that is potentially affect proper application.
 - C. Test sample applied primer or coating into a separate container.
 - D. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces is below the maximum allowed.
1. Plaster and Gypsum is maximum percent.
 2. Masonry Concrete, and Concrete block Masonry percent.
 3. Concrete is maximum percent.

3.02. PREPARATION

- A. Surfaces Appertences Re the or Electric ppates, cordore, itit itre tri , escetcens, and itins prior to prepin sources or thisin.
- B. Surfaces Correct defects and cñn surfaces oic oect or oot is section.
- C. Mors Se oit s e t e s e oic o o eed to r o o s r o c e i n i s e s .
- D. I o p e r o o s S r o c e s R e o e o i d e o o s c r o o i n o i t o s o t t i o n o t r i s d i o p o s p o t e o n d e e c o . R i n s e o i t o c ñ n o t e r o n o s r o c e t o d r o .
- E. Concrete and nit M o n r o S r o c e s t o e P i n t e d R e o e d i r t , o s e o o r t o r , s c o e , s o t o r o o o i p o o d e r , o n d o t e r o r e i n o o t t e r . R e o e o i n d o r e s e o i t o s o t t i o n o t r i s d i o p o s p o t e i n s e o e o n d o o o t o d r o . R e o e s t a i n s c o s e d o o e o t e r i n o o c o r r o d i n o e t o s o i t o s o t t i o n o s d i o o e t s i f i c a t e o t e r t o o o o o o e t t i n o i t o o t e r . o o o t o d r o .
- F. o p s o o B o o r d S r o c e s t o e P i n t e d o i n o i n o r d e f e c t s o i t o t e r c o o p o n d . S p o t p r i e d e f e c t s o t e r r e p a i r .
- G. I n s o o t e d C o e r i n o s t o e P i n t e d R e o e d i r t , o r e s e , o n d o i o o o c o n o s o n d c o t t o n .
- H. Concrete o o o r s t o e P i n t e d R e o e c o n t o o i n o t i o n , o i d e t c o , o n d r i n s e o o o r s o i t o c ñ r o t e r . o e r i o r e o i r e d o i d o o o o o o o n c e i s o c i e e d . o o o t o d r o .
- I. o o o o i e d S r o c e s t o e P i n t e d R e o e s r o c e c o n t o o i n o t i o n o n d o i s o n d o o s o i t o s o o e n t . o p p o c o o t o e t c o i n o p r i e r .
- J. I n c o o t e d S t e e o n d I r o n S r o c e s t o e P i n t e d R e o e o r e s e , o i o s c o e , o e d s p o t t e r , d i r t , o n d r o s t . o e r e o e o o c o t i n o s o s c o e o r e e i d e n t , r e o e o o o n d o i r e o r s i n o o r s o n d o s t i n o c o e o n o o o s i n o i t o s o o e n t . o p p o t r e o t o e n t o p o s p o r i c o i d s o t t i o n , e n s o r i n o o e d o i n t s , o o f t s , o n d n o t s o r e S i o i o r o c ñ e d . P r i e p i n t e n t i r e s r o c e s p o t p r i e o t e r r e p a i r s .
- K. S o o p P r i e d S t e e S r o c e s t o e o i n i s P i n t e d S o n d o n d s c r o p e t o r e o e o s e p r i e r o n d r o s t . o e t e r e d e s t o o o e t o o o o p p o t e s i n o s p i c o o s . C ñ n s r o c e s o i t o s o o e n t . P r i e o o r e s t e e s r o c e s .
- L. M e t o o D o o r s t o e P i n t e d P r i e o e t o o o o r t o p o n d o t t o o e d e s r o c e s .

3.03. APPLICATION

- A. o p p o p r o d u c t s i n o c c o r d o n c e o i t o o o n o o c t o r e r s i n s t r o c t i o n s .
- B. o e r e o d e c e n t s e o o n t i s t o e p i n t e d , d o n o t o p p o i n i s o c o o t s o n t i s e o o n t i s o p p l i e d .
- C. D o n o t o p p o i n i s e s t o s r o c e s t o o t o r e n o t d r o o o o o p p l i e d c o o t s t o d r o o e r e n e o t c o o t i s o p p l i e d .
- D. o p p o e c o c o o t t o o n i o r o o p p e a r o n c e . o p p o e c o c o o t o p p i n t s i o o t o d o r e r t o o n p r e c e d i n o c o o t o n e s s o t e r o i s e o p p r o e d .
- E. B r o o d c o s t o n d o r o o o o t s e o s i n t o e p o o o o o r c o o t i n o p e r o o n o o c t o r e r s r e c o o o e n d o t i o n s o n d o p o n o p p r o o o o o o o n e r .
- F. o o c o o o c ñ n s r o c e s o s e p a r t i c l e s . o s e t o o c o o t t o r e o e d o s t o n d p a r t i c l e s o s t p r i o r t o o p p o i n o n e o t c o o t .

3.04. FINISHING PIPING SYSTEMS

- A. P o i n t i n o o P i p i n o o
 - a. P i n t o e d i c o o o o s p i p i n o i n t o e s t o o p i e p r i o r t o i n s t o o t t i o n . o e o e e n d s o n p i n t e d o e r e t o e o i o e o r o e d o r s o d e r e d .
 - b. o t e r i n s t o o t t i o n , t o o c o o p p i n t o n e p o s e d p i p i n o .
 - c. C o o r c o d e s o r o e d i c o o o s p i p i n o
 - a. M e d i c o o c o o p r e s s e d o r o e o o o
 - b. o o o e n o o r e e n
 - c. o i t r o o s o o d e M e d i o o o e
 - d. M e c o o n i c o o P i p i n o o

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- ☐ Exposed or concealed, not accessible insulated and uninsulated mechanical piping shall be painted in its entirety.
- ☐ Coatings for mechanical piping
 - ☐ Coated Water Pipe Green
 - ☐ Condensed Water Blue Green
- ☐ c. Galvanized Water Pipe
- ☐ d. Steel Drainage
- ☐ e. Steel condensate drain
- ☐ Domestic cold Water Drain
- ☐ Domestic hot Water Rise red
- ☐ Gutters Metal

3.05. CLEANING

- ☐ Collect waste materials which constitute a fire hazard, place in closed metal containers, and remove from site.

3.06. SCHEDULE -SURFACES TO BE FINISHED

- ☐ Dotted Paint or finish the following items
 - ☐ Items that are finished unless specifically noted.
 - ☐ Fire rating tests, equipment series number and capacity tests.
 - ☐ Stainless steel items.
- ☐ B. Paint the surfaces described below under SCHEDULE Paint Systems.
- ☐ C. Mechanical and Electrical base paint systems defined for the substrates to be finished.
 - ☐ Paint appropriate items occurring in finished areas.
 - ☐ Paint interior surfaces which ducts that are visible through pipes and doors into the coat shall be painted to visible surfaces.
 - ☐ Paint doors exposed behind doors, pipes, to electric pipe lines.
- ☐ D. Paint all sides and edges exposed and exposed for electrical and telephone equipment where installed equipment.

3.07. SCHEDULE -PAINT SYSTEMS

- ☐ A. General See A-15 SCHEDULE on drawings. See below for those items not listed in the schedule.
- ☐ B. Concrete Block masonry surfaces exposed to air and parapet walls.
 - ☐ Exterior PE
 - ☐ Interior PI
- ☐ C. Brick Masonry masonry exposed surfaces.
 - ☐ Exterior PE
- ☐ D. Steel Doors and Frames
 - ☐ Exterior PE
- ☐ E. Steel Fabrications masonry surfaces exposed to air.
 - ☐ Primed
 - ☐ Exterior PE
 - ☐ Interior PI
 - ☐ Non Primed
 - ☐ Exterior PE
 - ☐ Interior PI
- ☐ F. Galvanized Steel masonry surfaces exposed to air.
 - ☐ Exterior PE
 - ☐ Interior PI

POINTS TO REMEMBER

- ## SECTION

SECTION 10 1400 SPECIALTY SIGNS

PART 1 - GENERAL

1.01. RELATED DOCUMENTS

- Drawings and General provisions of the Contract, including General and Supplemental Conditions and Division 10 Specification sections, apply to those specified in this section.

1.02. SECTION INCLUDES

- Extent of specifications is as shown on the drawings
- Signs and specifications required include the following:
 - Core series – Material required length
 - Rigid designation series – MD – 2 1/2" x 5"
 - ADA requirements
 - Color Title signs

1.03. SUBMITTAL

- Manufacturers list submit references showing products or projects completed within the last 12 months.
- Submit manufacturer's technical data and installation or erection type as required.
- Submit shop drawings listing sign size, letter size and letter heights.
- Submit one sample sign type, size and color specified, including etched or attached. In process, the sample must be made prior to the start of the work.

1.04. SIGN TYPE DESCRIPTION

- Signs shall consist of rigid material and rigid function to meet the requirements of the Americans with Disabilities Act (ADA) and California State Code – Title 24, Part 2, California Building Code (CBC) 2019 Edition

PART 2 - PRODUCTS

2.01. MANUFACTURER

- Provide products from Manufacturer Sign Systems, Inc. P.O. Box 1000, San Diego, CA 92101 or approved equal.
- Substitutions See Section 01 20 00 (Product Requirements).

2.02. GRAPHIC PROCESS

- Signs shall be manufactured using Graphic Process Series 1000 Standard Color Series or 1000 D.
 - Text characters shall be raised the required height inches from sign face. Depth letters or etched characters are not acceptable.
 - Text shall be accompanied by grade or grade. Braille shall be separated 1" from the corresponding raised characters or signs. Grade or grade transition to be provided by sign manufacturer.
 - Perimeter borders shall be 1". optional
 - Letters, numbers and/or signs shall be in high contrast to their background, either light characters on dark background or dark characters on light background. Characters and background shall be in high contrast.
- Provide materials for Special Purpose Signage decorative layer setting in pressure laminate. Material to be 1/8" thick laminate with a melamine resin surface and a phenolic resin core which provides resistance to corrosion, stains, discolorations, fading, and heat. The materials shall be EMO rated and shall be in high contrast and shall be in high contrast to meet the standards for high contrast interior materials.

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C. Background color as selected by architect from manufacturer's actual color samples.

D. Lettering shall include Gill Sans upper case letters and numbers.

E. Sign letters and numbers shall be as follows:

- ☐ Raised numbers shall be 1".
- ☐ Lettering for room ID signs shall be 1" or as noted.
- ☐ Sign shall be 1" thick.
- ☐ Standard grade of grade shall be 1" or as noted.
- ☐ Corners shall be 1" radius.
- ☐ Composition shall be centered or as indicated on drawings.

2.03. SIGN DESIGN

Type A Room ID signs shall include room number and function.

Type B Room ID signs shall include function only on one or two lines.

Type C Directional signs shall include description and grade of grade.

Type D – Corridor Title shall be painted sign.

2.04. EXTERIOR WALL SIGNS (At Handicapped Entrances)

Type E Accessible entrance shall include, insert sign 1" or 2". Insert appropriate raised 1" accessibility symbol with the verbal description, "Entrance" using 1" Gill Sans upper case letters direct to the door and include 1" or as noted.

See sign details on Architectural drawings and sign schedule.

PART 3 - EXECUTION

3.01. INSTALLATION

A. Signs shall be mounted using appropriate and suitable adhesive.

B. Mechanical sign Type E.

C. Signs shall be mounted 1" from the door to the center of the sign on the left side. The distance between the door frame and sign shall be 1".

D. Installer shall be responsible for suitable installation of the signs.

3.02. CLEANING AND PROTECTION

A. After installation, clean soiled signs surface according to manufacturer's instructions. Protect from damage and acceptance.

END OF SECTION

SECTION 10 2113 TOILET PARTITIONS

PART 1 - GENERAL

1.01. RELATED DOCUMENTS

- Drawings and General provisions of the Contract, including General and Supplemental Conditions and Division 10 Specification Sections, apply to this Section.

1.02. SUMMARY

- Section Includes
 - Solid plastic toilet compartments considered as toilet enclosures and drain screens.
 - Painted steel toilet compartments considered as toilet enclosures and drain screens.
- Related Requirements
 - Section 05 0000 "Metal Fabrications" for supports that attach floor and ceiling mounted compartments to concealed structural steel.
 - Section 05 0000 "Miscellaneous Ready-Carpened" for skirting.
 - Section 05 0000 "Toilet, Bath, and Shower Accessories" for toilet tissue dispensers, mirrors, paper sleeves, and similar accessories mounted on toilet compartments.

1.03. ACTION SUBMITTALS

- Submit to Compliance for Basis of Design products are provided, Submit to Compliance for the submit in the required Product Data sheets and Samples submit to Ensure compliance with requirements included in Section 05 0000 "Submit Procedures."
- Product Data for each type of product.
 - Include construction details, material descriptions, dimensions and individual components and profiles, and finishes for toilet compartments.
- Shop Drawings for toilet compartments.
 - Include plans, elevations, sections, details, and attachment details.
 - Submit locations and details for compartment mounted toilet accessories.
 - Submit locations and centerlines for toilet fixtures.
 - Submit locations for drains.
 - Submit ceiling grid, ceiling mounted items, and concealed support or bracing locations.
- Samples for verification for the following products, in manufacturer's standard sizes unless otherwise indicated
 - Each type of material, color, and finish required for toilet compartments, prepared on the indicated Samples as the thickness and material indicated for each.
 - Each type of mirror and accessory.

1.04. INFORMATIONAL SUBMITTALS

- Product Certificates for each type of toilet compartment.

1.05. CLOSEOUT SUBMITTALS

- Maintenance Data for toilet compartments to include in maintenance manuals.

1.06. PROJECT CONDITIONS

- Field Measurements for the following conditions for toilet fixtures, doors, cabinets, ceilings, and other construction conditions of toilet compartments field measurements are verification.

PART 2 - PRODUCTS

2.01. PERFORMANCE REQUIREMENTS

- Source Based Characteristics: Compare with ASTM E 1066 testing or equivalent testing to ensure identified products are appropriate for the applicable testing to ensure.

TITLE PARTITIONS

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TITLE PARTITIONS

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- Core Material Manufacturer's standard standard design one inch resin impregnated kraft paper in thickness required to provide finished thickness including doors and panels and including inches of plaster.
 - Corrosion Reinforcement Provide concealed internal reinforcement for doors mounted on units inside and exterior concrete for panels attached and applied door and on door and test and materials to be tested in accordance with ASTM 1003, attachment details.
 - I. Reinforced Screen Construction
 - Reinforced Screen Material in panel construction.
 - Reinforced Sheets and Cores Electrically coated steel sheet with in case of etched thicknesses is inches
 - Plasters, Braced at Both Ends Manufacturer's standard thickness, not less than 1 inch inches.
 - Plasters, Unbraced at One End Manufacturer's standard thickness, not less than 1 inch inches.
 - Panel Manufacturer's standard thickness, not less than 1 inch inches.
 - Doors Manufacturer's standard thickness, not less than 1 inch inches.
 - Reinforced Screen Thickness of thickness of the panels.
 - Plaster Sides Stiffness steel sheet, not less than 1 inch inches in thickness and inches of stiffening. See attached enclosed and internal compartment structure. Secure to wall with manufacturer's recommended concrete anchors.
 - Panel Plaster Pedestals Stiffness steel and inches of stiffening. Pedestals are attached in detail to attach inches of stiffening. Secure to wall with recommended inches of stiffening, corrosion resistant screws.
- M. Brackets fitting
 - Stirrup Type for or brackets stiffness steel.
 - Continuous Type Manufacturer's standard design stiffness steel.
- Steel Sheet finish is edited after cleaning, apply manufacturer's standard coated with primer setting, electrostatic applied powder coatings. Coat with coating of manufacturer's written instructions for applying and drying.
 - Coatings selected to meet or exceed manufacturer's schedule

2.04. HARDWARE AND ACCESSORIES

- Hardware and Accessories Manufacturer's schedule to operating hardware and accessories.
 - Doors Manufacturer's finish of 1 inch inches stiffness steel continuous, coat type that allows to closed or partially open position, provide emergency access to fitting door. Mount with hardware.
 - Lock and Keeper Manufacturer's schedule to schedule coated cast stiffness steel lock unit designed to resist door due to slamming, with combination roller tipped door strike and keeper, and with provision for emergency access. Provide units that coat with retractor require for access to compartment doors designated as accessible. Mount with hardware.
 - Coat Manufacturer's schedule to combination cast stiffness steel and roller tipped roller, sized to prevent intrusion in door with fitting compartment doors accessories. Mount with hardware.
 - Door Keeper Manufacturer's schedule to roller tipped cast stiffness steel roller per fit in opening doors. Mount with hardware.
 - Door Panel Manufacturer's schedule to cast stiffness steel panel fits in opening doors that complies with retractor require for access to fitting. Provide units on both sides of doors at compartment doors designated as accessible. Mount with hardware.

2.05. MATERIALS

- Stiffness Steel Sheet ASTM 1003, Type 1003, stretcher level standard thickness.

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B. Stainless Steel Continues STM 100000000M.

2.06. FABRICATION

- A. Fabrication, General Fabricate to let component components to sizes indicated. Coordinate requirements and provide details for fabrication of let accessories where required for attachment of let accessories.
- B. Percead Braced Units Provide a manufacturer's standard corrosion resistant supports, leveling, and anchors at piers to suit floor conditions. Provide shoes at piers to conceal supports and leveling devices.
- C. Door Size and Sizing Unless otherwise indicated, provide 100000000, in 100000000 doors for standard let components and 100000000, 100000000 doors with 100000000 100000000 side, clear opening for components designated as access.

PART 3 - EXECUTION

3.01. EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for fastening, support, alignment, operation clearances, and other conditions affecting performance.
 - 1. Confirm location and adequacy of connections and supports required for installation.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02. INSTALLATION

- A. General Component with a manufacturer's written installation instructions. Install units rigid, straight, level, and plumb. Secure units in position with a manufacturer's recommended anchoring devices.
 - 1. Minimum Clearances
 - a. Piers and Panels 100000000
 - b. Panels and 100000000
- B. Concealed Continues Brackets Secure panels to walls and to piers with concealed brackets.
 - 1. Locate bracket fasteners so shoes for concealed doors occur in 100000000 joints.
 - 2. Align brackets at piers with brackets at walls.
- C. Percead Braced Units Secure piers to floor and level, plumb, and tighten. Set piers with anchors penetrating not less than 100000000 inches into structure unless otherwise indicated in a manufacturer's written instructions. Secure continues lead rod end of pier with not later than to fasteners. Anchor doors to floor tops and tops of panels, and adjust stops and doors are parallel to percead brace when doors are in closed position.
- D. Door Screens Attach with anchoring devices to suit supporting structure. Set units level, rigid, and secured to resist lateral impact.

3.03. ADJUSTING

- A. Adjust and operate and fabricate adjust according to adjust a manufacturer's written instructions for proper operation. Set hinges on 100000000 doors to 100000000 open 100000000 degrees from closed position when indicated. Set hinges on 100000000 doors to return doors to 100000000 closed position.

END OF SECTION

SECTION 10 2233 WIRE MESH PARTITIONS

PART 1 - GENERAL

1.01. SUMMARY

- A. Section Includes
 - 1. Standard wire mesh partitions.
 - 2. Reinforced wire mesh partitions.
 - 3. Wire mesh ceilings.
 - 4. Wire mesh independent partition carriers.

1.02. DEFINITIONS

- A. Intermediate Crippers pass over one and under the next adjacent wire in both directions, with wires crimped where joined and with end crippers between the intersections.
- B. Welded wire mesh is welded at every intersection, secured within wires in place.
- C. Cold Cripper Deep crippers at points of intersection that wires secured in place.

1.03. ACTION SUBMITTALS

- A. Product Data
 - 1. Wire mesh partitions
- B. Shop Drawings
 - 1. Include plans, elevations, sections, and attachment details.
 - 2. Indicate clearances required for operation and doors.
- C. Samples for Initial Selection Manufacturer's standard color sheets, showing machine or painted colors for units with factory applied finishes.
- D. Samples for Verification Panel constructed as specified with eelers and wire mesh. Show etched finishing eelers at intersections.
 - 1. Size and color in inches.
- E. Detailed Design Submit wire mesh partitions indicated to comply with performance requirements and design criteria, including analysis designed and sealed with the qualified professional engineer responsible for their preparation.
- F. Sustained Design Submittals
 - 1. Product Data and recorded content, indicating postcure and pre-cure recorded content and cost.

1.04. INFORMATIONAL SUBMITTALS

- A. Certificates
 - 1. Eelers certificates.
- B. Identification Data
 - 1. Installer
 - 2. Detailed Design Engineer.

1.05. CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data for wire mesh partition hardware.

1.06. QUALITY ASSURANCE

- A. Inspections
 - 1. Installer.
 - 2. Eelers and inspection procedures and personnel in accordance with the eelers and codes.

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1.08. FIELD CONDITIONS

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2.01. SOURCE LIMITATIONS

- ## 2.02. MANUFACTURERS

- B. Substitutions See Section 11.00 Product Requirements.

2.04. STANDARD-DUTY WIRE MESH PARTITIONS

- A. Partition eiect f. incs . . .
- B. eded ire Mes . . . , . . . inc di eter ire, . . . inc s . . . re es .
- C. ertic and riant P ne r in inc s . . . ped ste n . . . es.

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2.05. MATERIALS

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2.06. FABRICATION

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- ☐ Provide orientosteners as indicated or, if not indicated, as required by panel detail and as recommended by wire mesh partition manufacturer. Weld orientosteners to vertical rods in.
- ☐ Fabricate floor and wall intersections in intersection posts.
- ☐ c. Fabricate partition and door frame into its set of pieces for connecting adjacent panels.
- ☐ Fabricate wire mesh partitions into their orientosteners in the set of finished work.
- ☐ Doors shall be set into their set of pieces for adjacent panels.
- ☐ For doors that do not extend into partition, provide transom over door, indicated in set of pieces and frame in partition panels.

2.07. STEEL AND IRON FINISHES

- ☐ Powder-Coated finish shall be applied after cleaning and pretreating, apply by manufacturer's standard recommended finish, surface for use indicated, with a minimum dry film thickness of 1.5 mils. Insert dimension.
- ☐ Coatings selected by owner architect for by manufacturer's name.

PART 3 - EXECUTION

3.01. EXAMINATION

- ☐ Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance before work.
- ☐ B. Examine areas for suitable conditions before wire mesh items are installed.
- ☐ C. Examine areas to which wire mesh items are attached for proper located blocking, grounds, and other solid blocking for attachment and support fasteners.
- ☐ D. Proceed with installation and after unsatisfactory conditions have been corrected.

3.02. INSTALLATION OF WIRE MESH PARTITIONS

- ☐ Install wire mesh partitions to their set of pieces after, post installed expansion anchors through base plates located at each post and corner.
- ☐ B. Install wire mesh partitions to their set of pieces through each corner panel in and as follows:
 - ☐ For concrete and solid masonry anchorage, use expansion anchors.
- ☐ C. Provide tie posts at locations indicated or, if not indicated, as follows:
 - ☐ On each side of door openings.
 - ☐ Match the set of pieces support, regardless of detail.
- ☐ D. Provide seismic supports and bracing as indicated or, if not indicated, as recommended by manufacturer and as required for stability, extending and fastening members to supporting structure.
- ☐ E. Where standard wire mesh partition panels do not entirely extend across, provide custom door panels to fill openings.
- ☐ Install doors complete with door hardware.
- ☐ Install service windows complete with window hardware.
- ☐ Both accessories to wire mesh partition frame.

3.03. REPAIR

- ☐ Touchup Painting shall be applied after erection, clean field welds, welded connections, and welded areas. Paint indicated and welded areas with the same materials used for shop painting to comply with SSPC-PP or to comply with shop painted surfaces.

3.04. ADJUSTING

- ☐ Adjust doors to operate smoothly and easily, without binding or rubbing. Adjust hardware to function smoothly. Verify that doors and doors engage correctly and secure without binding or rubbing.

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3.05. PROTECTION

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- ☐. Repair and replace defective work, including doors and windows that are warped, cracked, or otherwise unacceptable.

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END OF SECTION

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SECTION 10 2600 WALL AND DOOR PROTECTION

PART 1 - GENERAL

1.01. RELATED DOCUMENTS

- . Drawings and General provisions of the Contract, including General and Supplemental Conditions and Division 00 Specification Sections, apply to this Section.

1.02. SUMMARY

- . Section Includes
 - . Corner guards.
 - . Impact-resistant coverings.
- B. Related Sections
 - . Section 00 0000 "Ordere" for etwork or, dc, op, and psp ptes.

1.03. PERFORMANCE REQUIREMENTS

- . Structural Performance Provide and/or is capable of withstanding the effects of loads and the resulting loads and stresses within its and under conditions indicated
 - . Uniform load applied in one direction.
 - . Concentrated load applied in one direction.
 - . Uniform and concentrated loads need not be assumed to act concurrently.

1.04. ACTION SUBMITTALS

- . Submit for compliance with Basis of Design products are provided, Submit for compliance with the required Product Data submit and Samples submit. Ensure compliance with requirements included in Section 00 0000 "Administrative Requirements."
- B. Product Data include construction details, material descriptions, impact strength, fire test response characteristics, dimensions, individual components and profiles, and finishes for each impact-resistant protection unit.
- C. Shop Drawings for each impact-resistant protection unit showing locations and extent. Include sections, details, and attachments to other work
 - . For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- D. Samples for verification of each type proposed (this is required, prepared on Samples as indicated below).
 - . Impact-Resistant Coverings includes sample.
 - . Door Surface Protection includes sample.

1.05. CLOSEOUT SUBMITTALS

- . Maintenance Data for each impact-resistant protection unit to include in maintenance manuals.
 - . Include recommended methods and references for maintenance or containment of plastic covers under anticipated traffic and use conditions. Include precautions against staining materials and methods to be used to remove debris from plastic finishes and periodically.

1.06. QUALITY ASSURANCE

- . Installer qualifications on employer orders trained and approved by manufacturer.
- B. Source of materials for impact-resistant protection units from single source from single manufacturer.

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C. Product options Drawings indicate size, profiles, and dimensions and require units impact resistant impact protection units and are based on the specific system indicated. Refer to Section 05 00 00 "Finish Requirements."

- Do not add unintended aesthetic effects, as added some impact protect, except impact protect's appropriate indications are proposed, some impact comprehensive expansion data to impact or

D. Surface Barrier Characteristics Provide impact resistant, plastic impact protection units with surface barrier characteristics as determined by testing identical products per ASTM E 88, IP 000, or other test or other qualified testing agency.

E. Reinforcement Requirements Comply with applicable provisions in the 2000 AD Standards and CBC 18B.

- Preinstallation Conference Conduct conference at Project site.

- Provide the following open request

- Specification Document qualified Installer.
- Material Certificates for each impact resistant plastic material, from manufacturer.
- Material Test Reports for each impact resistant plastic material

1.07. DELIVERY, STORAGE, AND HANDLING

- Store impact resistant impact protection units in original and sealed packages and containers inside the tented area protected from weather, moisture, staining, extreme temperatures, and humidity.

- Maintain room temperature within storage area at not less than 40 degrees Fahrenheit during the period plastic materials are stored.
- Keep plastic sheet material dry and direct sunlight.
- Store plastic impact protection components for initial 90 days, or until plastic materials are initial 90 days room temperature 40 degrees Fahrenheit.
- Store corner board covers in a vertical position.
- Store covers in a horizontal position.

1.08. PROJECT CONDITIONS

- Environmental conditions Do not deliver or install impact resistant impact protection units until wind is enclosed and weatherproof let area is complete and dry, and ambient system is operating and maintaining temperature at 40 degrees Fahrenheit or not less than 40 degrees Fahrenheit during installation and for the remainder of the construction period.

1.09. WARRANTY

- Specify Manufacturer's standard warranty in which manufacturer agrees to repair or replace components of impact resistant impact protection units that fail in materials or workmanship within specified warranty period.

- Warranties include, but are not limited to, the following:
 - Structural warranties.
 - Deterioration of plastic and other materials beyond normal use.
- Warranty Period shall be as per date of Substantial Completion.

PART 2 - PRODUCTS

2.01. MATERIALS

- PVC Plastic ASTM D 2000, Class 1, textured, chemically and stain resistant, impact resistant PVC or Corrosion modified polypropylene with interlocking tongue and groove and sheet material thickness as indicated.

- Impact Resistance Minimum 100 ft-lb. Impact when tested according to ASTM D 2000, Test Method 1.
- Chemically and Stain Resistance Tested according to ASTM D 2000.
- Seamless and is not tested according to ASTM D 2000.
- Weight Spread Index 100 or less.

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- ☐ **A.** ☐ **See Deformed Indentations or Less.**
- ☐ **B.** ☐ **in the Extrusions and temper recast ended in an indicator or type case and**
☐ **finish indicated, but it is not less than strength and durability properties specified in ASTM B**
☐ **for the alloy used.**
- ☐ **C.** ☐ **fasteners in, non-mechanical stainless steel or other noncorrosive metals,**
☐ **and other fasteners compatible with it is used. Use security type fasteners where**
☐ **exposed to fire.**
- ☐ **D.** ☐ **desires recast ended in impact resistant plastic protection in indicator and that**
☐ **complies with the test and product requirements of the Commercial Department of the**
☐ **Services Standard Practice for the Testing of the Organic Emissions from Various Sources**
☐ **in the Same Section of the Code.**

2.02. CORNER GUARDS

- . Surface Mounted, Resilient, Plastic Corner Boards Consist of a Consistent Snap-on Plastic Corner Installed over Continuous Retainer Inclusion of Continuous Board Recommended into Corner Condition.
- . Manufacturers Subject to Compliance with Requirements, including Manufacturers Offering Products that are Incorporated into the Board Inclusion, are not limited to the following:
 - . Orden Architectural Specities, Inc.
 - . Construction Specities, Inc.
 - . IPC Door and Window Protection Systems Division InPro Corporation.
 - . Corner Extruded rigid plastic, initial 1/4 inch thickness in dimensions and profiles indicated on Drawings.
 - . Color and Texture as selected Architect from Manufacturers offering.
 - . Retainer Mini 1/4 inch thick, one piece, extruded aluminum.
 - . Retainer Clips Manufacturers standard impact resistant clips.
 - . Top and Bottom Caps Pre-Installed, injection molded plastic cover attached corner of door frame or case in front of its snap-on cover.

2.03. IMPACT-RESISTANT WALL COVERINGS

- [illegible]

2.04. FABRICATION

- . Fabricate impact-resistant impact protection units to compare with requirements indicated for design, dimensions, and other sizes, including thicknesses components.
- B. Assess the components in order to determine extent possible to minimize field assessment. Disassemble the units necessary for shipping and handling.
- C. Fabricate components with tight seals and joints with exposed edges rounded. Provide sources free of wrinkles, creases, dents, uneven coloration, and other imperfections. Fabricate the covers and fittings to produce the soft, and rigid marine units.

2.05. METAL FINISHES

- . Coo p ito MM's "Met inis es M n rrc itect r and Met Pr d cts" r rec end tions r app in and des n t n inis es.
- Re o e t and die r s and stretc nes, r end int inis .
 - rind and p is s rces t p d ce n r inis , re cr ss scr c es.
 - R n r n in d d r c t n inis es it n n d i n s n e c p e e.

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- ☐ When painting is completed, pressure and rinse surfaces. Remove embedded dirt on floor and base surfaces chemically.
- ☐ B. Protect finishes on exposed surfaces from damage by applying a stripping, temporary protective covering before stripping.

PART 3 - EXECUTION

3.01. EXAMINATION

- ☐ A. Examine substrates and surfaces, if installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.
- ☐ B. Examine walls to identify paint-resistant nonprotection areas attached for blocking, grounds, and other solid materials that have been installed in the locations required for secure attachment of support fasteners.
 - ☐ For paint-resistant nonprotection units attached with adhesive or other type, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- ☐ C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02. PREPARATION

- ☐ A. Complete finishing operations, including painting, before installing paint-resistant nonprotection system components.
- ☐ B. Before installation, clean substrate to remove dust, debris, and loose particles.

3.03. INSTALLATION

- ☐ A. General installation of paint-resistant nonprotection units shall comply with and true to the dimensioned details. Do not use materials with chips, cracks, voids, stains, or other defects that affect the finish in the finished area.
 - ☐ Provide splices, continuous coverage, anchors, and other accessories required for complete installation.
 - ☐ Provide anchoring devices to withstand imposed loads.
 - ☐ Where splices occur in orientations where they are under load, splice shall include retainers and plastic covers at different locations along the run, at no closer than 12 inches.
 - ☐ End of end and top caps as required to ensure tight seals.
- ☐ B. For paint-resistant nonprotection installation top and edge conditions, corners, and divider bars as required for complete installation.

3.04. CLEANING

- ☐ A. Immediately after completion of installation, clean plastic covers and accessories using standard, non-abrasive, household cleaning agent.
- ☐ B. Remove excess adhesive using methods and materials recommended in writing by manufacturer.

END OF SECTION

SECTION 10 265 WALL SURFACE PROTECTION SYSTEM

PART 1 - GENERAL

1.01. RELATED DOCUMENTS

- . Drawings and General Provisions of Contract, including General and Supplemental Conditions and Division 5 Specification Sections, apply to this Section.

1.02. SUMMARY

- . This Section includes the following types of wall surface protection systems:
 - Rigid sheet piling or panels.
- . Related Sections of the Division 5 Sections contain requirements that relate to this Section.

1.03. SUBMITTALS

- . General Submit the following in accordance with Conditions of the Contract and Division 5 Specification Sections.
 - . Product data for each wall surface protection system component and installation access required, including installation methods for each type of substrate. Provide written data on each required component including physical characteristics, such as density, resistance to wind, and fire resistance.
 - . Shop drawings showing locations, extent, and installation details. Show methods of attachment to existing construction.
 - . Samples for Initial Selection for initial selection color, pattern and surface texture, provide the manufacturer's standard color chips consisting of color sections of each non-pigmented material required showing the range of colors, colors, and textures available.
 - . Samples for Verification Purposes Submit the following samples, prepared from the same material to be used in the work, for verification of color, pattern, and texture selected and for compliance with requirements indicated:
 - One square sample of initial color side samples of each rigid sheet or panel type wall surface protection material required.
 - . Maintenance data for wall surface protection system components for inclusion in the Operation and Maintenance Manual specified in Division 5.

1.04. QUALITY ASSURANCE

- . Installer Qualifications Employ an experienced Installer who has previously installed wall surface protection systems similar in material, design, and extent to the systems indicated for this Project.
- . Manufacturer Qualifications Hire experienced in manufacturing wall surface protection system components that are similar to those required for this Project and that have a record of successful in-service performance.
- . Fire Performance Characteristics Provide wall surface protection system components that are identical to those tested in accordance with ASTM E 84 for the fire performance characteristics indicated below. Identify wall surface protection system components with appropriate markings from the testing and inspection organization.
 - Flame Spread Class or less.
 - Smoke Developed Class or less.
- . Impact Strength Provide wall surface protection system components with minimum impact resistance of 1 ft. lbs. per sq. ft. when tested in accordance with ASTM D 2896 direct impact, 1 ft. lbs. per inch notch.
- . Single Source Responsibility Obtain each color, grade, finish, and type wall surface protection system component from a single source with resources to provide products of consistent quality in appearance and physical properties throughout the project.

1.05. DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in original manufacturer's packaging and containers, clearly marked with identification of manufacturer, brand name, model or grade, and fire hazard classification.
- B. Store polyisocyanurate protection materials in original unopened packages and containers inside a dehumidified and protected area sheltered from weather, moisture, soiling, extreme temperatures, and sunlight.
 - 1. Maintain room temperature within the storage area at not less than 60 degrees Fahrenheit during the period plastic materials are stored. Keep sheet materials off direct sunlight to avoid surface distortion.
 - 2. Store rigid plastic materials in a horizontal position or in a bin or other containers, or entitle plastic materials to the initial room temperature 60 degrees Fahrenheit.

1.06. PROJECT CONDITIONS

- A. Environment Conditions Do not install polyisocyanurate protection system components until the space is enclosed and dehumidified until the ambient temperature within the addition is maintained at not less than 60 degrees Fahrenheit not less than 48 hours prior to beginning of the installation. Do not install rigid plastic polyisocyanurate protection systems until the temperature has been attained and is stabilized.

1.07. MAINTENANCE

- A. Maintenance Instructions Provide the manufacturer's instructions for maintenance of installed work. Include recommended methods and frequency for maintaining optimal condition under anticipated traffic and use conditions. Include precautions against cleaning materials and methods that could be detrimental to finishes and performance.
- B. Replacement Materials After completion of work, deliver not less than 5 percent stock type, color, and pattern polyisocyanurate protection materials. Replacement materials shall be the same production runs as materials installed. Package replacement materials in protective covering, identified with appropriate marks.

PART 2 - PRODUCTS

2.01. MANUFACTURERS

- A. Qualify Manufacturers Subject to compliance with requirements, manufacturers offering products for polyisocyanurate protection shall be incorporated into the schedule, but are not limited to, the following:
 - 1. Construction specialties, Inc.
 - 2. InPro Corporation
 - 3. Prosecco Interiors

2.02. MATERIALS

- A. Plastic Sheet Polyisocyanurate Material Textured, chemically and stain resistant, rigid polyisocyanurate (PAC) acrylic modified polyisocyanurate sheets, thickness as indicated. Comply with specified requirements for STM D for impact resistance and STM E for flame spread and smoke developed characteristics.
 - 1. Corners and Textures of Plastic Material Provide extruded plastic materials in all areas selections of the architect from the manufacturer's standard corner and textures.
- B. Accessories Provide top caps, inside corner, divider bars and outside corners for extruded PAC and as recommended by the manufacturer.

2.03. IMPACT-RESISTANT WALL COVERINGS

- A. Self-irrigated Sheet Polyisocyanurate Provide manufacturer's standard self-irrigated, extruded, textured, impact resistant plastic sheets. Sheets shall comply with the performance characteristics specified and be chemically and stain resistant. Provide manufacturer's standard section details and trim as required.
 - 1. Sheet Size Sheet 48" x 96".
 - 2. Sheet Thickness 1/4" minimum thickness.

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- ☐ ☐ Try Provide Manufacturer's standard protection standards and trials required.
- ☐ B. Correct Matched Component Manufacturer's standard
- ☐ C. Adhesive and Primer products recommended by Manufacturer.

2.04. FABRICATION

- ☐ ☐ Generate protective systems to complete it requires indicated for design, dimensions, details, finish, and other sizes, including thicknesses components.
- ☐ B. Provide surfaces free of evidence of staining, clipping, chemical corrosion, dents, and other imperfections.

PART 3 - EXECUTION

3.01. EXAMINATION

- ☐ ☐ Examine areas and conditions in which protective systems will be installed.
 - ☐ Complete finishing operations, including painting, before beginning installation of surface protection systems.
- ☐ B. Inspect Resistant or Coating Materials on surfaces to receive impact resistant coating materials should be free from dirt, grease, loose paint, and scale.
- ☐ C. Do not proceed with installations until unsatisfactory conditions have been corrected.

3.02. PREPARATION

- ☐ ☐ Generate Prior to installation, clean substrate to remove dust, debris, and loose particles.

3.03. INSTALLATION

- ☐ ☐ Generate Install surface protection units properly, level, and true to line without distortions.
 - ☐ Do not use materials with chips, cracks, voids, stains, or other defects that will be visible in the finished work.

3.04. CLEANING

- ☐ ☐ Generate Immediately upon completion of installation, clean plastic covers and accessories using standard non-abrasive cleaning agent. Clean equipment components in accordance with the Manufacturer's recommendations.
- ☐ B. Remove excess adhesive using methods and materials recommended by Manufacturer.
- ☐ C. Remove surplus materials, rubbish, and debris resulting from installation upon completion of work and leave areas in neat, clean condition.

END OF SECTION



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- ☐ ☐ Include electric characteristics.
- ☐ C. Samples size, are exposed product and are finished specified.
- ☐ ☐ Approved size Samples are returned and are used in the area.
- ☐ D. Product Schedule Indication types, quantities, sizes, and installation locations are specified.
- ☐ ☐ Access required.
- ☐ ☐ Identification signs or designations indicated.
- ☐ ☐ Identification accessories or designations indicated.

1.05. CLOSEOUT SUBMITTALS

- ☐ Maintenance Data or accessories to include in maintenance manuals.

1.06. WARRANTY

- ☐ Manufacturer's Specific Warrant for Mirrors Manufacturer agrees to repair or replace mirrors that fail in terms of workmanship within specified warranty period.
- ☐ ☐ Warrant includes, but are not limited to, visible surface defects.
- ☐ ☐ Warranty Period Years from date of substantial completion.

PART 2 - PRODUCTS

2.01. MANUFACTURERS

- ☐ Products listed are made by Biorich or Biorich Equipment, Inc.
- ☐ B. Other Acceptable Manufacturers
 - ☐ Biorich Specities, Inc.
 - ☐ Substitutions Section or Product Requirements.
- ☐ C. Other acceptable type to be made by the same manufacturer.

2.02. PUBLIC-USE WASHROOM ACCESSORIES

- ☐ Source of installation in public use or service accessories from source from source manufacturer.
- ☐ B. Toilet Tissue Rack Dispenser
 - ☐ Description Double rack dispenser.
 - ☐ Mounting Surface mounted.
 - ☐ Operation Concentric roller or standard spindle.
 - ☐ Capacity Designed for continuous unattended roller tissue rolls.
 - ☐ Material and Finish Stainless steel, or finish satin.
- ☐ C. Coination Tissue loaded Dispenser Waste Receptacle
 - ☐ Description Coination unit for dispensing Coin or coinated tissues, into receptacle waste receptacle.
 - ☐ Mounting Recessed into protection receptacle.
 - ☐ Mini or Tissue Dispenser Capacity Coin or coinated paper tissues.
 - ☐ Mini or Waste Receptacle Capacity
 - ☐ Material and Finish Stainless steel, or finish satin.
 - ☐ Inner Receptacle, in waste receptacle liner.
 - ☐ Access to other type or tissue dispenser component.
- ☐ D. Solid Soap Dispenser
 - ☐ Description Designed for dispensing soap in solid or liquid form.
 - ☐ Mounting Orientation oriented, surface mounted.
 - ☐ Reel Indication indicator type.
- ☐ E. Mirror
 - ☐ Mounting Includes into concealed fasteners.

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2.03. CHILDCARE ACCESSORIES

- A. Source of information can indicate accessories from single source from single manufacturer.
- B. Dispenser Construction
- a. Description orient unit that opens or wind down from stored position and interlock protection strip.
 - i. Manufacturer's name Products, division of Brierley Centennial
 - ii. Made in Germany Mount Stainless Steel, Brierley SS M
 - c. Engineered to support initial static load when opened.
 - d. Maintains Service oriented, unit unit protection not more than inches from open closed.
 - e. Operation Bopne static sources strain mechanics.
 - f. Inner Dispenser Built in.

2.04. UNDERLAVATORY GUARDS

- Understand

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- Description: Insulation pipe covering for support and drain piping. Sse. Dies to prevent direct contact with it and forms the piping service access without re-in. covering.
- Material: and inis. anti-cracking, added plastic, etc.

2.05. CUSTODIAL ACCESSORIES

- ☐ Map and Brakes order
 - ☐ Description of its size, wheels, brakes, and red suspended benefit size
 - ☐ Benefit increases.
 - ☐ Brakes order.
 - ☐ Map Brakes order Tree, spring loaded, roller out, cut type.
 - ☐ Material and finish stainless steel, or finish satin
 - ☐ Steel less than non-increase in stainless steel
 - ☐ Red upper or teal increase in stainless steel

2.06. MATERIALS

- Stainless Steel STM is Type 304, and is incriminated in non-infectiousness unless otherwise indicated.
- Steel Sheet STM is 304M, Designation CS 600 is used, and is incriminated in non-infectiousness.
- Coated Steel Sheet STM is 304M, and it is not dip coated.
- Coated Steel Continues STM is 304M, and it is dip coated after fabrication.
- Fasteners Screws, Bolts, and other devices are made of materials accessible and to be performed and the resistant were exposed, and the coated steel were checked.
- Mirrors STM C 304, Mirror is made of 304, clear glass mirrors, non-infectious and toxic.

2.07. FABRICATION

- A. Generate metrics for units, initiatives, sections and units, and expressed desires. Monitor and access points into content, continuous lines. Equip units for concealed disclosure and information resistant to control points.
- B. Provide university access for internal access to accessaries for servicing and responding. Provide initial access to others representative.

PART 3 - EXECUTION

3.01. EXAMINATION

- A. Perfection conditions are starting
- B. Perfection condition success rates or institution.

3.02. PREPARATION

- B. Provide templates and resources in easy-to-use formats as required.

3.03. INSTALLATION

- Instructions are written in a high-level, human-readable language and are then translated into machine code by a compiler. The machine code is then loaded into memory and executed by the processor. Instructions are typically stored in memory in a sequential order, and the processor fetches and executes them in that order. Instructions are typically stored in memory in a sequential order, and the processor fetches and executes them in that order.
- Machine code is a binary representation of instructions that can be executed by the processor. It is typically stored in memory in a sequential order, and the processor fetches and executes them in that order. Machine code is a binary representation of instructions that can be executed by the processor. It is typically stored in memory in a sequential order, and the processor fetches and executes them in that order.
- Machine code is a binary representation of instructions that can be executed by the processor. It is typically stored in memory in a sequential order, and the processor fetches and executes them in that order. Machine code is a binary representation of instructions that can be executed by the processor. It is typically stored in memory in a sequential order, and the processor fetches and executes them in that order.

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3.04. ADJUSTING AND CLEANING

- A. Adjust accessories or encased, so that operation. Replace damaged or defective items.
- B. Remove temporary covers and protective coatings.
- C. Clean and polish exposed surfaces according to manufacturer's written instructions

END OF SECTION



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SECTION 10 4413 FIRE EXTINGUISHERS AND CABINETS

PART 1 - GENERAL

1.01. SECTION INCLUDES

- A. Fire extinguishers.

1.02. REFERENCES

- A. NFPA Fire Protection Equipment Directory Underwriters Laboratories Inc. Current edition.

1.03. PERFORMANCE REQUIREMENTS

- A. Conform to NFPA 10 and Title 24 of the California Code of Regulations.
- B. Provide extinguishers classified and labeled by Underwriters Laboratories Inc. for the purpose specified and indicated.

1.04. SUBMITTALS

- A. See Section 01 0000 and Instructional Requirements, for submittal procedures.
- B. Product Data Provide extinguisher operation details.
- C. Manufacturer's Installation Instructions indicate specific criteria and sequencing coordination requirements.
- D. Maintenance Data include test, repair, recharge schedules and recertification requirements.

1.05. ENVIRONMENTAL REQUIREMENTS

- A. Do not install extinguishers when ambient temperature is above freezing or extinguisher ingredients.

PART 2 - PRODUCTS

2.01. MANUFACTURERS

- A. Fire Extinguishers, and accessories
 - 1. Industries, Inc.
 - 2. Jensen's Manufacturing Co.
 - 3. Potter Relief.
 - 4. Substitutions See Section 01 0000 Product Requirements.

2.02. FIRE EXTINGUISHERS

- A. Fire extinguishers shall comply with requirements governing authorities and manufacturer's requirements.
- B. Size and classification as indicated.

2.03. MOUNTING BRACKETS:

- A. Provide manufacturer's standard bracket designed to prevent accidental dislodgement of extinguisher, proper size for type and capacity of extinguisher indicated, in manufacturer's standard printed list.

PART 3 - EXECUTION

3.01. EXAMINATION

- A. Verify existing conditions before starting work.

3.02. INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install brackets for each type and capacity of extinguisher and locate so that top of extinguisher is in line with face of finished wall.

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- ☐ C. Secure rigid in place.
- ☐ D. Place e-timers on concrete.

☐ **END OF SECTION**

SECTION 11 5213 PROJECTION SCREENS

PART 1 - GENERAL

1.01. RELATED DOCUMENTS

- . Drawings and General provisions of the Contract, including General and Supplemental Conditions and Division 00 Specification Sections, apply to this Section.

1.02. SUMMARY

- . Section Includes
 - Electric operated, front projection screens and controls.
- B. Related Requirements
 - Section 00 0000 "Metal Fabrications" for metal support frame for front projection screens.
 - Section 00 0000 "Miscellaneous Ready-Carpeting" for wood backing for screen installation.

1.03. DEFINITIONS

- . Gain Ratio is the ratio of light reflected from screen to light reflected perpendicular from a glossy cardboard surface as determined per SMPTE RP 100.
- B. Screen Gain Angle: The angle, measured from the axis of the screen surface to the most central position on a perpendicular plane through the horizontal centerline of the screen where the gain is one-half the peak gain.

1.04. ACTION SUBMITTALS

- . Submit for review and approval on a basis of Design products are provided, Submit for review and approval on a basis of products submitted in the required Product Data sheets and Samples submitted. Ensure compliance with requirements included in Section 00 0000 "Submit Procedures."
- B. Product Data for each type of product.
- C. Shop Drawings, Submit materials and types of front projection screens. Include the following:
 - Drawings.
 - Location of screens in design spaces.
 - Location of screen centerline relative to ends of screen case.
 - Enclosure details, including connection to supporting structure for suspended units.
 - Details of structure for suspended screens and adjacent finishes.
 - Location of wiring connections for electric operated units.
 - Wiring details for electric operated units.
 - Accessories.
- D. Samples for initial selection of finishes for surface of front projection screen cases.

1.05. CLOSEOUT SUBMITTALS

- . Maintenance Data for front projection screens to include in maintenance manuals.

1.06. DELIVERY, STORAGE, AND HANDLING

- . Enclose and protect all materials and equipment for front projection screens. Enclose and protect all materials and equipment in spaces is complete and dry, and temperature and humidity conditions of enclosure are within the recommended construction period.

1.07. COORDINATION

- . Coordinate installation and installation of front projection screens with adjacent construction, including ceiling suspension systems, light fixtures, HVAC equipment, fire suppression systems, and partitions.

PART 2 - PRODUCTS

2.01. MANUFACTURERS

- A. Source quotations for Projection Screens shall include projection screens from single manufacturer. It shall accessories, including necessary mounting hardware, from screen manufacturer.
- B. Daper, Inc
- C. Substitutions See Section 01 0000 Product Requirements.

2.02. ELECTRICALLY OPERATED, FRONT-PROJECTION SCREENS

- A. Suspended, Electrically Operated Screens shall include Ceiling Caisse, Motor in Roller, and Electric Tensioning units designed and fabricated for suspended continuous rotation case composed of panels, enclosure screen, motor, and drive pulley panel inched and designed to open and close electrically when screen is lowered and retracted, the motor release or open for access to interior space.
 - 1. Provide electrically operated drive pulley panel.
 - 2. Screen Case Made from metal
 - 3. Provide screen case constructed to be installed on underside of ceiling.
 - 4. Finish on Exposed Surfaces Prime painted.

2.03. FRONT-PROJECTION SCREEN MATERIAL

- A. Minimum Reflective Coefficient Surface Percent shall not less than 80, and minimum angle of reflection shall not less than 10 degrees from the axis of the screen surface.
- B. Material finished, smooth finish.
- C. Minimum Resistance Rating shall be or shall be tested according to ASTM D 100.
- D. Flame Resistance Passes NFPA 701.
- E. Flame Spread Index shall be greater than or shall be tested according to ASTM E 84.
- F. Seamless Construction Provide screens, in sizes indicated, without seams.
- G. Edge Treatment Backed up in borders.
- H. Provide extra drop length dimensions and at locations indicated.
 - 1. Corner Back

PART 3 - EXECUTION

3.01. INSTALLATION

- A. Install front projection screens at locations indicated to comply with screen manufacturer's written instructions.
- B. Install front projection screens with screen cases in position and in relation to building construction indicated. Secure enclosure to support structure in a manner that produces a smooth operating screen with vertical edges parallel and drive surface with screen is lowered.
 - 1. Install electric controls according to NFPA 701 and comply with manufacturer's written instructions.
 - 2. Drive Motor Install in place except in accessible ceiling spaces and in open partitioned areas enclosed drive motor shall be used. Use of listed panel cover in environment spaces, including panel ceiling. Conceal motor and cables except in finished spaces.
 - 2. Test electrically operated units to verify that screen controls, motor, cables, and other operating components are in optimal functioning condition.

END OF SECTION

SECTION 12 9313 BIKE RACKS

PART 1 - GENERAL

1.01. SECTION INCLUDES

- . Bicycle racks of the following types:
 - . Free Space Saver.

1.02. RELATED DOCUMENTS

- . Drawings and General provisions of the Contract, including General and Supplemental Conditions and Division 12 Specification Sections, apply to this Section.

1.03. SUBMITTALS

- . Submit under provisions of Section 01 00 00 Administrative Requirements.
- . Product Data: Manufacturer's product literature and technical data, including physical characteristics such as shape, dimensions, cycle per hour capacity, and finish for each product.
- . Shop Drawings: Show installation details for each product.
- . Maintenance Data: For each bicycle rack. Include recommended methods for repairing damaged parts to the finish.

1.04. QUALITY ASSURANCE

- . Manufacturer qualifications: Minimum 10 years of manufacturing similar products.
- . Installer qualifications: An experienced installer who has completed installation of products similar in material, design, and extent to that indicated for this project.
- . Source qualifications: Obtain each component, finish, shape and type of product from a single source of resources to provide components of consistent quality in appearance and physical properties.

1.05. DELIVERY, STORAGE, AND HANDLING

- . Complete manufacturer's recommended conditions.
- . Store products in original and labeled packages and containers until ready for installation.

1.06. PROJECT CONDITIONS

- . Maintain environment conditions (temperature, humidity, and ventilation) within its recommended manufacturer or optimal results. Do not install products under environment conditions outside of manufacturer's recommended limits.

1.07. WARRANTY

- . Provide manufacturer's standard limited warranty against defects in materials and workmanship.

PART 2 - PRODUCTS

2.01. MANUFACTURERS

- . Acceptable Manufacturer: Derby Bike Rack Co.
- . Substitutions: See Section 01 00 00 Product Requirements.

2.02. BICYCLE RACKS

- . Free Space Saver Rack: Modular system, one piece per hour.
 - . Single Sided
 - . Corner or end of D. or square table or it can be end steel or end bar.
 - . Prior to 1000 square inch square table.
 - . Meet ISI Code or ANSI certified steel code.

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- ☐ Crossbeams installed in schedule 40 standard pipe, 4 inch I.D.
- ☐ Spacers installed in 4 inch I.D. plastic tubes with 1/2 inch thickness.
- ☐ Minimum 1/2 inch thick.
- ☐ Finish Powder coated.
- ☐ Epoxy primer.
- ☐ 1/2 inch resistant polyester powder coat.
- ☐ c. Minimum thickness 1/2 inch.
- ☐ Contractor to be selected by owner architect and manufacturer's approval.

PART 3 - EXECUTION

3.01. EXAMINATION

- ☐ Verification of conditions before and conditions under which work is to be performed and identify conditions that may be detrimental to proper or timely completion.
- ☐ B. Do not proceed until satisfactory conditions have been corrected.

3.02. INSTALLATION

- ☐ Install products in accordance with manufacturer's instructions, approved submittals, and in proper relationship to adjacent construction.
- ☐ Comply with manufacturer's published minimum set back dimensions and recommended clearances.

3.03. CLEANING AND PROTECTION

- ☐ Protect from damage during construction operations. Prompt repair and damaged surfaces. Repair and replace work which cannot be satisfactorily repaired.

END OF SECTION

SECTION 20 0100
GENERAL MECHANICAL PROVISIONS

PART 1 - GENERAL

1.1 GENERAL CONDITIONS

- A. The preceding General Conditions shall form a part of this Section with the same force and effect as though repeated here. The provisions of this Section shall also apply to the following Divisions 22, 23 and 25 of these Specifications and shall be considered a part of those Divisions.

1.2 CODES AND REGULATIONS

- A. All work and materials shall be in accordance with current rules and regulations of applicable codes. Nothing in these Drawings or Specifications is to be construed to permit work not conforming to these codes. Should the Drawings or Specifications call for material or methods of construction of a higher quality or standard than required by these codes, the Drawings and Specifications shall govern. Applicable codes and regulations include, but are not necessarily limited to, the following:

California Building Code	CCR Title 24, Part 2
California Electrical Code	CCR Title 24, Part 3
California Mechanical Code	CCR Title 24, Part 4
California Plumbing Code	CCR Title 24, Part 5
California Energy Code	CCR Title 24, Part 6
California Fire Code	CCR Title 24, Part 9
Local Codes	

1.3 DEFINITIONS

- A. Provide: The term "provide" as used in these specifications or on the drawings shall mean furnish and install.
- B. Piping: The term "piping" as used in these specifications or on the drawings shall mean all pipe, fittings, valves, hangers, insulation, etc. as may be required for a complete and functional system.
- C. Ductwork: The terms "duct" or "ductwork" as used in these specifications or on the drawings shall mean all ducts, fittings, joints, dampers, hangers, insulation, etc. as may be required for a complete and functional system.
- D. Wiring: The term "wiring" as used in these specifications or on the drawings shall mean all wiring, conduit, boxes, connections, transformers, relays, switches etc. as may be required for a complete and functional system.

1.4 PERMITS AND FEES

- A. The Contractor shall take out all permits and arrange for all tests in connection with his work as required. All charges are to be included in the work.

1.5 COORDINATION OF WORK

- A. Examination: Before starting work, thoroughly examine existing and newly completed underlying and adjoining work and conditions on which the installation of this work depends. Report to the Engineer in writing all conditions which might adversely affect this work.
- B. Layout: Layout of materials, equipment and systems is generally diagrammatic unless specifically dimensioned. Some work may be shown offset for clarity. The actual locations of all materials, piping, ductwork, fixtures, equipment, supports, etc. shall be carefully planned prior to installation of any work in order to avoid all interference with each other, or with structural, electrical, architectural or other elements.
- C. Verification: If discrepancies are discovered between drawing and specification requirements, the more stringent requirement shall apply. All conflicts shall be called to the attention of the Engineer prior to the installation of any work or the ordering of any equipment. No work shall be prefabricated or installed prior to this coordination. No costs will be allowed to the Contractor for any prefabrication or installation performed prior to this coordination. Verify the proper voltage and phase of all equipment with the electrical plans.

- D. Location of Utilities Prior to Trenching or Earthwork: The Contractor shall notify the Owner a minimum of two business days prior to beginning trenching or earthwork. Prior to this notification, the Contractor shall have marked all proposed trenches with paint and shall have contacted a utility locating company and have had this company mark all found underground utilities with paint. The Contractor shall then coordinate and arrange for a site visit with the Owner to review the proposed trenching and/or earthwork areas. Trenching and/or earthwork shall not begin until the Owner agrees. Repair and/or compensation for repair of marked utilities is the responsibility of the Contractor. The Owner retains the right to either self-perform the repair or require the Contractor to complete the repair, as directed by the Owner. If while performing the work, the Contractor discovers utilities that have not been marked, the Contractor shall immediately notify the Owner verbally and in writing.

1.6 GUARANTEE

- A. Guarantee shall be in accordance with the General Conditions. The Contractor shall repair any defects due to faulty materials or workmanship and pay for any resulting damage to other work which appears within the guarantee period. These Specifications may extend the period of the guarantee for certain items. Where such extensions are called for, or where items are normally provided with guarantee periods in excess of that called for in the General Conditions, the certificate of guarantee shall be furnished to the Owner through the Engineer.

1.7 QUIETNESS

- A. Piping, ductwork and equipment shall be arranged and supported so that vibration is a minimum and is not transmitted to the structure.

1.8 DAMAGES BY LEAKS

- A. The Contractor shall be responsible for damages caused by leaks in the temporary or permanent piping systems prior to completion of work and during the period of the guarantee, and for damages caused by disconnected pipes or fittings, and the overflow of equipment prior to completion of the work.

1.9 EXAMINATION OF SITE

- A. The Contractor shall examine the site, compare it with Plans and Specifications, and shall have satisfied himself as to the conditions under which the work is to be performed. No allowance shall subsequently be made in his behalf for any extra expense to which he may be put due to failure or neglect on his part to make such an examination.

1.10 COMPATIBILITY WITH EXISTING SYSTEMS

- A. Any work which is done as an addition, expansion or remodel of an existing system shall be compatible with that system.

1.11 MATERIALS AND EQUIPMENT

- A. Materials and equipment shall be new unless otherwise noted. Materials and equipment of a given type shall be by the same manufacturer. Materials and equipment shall be free of dents, scratches, marks, shipping tags and all defacing features at time of project acceptance. Materials and equipment shall be covered or otherwise protected during construction as required to maintain the material and equipment in new factory condition until project acceptance. All HVAC equipment and ductwork shall be covered, sealed and protected per CGBSC Section 5.504.3 from delivery on site until final start-up.

1.12 SUBMITTALS

- A. Shop Drawings: Within 30 days of contract award, the Contractor shall submit six copies of shop drawings for all materials, equipment, etc. proposed for use on this project. Material or equipment shall not be ordered or installed until written review is processed by the Engineer. All shop drawings must comply with the following:
1. Shop drawings are required for all material and equipment items and shall include manufacturer's name and catalog numbers, dimensions, capacities, performance curves, and all other characteristics and accessories as listed in the specifications or on the drawings. Descriptive literature shall be current factory brochures and submittal sheets. Capacities shall be certified by the factory. FAX submittals are not acceptable.
 2. All shop drawings shall be submitted at one time in a neat and orderly fashion in a

- 1 suitable binder with title sheet including Project, Engineer and Contractor, table of
2 contents, and indexed tabs dividing each group of materials or item of equipment. All
3 items shall be identified by the specification paragraph number for which they are
4 proposed. All equipment shall also be identified by the mark number as indicated on
5 drawings.
- 6 3. All capacities, characteristics, and accessories called for in the specifications or on the
7 drawings shall be high-lighted, circled or underlined on the shop drawings. Calculations
8 and other detailed data indicating how the item was selected shall be included for items
9 that are not scheduled. Data must be complete enough to permit detailed comparison of
10 every significant characteristic which is specified, scheduled or detailed.
- 11 4. Electronic Submittals: Where allowed by Division 01, electronic submittals are
12 acceptable providing the following requirements are met. Electronic submittals which do
13 not comply with these requirements will be rejected.
- 14 a. Submittal shall be a single file in PDF format, with bookmarks for table of
15 contents and each tab, and sub-bookmarks for each item.
- 16 b. All text shall be searchable (except text that is part of a graphic).
- 17 c. Submittal shall include all items noted in 1 through 3 above, except a binder is
18 not required.
- 19 d. Electronic submittals shall be processed through normal channels. Do not
20 submit directly to the Engineer unless the Engineer is the prime consultant for
21 the project.
- 22 e. Contractor shall provide Owner and Owner's Representative with hard copies
23 of the final submittal. Coordinate exact number required with Owner through
24 Architect/Engineer.
- 25 B. Substitutions: Manufacturers and model numbers listed in the specifications or on the drawings
26 represent the standard of quality and features desired. Proposed substitutions shall comply with
27 the Owner's General Requirements. Calculations and other detailed data indicating how the item
28 was selected shall be included. The Contractor shall assume full responsibility that substituted
29 items or procedures will meet the specifications and job requirements and shall be responsible
30 for the cost of redesign and modifications to the work caused by these items. At the Engineer's
31 request, furnish locations where equipment similar to the substituted equipment is installed and
32 operating along with the user's phone numbers and contact person. Satisfactory operation and
33 service history will be considered in the acceptance or rejection of the proposed substitution.
- 34 C. Review: Submittals will be reviewed for general conformance with the design concept, but this
35 review does not guarantee quantity shown, nor does it supersede the responsibility of the
36 Contractor to provide all materials, equipment and installation in accordance with the drawings
37 and specifications. The Contractor shall agree that shop drawing submittals processed by the
38 Engineer are not Change Orders; that the purpose of shop drawing submittals by the Contractor
39 is to demonstrate to the Engineer that the Contractor understands the design concept, that he
40 demonstrates his understanding by indicating which equipment and material he intends to furnish
41 and install and by detailing the fabrication and installation methods he intends to use. The
42 Contractor shall agree that if deviations, discrepancies or conflicts between shop drawings and
43 design drawings and specifications are discovered either prior to or after shop drawing submittals
44 are processed by the Engineer, the design drawings and specifications shall control and shall be
45 followed. If a resubmittal is required, submit a complete copy of the Engineer's review letter
46 requiring such with the resubmittal.
- 47 **1.13 MANUFACTURER'S RECOMMENDATIONS**
- 48 A. All material, equipment, devices, etc., shall be installed in accordance with the recommendations
49 of the manufacturer of the particular item. The Contractor shall be responsible for all installations
50 contrary to the manufacturer's recommendations. The Contractor shall make all necessary
51 changes and revisions to achieve such compliance. Manufacturer's installation instructions shall
52 be delivered to and maintained at the job site through the construction of the project.
- 53 **1.14 SCHEDULING OF WORK**
- 54 A. All work shall be scheduled subject to the review of the Engineer and the Owner. No work shall
55 interfere with the operation of the existing facilities on or adjacent to the site. The Contractor shall
56 have at all times, as conditions permit, a sufficient force of workmen and quantity of materials to
57 install the work contracted for as rapidly as possible consistent with good work, and shall cause

no delay to other Contractors engaged upon this project or to the Owner. HVAC equipment and functions, whether existing or new, shall be maintained in operating condition whenever the facility is occupied, unless otherwise approved by the Owner.

1.15 DEMOLITION

- A. Existing equipment, ducts, piping, etc. noted for removal shall be removed and delivered to the Owner at a location to be determined by the Owner. Those items determined by the Owner to be of no value shall become the property of the Contractor and shall be removed from the job site by the Contractor at the Contractor's expense. Existing piping, ducts, services, etc. requiring capping shall be capped below floors, behind walls, above ceilings or above roof unless otherwise noted. Where items are removed, patch the surfaces to match the existing surfaces.

1.16 HAZARDOUS MATERIAL REMOVAL

- A. All hazardous material removal will be by the Owner. Hazardous material is to be removed before the work is started. If the Contractor discovers hazardous material which has not been removed, the Contractor shall immediately cease work in that area and promptly notify the Owner.

1.17 OPENINGS, CUTTING AND PATCHING

- A. The locations and dimensions for openings through walls, floors, ceilings, foundations, footings, etc. required to accomplish the work under this Specification Division shall be provided under this Division. Except as noted below, the actual openings and the required cutting and patching shall be provided by other Divisions. Coring through existing concrete or masonry walls, floors, ceilings, foundations, footings, etc., and saw cutting of concrete floors or asphaltic concrete required to accomplish the work under this Specification Division shall be provided under this Division. Patching of these surfaces shall be provided by other Divisions. Cutting or coring shall not impair the strength of the structure. Any damage resulting from this work shall be repaired at the Contractor's expense to the satisfaction of the Engineer.

1.18 EXCAVATION AND BACKFILL

- A. General: Barrel of pipe shall have uniform support on sand bed. Sand shall be free from clay or organic material, suitable for the purpose intended and shall be of such size that 90 percent to 100 percent will pass a No. 4 sieve and not more than 5 percent will pass a No. 200 sieve. Unless otherwise noted, minimum earth cover above top of pipe or tubing outside building walls shall be 24", not including base and paving in paved areas.
- B. Excavation: Width of trench at top of pipe shall be minimum of 16", plus the outside diameter of the pipe. Provide all shoring required by site conditions. Where over excavation occurs, provide compacted sand backfill to pipe bottom. Where groundwater is encountered, remove to keep excavation dry, using well points and pumps as required.
- C. Backfill:
1. 6" Below, Around, and to 12" Above Pipe: Material shall be sand. Place carefully around and on top of pipe, taking care not to disturb piping, consolidate with vibrator.
 2. One Foot Above Pipe to Grade: Material shall be sandy or silty loam, free of lumps, laid in 6" layers, uniformly mixed to proper moisture and compacted to required density. If backfill is determined to be suitable and required compaction is demonstrated by laboratory test, water compaction in 6" layers may be used, subject to review by Engineer.
- D. Compaction: Compact to density of 95% within building and under walkways, driveways, traffic areas, paved areas, etc. and to 90% elsewhere. Demonstrate proper compaction by testing at top, bottom and one-half of the trench depth. Perform these tests at three locations per 100' of trench.

1.19 CONTINUITY OF SERVICES

- A. Existing services and systems shall be maintained except for short intervals when connections are made. The Contractor shall be responsible for interruptions of services and shall repair damage done to any existing service caused by the work. If utilities not indicated on the drawings are uncovered during excavation, the Contractor shall notify the Engineer immediately.

1.20 PROTECTIVE COATING FOR UNDERGROUND PIPING

- 1 A. All ferrous pipe below grade (except cast iron) shall have a factory applied protective coating of
2 extruded high density polyethylene, 35 to 70 mils total thickness, X-Tru-Coat, Scotchkote. All
3 fittings and areas of damaged coating shall be covered with two layer double wrap of 10 mil
4 polyvinyl tape to total thickness of 40 mils. John-Mansville. Protective coating shall be extended
5 6" above surrounding grade.

6 **1.21 ACCESS DOORS**

- 7 A. Provide access doors as required where equipment, piping, valves, ductwork, etc. are not
8 otherwise accessible. Access doors shall match the wall or ceiling finish and fire rating as
9 indicated on the Architectural drawings. 16-gage steel frame and 14-gage steel door with
10 paintable finish, except in ceramic tile, where door shall be 16-gage stainless steel with satin
11 finish. Continuous hinge. Deliver doors to the General Contractor for installation. Milcor. Unless
12 otherwise noted, the minimum sizes shall be as follows:

13	1 valve up to 1-1/2"	12" x 12"
14	1 valve up to 3"	16" x 16"

15 **1.22 HOUSEKEEPING PAD**

- 16 A. Housekeeping pads shall be 6" high concrete, 3000 PSI strength, unless otherwise noted. Pad
17 shall extend 6" beyond the largest dimensions of the equipment, unless otherwise noted. The top
18 edge of the pad shall have a 3/4" chamfer. Unless otherwise noted, the pad shall have #4
19 reinforcing bars at 12" on center, each way, located at mid-depth of the pad. If not poured at the
20 same time as the slab with pad rebar tied to slab rebar, the pad shall be anchored as follows: Drill
21 5/8" diameter, 3" deep hole in slab. Install 7" long, #4 rebar with Simpson Set epoxy system.
22 Provide a minimum of 4 of these anchors per pad, but no more than 4 feet apart in either
23 direction. Anchor points shall be 12" from the edge of the pad.

24 **1.23 CONCRETE ANCHORS**

- 25 A. Steel bolt with expansion anchor requiring a drilled hole - powder driven anchors, adhesive
26 anchors and concrete screws are not acceptable. Re-use of screw anchor holes shall not be
27 permitted. Minimum concrete embedment shall be 4-1/2 diameters. Minimum spacing shall be 12
28 diameters center to center and 6 diameters center to edge of concrete. Post-installed anchors in
29 concrete used for component anchorage shall be pre-qualified for seismic application in
30 accordance with ACI 355.2 and ICC-ES AC193. Post-installed anchors in masonry used for
31 component anchorage shall be pre-qualified for seismic applications in accordance with ICC-ES
32 AC01. Maximum allowable loads for tension and shear shall be as determined by Calculation in
33 compliance with ACI 318-14, Chapter 17, and the anchor's ICC or IAPMO evaluation report. Hilti,
34 Powers, Red Head.

35 **1.24 EQUIPMENT ANCHORING AND OTHER SUPPORTS**

- 36 A. Mechanical systems (equipment, ductwork, piping, conduit, etc.) shall be anchored in accordance
37 with the CBC. All systems mounted on concrete shall be secured with a concrete anchor at each
38 mounting point. All air handlers shall be mounted on spring isolators. Secure base plate as
39 indicated above. Attachment of equipment, ductwork, piping, conduit, etc. supported on curbs or
40 platforms shall be made to the side of curbs and platforms, where possible. Where screws or lag
41 bolts must be installed through the top of a sheet metal cap, the installation shall be as follows.
42 Pre-drill pilot hole. Fill pilot hole with polyurethane sealant. Install screw or lag bolt with a flat
43 washer and an EPDM washer adjacent to the sheet metal.

44 **1.25 SUPPORTS AND SEISMIC RESTRAINTS**

- 45 A. Any structural element required to hang or support piping, ducts or equipment provided under
46 this Division and not shown on other drawings shall be provided under this Division.
- 47 B. Mechanical systems (equipment, ductwork, piping, etc.) shall be provided with supports and
48 seismic restraints in accordance with the CBC. Submit anchorage calculations and details
49 stamped and signed by a structural engineer registered in the State of California. Submit shop
50 drawings showing location, type and detail of restraints. Submit manufacturer's data for
51 restraints. Restraint system shall be Mason West, Inc. (OSHDP OPM 0043-13), or other OSHPD
52 preapproved system.

53 **1.26 PAINTING**

- 54 A. Paint all black iron supports, hangers, anchors, etc. with two coats of rust resisting primer. Also

1 paint all uninsulated black iron piping exposed to weather with two coats of rust resisting primer.

2 **1.27 ROOF PENETRATIONS AND PATCHING**

3 A. Whenever any part of the mechanical systems penetrates the roof or exterior wall, the
4 openings shall be flashed and counter-flashed water tight with minimum 22 gauge galvanized
5 sheet metal. Flashing shall extend not less than eight inches from the duct, pipe, or supporting
6 member in all directions unless detailed otherwise. All roof penetrations and patching shall be
7 in accordance with the recommendations of the National Roofing Contractor's Association and
8 the Owner's roofing standards.

9 **1.28 SYSTEM IDENTIFICATION**

- 10 A. Above Grade Piping: Provide markers on piping which is either exposed or concealed in
11 accessible spaces. For piping systems, other than drain and vent lines, indicate the fluid
12 conveyed or its abbreviation, either by pre-printed markers or stenciled marking, and include
13 arrows to show direction of flow. Pre-printed markers shall be the type that wrap completely
14 around the pipe, requiring no other means of fastening such as tape, adhesive, etc. Comply with
15 ANSI A13.1 for colors. Locate markers at ends of lines, near major branches and other
16 interruptions including equipment in the line, where lines pass through floors, walls or ceilings or
17 otherwise pass into inaccessible spaces, and at 50' maximum intervals along exposed portions of
18 lines. Marking of short branches and repetitive branches for equipment connections is not
19 required.
- 20 B. Below Grade Piping: Bury a continuous, pre-printed, bright-colored, metallic ribbon marker
21 capable of being located with a metal detector with each underground pipe. Locate directly over
22 buried pipe, 6" to 8" below finished grade.
- 23 C. Equipment: All equipment shall be identified with a plastic laminated, engraved nameplate which
24 bears the unit mark number as indicated on the drawings (e.g. AC-4) and identifies the area or
25 space served by the equipment. Provide 1/2" high lettering - white on black background.
26 Nameplates shall be permanently secured to the exterior of the unit.
- 27 D. Valves: Provide stamped brass valve tags with brass hooks or chains on all valves of each piping
28 system, excluding check valves, valves within equipment, faucets, stops and shut-off valves at
29 fixtures and other repetitive terminal units. Prepare and submit a tagged-valve schedule, listing
30 each valve by tag number, location and piping service.

31 **1.29 CLEANING**

- 32 A. Progressively and at completion of the job, the Contractor shall thoroughly clean all of his work,
33 removing all debris, stain and marks resulting from his work. This includes but is not limited to
34 building surfaces, piping, equipment and ductwork, inside and out. Surfaces shall be free of dirt,
35 grease, labels, tags, tape, rust, and all foreign material.
- 36 B. At the end of each work day, the Contractor shall cover all open ends of piping and ductwork with
37 protective plastic.

38 **1.30 OPERATION AND MAINTENANCE INSTRUCTIONS**

- 39 A. Printed: Three copies of Operation and Maintenance Instructions and Wiring Diagrams for all
40 equipment and parts list for all faucets, trim, valves, etc. shall be submitted to the Engineer. All
41 instructions shall be clearly identified by marking them with the same designation as the
42 equipment item to which they apply (e.g. AC-3). All Wiring Diagrams shall agree with reviewed
43 Shop Drawings and indicate the exact field installation. All instructions shall be submitted at the
44 same time and shall be bound in a suitable binder with tabs dividing each type of equipment (e.g.
45 Pumps, Fans, Motors, etc.). Each binder shall be labeled indicating "Operating and Maintenance
46 Instructions, Project Title, Contractor, Date" and shall have a Table of Contents listing all items
47 included.
- 48 B. Verbal: The Contractor shall verbally instruct the Owner's maintenance staff in the operation and
49 maintenance of all equipment and systems. The controls contractor shall present that portion of
50 the instructions that apply to the control system. The Engineer's office shall be notified 48 hours
51 prior to this meeting.
- 52 C. Acknowledgment: The Contractor shall prepare a letter indicating that all operation and
53 maintenance instructions (printed and verbal) have been given to the Owner, to the Owner's
54 satisfaction. This letter shall be acknowledged (signed) by the Owner and submitted to the

1 Engineer.

2 **1.31 RECORD DRAWINGS**

3 A. The Contractor shall obtain one set of prints for the project, upon which a record of all
4 construction changes shall be made. As the work progresses, the Contractor shall maintain a
5 record of all deviations in the work from that indicated on the drawings. Final location of all
6 underground work shall be recorded by depth from finished grade and by offset distance from
7 permanent surface structures, i.e. building, curbs, walks. In addition, the water, gas, sewer, under
8 floor duct, etc. within the building shall be recorded by offset distances from building walls. An
9 electronic copy of the original drawings will be made available to the Contractor. The Contractor
10 shall transfer the changes, notations, etc. from the marked-up prints to the electronic copy. The
11 record drawings (marked-up prints, electronic drawings disc and a hard copy) shall be submitted
12 to the Engineer for review.

13 **1.32 ACCEPTANCE TESTING**

14 A. The Contractor shall perform, document and submit all acceptance testing as required by
15 California Code of Regulations, Title 24, Part 6.

16 **END OF SECTION**

**SECTION 22 0400
PLUMBING**

PART 1 - GENERAL

1.1 GENERAL MECHANICAL PROVISIONS

- A. The General Mechanical Provisions, Section 20 01, 00, shall form a part of this Section with the same force and effect as though repeated here.

1.2 SCOPE:

- A. Included: Provide all labor, materials and services necessary for complete, lawful and operating systems as shown or noted on the drawings or as specified here. The work includes, but is not necessarily limited to, the following:
1. Sanitary sewer system.
 2. Domestic water system.
 3. Drain system (including condensate drain).
 4. All equipment as shown or noted on the drawings or as specified.
 5. Demolition as indicated on drawings. Where demolition is called for, remove all equipment, piping, braces, housekeeping pads, supports and related items no longer required.
 6. Lead Free: All equipment, fixtures, valves and fixture stops providing water for human consumption installed after January 1, 2010, must meet the "Lead Free" requirements for the State of California.
- B. Work Specified Elsewhere:
1. Line voltage power wiring, disconnect switches and installation of all starters are included in the Electrical Section unless otherwise noted.
 2. Access doors.
 3. Concrete and reinforcing steel unless specifically called for on the drawings or specifications.
 4. Painting unless specifically called for in the drawings or specifications.
 5. Carpentry.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS:

- A. Sanitary Sewer:
1. Soil, Waste and Vent Piping (Non-Pressurized):
 - a. Inside Building and Within Five Feet of Building Walls: Standard weight coated cast iron pipe and fittings. Plain end, CISPI 301, ASTM A888, or hub end with rubber gaskets, ASTM A74, ASTM C564. ABI, Tyler, Charlotte. Couplings shall be heavy-duty shielded couplings. Type 304 stainless steel, with neoprene gasket, ASTM C1540. Husky HD 2000, Clamp-All 80, Mission HeavyWeight. MG Couplings are also acceptable. 2" and smaller exposed to view shall be galvanized steel, ASTM A53, with coated cast iron recessed drainage fittings, ANSI B16.12.
Where required by soil conditions, as determined by the method described in ASTM A74-09, Appendix X2, below grade cast iron pipe and fittings shall have 8 mil (minimum) Polyethylene Encasement (Poly Wrap), Per ANSI/AWWA C105/A21.5.
 2. Cleanouts: Comparable models of Josam, Wade, Mifab or Zurn are acceptable. Grease plug prior to installation. Floor Cleanouts: Smith 4023 with nickel bronze top in finished areas; Smith 4223 in utility areas. Wall Cleanouts: Smith 4532 with stainless steel cover and screw. Pipe Cleanouts: Iron body with threaded brass plug. Site cleanouts more than 5' outside building may be PVC with PVC plug.
 3. Cleanout Box: Precast reinforced concrete. Cast iron lid marked for service. Christy F8 in foot traffic areas; G5 in roadways. Provide with PVC pipe extension down to top of

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- 1 pipe.
- 2 B. Water:
- 3 1. Hot and Cold Water Piping: Materials used in the water system, except valves and
- 4 similar devices, shall be of like material, except where otherwise approved by Engineer
- 5 and Authority Having Jurisdiction, prior to start of work.
- 6 a. Inside Building, Within Five Feet of Building Walls, and All Above Grade:
- 7 (1) Hard temper seamless copper, ASTM B88. Wrought copper fittings,
- 8 ANSI B16.22. Type L with brazed joints (1100F, min.). 1-1/2" and
- 9 smaller above grade may be soldered, lead-free solder. All nipples
- 10 shall be lead-free red brass (85% copper). Above grade fittings may
- 11 be copper press fittings, ASME B16.18 or ASME B16.22. EPDM O-
- 12 rings. Installation shall be in accordance with the manufacturer's
- 13 installation instructions. ProPress.
- 14 2. Valves and Specialties:
- 15 a. Valves:
- 16 (1) General: Manufacturer's model numbers are listed to complete
- 17 description. Equivalent models of Crane, Kitz, Milwaukee, Nibco,
- 18 Stockham, Walworth or Watts are acceptable. All valves of a
- 19 particular type or for a particular service shall be by the same
- 20 manufacturer. Butterfly valves may be substituted for 2-1/2" and
- 21 larger gate valves above grade; see specification below. Provide a
- 22 minimum of two operating "T" handles for underground valves for
- 23 each underground system where valves are required. The lengths of
- 24 the handles are dependent upon the depth of the valves and the
- 25 ability of the handles to fully open and/or close the valves. At least
- 26 one "T" handle for each system shall be on site at the beginning of
- 27 the installation of a particular system for emergencies, and the
- 28 Construction Manager shall have access to these "T" handles and
- 29 valves.
- 30 (2) Gate Valve: 2" and Smaller: All bronze. Non-rising stem. Threaded
- 31 bonnet. Wedge disk. Malleable iron handwheel. 200 psi CWP. Nibco
- 32 T-113-LF. 2-1/2" and Larger: Iron body, bronze mounted. Non-rising
- 33 stem. Resilient wedge disk. 200 psi CWP. Flanged or AWWA hub
- 34 end as applicable. Nibco F-619-RWS. Underground valves shall
- 35 have square operating nut.
- 36 (3) Butterfly Valve: Ductile iron threaded lug body. Aluminum bronze
- 37 disk. EPDM molded-in liner and seals. 416 stainless steel shaft. 6"
- 38 and smaller valves shall have multi-position lever handle. 8" and
- 39 larger valves shall have gear operator. Provide 2" extension neck at
- 40 insulated pipes. Nibco LD-2000.
- 41 (4) Check Valve: Lead-free bronze swing check, regrinding. 200 psi
- 42 CWP. Nibco T-413-Y-LF. For vertical applications use lead-free
- 43 bronze, spring-loaded, lift-type. Nibco T-480-Y-LF.
- 44 (5) Ball Valve: Full port. Lead free brass body, cap, stem, disk and ball.
- 45 Screwed connection. Lever handle. PTFE seat and stem packing.
- 46 Min. 400 psi CWP. CSA-US and UL listed. Nibco T-FP-600A-LF.
- 47 (6) Valve Box: Precast reinforced concrete. Cast iron lid marked for
- 48 service. Christy F8 in foot traffic areas; G5 in roadways. Provide with
- 49 PVC pipe extension down to top of pipe.
- 50 b. Miscellaneous Specialties:
- 51 (1) Temperature and Pressure Relief Valve: ASME rated fully automatic,
- 52 reseating combination temperature and pressure relief valve sized in
- 53 accordance with energy input. Sensing element immersed within
- 54 upper 6" of tank. Watts.

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- 1 (2) Union: 2" and Smaller: AAR malleable iron, bronze to iron ground
2 seat. 300 psi. Unions for copper piping shall be copper or lead free
3 cast bronze. Anvil. Size 2-1/2" and Larger: Grooved pipe, synthetic
4 gasket, malleable iron housing. EPDM gasket, NSF 61 rated.
5 Victaulic Style 77, Gruvlok.
- 6 (3) Dielectric Coupling: Insulating union or flange rated for 250 psig.
7 Wilkins DUXL Series.
- 8 (4) Shock Absorber: Multiple bellows. All stainless steel construction.
9 Designed and applied in accordance with PDI WH201. Amtrol, Smith,
10 Wade, Zurn.
- 11 C. Drain Piping (including Condensate): Same as inside building cold water piping.
- 12 D. Miscellaneous Piping Items:
- 13 1. Pipe Support:
- 14 a. Pipe Hanger: Steel "J" hanger with side bolt for piping 4" and smaller; steel
15 clevis hanger for piping 5" and larger. Load and jam nuts. Size and maximum
16 load per manufacturer's recommendation. Felt liner for copper piping. Hanger
17 and rod shall have galvanized finish. B-Line, Anvil, Unistrut.
- 18 b. Isolating Shield: Galvanized steel shell and reinforcing ribs. 1/4"
19 non-conducting hair felt pad. Pipe hanger in accordance with paragraph
20 above. Increase hanger size per manufacturer's recommendation. B-Line,
21 Semco, Superstrut.
- 22 c. Construction Channel: 12-gage, 1-5/8" x 1-5/8" galvanized steel channel.
23 Single or multiple section. Self-locking nuts and fittings. B-Line, Anvil, Unistrut.
- 24 2. Flashing: Vent flashing shall be 4 lb/ft² lead, 16" sq. flange, length sufficient to be
25 turned down 2" into vent. Oatey. Flashing for other piping through roof shall be
26 prefabricated galvanized steel roof jacks with 16" sq. flange. Provide clamp-on storm
27 collar and seal water tight with mastic. For cold process built-up roof, material shall be 4
28 lb/ft² lead instead of galvanized steel. For single-ply roofing, use the roofing
29 manufacturer's recommended flashing material.
- 30 **2.2 PIPING INSULATION MATERIALS:**
- 31 A. General: All piping insulation materials shall have fire and smoke hazard ratings as tested under
32 ASTM E-84 and UL 723 not exceeding a flame spread of 25 and smoke developed of 50.
- 33 B. Pre-Molded Fiberglass: Heavy density sectional pre-molded fiberglass with vapor barrier
34 laminated all service jacket and pressure sealing vapor barrier lap. Thermal conductivity shall not
35 exceed 0.25 Btu-in/hr-ft²-F at a mean temperature of 50F. Perm rating 0.02, ASTM E96.
36 Puncture rating 50 Beach units, ASTM D781. Provide 3" (min.) wide tape of same material as lap
37 for butt joints. For hot water piping to 140°F, thickness shall be 1" for pipe sizes less than 1";
38 1-1/2" thickness for pipe sizes 1" and 1-1/2"; 2" thickness for 2" and larger. See Title 24, Part 6
39 "California Energy Code" for temperatures above 140°F. Knauf, Johns-Manville, Owens-Corning.
- 40 C. Fiberglass Blanket: Unfaced. Thermal conductivity shall not exceed 0.25 Btu-in/hr-ft²-F at a
41 mean temperature of 50F. 1-1/2" thickness. Knauf, Johns-Manville, Owens-Corning.
- 42 D. PVC Jacket (for pipe, fittings and valves): Pre-molded polyvinyl chloride (PVC) jackets, 0.020"
43 thickness. Size to match application. Provide solvent weld adhesive and PVC vapor barrier
44 pressure sealing tape by same manufacturer. Zeston.
- 45 E. Stretchable Glass Fabric: Reinforcing mesh. 10 X 20 continuous filament glass yarns per inch.
46 Johns-Manville.
- 47 F. Vapor Barrier Coating: Childers CP-30, Foster 30-25.
- 48 G. Lagging Adhesive: Childers CP-50A, Foster 30-36.
- 49 H. Aluminum Jacketing: Aluminum pipe and fitting jacketing. 0.016" thickness for straight pipe.
50 0.024" thickness for fittings. Stucco-embossed finish. Integral moisture barrier. Provide
51 pre-fabricated aluminum strapping and seals by same manufacturer. Childers.

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- 1 I. Outdoor Mastic: Childers CP-10, Foster 65-05.
- 2 J. Insulating Tape: Ground virgin cork and synthetic elastomeric. Black, odorless, and non-toxic. K
- 3 factor 0.43 Btu-in/hr-ft²-F or less. Non-shrinking. For outdoor use, provide protective finish by
- 4 same manufacturer. Halstead.
- 5 K. Molded Closed Cell Vinyl (Piping Insulation Under Lavatories and Sinks): Fully molded closed
- 6 cell vinyl, 1/8" thick, minimum. Thermal conductivity shall not exceed 1.17 BTU-in/hr-ft²-°F at an
- 7 average temperature of 73°F. Weep hole in cleanout nut enclosure. Hinged cap over valve to
- 8 allow access for servicing. Out of sight nylon fastening system and internal ribs on drain
- 9 insulation to provide air gap (Lav-Guard Only). Truebro Lav-guard, McGuire Pro Wrap,
- 10 Plumberex.

2.3 FIXTURES:

- 12 A. General: Provide rough-in for and install all plumbing fixtures shown on drawings. Except in
- 13 equipment rooms, all trim, valves and piping not concealed in wall structure, above ceiling or
- 14 below floors, shall be brass with polished chrome plate finish, unless noted otherwise. All
- 15 enameled fixtures shall be acid resisting. Standard color is white unless otherwise noted.
- 16 B. Schedule: Refer to Plumbing Fixture Schedule on the drawings for list of fixtures and trim.
- 17 Manufacturer's model numbers are listed to complete description. Equivalent models of American
- 18 Standard, Eljer, Elkay, Haws, Just, Kohler, Moen, T&S Brass, Willoughby or Zurn are acceptable.
- 19 For drainage fixtures, equivalent models of Josam, Mifab, Smith, Wade or Zurn are acceptable.
- 20 C. Stops and P-Traps: All fixtures shall be provided with stops and P-Traps as applicable. Wall
- 21 mounted faucets, valves, etc. shall have integral stops or wall mounted stops.
- 22 1. Stops: All hot and cold water supplies shall be 1/2" I.P.S. inlet angle stops with
- 23 stuffing box, loose key lock shield, and brass riser (3/8" for 2-1/2 gpm and less,
- 24 otherwise 1/2"). 1/4 turn ball stops do not require stuffing box. Dahl, McGuire,
- 25 Speedway.
- 26 2. P-Traps: Semi-cast brass, ground joint. 17-gage. Clean-out plug. Unobstructed
- 27 waterway. California Tubular, McGuire.
- 28 D. Caulking: Caulk fixtures with white G.E. "Sanitary SCS1700", mildew resistant silicone sealant
- 29 with EPA listed anti-microbial.

2.4 EQUIPMENT:

- 31 A. General Requirements:
- 32 1. Capacity: Capacities shall be in accordance with schedules shown on drawings.
- 33 Capacities are to be considered minimum.
- 34 2. Dimensions: Equipment must conform to space requirements and limitations as
- 35 indicated on drawings and as required for operation and maintenance. Equipment will
- 36 not be accepted that does not readily conform to space conditions. Prepare and
- 37 submit layout drawings for all proposed equipment (different than scheduled units)
- 38 showing actual job conditions, required clearances for proper operation, maintenance,
- 39 etc.
- 40 3. Ratings -Electrical: Electrical equipment shall be in accordance with NEMA standards
- 41 and UL or ETL listed where applicable standards have been established.
- 42 4. Piping: Each item or assembly of items shall be furnished completely piped for
- 43 connection to services. Control valves and devices shall be provided. Equipment
- 44 requiring domestic water for non-potable use shall be provided with backflow
- 45 preventer acceptable for intended use by local governing authorities.
- 46 5. Electrical:
- 47 a. General: Each item or assembly of items shall be furnished completely wired
- 48 to individual terminal blocks for connection to single branch electrical circuit. All
- 49 electrical accessories and controls required by equipment shall be furnished.
- 50 Provide terminal blocks for controls and interlocks not included in equipment
- 51 package. Manual and magnetic starters shall have ambient compensating
- 52 running overcurrent protection in all ungrounded conductors. Magnetic starters
- 53 shall be manual reset, and shall have H-O-A switches and auxiliary contacts.
- 54 Controllers and other devices shall be in NEMA 1 or 3R enclosures as

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applicable.

- b. Wiring: Conductors, conduit, and wiring shall be in accordance with Electrical Specifications. Individual items within assembly shall be separately protected with dead front, fused disconnect, fuse block, or circuit breaker for each ungrounded conductor, all accessible on operating side of equipment. Switches, contacts and other devices shall be in ungrounded conductors.
- c. Motors: Shall be rated, constructed and applied in accordance with NEMA and ANSI Standards without using service factor. Single-phase motor shall be of type to suit application. Motors exposed to weather shall be TEFC. Vertical motors with exposed fans shall have rain caps.
- d. Starters: Motor starters shall be furnished for all equipment except where starter is in a motor control center as designated on the electrical drawings. Deliver starter to Electrical Contractor for installation and wiring.
- e. Control Voltage: Equipment connected to greater than 240 volts shall be provided with 120 volt control circuit from integral protected transformer if separate source is not indicated on plans. 240 volt control is acceptable if confined within control panel.
- f. Submittals: Included in shop drawings shall be internal wiring diagrams and manufacturer's recommended external wiring.

- B. Electric Drinking Fountain with Bottle Filler: Wall hung. Provide steel mounting brackets. Stainless steel basin. Removable grid drain. Chrome plated brass bubbler with automatic flow regulator and self-closing valve. Non-ferrous evaporator. Lead solder shall not be used. Hermetic compressor with automatic reset overload protection. Air cooled condenser. Adjustable thermostat. UL listed. ARI certified. Elkay, Halsey-Taylor, Haws, Sunroc.

PART 3 - EXECUTION

3.1 PIPING INSTALLATION:

A. General:

- 1. Piping Layout: Piping shall be concealed in walls, above the ceilings, or below grade unless otherwise noted. Exposed piping shall run parallel to room surfaces; location to be approved by Architect. No structural member shall be weakened by cutting, notching, boring or otherwise, unless specifically allowed by structural drawings and/or specifications. Where such cutting is required, reinforcement shall be provided as specified or detailed. All piping shall be installed in a manner to ensure unrestricted flow, eliminate air pockets, prevent any unusual noise, and permit complete drainage of the system. All piping shall be installed to permit expansion and contraction without strain on piping or equipment. Vertical lines shall be installed to allow for building settlement without damage to piping. Pipe sizes indicated on the drawings are nominal sizes unless otherwise noted.
- 2. Joints:
 - a. Threaded: Pipe shall be cut square and reamed to full size. Threads shall be in accordance with ANSI B2.1. Joint compound or tape suitable for conveyed fluid shall be applied to male thread only. Joints shall be made with three threads exposed.
 - b. Brazed: Filler rod shall be of suitable or the same alloy as pipe. Brazing filler metal shall have a minimum melting point of 1100F. Brazing shall be performed by a Certified Brazier as certified by an organization/institution that uses standards recognized by the American Welding Society (AWS) and meets the requirements of the ASME Boiler and Pressure Vessels Code, Section 9.
 - c. Open Ends: Open ends of piping shall be capped during progress of work to preclude foreign matter.
 - d. Electrical Equipment: Piping shall not be run over electrical panels, motor control centers or switchboards.
- 3. Fittings and Valves:

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- a. Standard Fittings: All joints and changes in direction shall be made with standard fittings. Close nipples shall not be used.
- b. Reducers: Pipe size reduction shall be made with bell reducer fittings. Bushings shall not be used.
- c. Unions: A union shall be installed on the leaving side of each valve, at all sides of automatic valves, at equipment connections, and elsewhere as necessary for assembly or disassembly of piping.
- d. Valves: All valves shall be full line size. Provide shut-off valve for each building and each equipment connection. Provide shut-off valve at each point of connection to existing piping. At equipment connections, valves shall be full size of upstream piping.
- e. Valve Accessibility: All valves shall be located so that they are easily accessible. Valves located above ceilings shall be installed within 24" of the ceiling. For situations where this is not practical or where valves are greater than 10' above the floor, chain wheel operators shall be provided. Chain shall extend down to 7' above the floor. All such installations must have prior review by the Engineer.

4. Pipe Support:

- a. General: Hangers shall be placed to support piping without strain on joints or fittings. Maximum spacing between supports shall be as specified below. Actual spacing requirements will depend on structural system. Side beam clamps shall be provided with retaining straps to secure the clamp to the opposite side of the beam. Vertical piping shall be supported with riser clamp at 20' on center (maximum). Support pipe within 12" of all changes in direction. Support individual pipes with pipe hanger. Copper piping systems which protrude through a surface for connection to a fixture stop or other outlet shall be secured with a drop ell, Nibco 707-3-5, to a Holdrite Model #SB1 bracket; nipple through surface shall be threaded brass.

(1) Pressure Pipe:

Pipe Size (Inches)	Maximum Spacing*	
	Between Supports (ft.)	
	Copper	Sch. 40 steel
1/2	6	6
3/4	6	8
1	6	8
1-1/4	6	10
1-1/2	6	10
2	10	10
2-1/2	10	10
3	10	10
4	10	10
6	10	10

*Based on straight lengths of pipe with couplings only. Provide additional supports for equipment, valves or other fittings. Seismic requirements may reduce maximum spacing.

(2) Gravity Drain Pipe: Piping shall be supported at each length of pipe or fitting, but in no case at greater spacing than indicated above for pressure pipe.

- b. Hot and Cold Water Piping: All hot and cold water piping shall have isolating shield; no portion of this piping shall touch the structure without an isolating shield except at anchor points for fixture rough-in.
- c. Trapeze: Trapeze hangers of construction channel and pipe clamps may be used. Submit design to Engineer for review.

5. Miscellaneous:

- a. Escutcheons: Provide chrome plated metal escutcheons where piping penetrates walls, ceilings, or floors in finished areas.
- b. Pipe Sleeves: All piping passing through concrete shall be provided with pipe sleeves. Allow 1" annular clearance between sleeve and pipe for piping 3" and

- 1 smaller, otherwise 2" annular clearance. Piping through walls below grade
2 shall be sealed with Link-Seal.
- 3 c. Pipes Passing through Fire Rated Surfaces: Pipes passing through fire rated
4 walls, floors, ceilings, partitions, etc. shall have the annular space surrounding
5 the pipe or pipe insulation sealed with fire rated materials in accordance with
6 the requirements of 2019 CBC Section 714.
- 7 d. Dielectric Couplings: Dielectric couplings shall be installed wherever piping of
8 dissimilar metals are joined, except that bronze valves may be installed in
9 ferrous piping without dielectric couplings.
- 10 B. Sanitary Sewer Piping:
- 11 1. General: Where inverts are not indicated, sanitary sewer piping shall be installed at 1/4"
12 per foot pitch. Piping 4" and larger may be installed at 1/8" per foot pitch where
13 structural or other limitations prevent installation at a greater pitch. Bell and spigot piping
14 shall be installed with barrel on sand bed; excavate hole for bell.
- 15 2. Cleanouts: Install cleanouts at ends of lines, at changes of direction greater than 45
16 degrees, and at not greater than 100 foot intervals. Locate interior cleanouts in
17 accessible locations and bring flush to finished surface.
- 18 3. Vents: Vents shall terminate not less than 6" above the roof nor less than 12" from any
19 vertical surface nor within 10' of any outside air intake. Install horizontal vent lines at
20 1/4" per foot pitch. Offset vents 2' minimum from gutters, parapets, ridges and roof
21 flashing.
- 22 C. Water Piping: Connections to branches and risers shall be made from top of main. Supply header
23 in fixture battery shall be full size to last fixture, reducing in size only on individual connections to
24 each fixture in battery. Minimum pipe size shall be 1/2", unless otherwise noted. Exposed fixture
25 stops and flush valves shall be installed with brass nipples for copper piping and galvanized
26 nipples for galvanized piping. Nipples are to extend from outside of wall to fitting at header or
27 drop behind finish wall surfaces. Pipe nipples shall be same size as stop or flush valve. Provide
28 shut off for each building and each connection to equipment. Shock absorbers shall be installed
29 in a vertical position as indicated on drawings. Only equipment mounted on vibration isolators
30 shall be connected with flexible connections. Underground hot water and cold water piping which
31 run parallel to each other shall be installed a minimum of 3 feet apart.
- 32 D. Drain Piping (Including Condensate): Install with constant pitch to receptacle, 1/4" per foot where
33 possible, otherwise 1/8" per foot minimum. Provide TEE with clean-out plug at all changes of
34 direction. Provide trap at each air handling unit to prevent air leakage. Only equipment mounted
35 on vibration isolators shall be connected with flexible connection. Piping not concealed in wall
36 structure, above ceilings or below floors shall be chrome plated brass, except in equipment
37 rooms, piping shall be galvanized steel. P&T relief and water heater drain piping shall be
38 galvanized steel. Provide secondary drain piping where required.
- 39 **3.2 PIPING INSULATION INSTALLATION:**
- 40 A. Domestic Hot Water:
- 41 1. General: All domestic hot water piping, fittings and accessories shall be insulated.
- 42 2. Pipe: Apply pre-molded fiberglass sections to pipe using integral pressure sealing lap
43 adhesive in accordance with manufacturer's recommendations. Stagger longitudinal
44 joints. Seal butt joints with factory supplied pressure sealing tape.
- 45 3. Fittings and Valves:
- 46 a. Wrap all fittings and valves with pre-cut fiberglass blanket to thickness
47 matching adjoining insulation. Cover blanket with PVC jacket in accordance
48 with manufacturer's recommendations. Solvent weld. Seal all joints with factory
49 supplied pressure sealing vapor barrier tape with 1-1/2" (min.) overlap on both
50 sides of joint. Insulate valves to stem. Do not insulate unions, flanges or valves
51 unless water temperature exceeds 140F or the piping is exposed to weather.
- 52 b. For miscellaneous fittings and accessories for which PVC jackets are not
53 available or where proximity of fittings precludes a neat-appearing installation,
54 the Contractor may cover the fiberglass blanket with stretchable glass fabric,
55 one coat of lagging adhesive and a final coat of vapor barrier coating. All
56 exposed ends of insulation shall be adequately sealed.

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4. Additional Finish for Exposed Piping and Equipment: All piping and equipment exposed to view but protected from the weather shall be given an additional finish of PVC jackets.

B. Cold Water Piping-Freeze Protection: All cold water piping exposed to weather or other areas subject to freezing (i.e. ventilated attics, uninsulated exterior soffits, etc.) shall be insulated same as hot water piping. Cover with aluminum jacketing where exposed to weather. Short lengths of pipe and valves may be wrapped with insulating tape, 50% overlap. Cover valves to stem. Apply at least two coats of protective finish where exposed to weather.

C. Piping Insulation Under Lavatories and Sinks: Exposed water piping, water stops and drain piping under lavatories and sinks shall be insulated with 1/8" thick molded closed cell vinyl. Installation shall be in accordance with manufacturer's instructions.

3.3 FIXTURE INSTALLATION:

A. Fixture Height: Shall be as indicated on Architectural drawings.

B. Floor Drains or Floor Sinks: Shall be placed parallel to room surfaces, set level, flush with floor, and adjusted to proper height to drain. Cover openings during construction to keep all foreign matter out of drain line.

C. Wall Hung Fixtures: Shall be provided with proper backing and hanger plates secured to wall. Fixtures mounted on carriers shall bear against stop nuts, clear of wall surface. Caulk fixtures against walls with white G.E. "Sanitary SCS1700" silicone sealant. Caulking shall be smooth and flush with fixture surface (not concave).

D. Floor Mounted Fixtures: Shall be provided with proper support plates. Caulk floor mounted fixtures with white G.E. "Sanitary SCS1700" silicone sealant. Caulking shall be smooth and flush with fixture surface (not concave).

E. Other Connections: Rough-in and connection for trim or fixtures supplied by others shall be included in this specification section.

3.4 EQUIPMENT INSTALLATION:

A. General: It shall be the responsibility of the equipment installer to insure that no work done under other specification sections shall in any way block, or otherwise hinder the equipment. All equipment shall be securely anchored in place.

B. Connections to Equipment: Where size changes are required for connections to equipment, they shall be made immediately adjacent to the equipment and, if possible, inside the equipment cabinet.

3.5 TESTS AND ADJUSTMENTS:

A. General: Unless otherwise directed, tests shall be witnessed by a representative of the Architect. Work to be concealed shall not be enclosed until prescribed tests are made. Should any work be enclosed before such tests, the Contractor shall, at his expense, uncover, test and repair all work to original conditions. Leaks and defects shown by tests shall be repaired and entire work retested. Tests may be made in sections, however, all connections between sections previously tested and new section shall be included in the new test.

B. Gravity Systems:

1. Sanitary Sewer: All ends of the sanitary sewer system shall be capped and lines filled with water to the top of the highest vent, 10' above grade minimum. This test shall be made before any fixtures are installed. Test shall be maintained until all joints have been inspected, but no less than 2 hours.

2. Drains (Including Condensate): Similar to Sanitary Sewer.

C. Pressure Systems:

1. General: There shall be no drop in pressure during test except that due to ambient temperature changes. All components of system not rated for test pressure shall be isolated from system before test is made.

2. Domestic Hot and Cold Water Piping: Maintain 100 psig water pressure for 4 hours.

D. Fixtures: Provide torque testing of water closet carrier anchor bolts in presence of Inspector. If Inspector is not available, a testing agency shall handle the inspection.

3.6 DISINFECTION:

- A. Disinfect all domestic water piping in accordance with 2019 CPC Section 609.9, and in accordance with administrative authority. Disinfection process shall be performed in cooperation with health department having jurisdiction and witnessed by a representative of the Architect. During procedure signs shall be posted at each water outlet stating, "Chlorination - Do Not Drink". After disinfection, one set of water samples shall be collected by Contractor for bacteriological analysis in presence of Inspector. If the water fails the bacteriological test, Contractor shall disinfect the piping again and pay for any retesting required, at no additional cost to owner. Bacteriological testing results shall be obtained by Contractor and delivered to the Owner through the Architect before project completion. Contractor shall include copy of Bacteriological Test Results at closeout with operation and maintenance manuals.

END OF SECTION

SECTION 23 0800
HEATING, VENTILATING AND AIR CONDITIONING

PART 1 - GENERAL

1.1 GENERAL MECHANICAL PROVISIONS

- A. The General Mechanical Provisions, Section 20 01 00, shall form a part of this Section with the same force and effect as though repeated here.

1.2 SCOPE

- A. Included: Provide all labor, materials and services necessary for complete, lawful and operating systems as shown or noted on the drawings or as specified here. The work includes, but is not necessarily limited to, the following:
1. Air distribution system.
 2. All equipment as shown or noted on the drawings or as specified. Furnish motor starters except where motor control centers are used. Coordinate with Division 26.
 3. Circulating water system.
 4. Refrigeration system.
 5. System energy balance.
 6. Coordinate with Section 25 09 00 (Direct Digital Control System) regarding location and installation of system sensors, valves, actuators, etc. and to provide simultaneous start-up.
 7. Demolition as indicated on drawings. Where demolition is called for, remove all equipment, piping, ductwork, braces, supports, housekeeping pads, temperature controls and related items no longer required.
- B. Work Specified Elsewhere:
1. Line voltage power wiring to equipment, motor starters in motor control centers, disconnect switches and installation of all starters are included in the Electrical Sections, unless otherwise noted.
 2. Connection of condensate drains and domestic water to equipment.
 3. Access doors.
 4. Concrete and reinforcing steel unless specifically called for in the drawings or specifications.
 5. Painting unless specifically called for in the drawings or specifications.
 6. Carpentry.
 7. Direct Digital Control System.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS

- A. Hot or Chilled Water Piping:
1. Above Grade:
 - a. 2" and Smaller: Schedule 40 black steel pipe, ASTM A53. 150 psi black malleable iron screwed fittings, ANSI B16.3.
 - b. 2-1/2" Through 4": Screwed pipe as above -OR- welded or grooved pipe as below.
 - c. 6" and Larger: Schedule 40 black steel pipe, ASTM A53. Standard weight carbon steel welding fittings, long radius ells, ANSI B16.9. Joints may be grooved pipe unions, EPDM gaskets. Grinnell, Gruvlok, Victaulic.
 2. Valves and Specialties:
 - a. Valves:
 - (1) General: Manufacturer's model numbers are listed to complete description. Equivalent models of Crane, Milwaukee, Nibco, Stockham, Walworth, as well as Grinnell, Gruvlok and Victaulic for

- grooved joint systems, are acceptable. All valves of a particular type or for a particular service shall be by the same manufacturer. Butterfly valves may be substituted for 2-1/2" and larger gate valves above grade; see specification below.
- (2) Gate Valve: Provide 2" extension necks at insulated pipes, where required. 2" and Smaller: All bronze. Rising stem. Union bonnet. Wedge disk. Screwed connection. Malleable iron handwheel. Class 125. Nibco T-124. 2-1/2" and Larger: Iron body, bronze mounted. Non-rising stem. Resilient wedge. Class 125. Flanged or AWWA hub end as applicable. Nibco F-619-RWS. Underground valves shall have square operating nut. Provide one operating "T" handle for underground valves.
 - (3) Butterfly Valve: Iron threaded lug body. Aluminum bronze disk. O-ring seals. Resilient, removable seat. 416 stainless steel shaft. 6" and smaller valves shall have multi-position lever handle. 8" and larger valves shall have gear operator. Provide 2" extension neck at insulated pipes. Demco Series NE, Grinnell, Stockham.
 - (4) Plug Valve: Eccentric bronze or nickel plated semi-steel plug, semi-steel body, bronze bushings, Buna-N-rings. 175 psi WOG. KeyPort Valve Series 400.
 - (5) Check Valve: Non-slam, lift type. Replaceable bronze seat, disk and bushings. Stainless steel helical spring. Disk guided at top and bottom. Flow area through valve shall exceed cross sectional area of pipe. 150 psi WOG. CPV, Mueller Steam Specialty. 2" and Smaller: Shall be screwed brass with hand lapped bronze disk. 2-1/2" and Larger: Shall be iron body, wafer or flanged with resilient Buna-N or TFE facing on seat.
 - (6) Ball Valve: Full port. Bronze body, cap, stem, disk and ball. Screwed connection. Lever handle. TFE seat. O-ring seals. 300 psi WOG. Apollo, Nibco, Jomar.
 - (7) Globe Valve: All bronze. Renewable TFE disk. Screwed connection. Malleable iron handwheel. Union bonnet. Class 150. Stockham B-22.
 - (8) Valve Box: Pre-cast reinforced concrete. Cast iron lid marked for services. Christy F22 in foot traffic areas; G5 in roadways.
- b. Instruments:
- (1) Pressure Gage: Phosphor bronze tube. Bronze bushed. 1% accuracy. Cast aluminum case. 3-1/2" white dial. Adjustable pointer. Operating pressure at midscale. 1/4" NPT brass socket. Provide brass porous core pressure snubber and gage cock. Terice, Weksler, Winters.
 - (2) Thermometer: 3" dial. Stainless steel case. Back or bottom connected as required. 1/2" NPT. 20-240°F, 2°F divisions for hot water, 25-125°F, 2°F divisions for chilled water. 2" insertion length. Allowance to be made for insulation thickness. Marshalltown, Moeller, Taylor, Tel Tru, Winters.
 - (3) Thermometer Well: Brass well. Suitable for 3" dial thermometer above. Provide 2" extension at insulated pipes.
 - (4) Gage Cock: Lever handle brass cock. 1/4" NPT connections. Provide 2" extension at insulated pipes.
 - (5) Instrument Well: Suitable for temperature sensing element. Coordinate with supplier of temperature controls.
 - (6) Flow Switch: Paddle type. McDonnell No. FS4-3.
- c. Miscellaneous Specialties:
- (1) Pressure Relief Valve: ASME rated fully automatic, reseating pressure relief valve sized in accordance with energy input. Watts.
 - (2) Union: 2" and Smaller: AAR malleable iron, bronze to iron ground seat. 300 psi. Grinnell. Size 2-1/2" and Larger: Grooved pipe, synthetic

- 1 gasket, malleable iron housing. Victaulic Style 77, type "E" gasket,
2 Grinnell.
- 3 (3) Balancing Cock: Calibrated all bronze balancing/shutoff valve or cock.
4 Screwed connections. Memory stop. Position indicator. Drain
5 connection. Taps for differential pressure gage, with check valves or
6 shutoffs. 125 psi working pressure. Internal seals. Preformed
7 insulation block. Armstrong, FlowSet by Flow Design, Inc., Grinnell,
8 Tour and Andersson, Victaulic.
- 9 (4) Strainer: "Y" type, 125 psi. Machined seats. Stainless steel screens.
10 Provide gate valve blowoff with hose threads. Bailey, Mueller Steam
11 Specialty.
12 2" and Smaller: Screwed bronze body. Perforation size 0.057".
13 2-1/2" and Larger: Flanged iron body, perforation size as follows:
14 Pipe Size Perforation Dia.
15 2-1/2" - 3" 1/16"
16 4" - 6" 3/32"
17 8" and Larger 1/8"
- 18 (5) Dielectric Coupling: Insulating union, flange or waterway fitting rated
19 for 250 psig. EPCO, Clearflow.
- 20 (6) Flexible Connection: 2" and Smaller: Screwed connection. Corrugated
21 bronze core covered with high tensile bronze tubular braid. 150 psi
22 working pressure. Flexonics, Keflex. 2-1/2" and Larger: Contoured,
23 molded Teflon bellows. Minimum of three convolutions. Monel
24 reinforcing rings. Limit bolts. Flanged connection. 100 psi working
25 pressure. Belmont, Resistoflex. -Or- Multiple laminations of 321
26 stainless steel. 150 psi working pressure. Limit bolts. Flanged
27 connection. Hyspan Series 5500.
- 28 B. Refrigerant Piping: Hard drawn Type ACR copper, dried and capped, ASTM B280. Wrought
29 copper fittings, silver alloy brazed, 1100°F, Silfos.
- 30 C. Miscellaneous Piping Items:
- 31 1. Pipe Support:
- 32 a. Pipe Hanger: Steel "J" hanger with side bolt. Load and jam nuts. Size and
33 maximum load per manufacturer's recommendations. Felt liner for copper
34 piping. Hanger and rod shall have galvanized finish. B-Line, Unistrut.
- 35 b. Isolating Shield: Galvanized steel shell and reinforcing ribs. 1/4" non-
36 conducting hair felt pad. Pipe hanger in accordance with paragraph above.
37 Increase hanger size per manufacturer's recommendation. B-Line, Semco.
- 38 c. Construction Channel: 12-gage, 1-5/8" x 1-5/8" galvanized steel channel.
39 Single or multiple section. Self-locking nuts and fittings. B-Line, Unistrut.
- 40 2. Flashing: Flashing for piping through roof shall be prefabricated galvanized steel roof
41 jacks with 16" square flange around pipe. Provide clamp-on storm collar and seal
42 water tight with mastic. Maintain dielectric separation between copper and galvanized
43 materials. For cold process built-up roof, material shall be 4 lb/ft² lead instead of
44 galvanized steel.
45
- 46 **2.2 PIPING INSULATION MATERIALS**
- 47 A. General: All piping insulation materials shall have fire and smoke hazard ratings as tested
48 under ASTM E-84 and UL 723 not exceeding a flame spread of 25 and smoke developed of
49 50.
- 50 B. PVC Jacket (for pipe, fittings and valves): Pre-molded polyvinyl chloride (PVC) jackets, 0.020"
51 thickness. Size to match application. Provide solvent weld adhesive and PVC vapor barrier
52 pressure sealing tape by same manufacturer. Zeston.

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- 1 C. Aluminum Jacketing: Aluminum pipe and fitting jacketing, 0.016" thickness for straight pipe.
2 0.024" thickness for fittings. Integral moisture barrier. Stucco-Embossed finish. Provide
3 pre-fabricated aluminum strapping and seals by same manufacturer. ITW or RPR.
- 4 D. Metal Jacketing Sealant: Childers CP-76, Foster 95-44.
- 5 E. Flexible Elastomeric: Closed cell flexible elastomeric preformed pipe insulation. Thermal
6 conductivity shall not exceed 0.27 Btu-in/hr-ft²-°F at a mean temperature of 70°F. 1/2" thick.
7 Provide #520 adhesive and Armaflex insulation pipe hangers by same manufacturer. Armacell
8 Armaflex.

9 2.3 DUCTWORK MATERIALS:

- 10 A. General: All ductwork materials shall have fire and smoke hazard ratings as tested under
11 ASTM E-84 and UL 723 not exceeding a flame spread of 25 and smoke developed of 50. Shall
12 comply with 2019 CMC.
- 13 B. Metal Ductwork: Metal ductwork shall be galvanized sheet steel, lock forming quality, ASTM
14 A-653, with gage and construction to match SMACNA Standard for pressure required (26 gage
15 minimum).
- 16 C. Flexible Ductwork: Insulated flexible ductwork. One pound per cubic foot glass fiber insulation,
17 1-1/2" thick (R-6), 2" thick (R-8) where ductwork is outside the building thermal insulation
18 envelope. Thermal conductivity shall not exceed 0.25 Btu-in/hr-ft²-°F at a mean temperature of
19 75°F. Seamless metalized reinforced polyester vapor barrier jacket. Duct shall comply with
20 NFPA 90A. Continuous internal liner bonded to galvanized steel wire helix. Duct shall be
21 capable of continuous operation at 1-1/2" of positive water static pressure and 4,000 ft/min air
22 velocity. JP Lamborn.
- 23 D. Duct Sealants: All Joints Exposed to Weather: Sealant shall be water based, Foster 32-19/32-
24 17, Childers CP-146/148, United Duct Sealer WB or G.E. "SilPruf" SCS2000 silicone sealant.
25 Joints Not Exposed to Weather (Except Spiral Wound Exposed to View in Finished Areas):
26 Fiber reinforced. White in color. Foster 32-17, Childers CP-148, Design Polymerics DP1030,
27 Hardcast Versa-Grip 181, Hardcast CCWI-181. Spiral Wound Joints Not Exposed to Weather
28 and Exposed to View in Finished Areas: Non fibrated. Gray in color. Foster 32-19, Childers
29 CP-146, Design Polymerics DP 1010, or United Duct Sealer WB.
- 30 E. Spiral Wound Metal Ductwork: Spiral wound factory fabricated galvanized steel, gages in
31 accordance with the CMC. All fittings shall be factory fabricated. Fittings exposed to view shall
32 have all seams fully welded. Tees and laterals shall be conical type. Connections to plenums
33 shall be with bell mouth fittings. 12" and smaller ells shall be two piece die stamped. Ells larger
34 than 12" shall be five piece. McGill Airflow. Shop fabricated fittings are not acceptable.

35 2.4 AIR TERMINALS AND DUCT FITTINGS:

- 36 A. Grilles: (Grilles, Registers, Diffusers and Louvers)
 - 37 1. Information on Drawings: Refer to Grille Schedule on the drawings for the list of
38 grilles. Manufacturer's model numbers are listed to complete the description Titus.
39 Equivalent models of Anemostat or Krueger are acceptable. Refer to the floor plans
40 for neck size, CFM, air diffusion pattern and fire damper, if required.
 - 41 2. Performance: Submit complete performance data (throw, pressure drop, noise level,
42 etc.) for all grilles proposed, other than those scheduled. Testing shall be in
43 accordance with ANSI/ASHRAE 70-1991. If, according to the certified data of the
44 manufacturer of the proposed units, the sizes indicated on the drawings will not
45 perform satisfactorily, the units shall be reselected by the Contractor for the proper
46 diffusion, spread, pressure drop, throw and noise level.
 - 47 3. Frame and Accessories: Supply, return, and exhaust grilles shall not have an
48 opposed blade volume control damper unless otherwise noted. All surface mounted
49 grilles shall have a perimeter gasket and flanged edge. All grilles shall have frames
50 suitable for mounting in the surfaces designated by the architectural drawings. Key or
51 screwdriver operated, no slide bars.
 - 52 4. Finish: All ceiling and wall grilles and all louvers shall have a paintable white finish
53 unless otherwise noted. Interior components (everything behind the face plate) shall
54 be flat black. Floor grilles shall have an anodized aluminum finish unless otherwise
55 noted.

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- 1 B. Branch Duct Volume Damper: Volume control damper (VCD) in rectangular ducts shall be as
2 follows: Opposed blade, 6" maximum blade width, 16-gage blade, 48" maximum length, nylon
3 or oil impregnated bronze bearings, 1/2" diameter pin shaft, 16-gage channel frame, actuating
4 rod and linkage out of air stream. VCD in round duct shall be as follows: Damper blade full height
5 of branch and 1" less than branch width. All branch dampers shall have regulator with stamped
6 steel handle, spring loaded shaft nut, cast body and serrated self-locking die cast core. Regulator
7 for horizontal ducts overhead shall be mounted on sides or bottom of ducts. Secure a 12" length
8 of brightly colored plastic ribbon to handle for ease of location. Where rectangular or round
9 ductwork is insulated, slit insulation to allow handle to protrude. Ventlok 641 (with 607 end
10 bearing for round ducts).
- 11 C. Extractor: Curved blade turns in adjustable position rigid frame. Tuttle and Bailey Deflectrol.
- 12 D. Turning Vanes: Double wall, hollow metal, air foil shape. Spacing in accordance with
13 manufacturer's recommendations. Aero Dyne HEP.
- 14 E. Flexible Connection: UL listed neoprene coated 30 ounce fiberglass cloth. 3" metal, 3" fabric, 3"
15 metal. Ventglas.
- 16 F. Fire/Smoke Damper: California State Fire Marshal approved. UL listed and labeled indicating
17 fire rating. Hour rating as required by the rating of the wall, ceiling, floor, etc. in which it is
18 installed. Combination fire/smoke dampers shall have normally-closed, non-stall factory electric
19 actuator rated for 250°F (min.) and shall be Leakage Class II.
- 20 G. Duct Access Door:
- 21 1. Rectangular: Insulated double wall door. Full piano hinge. Cam latch. Pressure rating
22 to match application. Air Balance, Ductmate.
- 23 2. Round: Three layers of stamped steel. Inside panel shall consist of two layers of metal
24 which are spotwelded together along the rim, encapsulating high density fiberglass
25 insulation (25/50 rated). Closed cell neoprene gasket bonded to the inside of the door.
26 Zinc plated conical springs installed between the inner and outer door. Polypropylene
27 molded knobs with threaded metal inserts. Knobs shall be easily turned by hand and
28 shall be UL94HB listed. Zinc plated carriage bolts, clinched and sealed to the inner
29 door. Provide self adhesive template for the exact size of duct opening. Pressure rating
30 to match application. Ductmate.
- 31 H. Variable Air Volume Terminal (VAV/VVH):
- 32 1. General: Pressure independent, single-duct electric powered variable volume terminal.
33 Scheduled pressure drop is maximum allowable at inlet static at design conditions.
34 Provide integral flow taps and calibration chart on each unit. Performance testing shall
35 be in accordance with ARI Standards. Enviro-Tec, Titus.
- 36 2. Casing: Welded 24-gage galvanized steel. Provide hanger holes on four corners.
37 Interior insulation shall be 1/2" thick, 1-1/2 lb. density glass fiber with high density
38 facing. Insulation shall be UL listed and in compliance with NFPA 90A. Maximum
39 allowable leak rate 2% at 3" WC.
- 40 3. Controls: Provide integral cross flow velocity sensor furnished and installed at the
41 factory.
- 42 4. Coils: Units specified with hot water coils shall have factory installed access panel
43 upstream of the coil and shall have coil with 1/2" O.D. seamless copper tube with 0.017"
44 tube wall. Fin tube expanded into fin collar for permanent bond. Leak tested at 300
45 psig.
- 46 5. Sound Performance Data: Discharge sound and radiated sound levels shall not exceed
47 the published sound levels of the terminals which were used as the basis of design.
48 The manufacturer shall submit discharge sound and radiated sound data in both sound
49 power level (ref: 10-12 watts) in octave bands and noise criteria (NC) ratings. Testing
50 shall be in accordance with ARI Standards.
- 51 I. Kitchen Hood:
- 52 1. General: Factory fabricated in accordance with CMC Chapter 5 and State codes. Install
53 with bottom of hood 48" above cooking surface. UL labeled. Greenheck.
- 54 2. Materials: Unless otherwise noted, all visible elements of the hood shall be constructed
55 of stainless steel, 18 gage, type 304, with a No. 4 polished finish. All seams shall have a

- 1 liquid tight, continuous weld, ground smooth and polished. Provide factory stainless steel
- 2 enclosure panels.
- 3 3. Filters: Filters shall be fixed baffle type. 20 gage stainless steel construction. Filters shall
- 4 be furnished with handles. Blank panels shall be installed where required to symmetrically
- 5 space filters. 20 gage full length stainless steel filter rack with continuous, removable,
- 6 stainless steel grease trough.
- 7 4. Lights: UL listed vapor proof lights. Conduit and conductors shall be pre-wired to a J-box
- 8 on top of canopy.

9 2.5 DUCTWORK INSULATION MATERIALS:

- 10 A. General: All ductwork insulation materials shall have fire and smoke hazard ratings as tested
- 11 under ASTM E-84 and UL 723 not exceeding a flame spread of 25 and smoke developed of
- 12 50.
- 13 B. Fiberglass Blanket: **Installed** thermal resistance at a mean temperature of 75°F shall meet or
- 14 exceed indicated value. 3/4 lb/ft³ or 1 lb/ft³, **R-6** where ductwork is within the building thermal
- 15 insulation envelope. 3/4 lb/ft³ **R-8** where ductwork is outside the building thermal insulation
- 16 envelope and/or above the roof. Faced with glass reinforced foil laminated to Kraft paper.
- 17 Certaineed, Knauf, Johns-Manville, Owens-Corning.
- 18 C. Acoustic Lining: Glass fiber. **Installed** thermal resistance at a mean temperature of 75°F shall
- 19 meet or exceed indicated value. One side coated to prevent fiber erosion up to 6000 ft/min.
- 20 Average noise reduction coefficient of 0.80. 1.5 lb/ft³ density. 1" thick (**R-4.2**) where ductwork
- 21 is within the building thermal insulation envelope. 2" thick (**R-8**) where ductwork is outside the
- 22 building thermal insulation envelope and/or above the roof. Certaineed, Knauf, Johns-
- 23 Manville, Owens-Corning.
- 24 D. Bonding Adhesive: Design Polymerics DP2501, Foster 85-60.
- 25 E. Fire Resistive Duct Wrap: Nominal 1-1/2" thick, 6 lb/ft³ high-temperature fiber blanket thermal
- 26 insulation encapsulated in a fiberglass-reinforced aluminized polyester foil. Grease Duct Listing
- 27 Standards (Double Wrap) ASTM E 2336 / ICC-ES AC101. Ventilation Duct Listing Standard
- 28 (Single Wrap) – ISO 6944. 3M Fire Barrier Duct Wrap 615+.

29 2.6 EQUIPMENT

- 30 A. General Requirements:
- 31 1. Start-up: All equipment shall be started and tested in accordance with the
- 32 manufacturer's written instructions. Start-up procedure shall be performed by a factory
- 33 trained service technician – not the installing contractor. Provide the inspector of record
- 34 with factory start-up literature for each mechanical equipment item. Demonstrate to
- 35 inspector that the start-up procedure has been completed. Start-up sheets shall be
- 36 completed and submitted with O&M manuals. Start-up sheets shall be submitted,
- 37 certifying that start-up has been completed per manufacturer's written instructions.
- 38 2. Capacity: Capacities shall be in accordance with schedules shown on drawings.
- 39 Capacities are to be considered minimum.
- 40 3. Dimensions: Equipment must conform to space requirements and limitations as
- 41 indicated on drawings and as required for operation and maintenance. Where
- 42 Architectural screening is indicated, equipment shall not extend above or beyond
- 43 screening. Equipment will not be accepted that does not readily conform to space
- 44 conditions. Prepare and submit layout drawings for all proposed equipment (different
- 45 than scheduled units) showing actual job conditions, required clearances for proper
- 46 operation, maintenance, etc.
- 47 4. Ratings: Electrical equipment shall be in accordance with NEMA Standards and UL or
- 48 ETL listed where applicable standards have been established.
- 49 5. Piping: Each item or assembly of items shall be furnished completely piped for
- 50 connection to services. Control valves and devices shall be provided. For equipment
- 51 mounted on springs, provide flex connections. Equipment requiring domestic water
- 52 for non-potable use shall be provided with backflow preventer acceptable for intended
- 53 use by local governing authorities.
- 54 6. Electrical:

- 1 a. General: Each item or assembly of items shall be furnished completely wired
2 to individual terminal blocks for connection to single branch electrical circuit.
3 All electrical accessories required by equipment shall be furnished. Provide
4 terminal blocks for controls and interlocks not included in equipment
5 package. Manual and magnetic starters shall have ambient compensating
6 running overcurrent protection in all ungrounded conductors. Magnetic
7 starters shall be NEMA rated, manual reset, shall have H-O-A switches and
8 auxiliary contacts. Controllers and other devices shall be in NEMA 1 or 3R
9 enclosures as applicable.
- 10 b. Wiring: Conductors, conduit, and wiring shall be in accordance with
11 Electrical Specifications. Individual items within assembly shall be separately
12 protected with dead front, fused disconnect, fuse block, or circuit breaker for
13 each ungrounded conductor, all accessible on operating side of equipment.
14 Switches, contacts and other devices shall be in ungrounded conductors.
- 15 c. Motors: Shall be rated, constructed and applied in accordance with NEMA
16 and ANSI Standards without using service factor. Single-phase motor shall
17 be of type to suit application. Three-phase motors shall be NEMA B design
18 on pumps and fans, NEMA C on reciprocating equipment, sealed ball
19 bearing, three-phase induction unless otherwise noted. Motors 1 HP and
20 above shall be NEMA premium efficiency, Class F insulation. Motors in a
21 fan air stream shall be TEFC or TEO. Vertical motors exposed to weather
22 shall be TEFC and shall have rain caps. Horizontal motors exposed to
23 weather shall be TEFC. Motors for use with VFD's shall be inverter ready.
- 24 d. Starters: Motor starters shall be furnished for all equipment except where
25 starter is in a motor control center as designated on the electrical drawings.
26 Deliver starter to Electrical Contractor for installation and wiring.
- 27 e. Control Voltage: Equipment connected to greater than 240 volts shall be
28 provided with 120 volt control circuit from integral protected transformer if
29 separate source is not indicated on plans. 240 volt control is acceptable if
30 confined within control panel.
- 31 f. Submittals: Included in shop drawings shall be internal wiring diagrams and
32 manufacturer's recommended external wiring.
- 33 7. Fan Selection:
 - 34 a. Fan Curves: Performance curves shall be submitted for all units of 3000
35 CFM or greater. Operating point for forward curved fans shall be from point
36 of maximum efficiency toward increased CFM limited by horsepower
37 scheduled. Operating point for backward inclined fans shall be selected near
38 point of maximum efficiency. Curves shall plot CFM verses static pressure
39 with constant brake horsepower, RPM and efficiency lines.
 - 40 b. Static Pressure: Unless otherwise noted, pressure scheduled as external
41 static pressure (ESP) includes all ductwork and accessory losses external to
42 the unit housing. Unless otherwise noted, pressure scheduled as total static
43 pressure includes all ductwork, filter, coil, cabinet, damper and other
44 accessory losses. Unless otherwise noted, pressure scheduled as duct static
45 pressure includes all supply and return ductwork and accessory losses
46 external to the unit housing and plenum (as applicable). The allowance for
47 filter losses is 0.3" WC, unless otherwise noted. Submit itemized static
48 pressure losses for all components.
- 49 8. Filters:
 - 50 a. General: Tested and rated in accordance with ASHRAE Standard 52.2 and
51 Title 24, C.C.R. Furnish and install one complete change of all filters after air
52 balance is completed and prior to acceptance.
 - 53 b. Filter Media: 2" media. MERV-13. Clean filter resistance 0.41" water at 500
54 fpm. Throw-away frame. Class 2. Camfil AP-Thirteen.
- 55 9. Screens: All duct or louver openings to the outside shall be covered with 1/2", 16-
56 gage, galvanized wire mesh screen.
- 57 10. Mixing Dampers: Opposed blade, 16 gage. Six inch maximum blade width, 48"
58 maximum length. Nylon or oil impregnated bronze bearings. One half inch diameter

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- 1 pin shaft. 16 gage channel frame. One percent maximum leakage at 4" WC in
2 accordance with AMCA 500 for outside air dampers. Actuating rod out of air stream.
3 Arrow.
- 4 11. Sound Ratings: Shall be in accordance with ASHRAE 36 - 72. Sound ratings shall not
5 exceed scheduled values.
- 6 12. Drives: Unless noted as direct connected, drives shall be V-belt, rated at 150% of
7 motor horsepower. Multiple drive belts shall be matched set. Drive sheaves shall be
8 dynamically balanced, adjustable, range +/- 10%, selected at mid range. Adjustable
9 relative movement shall be lockable to shaft. Belts shall be aligned within 1-1/2
10 degrees at all times. Open drives shall be provided with OSHA approved open mesh
11 belt guards. Belt guards exposed to weather shall be weatherproof enclosure with
12 louvered face for adequate ventilation. Driving motor shall be mounted on adjustable
13 rails. T.B. Woods, Browning. Submit RPM range of driven machine with drive
14 selection.
- 15 13. Coils:
- 16 a. Construction: Copper tube. Copper or aluminum 0.0075" min. thickness fins
17 hydraulically or mechanically bonded to tube. 16 gage galvanized steel rigid
18 channel coil casing. Rated working pressure 200 psig min. All coils shall
19 have connections at the same end. Wherever two or more coils are being
20 controlled by a single control valve, each coil shall be installed with a
21 separate balancing cock and a Pete's Plug at each outlet.
- 22 b. Capacity: Ratings certified by ARI in accordance with ARI Standard 410.
23 Cooling coil face velocity shall not exceed manufacturer's published ratings
24 or 600 fpm. Heating coil face velocity shall not exceed 1000 fpm. Include coil
25 selection calculations in shop drawings.
- 26 c. Hot or Chilled Water Coils: Copper or cast iron headers, brazed or spun to
27 tube. Tube wall minimum thickness 0.024". 10 fins/inch maximum.
- 28 d. Direct Expansion Coils: Copper suction header silver brazed to tubes,
29 distributing tubes and expansion valve. Working pressure 250 psig
30 minimum. 10 fins/inch maximum.
- 31 B. Indoor / Outdoor Units: Variable capacity, heat pump heat recovery air conditioning system
32 providing cooling or heating. Refer to Paragraph 2.6A for general requirements. All
33 components shall be by same manufacturer. Daikin.
- 34 1. Outdoor Unit: The outdoor unit is designed specifically for use with Daikin VRV IV series
35 components.
- 36 a. The condensing unit shall be factory assembled in the USA and pre-wired with
37 all necessary electronic and refrigerant controls. The refrigeration circuit of the
38 condensing unit shall consist of Daikin inverter scroll compressors, motors,
39 fans, condenser coil, electronic expansion valves, solenoid valves, 4-way
40 valve, distribution headers, capillaries, filters, shut off valves, oil separators,
41 service ports and refrigerant accumulator.
- 42 b. Liquid and suction lines must be individually insulated between the condensing
43 and indoor units.
- 44 c. The condensing unit can be wired and piped with access from the left, right,
45 rear or bottom.
- 46 d. The connection ratio of indoor units to condensing unit shall be permitted up to
47 200%.
- 48 e. Each condensing system shall be able to support the connection of up to 64
49 indoor units dependent on the model of the condensing unit.
- 50 f. The sound pressure level standard shall be that value as listed in the Daikin
51 engineering manual for the specified models at 3 feet from the front of the unit.
52 The condensing unit shall be capable of operating automatically at further
53 reduced noise during night time or via an external input

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- 1 g. The system will automatically restart operation after a power failure and will not
2 cause any settings to be lost, thus eliminating the need for reprogramming.
- 3 h. The unit shall incorporate an auto-charging feature to ensure optimum
4 performance. Manual changing should be support with a minimum of 2 hours
5 of system operation data to ensure correct operation
- 6 i. The condensing unit shall be modular in design and should allow for side-by-
7 side installation with minimum spacing.
- 8 j. The following safety devices shall be included on the condensing unit; high
9 pressure sensor and switch, low pressure switch, control circuit fuses,
10 crankcase heaters, fusible plug, overload relay, inverter overload protector,
11 thermal protectors for compressor and fan motors, over current protection for
12 the inverter and anti-recycling timers.
- 13 k. To ensure the liquid refrigerant does not flash when supplying to the various
14 indoor units, the circuit shall be provided with a sub-cooling feature.
- 15 l. Oil recovery cycle shall be automatic occurring 2 hours after start of operation
16 and then every 8 hours of operation
- 17 m. The condensing unit shall be capable of heating operation at 0°F dry bulb
18 ambient temperature without additional low ambient controls or an auxiliary
19 heat source.
- 20 n. Unit Cabinet: The condensing unit shall be completely weatherproof and
21 corrosion resistant. The unit shall be constructed from rust-proofed mild steel
22 panels coated with a baked enamel finish.
- 23 o. Fan:
- 24 (1) The condensing unit shall consist of one or more propeller type,
25 direct-drive 350 or 750 W fan motors that have multiple speed
26 operation via a DC (digitally commutating) inverter.
- 27 (2) The condensing unit fan motor shall have multiple speed operation of
28 the DC (digitally commutating) inverter type, and be of high external
29 static pressure and shall be factory set as standard at 0.12 in. WG. A
30 field setting switch to a maximum 0.32 in. WG pressure is available to
31 accommodate field applied duct for indoor mounting of condensing
32 units.
- 33 (3) The fan shall be a vertical discharge configuration with a nominal
34 airflow maximum range of 5,544 CFM to 22,283 CFM dependent on
35 model specified
- 36 (4) The fan motor shall have inherent protection and permanently
37 lubricated bearings and be mounted.
- 38 (5) The fan motor shall be provided with a fan guard to prevent contact
39 with moving parts.
- 40 (6) Night setback control of the fan motor for low noise operation by way
41 of automatically limiting the maximum speed shall be a standard
42 feature. Operation sound level shall be selectable from 3 steps.
- 43 p. Condenser Coil:
- 44 (1) The condenser coil shall be manufactured from copper tubes
45 expanded into aluminum fins to form a mechanical bond.
- 46 (2) The heat exchanger coil shall be of a waffle louver fin and rifled bore
47 tube design to ensure high efficiency performance.
- 48 (3) The heat exchanger on the condensing units shall be manufactured
49 from Hi-X seamless copper tube with N-shape internal grooves
50 mechanically bonded on to aluminum fins to an e-Pass Design.

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- 1 (4) The fins are to be covered with an anti-corrosion Ultra Gold coating as
2 standard with a salt spray test rating of 1000hr(ASTM B117), Acetic
3 acid salt spray test: 500hr(ASTM G85)
- 4 (5) The pipe plates shall be treated with powdered polyester resin for
5 corrosion prevention.
- 6 q. Compressor:
- 7 (1) The Daikin inverter scroll compressors shall be variable speed (PVM
8 inverter) controlled which is capable of changing the speed to follow
9 the variations in total cooling and heating load as determined by the
10 suction gas pressure as measured in the condensing unit. The target
11 suction pressure should be capable of automatic reset based on
12 outdoor temperature and system load to improve efficiency. In
13 addition, samplings of evaporator and condenser temperatures shall
14 be made so that the high/low pressures detected are read every 20
15 seconds and calculated. With each reading, the compressor capacity
16 (INV frequency) shall be controlled to eliminate deviation from target
17 value.
- 18 (2) The inverter driven compressors in the condensing unit shall be of
19 highly efficient reluctance DC (digitally commutating), hermetically
20 sealed scroll "G-type" or "J-type".
- 21 (3) Neodymium magnets shall be adopted in the rotor construction to
22 yield a higher torque and efficiency in the compressor instead of the
23 normal ferrite magnet type. At complete stop of the compressor, the
24 neodymium magnets will position the rotor into the optimum position
25 for a low torque start.
- 26 (4) The capacity control range shall be as low as 10% to 100%.
- 27 (5) Each compressor shall be equipped with a crankcase heater, high
28 pressure safety switch, and internal thermal overload protector.
- 29 (6) Oil separators shall be standard with the equipment together with an
30 intelligent oil management system.
- 31 (7) The compressor shall be spring mounted to avoid the transmission
32 of vibration eliminating the standard need for spring insulation
- 33 (8) In the event of compressor failure the remaining compressors shall
34 continue to operate and provide heating or cooling as required at a
35 proportionally reduced capacity. The microprocessor and
36 associated controls shall be designed to specifically address this
37 condition for single module and manifolded systems.
- 38 (9) In the case of multiple condenser modules, conjoined operation
39 hours of the compressors shall be balanced by means of the Duty
40 Cycling Function, ensuring sequential starting of each module at
41 each start/stop cycle, completion of oil return, completion of defrost
42 or every 8 hours. When connected to a central control system
43 sequential start is activated for all system on each DIII network
- 44 r. Electrical:
- 45 (1) The power supply to the condensing unit shall be 208-230 volts, 3
46 phase, 60 hertz +/- 10%.
- 47 (2) The control voltage between the indoor and condensing unit shall
48 be 16VDC non-shielded, stranded 2 conductor cable.
- 49 (3) The control wiring shall be a two-wire multiplex transmission
50 system, making it possible to connect multiple indoor units to one
51 condensing unit with one 2-cable wire, thus simplifying the wiring
52 installation

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2. Branch Selector Box for VRV IV Heat Recovery System: The branch selector boxes are designed specifically for use with VRV IV series heat recovery system components.
 - a. These selector boxes shall be factory assembled, wired, and piped.
 - b. These branch controllers must be run tested at the factory.
 - c. These selector boxes must be mounted indoors.
 - d. When simultaneously heating and cooling, the units in heating mode shall energize their subcooling solenoid valve.
 - e. The number of connectable indoor units shall be in accordance with the manufacturer's recommendations.
 - f. Unit Cabinet:
 - (1) These units shall have a galvanized steel plate casing.
 - (2) Each cabinet shall house multiple refrigeration control valves and a liquid gas separator.
 - (3) The cabinet shall contain a tube in tube heat exchanger.
 - (4) The unit shall have sound absorption thermal insulation material made of flame and heat resistant foamed polyethylene.
 - g. Dimensions: Each BSVQ unit shall be no larger than 8-3/16" x 15-5/16" x 12-7/8".
 - h. Refrigerant Valves:
 - (1) The unit shall be furnished with 5 electronic expansion valves to control the direction of refrigerant flow.
 - (2) The refrigerant connections must be of the braze type.
 - (3) Each circuit shall have at least one (36,000 Btu/h fan coil unit or smaller for the BSVQ36PVJU and 60,000 Btu/h fan coil unit or smaller for the BSVQ60PVJU) branch selector box.
 - (4) Multiple circuits may be connected to a branch selector box with the use of a REFNET™ joint provided they are within the capacity range of the branch selector.
 - i. Drainage: The unit shall not require any condensate drainage connection.
 - j. Electrical:
 - (1) The unit electrical power shall be 208/230 volts, 1 phase, 60 hertz.
 - (2) The unit shall be capable of operation within the limits of 187 volts to 255 volts.
 - (3) The minimum circuit amps (MCA) shall be 0.1 and the maximum fuse amps (MFA) shall be 15.
 - (4) The control voltage between the indoor and outdoor unit shall be 16VDC non-shielded 2 conductor cable.
3. Indoor Unit – Wall Mounted: Shall be a wall mounted fan coil unit, operable with refrigerant R-410A, equipped with an electronic expansion valve, for installation onto a wall within a conditioned space. Compact design with finished white casing. Computerized PID control shall be used to control superheat to deliver a comfortable room temperature condition. The unit shall be equipped with a programmed drying mechanism that dehumidifies while inhibiting changes in room temperature when used with Daikin remote control BRC1D71 and BRC2A71. A mildew-proof, polystyrene air filter and condensate drain pan shall be included as standard equipment. The indoor units sound pressure shall range from 32 dB(A) to 35 dB(A) at low speed measured at 3.3 feet below and from the unit.

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- 1 a. Indoor Unit:
 - 2 (1) The unit shall be completely factory assembled and tested. Included in the unit is
 - 3 factory wiring, piping, electronic proportional expansion valve, control circuit
 - 4 board, fan motor thermal protector, flare connections, condensate drain pan, self-
 - 5 diagnostics, auto-restart function, 3-minute fused time delay, and test run switch.
 - 6 The unit shall have an auto-swing louver which ensures efficient air distribution,
 - 7 which closes automatically when the unit stops. The remote controller shall be
 - 8 able to set five (5) steps of discharge angle. The front grille shall be easily
 - 9 removed for washing. The discharge angle shall automatically set at the same
 - 10 angle as the previous operation upon restart. The drain pipe can be fitted to from
 - 11 either left or right sides.
 - 12 (2) Indoor unit and refrigerant pipes will be charged with dehydrated air prior to
 - 13 shipment from the factory.
 - 14 (3) Both refrigerant lines shall be insulated from the outdoor unit.
 - 15 (4) Return air shall be through a resin net mold resistant filter.
 - 16 (5) The indoor units shall be equipped with a condensate pan.
 - 17 (6) The indoor units shall be equipped with a return air thermistor.
 - 18 (7) The indoor unit will be separately powered with 208~230V/1-phase/60Hz.
 - 19 (8) The voltage range will be 253 volts maximum and 187 volts minimum.
- 20 b. Unit Cabinet:
 - 21 (1) The cabinet shall be affixed to a factory supplied wall mounting template and
 - 22 located in the conditioned space.
 - 23 (2) The cabinet shall be constructed with sound absorbing foamed polystyrene and
 - 24 polyethylene insulation.
- 25 c. Fan:
 - 26 (1) The fan shall be a direct-drive cross-flow fan, statically and dynamically balanced
 - 27 impeller with high and low fan speeds available.
 - 28 (2) The fan motor shall operate on 208/230 volts, 1 phase, 60 hertz with a motor
 - 29 output range 0.054 to 0.058 HP.
 - 30 (3) The airflow rate shall be available in high and low settings.
 - 31 (4) The fan motor shall be thermally protected.
- 32 d. Coil:
 - 33 (1) Coils shall be of the direct expansion type constructed from copper tubes
 - 34 expanded into aluminum fins to form a mechanical bond.
 - 35 (2) The coil shall be of a waffle louver fin and high heat exchange, rifled bore tube
 - 36 design to ensure highly efficient performance.
 - 37 (3) The coil shall be a 2-row cross fin copper evaporator coil with 14 fpi design
 - 38 completely factory tested.
 - 39 (4) The refrigerant connections shall be flare connections and the condensate will
 - 40 be 11/16 inch outside diameter PVC.
 - 41 (5) A thermistor will be located on the liquid and gas line.
 - 42 (6) A condensate pan shall be located in the unit.
- 43 e. Electrical:
 - 44 (1) A separate power supply will be required of 208/230 volts, 1 phase, 60 hertz.
 - 45 The acceptable voltage range shall be 187 to 253 volts.

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- 1 (2) Transmission (control) wiring between the indoor and outdoor unit shall be a
2 maximum of 3,280 feet (total 6,560 feet).
- 3 (3) Transmission (control) wiring between the indoor unit and remote controller
4 shall be a maximum distance of 1,640 feet.
- 5 f. Control:
6 (1) The unit shall have controls provided by Daikin to perform input functions
7 necessary to operate the system.
- 8 g. Accessories Available:
9 (1) BRC2A71 "in-room" wired remote controller.
10 (2) A condensate pump.
- 11 4. Indoor Unit – Ceiling Cassette: Round flow ceiling cassette fan coil unit, operable with R-410A
12 refrigerant, equipped with an electronic expansion valve, direct drive DC (ECM) type fan, for
13 installation into the ceiling cavity equipped with an air panel grill. It shall be a round flow air
14 distribution type, fresh white, impact resistant decoration panel, or optional self-cleaning filter
15 panel. The supply air is distributed via four individually motorized louvers. To save energy and
16 optimize occupancy comfort, the indoor unit shall be equipped with built in occupancy sensor
17 and surface temperature sensor. Computerized PID control shall be used to control superheat
18 to deliver a comfortable room temperature condition. The unit shall be equipped with a
19 programmed drying mechanism that dehumidifies while limiting changes in room temperature
20 when used with Daikin remote control BRC1E72, BRC1E73, BRC2A71 and BRC1E52B7. The
21 indoor units sound pressure shall range from 30 dB(A) to 45 dB(A) at High speed measured at
22 5 feet below the unit.
- 23 a. Indoor Unit:
24 (1) The unit shall be completely factory assembled and tested. Included in the unit
25 is factory wiring, piping, electronic proportional expansion valve, control circuit
26 board, fan motor thermal protector, flare connections, condensate drain pan,
27 condensate drain pump, condensate safety shutoff and alarm, self-diagnostics,
28 auto-restart function, 3-minute fused time delay, and test run switch.
29 (2) Indoor unit and refrigerant pipes will be charged with dehydrated air prior to
30 shipment from the factory.
31 (3) Both refrigerant lines shall be insulated from the outdoor unit.
32 (4) The round flow supply air flow can be field modified to 23 different airflow
33 patterns to accommodate various installation configurations including corner
34 installations.
35 (5) Return air shall be through the concentric panel, which includes a resin net, mold
36 resistant, antibacterial filter.
37 (6) The indoor units shall be equipped with a condensate pan with antibacterial
38 treatment and condensate pump. The condensate pump provides up to 33-1/2"
39 of lift from bottom of unit to top of drain piping and has a built-in safety shutoff
40 and alarm.
41 (7) The indoor units shall be equipped with a return air thermistor.
42 (8) The indoor unit will be separately powered with 208~230V/1-phase/60Hz.
43 (9) The voltage range will be 253 volts maximum and 187 volts minimum.
44 (10) To save energy and optimize occupancy comfort, the indoor unit shall be
45 equipped with built in occupancy sensor and surface temperature sensor.
46 (11) Supplied air shall be directed automatically by four individually controlled louvers.
- 47 b. Unit Cabinet:
48 (1) The cabinet shall be space saving and shall be located into the ceiling.

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- 1 (2) Four auto-adjusted louvers shall be available to choose, which include standard,
2 draft prevention and ceiling stain prevention.
- 3 (3) The airflow of the unit shall have the ability to shut down outlets with multiple
4 patterns allowing for simpler installation in irregular spaces.
- 5 (4) Fresh air intake shall be possible by way of Daikin's optional fresh air intake kit.
- 6 (5) A branch duct knockout shall exist for branch ducting of supply air.
- 7 (6) The cabinet shall be constructed with sound absorbing foamed polystyrene and
8 polyethylene insulation.
- 9 (7) Optional high efficiency air filters are available for each model unit.
- 10 c. Fan:
 - 11 (1) The fan shall be direct-drive DC (ECM) type fan, statically and dynamically
12 balanced impeller with three fan speeds available.
 - 13 (2) The fan motor shall operate on 208/230 volts, 1 phase, 60 hertz with a motor
14 output range from 0.08 to 0.16 HP.
 - 15 (3) The airflow rate shall be available in three manual settings.
 - 16 (4) The DC fan shall be able to automatically adjust the fan speed in 5 speeds
17 based on the space load.
 - 18 (5) The fan motor shall be equipped as standard with adjustable external static
19 pressure (ESP) settings to allow operation with the high efficiency air filter
20 options.
 - 21 (6) The fan motor shall be thermally protected.
- 22 d. Filter:
 - 23 (1) The return air shall be filtered by means of a washable long-life filter with mildew
24 proof resin and antibacterial treatment.
 - 25 (2) Optional high efficiency disposable air filters shall be available.
 - 26 (3) Optional Self-Cleaning Filter Panel, which performs automatic filter cleaning up
27 to once a day, with dust collection box that indicates when to be emptied.
- 28 e. Coil:
 - 29 (1) Coils shall be of the direct expansion type constructed from copper tubes
30 expanded into aluminum fins to form a mechanical bond.
 - 31 (2) The coil shall be of a waffle louver fin and high heat exchange, rifled bore tube
32 design to ensure highly efficient performance.
 - 33 (3) The coil shall be a 2, or 3-row cross fin copper evaporator coil with up to 21 FPI
34 design completely factory tested.
 - 35 (4) The refrigerant connections shall be flare connections and the condensate will be
36 1 -1/4 inch outside diameter PVC.
 - 37 (5) A condensate pan with antibacterial treatment shall be located under the coil.
 - 38 (6) A thermistor will be located on the liquid and gas line.
- 39 f. Electrical:
 - 40 (1) A separate power supply will be required of 208/230 volts, 1 phase, 60 hertz.
41 The acceptable voltage range shall be 187 to 253 volts.
 - 42 (2) Transmission (control) wiring between the indoor and outdoor unit shall be a
43 maximum of 3,280 feet (total 6,560 feet).

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- 1 (3) Transmission (control) wiring between the indoor unit and remote controller shall
2 be a maximum distance of 1,640 feet.
- 3 g. Control:
 - 4 (1) The unit shall have controls provided by Daikin to perform input functions
5 necessary to operate the system.
 - 6 (2) The unit shall be compatible with interfacing with a BMS system via optional
7 LonWorks or BACnet gateways.
 - 8 (3) The unit shall be compatible with a Daikin Intelligent Touch Manager advanced
9 multi-zone controller.
 - 10 (4) For the Sensing functions and the optional Self-Cleaning Filter functions, Remote
11 controller BRC1E73/BRC1E52B7 shall be used. Consult with Daikin prior to
12 applying controls.
- 13 h. Accessories:
 - 14 (1) Remote "in-room" sensor kit (KRCS01-4B).
- 15 5. Indoor Unit – Concealed Ceiling Ducted: Shall be a built-in ceiling concealed fan coil unit, operable
16 with refrigerant R-410A, equipped with an electronic expansion valve, direct-drive DC (ECM)
17 type fan with auto CFM adjustment at commissioning, for installation into the ceiling cavity. It is
18 constructed of a galvanized steel casing. It shall be a horizontal discharge air with horizontal
19 return air configuration. All models feature a low height cabinet making them applicable to ceiling
20 pockets that tend to be shallow. Computerized PID control shall be used to control superheat
21 to deliver a comfortable room temperature condition. The unit shall be equipped with a
22 programmed drying mechanism that dehumidifies while limiting changes in room temperature
23 when used with Daikin remote control BRC1E71 and BRC2A71. Included as standard
24 equipment, a condensate drain pan and drain pump kit that pumps to 18-3/8" from the drain pipe
25 opening. The indoor units sound pressure shall range from 29 dB(A) to 40 dB(A) at low speed
26 measured 5 feet below the ducted unit.
- 27 a. Indoor Unit:
 - 28 (1) The indoor unit shall be completely factory assembled and tested. Included in
29 the unit is factory wiring, piping, electronic proportional expansion valve, control
30 circuit board, fan motor thermal protector, flare connections, condensate drain
31 pan, condensate drain pump, condensate safety shutoff and alarm, self-
32 diagnostics, auto-restart function, 3-minute fused time delay, and test run switch.
33 The unit shall be equipment with automatically adjusting external static pressure
34 logic that is selectable during commissioning. This adjusts the airflow based on
35 the installed external static pressure.
 - 36 (2) Indoor unit and refrigerant pipes will be charged with dehydrated air prior to
37 shipment from the factory.
 - 38 (3) Both refrigerant lines shall be insulated from the outdoor unit.
 - 39 (4) The indoor units shall be equipped with a condensate pan and condensate
40 pump. The condensate pump provides up to 18-3/8" of lift from the center of the
41 drain outlet and has a built in safety shutoff and alarm.
 - 42 (5) The indoor units shall be equipped with a return air thermistor.
 - 43 (6) The indoor unit will be separately powered with 208~230V/1-phase/60Hz.
 - 44 (7) The voltage range will be 253 volts maximum and 187 volts minimum.
- 45 b. Unit Cabinet:
 - 46 (1) The cabinet shall be located into the ceiling and ducted to the supply and return
47 openings.
 - 48 (2) The cabinet shall be constructed with sound absorbing foamed polystyrene and
49 polyethylene insulation.
- 50 c. Fan:
 - 51 (1) The fan shall be direct-drive DC (ECM) type fan, statically and dynamically
52 balanced impeller with three fan speeds available.

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- 1 (2) The unit shall be equipment with automatically adjusting external static pressure
- 2 logic selectable during commissioning.
- 3 (3) The fan motor shall operate on 208/230 volts, 1 phase, 60 hertz with a motor
- 4 output range of 0.12 to 0.47 HP respectively.
- 5 (4) The airflow rate shall be available in three settings.
- 6 (5) The fan motor shall be thermally protected.
- 7 (6) The fan motor shall be equipped as standard with adjustable external static
- 8 pressure (ESP) settings.
- 9 (7) Fan motor external static pressure range for nominal airflow:
- 10 d. Coil:
- 11 (1) Coils shall be of the direct expansion type constructed from copper tubes
- 12 expanded into aluminum fins to form a mechanical bond.
- 13 (2) The coil shall be of a waffle louver fin and high heat exchange, rifled bore tube
- 14 design to ensure highly efficient performance.
- 15 (3) The coil shall be a 3 row cross fin copper evaporator coil with 13 fpi design
- 16 completely factory tested.
- 17 (4) The refrigerant connections shall be flare connections and the condensate will be
- 18 1-1/4" outside diameter PVC.
- 19 (5) A condensate pan shall be located under the coil.
- 20 (6) A condensate pump with an 18-3/8" lift shall be located below the coil in the
- 21 condensate pan with a built in safety alarm.
- 22 (7) A thermistor will be located on the liquid and gas line.
- 23 e. Electrical:
- 24 (1) A separate power supply will be required of 208/230 volts, 1 phase, 60 hertz.
- 25 The acceptable voltage range shall be 187 to 253 volts.
- 26 (2) Transmission (control) wiring between the indoor and outdoor unit shall be a
- 27 maximum of 3,280 feet (total 6,560 feet).
- 28 (3) Transmission (control) wiring between the indoor unit and remote controller shall
- 29 be a maximum distance of 1,640 feet.
- 30 f. Control:
- 31 (1) The unit shall have controls provided by Daikin to perform input functions
- 32 necessary to operate the system.
- 33 (2) The unit shall be compatible with interfacing with a BMS system via a BACnet
- 34 gateways.
- 35 (3) The unit shall be compatible with a Daikin intelligent Touch advanced multi-zone
- 36 controller or an intelligent Manager III customizable BMS. Consult with Daikin
- 37 prior to applying controls.
- 38 (4) BRC2A71 "in-room" wired remote controller.
- 39 C. Air Handler:
- 40 1. General: Pressure classification, type, and accessories/options as indicated on
- 41 schedules. Refer to Paragraph 2-06A for general requirements. All motors 1
- 42 horsepower and larger shall be the premium efficiency type, VFD duty where
- 43 applicable. McQuay.
- 44 2. Cabinet: Galvanized steel channel post and panels. Bulb type gasketing between each
- 45 frame channel and unit panel to provide thermal break between inner and outer casing
- 46 components. Gasketing to meet UL 723 for surface burning characteristics. Casing leak
- 47 rate not to exceed 0.5 cfm/ft² of cabinet area at 5" static pressure. External casing
- 48 constructed of minimum 16 gauge G90 galvanized steel frame with 18 gauge panels.
- 49 Units shipped in sections shall have splice connectors extending across the section-to-
- 50 section joint, with bulb type gasketing to prevent air leakage between joints. Access
- 51 doors to be double wall, constructed of galvanized steel, flush mounted to cabinetry,
- 52 gasket sealed, with stainless steel hinges, door latch, and full size handle. Provide 2"
- 53 thick, injected foam insulation in walls, roof, and floor for an R-value of 13, with 20
- 54 gauge G90 solid galvanized steel inner liner. Provide integral formed galvanized steel
- 55 base rail of height shown on schedule for each shipping section, minimum 4" height.

3. Supply/Return Fans: DWDI FC, BI, or AF or SWSI AF type and pressure class, as indicated on schedules. Fan, motor, and drive mounted on internally isolated steel base, dynamically balanced as an assembly. Maximum fan rpm below the first critical fan speed. Motor base capable of sliding out the side of unit for removal. Access to motor, drive, fan, and bearings through hinged access doors, with inspection windows, on both sides of fan section. Internal spring vibration isolators with 2" deflection and seismic snubbers. Fan bearings to be sealed, self-aligning, grease lubricated, heavy-duty pillow block type with copper lubrication lines extended to access door location. Bearings to be load rated in accordance with AFBMA-ANSI Standard with L-50 life rating at 200,000 hours. V-Belt drive with variable and adjustable pitch sheaves selected for required fan rpm with set point at mid-position. Motor to be open drip proof, 1 speed, unless otherwise noted on schedule.
4. Sound Level: Submit factory fan sound data, by octave band for discharge and radiated sound. Sound level of specified model may not be exceeded.
5. Filter Box, Filter/Mixing Box, or Filter/Economizer Section: Factory fabricated and mounted section in arrangement shown or noted on drawings. Cabinet as specified in paragraph 2. Designed to hold as a minimum, 2" filters in "V" bank, or optional filters as scheduled. The filter sizes, quantity, and face area scheduled is minimum acceptable. Dampers shall be provided for mixing and/or exhaust for arrangement shown. Provide low leak dampers with leakage rate less than 0.20 of 1% at 2" static pressure differential, rated per AMCA Standard 500. Filter section to include racks for scheduled filters and hinged and latching doors on both sides of the section for side loading and removal.
6. Coil Section: Cabinet as specified in paragraph 2. Coils to be accessible from both sides of unit for service and cleaning. Headers and return bends fully enclosed within unit casing. Coil connections to extend minimum 5" beyond unit casing wall for field piping. Drain and vent connections on external coil connections. Piping penetrations factory sealed. Coils to be removable through side panels without disassembly of other sections. Performance in accordance with ARI 410, coils ARI and UL certified and listed. Drain pan to be constructed of stainless steel, cross-broken and pitched to drain connection to eliminated standing water. Pan to extend entire length of coil section. Provide intermediate drain pans for stacked coils. Drain connection to be minimum 3" above finished floor, plus the height of the unit base rail. Coils to have 5/8" o.d., 0.025" thick tube wall, minimum.

D. Exhaust Fan:

1. General: All exhaust fans shall be tested according to AMCA Standard 210 in an AMCA registered laboratory. Fans exposed to weather shall have ventilated weatherproof housing over motor and drive assembly. Refer to Paragraph 2.6A for general requirements. All direct drive fans shall be provided with unit mounted speed controllers, unless otherwise noted. All motors 1 horsepower and larger shall be the premium efficiency type.
2. Utility Fan (USF – Belt): Single width, single inlet housing. Each fan shall bear a permanently affixed manufacture's engraved metal nameplate containing the model and individual serial number. UL 762 listed. Fans shall be equipped with lifting lugs. Constructed of heavy gauge steel. After fabrication, untreated steel components go through a multi-stage cleaning and pre-treatment process before being finished with a high-performance powder coating having a minimum thickness of 2-4 mils, electrostatically applied and baked. Coating must exceed 1,000-hour salt spray under ASTM B117 test method. No uncoated metal fan parts will be allowed. Fan shall be of airtight mechanically fastened seam construction with the scroll panel material formed and embedded into the side panels. All interior and exterior surface untreated steel shall be coated with a high-performance powder coating. Housing and bearing support shall be constructed of bolted framework. The fan wheel shall be of the single width backward inclined centrifugal type. Fan Wheel shall be statically and dynamically balanced to balance grade G6.3 per ANSI S2.19. The wheel and fan inlet shall be carefully matched and shall have precise running tolerances for maximum performance and operating efficiency. Motors shall meet or exceed EISA (Energy Independence and Security Act) efficiencies. Motors to be NEMA T-frame, TEFC. Drive belts and sheaves shall be sized for 150% of the fan operating brake horsepower, and shall be readily and easily accessible for service, if required.

Movable motor plate with adjustment screws to make belt tensioning operations. Fan shaft to be turned and polished steel that is sized so the first critical speed is at least 25% over the maximum operating speed for each pressure class. Fan shaft bearings shall be Air Handling Quality, bearings shall be heavy-duty grease lubricated, self-aligning or roller pillow block type. Air Handling Quality bearings to be designed with low swivel torque to allow the outer race of the bearing to pivot or swivel within the cast pillow block. Bearings shall be 100% tested for noise and vibration by the manufacturer. Bearings shall be 100% tested to insure the inner race diameter is within tolerance to prevent vibration. Bearings shall be selected for a basic rating fatigue life (L-10) of 80,000 hours at maximum operating speed for each pressure class. Bearings shall have Zerk fittings to allow for lubrication. Greenheck.

PART 3 - EXECUTION

3.1 PIPING INSTALLATION

A. General:

1. Piping Layout: Piping shall be concealed in walls, above the ceilings, or below grade unless otherwise noted. Exposed piping shall run parallel to room surfaces; location to be approved by Engineer. No structural member shall be weakened by cutting, notching, boring or otherwise, unless specifically allowed by structural drawings and/or specifications. Where such cutting is required, reinforcement shall be provided as specified or detailed. All piping shall be installed in a manner to ensure unrestricted flow, eliminate air pockets, prevent any unusual noise, and permit complete drainage of the system. All piping shall be installed to permit expansion and contraction without strain on piping or equipment. Vertical lines shall be installed to allow for building settlement without damage to piping. Lines shall be adequately braced against vertical and lateral movement. For piping connected to equipment mounted on springs, provide flex connections. Pipe sizes indicated on the drawings are nominal sizes unless otherwise noted. Pipe sizes shall not decrease in direction of flow, unless otherwise noted.
2. Joints:
 - a. Threaded: Pipe shall be cut square, and reamed to full size. Threads shall be in accordance with ANSI B2.1. Joint compound or tape suitable for conveyed fluid shall be applied to male thread only. Joints shall be made with three threads exposed.
 - b. Brazed: Welding and brazing shall conform to American Welding Society (AWS) standards. Filler rod shall be of suitable or the same alloy as pipe. Brazing filler metal shall have a minimum melting point of 1100°F. Brazing shall be performed by a Certified Brazier as certified by an organization/institution that uses standards recognized by the AWS and meets the requirements of the ASME Boiler and Pressure Vessels Code, Section 9. The Contractor shall submit welding procedures per AWS for project welds for testing lab review.
 - c. Open Ends: Open ends of piping shall be capped during progress of work to preclude foreign matter.
3. Fittings and Valves:
 - a. Standard Fittings: All joints and changes in direction shall be made with standard fittings. Close nipples shall not be used.
 - b. Reducers: Pipe size reduction shall be made with bell reducer fittings. Bushings shall not be used.
4. Pipe Support:
 - a. General: Hangers shall be placed to support piping without strain on joints or fittings. Maximum spacing between supports shall be as specified below (based on straight lengths of pipe with couplings only). Provide additional supports for equipment, valves or other fittings. Seismic requirements may reduce maximum spacing. Actual spacing requirements will depend on structural system. Refer to drawings for additional requirements and attachment to structure. Side beam clamps shall be provided with retaining straps to secure the clamp to the opposite side of the beam. Vertical piping

- 1 shall be supported with riser clamp at 20' on center (maximum). Support
- 2 pipe within 12" of all changes in direction.
- 3 b. Refrigerant Piping: Support insulated refrigerant line with construction
- 4 channel and sheet metal support saddle or Cooper B-Line Armafix clamps.
- 5 5' spacing. Use isolation shield for uninsulated pipe. When using
- 6 pre-charged tubing, all changes of direction shall be made with bending tools
- 7 producing neat uniform bends. Free hand bends will not be accepted.
- 8 c. Trapeze: Trapeze hangers of construction channel and pipe clamps may be
- 9 used. Submit design to Engineer for review.
- 10 5. Miscellaneous:
- 11 a. Escutcheons: Provide chrome plated metal escutcheons where piping
- 12 penetrates walls, ceilings, or floors in finished areas.
- 13 b. Pipe Sleeves: All piping passing through concrete shall be provided with
- 14 pipe sleeves. Allow 1" (nominal) clearance between sleeve and pipe or pipe
- 15 insulation.
- 16 c. Pipes Passing through Fire Rated Surfaces: Pipes passing through fire rated
- 17 walls, floors, ceilings, partitions, etc. shall have the annular space
- 18 surrounding the pipe or pipe insulation sealed with fire rated materials in
- 19 accordance with the requirements of 2019 CBC Section 714.
- 20 B. Refrigerant Piping: Pipe shall be cut square. Joint surfaces shall be thoroughly cleaned, fitted
- 21 and erected before brazing. After installation, evacuate to 29 inches of mercury, ambient
- 22 temperature during evacuation shall not be less than 70°F. After evacuation, fill with dry
- 23 nitrogen to 250 psi and maintain for two-hour period without additional charge. After nitrogen
- 24 test, purge with refrigerant charged through dryer and maintain holding charge in system and
- 25 equipment. Refrigerant piping below grade shall be run in 4" (min.) PVC conduit with long
- 26 radius ells. Seal ends of conduit watertight. VRF system fittings shall be as recommended by
- 27 manufacturer. Installers shall have successfully completed manufacturer's installation training
- 28 within 6 months of installation. Provide training certificate or letter from manufacturer's rep
- 29 stating such.
- 30 **3.2 PIPING INSULATION INSTALLATION**
- 31 A. Refrigerant Piping: Cover piping with foamed plastic insulation. Longitudinal and end seams
- 32 shall be thoroughly cemented with adhesive in accordance with manufacturer's
- 33 recommendations. Cover all fittings, unions, valves and connections. Piping exposed to view
- 34 shall be covered with PVC jacketing. Piping exposed to weather shall be covered with
- 35 aluminum jacketing, install all joints and seams to prevent water entry, seal with 1/8" bead of
- 36 gray metal jacketing sealant.
- 37 **3.3 DUCTWORK INSTALLATION:**
- 38 A. General:
- 39 1. Standards: Unless otherwise noted, all ductwork shall be constructed and installed in
- 40 accordance with current SMACNA Standards. Ductwork shall be built to a pressure
- 41 classification equal to or greater than the maximum operating pressure at that point in
- 42 the ductwork. A copy of these standards shall be maintained at the job site at all
- 43 times. Duct work and accessories shall be installed in a manner to prevent vibration
- 44 and rattling.
- 45 2. Access: Provide duct access doors as required to adjust equipment and dampers.
- 46 Provide wall or ceiling access panels, or remote actuators as required where
- 47 equipment and dampers are not otherwise accessible. Ventlok 666 concealed remote
- 48 actuator with zinc finish on cover.
- 49 3. Flexible Connections: Connection of ductwork to any vibrating equipment shall be
- 50 with 3" (min.) flexible connection. Install with ample slack and uniform gap. There
- 51 shall be no metal to metal contact across flexible connection. Flexible connections
- 52 exposed to weather shall have a protective sheet metal cover.
- 53 4. Flanges and Escutcheon: Where ductwork penetrates walls, ceilings, or floors, furnish
- 54 and install flange or escutcheon of same material as duct.
- 55 B. Low Velocity-Low Pressure (up to 2,000 ft/min and up to 2.0 in water):

1. Sheet Metal Ductwork:
 - a. Ells: Ells with less than standard radius and square ells shall be fitted with turning vanes.
 - b. Tees: Tees in supply ductwork shall be straight tap-in with extractor or 45 degree take-off as shown on drawings. Grilles or branches in supply ductwork shall be a minimum of 8 duct diameters downstream of tees.
 - c. Duct Joints and Seams: All joints and seams which are not exposed to weather shall be sealed airtight with duct sealant. All joints and seams exposed to weather shall be sealed air and water tight with silicone sealant. (See Part 2 of this Specification). All joints on spiral wound metal ductwork not exposed to weather shall be sealed air tight with grey duct sealant.
 - d. Dampers: Install volume control damper and damper regulator in all branch ducts.
2. Flexible Glass Fiber Ductwork: The use of flexible duct is limited to the last 5 feet of each branch duct (i.e. one 5 foot section of flexible duct may be used to connect the grille to the sheet metal branch duct). No joints are permitted in this 5' length. Hangers shall be 4" wide metal straps spaced to prevent sagging, 42" spacing maximum. Insert 6" wide fiberglass pad between duct and hanging strap. Joints shall be installed with stainless steel or nylon draw bands, Duro Dyne Dyn-O-Tie. Minimum turn radius shall be in accordance with SMACNA Standards (turn radius of duct centerline not less than 1.5 times the duct diameter).
3. Spiral Wound Metal Ductwork: At side duct grilles, the grille shall be cut directly into the spiral duct. Duct to duct joints shall be made with the spiral seam rotated so that the seam forms a continuous helical pattern across the joint.

3.4 AIR TERMINALS AND DUCT FITTINGS INSTALLATION:

- A. General: Unless otherwise noted, all air terminals and duct fittings shall be installed in accordance with current SMACNA Standards. Terminals and fittings shall be installed in a manner to prevent vibration and rattling. Metal surfaces exposed to view behind grilles and registers shall be painted flat black.
- B. Fire/Smoke Damper: Shall be installed in accordance with the manufacturer's recommendations. Provide access doors as required, label per CBC. Manufacturer's instructions shall be available to the inspecting authorities. Shall be tested according to State Fire Marshal requirements.

3.5 DUCTWORK INSULATION INSTALLATION:

- A. General: Insulate all sheet metal supply, return and outside air intake ductwork except as noted below. Insulation shall be continuous through walls and floors except at fire dampers.
- B. Where Insulation Is Not Required: Do not insulate factory-insulated ducts or casings, acoustic lined ducts, fibrous glass ducts, underground ductwork, supply or return ductwork exposed to view in the space that it serves, or exhaust ductwork.
- C. Concealed Ductwork: Wrap concealed ductwork including outside air intakes with fiberglass blanket lapped 2" minimum. Secure with staples 4" on centers maximum on straight runs and 3" maximum at elbows and fittings. Insulation on bottom of ducts wider than 36" shall also be secured with mechanical fasteners at 24" on center.
- D. Acoustic Lining: Unless otherwise indicated, all supply and return ductwork in equipment rooms, all ductwork exposed to weather and other ducts as indicated on drawings, shall have acoustic lining. Do not acoustic line outside air intakes or evaporative cooling ductwork. Where acoustic lining is installed, increase each sheet metal dimension to accommodate lining and maintain clear inside duct dimensions shown on drawings. Apply lining with bonding adhesive in accordance with manufacturer's recommendations and also secure with mechanical fasteners in accordance with SMACNA Standards. Seal exposed edges of lining with bonding adhesive.
- E. Fire Resistive Wrapped Ducts: Where indicated on drawings, ductwork shall be covered with fire resistive duct wrap. Install in accordance with it's UL or Omega Point Laboratories Design number (as applicable) and the Manufacturer's Installation Instructions.

3.6 EQUIPMENT INSTALLATION

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- 1 A. General: The equipment installer shall ensure that no work done under other specification
2 sections will in any way block or hinder the equipment. All equipment shall be securely
3 anchored in place. Provide factory start-up for all equipment in the Central Plant.
- 4 B. Air Handling Units: Spring isolators shall be adjusted to allow movement to maximum free
5 spring length. Piping support shall be designed so that piping weight does not bear on
6 equipment. Hot water coil shall be mounted upstream of chilled water coil.
- 7 C. Gage Taps: Gage taps, such as Pete's Plugs, shall be installed immediately adjacent to all
8 heat exchanger and pump connections (i.e. inlet and outlet of all pumps, boilers, chillers,
9 condensers, coils, etc.). Taps shall be installed to allow for a pressure gage or thermometer to
10 be easily inserted and read. Provide 1 set of gages (pressure gage with Pete's Plug adapter,
11 chilled water thermometer and hot water thermometer). Deliver to Owner.
- 12 D. Connections to Equipment: Where size changes are required for connections to equipment,
13 they shall be made immediately adjacent to the equipment and, if possible, inside the
14 equipment cabinet.
- 15 E. Equipment Platforms: Shall be as shown on drawings and as follows: Flashing and platform
16 cover shall be 22 gage (min.) sheet metal. All joints and seams shall be soldered with 2" (min.)
17 overlaps. Provide 3/4" gap around perimeter between roofing and platform cover to facilitate
18 re-roofing. Extend drip lip down 3" (min.). Provide 30# felt under platform cover.

3.7 TESTS AND ADJUSTMENTS

- 20 A. General: Unless otherwise directed, tests shall be witnessed by a representative of the
21 Engineer. Work to be concealed shall not be enclosed until prescribed tests are made. Should
22 any work be enclosed before such tests, the Contractor shall, at his expense, uncover, test
23 and repair all work to original conditions. Leaks and defects shown by tests shall be repaired
24 and entire work retested.
- 25 B. Piping Tests:
 - 26 1. General: Tests may be made in sections, however, all connections between sections
27 previously tested and new section must be included in the new test. There shall be no
28 drop in pressure during test except that due to ambient temperature changes. All
29 components of system not rated for test pressure shall be isolated from system
30 before test is made.
 - 31 2. Water Piping: Maintain 100 psig water pressure for 4 hours.

3.8 SYSTEM ENERGY BALANCE

- 33 A. Scope: Provide the services of an independent test and balance agency to test, adjust and
34 balance, retest and record performance of the system to obtain design quantities as specified.
35 The agency must prove that they have no affiliation with any equipment manufacturer, design
36 engineer, installing contractor, or any other party which might lead to a conflict of interest, in
37 order to provide an unbiased, third party system balance and report.
- 38 B. Qualifications: Prior to commencing work, the agency shall be reviewed by the Engineer and
39 shall be certified by the Associated Air Balance Council or National Environmental Balancing
40 Bureau. The agency shall provide documentation of having successfully completed at least five
41 projects of similar size and scope. The Contractor must have sufficient personnel to respond
42 to a trouble call at the site within two hours.
- 43 C. Instruments: All instruments shall be accurately calibrated; calibration histories shall be
44 available for examination. Application of instrumentation shall be in accordance with AABC or
45 NEBB standards.
- 46 D. Submittals: Include in shop drawings copies of forms to be used for testing and balancing
47 showing all data which is to be recorded. Three copies of completed balance report shall be
48 submitted for review.
- 49 E. Procedure - General: Procedure shall be in accordance with Associated Air Balance Council's
50 "National Standards for Field Measurements and Instrumentation - Total System Balance",
51 Volume Two, No. 12173, or equivalent NEBB standards. System shall be in full, continuous
52 operation during test. Balanced quantities shall be plus 10%, minus 0% of design quantities.
53 All nameplate data, manufacturer, model and serial numbers shall be recorded for each item
54 tested.

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- 1 F. Extended Warranty: The test and balance agency shall include an extended warranty of 90
2 days after completion of test and balance work, during which time the Engineer, at his
3 discretion, may request a recheck or resetting of any item or items in test report. The agency
4 shall provide technicians to assist the Engineer in making any tests he may require during this
5 period of time.
- 6 G. Air Balance Procedure (For Each Air Handling System):
 - 7 1. All air filters shall be clean when air balance is performed.
 - 8 2. Provide a sketch of the equipment showing exactly where all pressure readings were
9 taken.
 - 10 3. Adjust blower RPM to design requirements.
 - 11 4. Record motor full load amperes.
 - 12 5. Make pitot tube traverse of main supply and return ducts and obtain design CFM at
13 fans.
 - 14 6. Record system static pressures, inlet and discharge.
 - 15 7. Record filter quantity, size(s) and pressure drop across filter(s) at each filter bank.
 - 16 8. Adjust system for design CFM recirculated air.
 - 17 9. Adjust system for design CFM outside air.
 - 18 10. Record entering air temperatures. (DB heating, DB and WB cooling.)
 - 19 11. Record leaving air temperatures. (DB heating, DB and WB cooling.)
 - 20 12. Adjust all main supply and return air ducts to design CFM.
 - 21 13. Adjust all zones to design CFM, supply and return.
 - 22 14. Adjust all diffusers, grilles and registers to plus 10%, minus 0% of design
23 requirements.
 - 24 15. Adjust CFM at all exhaust fans, make-up units, etc. (high and low speed, where
25 applicable). Record applicable data from items 1 through 11 above.
 - 26 16. Each grille, diffuser and register shall be identified as to location.
 - 27 17. Verify proper diffusion pattern for all ceiling grilles and that all sidewall grilles are set
28 for 5 degrees upward deflection unless otherwise noted. Make a notation of any that
29 are not set properly.
 - 30 18. Size, type and manufacturer of diffusers, grilles, registers and all tested items shall be
31 identified and listed. Manufacturer's ratings shall be used to make required
32 calculations on all items.
 - 33 19. Readings and tests of diffusers, grilles, and registers shall include required FPM
34 velocity and test resultant velocity, required CFM and test resultant CFM after
35 adjustments.
 - 36 20. In cooperation with the control manufacturer's representative, set adjustments of
37 automatically operated dampers to operate as specified. Testing agency shall check
38 all controls for proper calibrations and list all controls requiring adjustment by control
39 installers.
 - 40 21. All diffusers, grilles and registers shall be adjusted for required air patterns and to
41 minimize drafts.
 - 42 22. As a part of the work of this contract, THE AIR CONDITIONING CONTRACTOR shall
43 make any changes in pulleys, belts and dampers or the addition of dampers required
44 for correct balance as recommended by air balance agency, at no additional cost to
45 Owner.
 - 46 23. Set, test and adjust packaged heating/cooling unit economizer operation in
47 cooperation with controls contractor. Record minimum and maximum outside and
48 exhaust airflows.
- 49 H. Water Balance Procedure (For Each Pumping System):
 - 50 1. Set valves for maximum coil flow.
 - 51 2. Remove and clean all strainers.
 - 52 3. Examine water in system and determine if water has been treated and cleaned.

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4. Check expansion tanks to determine that they are properly charged and that the system is completely full of water. Bleed air from system.
5. Set operating temperatures of all equipment to design requirements.
6. Air balance must be complete before water balance begins.
7. Adjust pumps to design flow by use of differential pressure gage calibrated in feet of water.
8. Adjust water flow through all equipment to design flow.
9. Record leaving and return water temperatures at all equipment. Reset to correct design temperature.
10. Record water temperatures at inlet side of coils. Record rise or drop of temperatures from source.
11. Balance all coils for design flow and mark settings on flow controllers.
12. After coils are balanced, recheck settings at all equipment and readjust if required.
13. Record pressure drop through coils, and reset to design flow. Set pressure drop across bypass valve to match coil full flow pressure drop.
14. Record the following at each coil:
 - a. Inlet water temperatures.
 - b. Leaving water temperatures.
 - c. Pressure drop across coil.
 - d. Pressure drop across bypass valve.
15. Record pump suction and discharge pressures at operating condition and also with pump discharge valve completely closed.
16. Record running amperage of pump motor at operating condition and also with pump discharge valve completely closed.
17. Record water metering device readings.

3.9 WATER TREATMENT:

- A. General: All new HVAC equipment and auxiliary water piping systems shall be cleaned, passivated and treated as herein specified. Chemical compound identifications are from San Joaquin Chemicals, Inc., a State of California Contractor, License #461677. A written generic formula including active ingredients percentages must be submitted for review to be accepted as equivalent. Provide treatment as required to control scale, corrosion, biological growth, foaming and general fouling. Chemical treatments indicated below are generic in nature, actual formulations, dosages and application shall be determined by analysis of the make-up water to be treated with consideration for the system metallurgy, type of treatment equipment employed and operating units characteristics. Initial cleaning, preparation and start-up shall be supervised by the water treatment company's field service application specialist having a minimum of ten (10) years' experience with these type applications. The water treatment contracting company shall have not less than fifteen (15) years' experience with these type applications.
- B. Cleaning and Initial Preparations:
 1. Initial Fill: As the first water is introduced into the system, add not less than 10 gallons for each 1,000 gallons of contained water volume of a liquid blend of alkaline detergent; SANASOLV ® 6103 for closed systems, SANACOR ® 2605 -WR metal passivator as a white rust inhibitor for open galvanized systems, and SANACOR ® CUI for metal passivator as an enhanced copper tube corrosion inhibitor, comprised of the following ingredients:

Closed (Hot, Chilled, Non-Galvanized Open Systems):

 - Sodium Silicate Penta-hydrate
 - Sodium Tri-Polyphosphate
 - Tri-Sodium Phosphate
 - Dispersing Polymers
 - Wetting Agent, non-ionic
 2. Circulation: The above closed loop detergent shall be re-circulated for not less than twelve (12) hours/not more than forty-eight (48) hours after which the system shall be

rapidly dumped with re-circulating pumps operating to provide maximum practical motion, and whenever possible, with simultaneously adding or chasing with rinse water. It is important that make-up water rate exceed water discharge rate. In either case, the system shall be flushed until neutral to phenolphthalein, reaches the same pH and TDS levels as the clean flushing water and is free from suspended material and color.

- a. After flushing, all strainers shall be removed and cleaned. If the system contained a significant level of suspended solids, recirculating pump seal replacement may be required as requested by the project engineer as recommended by the water treatment field service application specialist. These functions will be the responsibility of the mechanical contractor with supervision by the water treatment applications specialist.
 - b. Be sure that all heating and/or cooling coils are kept open during the cleaning and flushing process and that cleaning solution is re-circulating through them and totally flushed from the entire system. These functions will be the responsibility of the mechanical contractor with supervision by the water treatment applications specialist.
 - c. After flushing cleaner/metal passivator from the open galvanized system, immediately re-passivate galvanized systems with SANACOR® 2605-WR at 10 gallons/1,000 gallons contained water and leave the passivator in the system to naturally deplete during normal operating blowdown cycles.
 - d. After flushing cleaner/metal passivator from the open condenser water system, immediately re-passivate these enhanced copper alloy tube systems with SANACOR® 2605-CUI at 10 gallons/1,000 gallons contained water and leave the passivator in the system to naturally deplete during normal operating blowdown cycles.
3. Initial Treatment Closed Loop: As soon as possible after flushing (within two hours), and with clean water in the systems, introduce 800 to 1,200 parts per million of sodium nitrite, pH buffer, yellow metal inhibitor and anti-scalants, (SANACOR® 2301-A) and adjust system water pH to 8.5 - 10.5. Maintain treatment concentration in all closed systems using by-pass feeders; (two-gallon feeders for less than 1,000 gallons contained water and five or twelve-gallon feeder for larger systems.
- C. Certification Before Start-Up: Equipment shall not be started until the water sides of all units have been cleaned and treated per these specifications under the supervision of the water treatment company's applications specialist. The field service applications specialist or their designate shall prepare a letter and submit it to the mechanical contractor and/or consulting engineer indicating that all piping systems have been properly cleaned and treated and are ready to be put into operation.
- D. Continuation of Supervision: The water treatment service company shall provide supervision of the water treatment program for a period of not less than one year from commencement of the water treatment program which shall consist of analysis of all treated systems and the submittal of a written analytical report stating the current conditions and recommendations for maintaining optimal controls. This service shall be performed monthly or more frequently as specified or required.

END OF SECTION

SECTION 25 0900
DIRECT DIGITAL CONTROL SYSTEM

PART 1 - GENERAL

1.1 GENERAL MECHANICAL PROVISIONS

- A. The General Mechanical Provisions, Section 20 01 00, shall form a part of this Section with the same force and effect as though repeated here.

1.2 SCOPE

- A. Included: Provide all labor, materials and services necessary for a complete, lawful and operating direct digital control (DDC) system as shown or noted on the drawings or as specified here. The work includes, but is not necessarily limited to, the following:
1. Control panels, control devices, line and low voltage wiring, conduit and related equipment as required for proper operation of all controlled systems.
 2. Power wiring required for control devices such as actuators, controllers, sensors and power supplies. Power wiring for these devices shall be fed from circuits dedicated to the DDC system.
- B. Work Specified Elsewhere:
1. Line voltage dedicated power circuits for stand-alone building controllers are included in the Electrical Divisions unless otherwise noted.

1.3 CONTRACTOR QUALIFICATIONS

- A. All controls shall be furnished and installed by a Contractor who is licensed, certified or contracted by the controls and VRV manufacturer for design, installation, start-up and service of their product. The Contractor must have factory supplied training and support. The Contractor shall have sufficient personnel to respond to a trouble call at the site within four hours. The Contractor's local manager shall have a minimum of five years' experience in the design, installation, start-up and service of similar systems. The Contractor shall submit a list of at least five projects which are similar in size, scope and contract value to this project. This list shall include the Owner's contact person, phone number and controls contract value.
- B. Quality Assurance
1. General
 - i. The Building Management System (BMS) Contractor shall be Authorized Building Controls Specialist contractor that is regularly engaged in the engineering, programming, installation and service of total integrated Building Management Systems. Bids from wholesalers, distributors or contractors who do not purchase directly from Johnson Controls are not allowed.
 - ii. The BMS Contractor shall have a branch facility within a 25-mile radius of the job site supplying complete maintenance and support services on a 24 hour, 7-day-a-week basis. The BMS Contractor shall have at this facility at least eight (8) factory trained, directly employed and full time technical staff, spare parts inventory, and all necessary test and diagnostic equipment.
 - iii. As evidence and assurance of the BMS contractor's ability to support the Owner's system with service and parts, the BMS contractor must have been in the BMS business for at least the last ten (10) years and have successfully completed total projects of at least 10 times the value of this contract in each of the preceding five years.
 - iv. The BMS architecture shall consist of the products of a manufacturer regularly engaged in the production of Building Management Systems, and shall be the manufacturer's latest standard of design at the time of bid.
 2. Workplace Safety and Hazardous Materials
 - a. Provide a safety program in compliance with the Contract Documents.
 - b. The BMS Contractor shall have a corporately certified comprehensive Safety Certification Manual and a designated Safety Supervisor for the Project.
 - c. The BMS Contractor and its employees and subtrades shall comply with federal, state and local safety regulations.

- d. The BMS Contractor shall ensure that all subcontractors and employees have written safety programs in place that covers their scope of work, and that their employees receive the training required by the OSHA rules that have jurisdiction for at least each topic listed in the Safety Certification Manual.
 - e. Hazards created by the BMS Contractor or its subcontractors shall be eliminated before any further work proceeds.
 - f. Hazards observed but not created by the BMS Contractor or its subcontractors shall be reported to either the General Contractor or the Owner within the same day. The BMS Contractor shall be required to avoid the hazard area until the hazard has been eliminated.
 - g. The BMS Contractor shall sign and date a safety certification form prior to any work being performed, stating that the Contractors' company is in full compliance with the Project safety requirements.
 - h. The BMS Contractor's safety program shall include written policy and arrangements for the handling, storage and management of all hazardous materials to be used in the work in compliance with the requirements of the AHJ at the Project site.
 - i. The BMS Contractor's employees and subcontractor's staff shall have received training as applicable in the use of hazardous materials and shall govern their actions accordingly.
3. Quality Management Program
- a. Designate a competent and experienced employee to provide BMS Project Management. The designated Project Manager shall be empowered to make technical, scheduling and related decisions on behalf of the BMS Contractor. At minimum, the Project Manager shall:
 - ◇ Manage the scheduling of the work to ensure that adequate materials, labor and other resources are available as needed.
 - ◇ Manage the financial aspects of the BMS Contract.
 - ◇ Coordinate as necessary with other trades.
 - ◇ Be responsible for the work and actions of the BMS workforce on site.

1.4 BASIS OF DESIGN

- A. The system shall be Johnson Metasys Building Systems, without substitution, to match County of Fresno Standard.

1.5 SUBMITTALS AND OPERATION AND MAINTENANCE MANUALS

- A. Submittals shall be in accordance with Section 20 01 00 and shall include the following:
1. Contractor qualifications. Manufacturer licenses, contracts or certifications for the installer shall be submitted on manufacturer's letterhead.
 2. Manufacturer's data for all devices.
 3. Manufacturer's data for all software.
 4. Diagrams showing control schematics. Diagrams shall include all sensors, terminal strips, panels and control devices. Locations of all devices shall be indicated.
 5. Sequence of operation.
 6. Site plan showing conduit trench and pullbox locations. This plan shall also show the conduit termination points inside the buildings.
- B. Operation and Maintenance Manuals: Furnish Operation and Maintenance Manuals for all components. These manuals shall contain full documentation which shall include, without being limited to, the following:
1. General description and specifications.
 2. Installation and initial checkout procedures.
 3. Complete trouble-shooting procedures and diagrams.
 4. Complete alignment and calibration procedures for all components.
 5. Preventative maintenance requirements.
 6. Detailed schematics and assembly drawings.

1.6 SYSTEM ARCHITECTURE

- A. The direct digital control system shall employ a multi-level distributed processing architecture. A web based front end controller shall act as the host and shall communicate with both the system operator and the stand-alone controllers. The stand-alone controllers shall be microprocessor based and perform the specified data acquisition and control functions. They shall connect to and supervise multiple application specific controllers (ASC). The stand-alone controllers shall perform stand-alone control functions whether in communications with the web based front end controller or not. All independent control loops shall be processed and controlled by the stand-alone controllers. Each stand-alone controller shall store historical data for all connected points for a minimum of 24 hours. Historical data shall include total run-time for each digital point. For analog data, periodic samples shall be stored at the frequency of once per minute. The physical connection and interface with the actual field points shall be accomplished through the ASC's. The ASC's shall be located throughout the data environment, communicate with, and be controlled by the stand-alone controllers. The stand-alone controllers shall be accessible by laptop computer with proper software via cable connection. Access to the system shall also be available through connection at selected space sensors.

PART 2 - PRODUCTS

2.1 SENSORS

- A. Space Temperature Sensor: Room sensor with solid-state electronic, interchangeable with housing appropriate for application occupant and adjustable set point. Occupant adjustable set point shall be limited by software. Wall mounted temperature sensors shall be mounted with bottom of sensor at 48" above finish floor.
- B. Outside Air Temperature Sensor: Provide one outside air sensor per stand-alone building controller. Install on north wall of building.
- C. Duct Sensor: Averaging sensor shall be used at ducts with greater than 9 square feet of cross sectional area. Sensor shall extend across 75% of the duct. Sensor shall be housed in a NEMA 3R enclosure with proper extension at insulated ducts. Provide access door.
- D. Photocell: Wattstopper EM-24 A 2.
- E. Status Sensor: Current sensing status sensor with sensitivity adjustment.

2.2 SYSTEM COMPONENTS

- A. Electric Actuators:
1. General: Fully modulating, UL listed. Visual position indicator, manual override, spring return. Factory weatherproof enclosure where exposed to weather. Belimo.
 2. Valve Actuators: Provide with factory mounting brackets and linkage to the control valve. Capable of shutting off against a 50 psi differential.
 3. Damper Actuators: Actuators shall be direct mounted onto the damper control shaft without linkage. Damper actuators shall be sized to provide a minimum of 5 inch-pounds of torque per square foot of damper face area.
- B. Lighting Contactors: Contactor with metal enclosure. Square D. Provide low voltage relays to complete the lighting control. For low voltage (120 volt) outside lighting, provide status relay for lighting status. For 277 volt outside lighting, provide current sensor for lighting status.
- C. Web Based Front End Controller with Graphical Interface: Provide color graphics accessible through the Owner's system (with security protocol) which will allow the user to override on/off and temperature set points directly. Real time data shall be continuously updated. The minimum graphic screens shall include the following:
1. Site lay-out locations of all equipment being controlled, control component locations and spaces served. Provide multiple screens – minimum of one screen per building, plus site and others as needed for clarity. By selecting the desired equipment item, a flow diagram shall be displayed for the related equipment (as described below). By selecting a conditioned space, a graphic display of the zone conditions shall be displayed (as described below).

- 1 2. Flow diagrams shall be provided for each HVAC system, such as air-handling system,
2 chilled water system, hot water system, condenser water system, package unit
3 system with all inputs and outputs dynamically displayed.
- 4 3. Each temperature control zone shall have a screen providing set points,
5 temperatures, and related HVAC system status data.
- 6 4. Scheduling screens allowing on/off times shall be set for all the following:
7 a. Pre-determined individual days
8 b. Pre-determined blocks of days (from/to)
9 c. Schedules for "Routine" days
10 d. Schedules for "Special" days
- 11 D. Enclosures: Hinged, lockable front panel. The panel shall be identified with a label as
12 specified. No conduit or other penetration of any kind shall be made on top of the enclosure. If
13 any such entry is made, a plug is not acceptable; replace the enclosure. Hoffman with metal
14 back panel. NEMA 1 for indoor; NEMA 3R for outdoor, NEMA 12 for hazardous locations.
- 15 E. Wiring: Sensor and communication cable shall be shielded cable, wire gage and number of
16 wires as recommended by the system manufacturer. Install per manufacturer's
17 recommendations. No splices will be allowed. Identify both ends at terminal blocks. All wiring
18 that is routed below grade shall have a PVC jacket, CL2-0552. All other wiring shall be
19 plenum-rated, CL3P-0552.
- 20 F. Conduit: Size conduit per the California Electrical Code and then increase by one size, except
21 that the minimum conduit size for low voltage shall be 1" and the minimum conduit size for 120
22 volt power shall be 3/4". For underground conduit, provide 100% spare capacity by installing a
23 second conduit (empty) along all conduit routes.
- 24 G. Labels: All labels, signs, etc. shall be engraved, laminated plastic, white on black background,
25 1/8" high lettering, minimum.
- 26 H. Mitsubishi or Daikin Controller. CITY MULTI Controls Network (CMCN) controller with on-site
27 LCD and internet IP accessibility with Factory BACnet Interface Card.
- 28 I. Mitsubishi or Daikin Room Sensor/Controller: Shall be wall mounted "in-room" wired remote
29 controller.

30 **2.3 VARIABLE SPEED DRIVE**

- 31 A. General: The variable frequency drive (VFD) shall be a completely adjustable frequency motor
32 drive system consisting of a pulse width modulated inverter for speed control of NEMA Design
33 B induction motors. Variable frequency drives shall be manufactured by a single source. The
34 VFD manufacturer shall have a minimum of five years experience in VFD design. Asea Brown
35 Boveri (ABB) is the basis of design and shall be used without substitution. Provide factory
36 start-up. Factory start up shall include adjustments to switching frequency and other
37 parameters as required to reduce motor noise at the controlled fan or pump.
- 38 B. Standards: VFD shall be in accordance with the latest revisions of the following:
39 1. IEEE Standard 519, Guide for Harmonic Control and Reactive Compensation for
40 Static Power Converters
41 2. UL Standard 508, Electrical Industrial Control Equipment
42 3. VFD shall be UL listed and bear the UL label.
- 43 C. Design Requirements: The VFD shall be capable of operating in the following conditions:
44 ambient temperature 0 to 40 degrees C and relative humidity 0 to 95%, noncondensing. The
45 power section shall allow the following faults to occur without damage to the VFD: single-
46 phase fault, three-phase short circuit, or phase to ground short circuit. VFD shall include the
47 following features: overcurrent protection, overspeed protection, over temperature protection,
48 electronic thermal motor protection. NEMA 1 or 4 enclosures, as applicable. Provide line
49 reactors, 3% impedance. Provide load filters for circuit lengths in excess of 200 feet.

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- D. Adjustments: VFD adjustments shall be set via menu driven selections accessible from the front panel. The VFD shall operate in the auto or manual mode and shall include the following front panel mounted switches and indicators:
1. 2 line x 14 character alphanumeric display
 2. Local/ remote switch.
 3. Digital indicator of frequency, current, volts, torque, HP, KW, KWhrs and run hrs.
 4. Manual speed control
 5. Run / stop switch.
 6. Power on and run indicator
 7. Fault indication including: current limit, overvoltage, undervoltage, overload or thermal motor protection.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: A dedicated ASC shall be provided for every item of new equipment and for every item of existing equipment. All electrical work shall be in accordance with the California Electrical Code and the Electrical Specification Sections. Wiring shall be concealed in walls, above the ceilings, or below grade unless otherwise noted. Exposed wiring shall run in conduit parallel to room surfaces; location shall be approved by the Engineer. Wiring in walls or in mechanical rooms, janitor rooms, or storage rooms shall be in conduit. Conduit above roofs shall be rigid conduit. Low voltage wiring in accessible attics may be run without conduit. This wiring shall be strapped to structure at 48" on center, and shall not lay on the ceiling. No structural member shall be weakened by cutting, notching, boring or otherwise. Provide power wiring for each device requiring external power. Dedicated circuits shall be provided for devices as required by the manufacturer. Devices or wiring exposed to the weather shall be protected in NEMA 3R enclosures and weatherproof conduit. All conduit shall include a pull wire. Set, test, and adjust the system for proper operation. Provide connection to the Owner's network for web-based access to stand-alone controllers.
- B. Programming: The Contractor shall be responsible for programming the system and shall coordinate the scheduling (on/off times) with the Owner. All point lists and programming blocks shall be provided by the Contractor. For upgrades or additions to existing systems, all existing programming and existing sequences of operation shall be incorporated into the new system and equipment. The project will not be considered complete until all programming and graphics have been completed and all systems are operational from the location of the web based front end controller.
- C. Control Panels/Enclosures:
1. ASC's, transformers, relays, etc. shall be housed in enclosures. Enclosures shall be installed as shown on plans. Wherever practical, do not locate enclosures above ceilings. Maintain access to enclosures that are located above ceilings (e.g. at VAV boxes).
 2. For all enclosures, provide a disconnect switch and an in-line fuse. All wiring shall be terminated at terminal strips – no wire nuts. Provide a plastic covered wiring diagram in each enclosure. All wiring (field and inside enclosures) shall be labeled at both ends with machine printed markers – black on white tape. At packaged equipment, locate the enclosure on the side of the unit without obstructing access or service clearance.
 3. Separate 120-volt circuits from low voltage circuits horizontally. A physical barrier is not required. Enclose wiring within the enclosure in 2"x2" Panduit.

3.2 TRAINING

- A. Prior to final acceptance, the Contractor shall provide operational training to the Owner's personnel. The training sessions shall include a complete demonstration of the system. Dates and times of the training sessions shall be coordinated through the Owner not less than one week prior to session. A total of 40 hours of instruction shall be provided - 20 hours initially, and 20 hours to be spread throughout the first year of operation. The Contractor shall maintain

a log of training sessions including dates, times and names/titles of those attending. The Contractor shall submit a copy of this log on request.

3.3 TESTING AND ACCEPTANCE

- A. The Contractor shall verify, in the presence of the Owner, the system accuracy and proper function of each controlled device and sensor. The following items shall be successfully demonstrated prior to acceptance by the Owner:
1. All system outputs including controllers, relays, and other control devices shall be addressed and start/stop functions demonstrated.
 2. All inputs shall be displayed and all event-initiated functions shall be demonstrated.
 3. Demonstrate program integrity and power restore sequence during and after a power failure and restoration.
 4. Deliver all record drawings, wiring diagrams, equipment specifications, operation and maintenance manuals and other documentation as required to describe the system.
 5. Complete operator training in the use, programming, and operation of the system.

3.4 SERVICE WORK

- A. Service work shall be performed by service personnel in the direct employ of the controls contractor. The service technicians shall be factory trained and certified by the manufacturer to be competent in all aspects of the installed system. The technician shall have a working knowledge of calibration techniques, preventive maintenance, troubleshooting, software diagnostics and microprocessor repair. Precaution shall be taken to minimize disruption of facility operations by service work.

3.5 SEQUENCE OF OPERATION

- A.

END OF SECTION

SECTION 26 00 00 GENERAL ELECTRICAL REQUIREMENTS

PART 1 – GENERAL

1.1 SECTION INCLUDES

This section includes general requirements specifically applicable to Divisions 26, 27, & 28; including requirements from Division 1.

1.2 RELATED SECTIONS

- A All included sections under Division 1
- B All included sections under Division 26
- C All included sections under Division 27
- D All included sections under Division 28
- E Plans
- F Manufacturers' manuals, product bulletins, etc.

1.3 REFERENCE STANDARDS AND CODES

- A Standards
 - 1 AEIC – Association of Edison Illuminating Companies
 - 2 ANSI – American National Standards Institute
 - 3 ASTM – American Society of Testing and Materials
 - 4 CBM – Certified Ballast Manufacturers Association
 - 5 EIA – Electronic Industry Association
 - 6 ICEA – Insulated Cable Engineers Association
 - 7 IEEE – Institute of Electrical and Electronics Engineers
 - 8 NEMA – The Association of Electrical and Medical Imaging Equipment Manufacturers
 - 9 FM - Factory Mutual
 - 10 UL – Underwriter's Laboratory's, Inc., Standards for Safety
- B Local codes and authorities having jurisdiction
 - 1 City codes
 - 2 County codes
 - 3 Local fire department
- C State codes and authorities having jurisdiction
 - 1 CBC – California Building Code
 - 2 CEC – California Electrical Code
 - 3 State of California Codes
- D National codes and authorities having jurisdiction
 - 1 NESC – National Electrical Safety Code
 - 2 OSHA – Occupational Safety and Health Act
- E Utilities
 - 1 Local cable company
 - 2 Local electrical company
 - 3 Local telephone company
- F Code compliance
 - 1 All work and materials shall comply with the latest rules, codes and regulations, including, but not limited to the following:

- a Occupational Safety and Health Act Standards (OSHA).
 - b CCR, Title 24, Part 3: California Electrical Code (CEC)
 - c All other applicable Federal, State and Local laws and regulations.
- 2 Code compliance is mandatory. Nothing in these Drawings and Specifications permits work not conforming to National, State, and Local electrical and building codes. Where work is shown to exceed minimum code requirements, comply with Drawings and Specifications.
- 3 No work shall be concealed until after inspection and approval by proper authorities. If work is concealed without inspection and approval, the Contractor shall be responsible for opening the concealed areas, making any required corrections and/or modifications to his work, and restoring the area to its previous condition.

1.4 DEFINITIONS (APPLICABLE TO DRAWINGS AND SPECIFICATIONS)

- A Provide: To supply, install and connect complete and ready for safe and regular operation of particular work referred to unless specifically otherwise noted.
- B Install: To erect, mount and connect complete with related accessories.
- C Supply: To purchase, procure, acquire and deliver complete with related accessories.
- D Work: Labor, materials, equipment, apparatus, controls, accessories and other items required for proper and complete installation.
- E Wiring: Raceway, fittings, wire, boxes, related items and connection.
- F Concealed: Embedded in masonry or other construction, installed in furred spaces, within double partitions or hung ceilings, in trenches, in crawl spaces or in enclosures.
- G Exposed: Either visible or subject to mechanical or weather damage, indoors or outdoors, including areas such as mechanical and storage rooms. In general, any item that is directly accessible without removing panels, walls, ceiling or other parts of structure.
- H Indicated, Shown, or Noted: As indicated, shown or noted on Drawings or Specifications.
- I Above Grade: Not buried in ground and not embedded in concrete slab on ground.
- J Below Grade: Buried in ground or embedded in concrete slab on ground.
- K Underground: Buried in ground, including under building slabs.
- L Connect: Complete hookup of item with required services, including conduit, wire and other accessories.
- M Furnish: Supply and deliver complete.
- N Similar or Equal: Of base bid manufacturer, equal in materials, weight, size, design, and efficiency of specified product, equivalent to Base Bid Manufacturer's product.
- O Reviewed, Satisfactory, Accepted, or Directed: As reviewed, satisfactory, accepted or directed by or to engineer.
- P Motor Controllers: Manual or magnetic starters (with or without switches), individual pushbuttons, or hand-off-automatic (HOA) switches controlling the operation of motors.
- Q Control Devices: Automatic sensing and switching devices such as thermostats, pressure, float, electro-pneumatic switches and electrodes controlling operation of equipment.
- R Contractor: Electrical Sub Contractor unless stated otherwise.
- S Use (verb): Furnish and install as defined above.

1.5 LICENSES, FEES AND PERMITS

Pay for all City, County or State electrical licenses, fees and permits. Arrange for all required inspections by agencies or authorities having local jurisdiction. The owner shall pay for all inspection fees and permits.

1.6 CONDITIONS AT SITE

- A A visit to the site is required of all bidders prior to submission of bid. All will be held to have familiarized themselves with all discernible conditions and no extra payment will be allowed for work required because of these conditions, whether specifically mentioned or not.
- B Underground or overhead lines or other services that are damaged as a result of this work shall promptly be repaired at no expense to the Owner and to complete satisfaction of the Owner.

1.7 DRAWINGS AND SPECIFICATIONS

- A All Drawings and all Divisions of these Specifications shall be considered as a whole and work of this Division shown anywhere therein shall be furnished under this Division.
- B The Contract Drawings are diagrammatic and indicate the general arrangement of equipment and wiring. Most direct routing of conduit and wiring is not assured. Exact requirements shall be governed by architectural, structural and mechanical conditions of the job. Consult all other Drawings in preparation of the bid. Extra lengths of wiring or addition of pull or junction boxes, etc., necessitated by such conditions shall be included in the bid. Check all information and report any apparent discrepancies before submitting bid.
- C Right is reserved to make change up to ten (10) feet in location of any outlet, device, or equipment prior to roughing in without increasing contract cost.
- D Equipment and fixtures shall be connected to provide circuit continuity in accordance with applicable codes, whether or not each piece of conductor, conduit or protective device is shown between items of equipment or fixtures and the point of circuit origin.

1.8 SAFETY AND INDEMNITY

- A Safety: The Contractor shall be solely and completely responsible for conditions of the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and not be limited to normal working hours.
- B No act, service, Drawing review or construction review by Owner, the Architect, the Engineers or their Consultants, is intended to include review of the adequacy of the Contractor's safety measures, in on or near the construction site.

1.9 RECORD DRAWINGS

- A Submit record Drawings under provisions of Section 013000.
- B Submit prior to final acceptance inspection, one complete marked-up set of reproducible engineering design Drawings.
 - 1 Fully illustrate revisions made by crafts in course of work.
 - 2 Include field changes, adjustments, variances, substitutions and deletions, including Change Orders.
 - 3 Indicate exact location of raceways, equipment, and devices.
 - 4 Indicate exact size and location of underground and under floor raceways, grounding conductors, and duct banks.

- 5 The record Drawings shall show all the work actually constructed and originally shown on the Drawing based upon the field construction by the Contractor.
- C These Drawings shall be for record purposes for Owner's use and are not considered Shop Drawings.

1.10 MANUFACTURER'S INSTRUCTIONS

- A Where the Specifications call for an installation to be made in accordance with manufacturer's recommendations, a copy of such recommendations shall at all times be kept in the job superintendent's office and shall be available to the Owner's representative.
- B Follow manufacturer's instructions where they cover points not specifically indicated on Drawings and Specifications. If they are in conflict with the Drawings and Specifications, obtain clarification from the Architect or Engineer before starting work.
- C One (1) set of equipment manufacturer's Drawings shall be submitted to the Engineer for their record.

1.11 OPERATING AND MAINTENANCE MANUALS

- A Operating and maintenance manuals and close-out documents are used interchangeably
- B Submit operating and maintenance manuals of equipment in the following format. Owner shall decide which format they prefer.
 - 1 Three (3) hardcopy sets
 - 2 PDF format
- C For specific requirements, see the sections in which the equipment is specified.

1.12 QUALITY ASSURANCE

- A Provide a meaningful quality assurance program. To assist the Contractor in this program, the Specifications contained herein are set forth as the minimum acceptable requirements. This does not relieve the Contractor from executing other quality assurance measures to obtain a complete operating facility within the scope of this project.
- B The Contractor shall insure that workmanship, materials employed, required equipment and the manner and method of installation conforms to accepted construction and engineering practices, and that each piece of equipment is in satisfactory working condition to satisfactorily perform its functional operation.

1.13 GUARANTEE

Guarantee the installation free from defects of workmanship and materials for a period of one (1) year after Date of Certificate of final payment and promptly remedy any defects developing during this period, without charge.

1.14 BIDDING

- A The contractor shall bid on the plans, specifications, etc. that constitute the contract documents.
- B The contractor shall not attempt to modify the contract documents without the approval of the electrical engineer.
- C All "value engineering" proposals shall be submitted in to the electrical engineer writing.

- D If the contractor makes changes to the contract documents not approved by the electrical engineer, the contractor will still be responsible for installing all devices, conductors, conduits, etc. the contract documents call for.

1.15 ABBREVIATIONS

AIC	Amps interrupting capability
ANSI	American National Standards Institute
ASTM	ASTM International, formerly American Society for Testing and Materials
ATC	Astronomical time clock
ATS	Automatic transfer switch
CAD	Computer aided design
CATV	Cable television
CBC	California Building Code
CCTV	Closed circuit television
CEC	California Electrical Code
CFC	California Fire Code
CFR	Code of Federal Regulations
CMC	California Mechanical Code
CPC	California Plumbing Code
CSFM	California State Fire Marshal
DPDT	Double pole, double throw
DPST	Double pole, single throw
DVR	Digital video recorder
EIA	Electronic Industries Association
EMT	Electrometallic conduit
EOR	Engineer of record
EPA	Effective projected area
FACP	Fire alarm control panel
FMC	Flexible metallic conduit
GRS	Galvanized, rigid steel conduit
HVR	Hybrid video recorder
ICC-ES	International Code Council Evaluation Service
IDF	Intermediate data frame
IEEE	Institute of Electrical and Electronic Engineers
IES	Illuminating Engineering Society of North America
IMC	Intermediate metallic conduit
I/O	Input/output
IOR	Inspector of record
IP	Internet protocol
ISO	International Organization for Standardization
LAN	Local area network
LCD	Liquid crystal display
LCP	Lighting control panel/lighting relay panel
LED	Light emitting diodes
LPI	Lightning Protection Institute
MDF	Main data frame
NEC	National Electrical Code
NEMA	Association of Electrical Equipment and Medical Imaging Manufacturers
NETA	National Electrical Testing Association
NFPA	National Fire Protection Association

NIST	National Institute of Standards and Technology
OCPD	Overcurrent protection device
PDF	Portable document format
PG&E	Pacific Gas and Electric
PTZ	Pan, tilt, zoom
SCCR	Short circuit current rating
SPD	Surge protective device
SPDT	Single pole, double throw
SPST	Single pole, single throw
THD	Total harmonic distortion
TIA	Telecommunications Industries Association
UL	Underwriters' Laboratories
USB	Universal series bus
UPS	Uninterruptable power supply
VFD	Variable frequency drive
VOIP	Voice over Internet protocol
VPN	Virtual private network
WAN	Wide area network

PART 2 – PRODUCTS

2.1 MATERIAL APPROVAL

- A All materials must be new and bear Underwriters' Laboratories label. Materials that are not covered by UL testing standards shall be tested and approved by an independent testing laboratory or a governmental agency.
- B Material not in accordance with these Specifications may be rejected either before or after installation.
- C Materials or equipment specified by:
 - 1 Name of manufacturer.
 - 2 Brand or trade name.
 - 3 Catalog reference.

2.2 SUBSTITUTIONS

- A Base the bid on use of materials specified.
- B Equipment other than specified will be considered for approval provided it meets previous items A through C and the following is submitted in writing by the Contractor to the Engineer to allow approval at least 14 days before the bid date:
 - 1 The request for permission to substitute shall be accompanied with a statement of the amount of money to be returned to the contract if the substitution is permitted.
 - 2 Return a completed request for substitution form.
- C The engineer is the sole judge of acceptability of preferred substitutions.
- D If a substitute is permitted, and any re design effort is thereby necessitated, the required re design shall be at the Contractor's expense.

2.3 SUBMITTALS

Submit to architect, or engineer if no architect is involved, seven (7) copies of complete Shop Drawings and materials lists, as noted below, for review within thirty (35) days after award of contract. All proposed deviations from Specifications must be clearly listed and submitted separately under a prominent heading entitled "Substitutions."

- A Fire Alarm Systems
- B Communication Systems
- C Pull Boxes and Cabinets
- D Conduit and Wire
- E Service and distribution
- F Transformers

2.4 OPERATING AND MAINTENANCE MANUALS

Submit Operating and Maintenance Manuals of equipment as specified under Division 1. Verify exact quantity with architect, or engineer if no architect is involved.

2.5 PRODUCT DELIVERY, STORAGE AND HANDLING

- A Equipment shall be shipped in its original packages, to prevent damaging or entrance of foreign matter. Handling and shipping shall be performed in accordance with manufacturer's recommendations. Provide protective covering during construction.
- B Replace at no expense to Owner, equipment or material damaged during the storage or handling, as directed by the engineer.
- C Equipment shall be tagged with a weatherproof tag identifying equipment by name and purchase order number. Packing and shipping lists shall be included.

PART 3 – EXECUTION

3.1 CLEARANCE

Minimum code required clearances for electrical equipment shall not be violated.

3.2 WORKMANSHIP AND CONTRACTOR'S QUALIFICATIONS

- A Only quality workmanship will be accepted. Haphazard or poor installation practice will be cause for rejection of work.
- B The Electrical Contractor shall provide a Superintendent in charge of this work at all times to direct the quality of the installation.

3.3 COORDINATION

- A Coordinate work with other trades to avoid conflict and to provide correct rough in and connection for equipment furnished under other trades and requiring electrical connections. Inform Contractors of other trades of the required access to and clearances around electrical equipment to maintain serviceability and code compliance.
- B Verify equipment dimensions and requirements with provisions specified under this Section. Check actual job conditions before fabricating work. Report necessary changes

in time to prevent needless work. Changes or additions subject to additional compensation and agreed price shall be at Contractor's risk and expense.

- C Provide temporary feeds and connections to areas and equipment as required to allow phased construction and operation.

3.4 CUTTING AND PATCHING

All cutting and patching required for work of this Division is included herein. Coordination with General Contractor and other trades is imperative. Contractor shall bear the responsibility for and bear the added expense of adjusting for improper holes, supports, etc.

END OF SECTION

SECTION 26 05 00 BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 – GENERAL

1.1 SECTION INCLUDES

Materials, equipment fabrication, installation and tests in conformity with applicable codes and authorities having jurisdiction, for the following:

- A Conduit and raceways
- B Wire and cables
- C Outlet boxes
- D Junction boxes
- E Pull boxes
- F Grounding

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A Division 1
 - 1 Section 013000: Administrative Requirements
 - 2 Section 013300: Submittal Procedures
 - 3 Section 014000: Quality Requirements
 - 4 Section 016000: Product Requirements
 - 5 Section 017000: Execution and Closeout Requirements
 - 6 All other included sections under Division 1
- B All included sections under Division 26
- C All included sections under Division 27
- D All included sections under Division 28
- E Plans
- F Manufacturers' manuals, product bulletins, etc.

1.3 REFERENCE STANDARDS AND CODES

Published specification standards, tests or recommended methods of trade, industry or government organizations apply to work in this section as cited in Section 260000.

- A American Society for Testing and Materials
 - 1 ASTM B3: Standard Specification for Soft or Annealed Copper Wire
 - 2 ASTM B33: Standard Specification for Tin-Coated or Annealed Copper Wire for Electrical Purposes
 - 3 ASTM B738: Standard Specification for Fine-Wire Bunch-Stranded and Rope-Lay Bunch-Stranded Copper Conductors for Use as Electrical Conductors
 - 4 ASTM B355: Standard Specification for Nickel-Coated, Soft or Annealed Copper Wire
 - 5 ASTM D412: Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension
- B California Electrical Code (CEC)
- C Institute of Electrical and Electronic Engineers (IEEE)
 - 1 IEEE 81: Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System Part 1: Normal Measurements
 - 2 IEEE 82: Standard Test Procedure for Impulse Voltage Tests on Insulated Conductors

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- 3 IEEE 95: Standard Test Procedure for Impulse Voltage Tests on Insulated Conductors
- 4 IEEE 141: Recommended Practice for Electric Power Distribution for Industrial Plants
- 5 IEEE 142: IEEE Recommended Practice for Grounding of Industrial and Commercial Power Systems
- 6 IEEE 241: Recommended Practice for Electric Power Systems in Commercial Buildings
- 7 IEEE 242: Recommended Practice for Protection and Coordination of Industrial and Commercial Power Systems (IEEE Buff Book)
- 8 IEEE 399: Recommended Practice for Industrial and Commercial Power Systems Analysis (Brown Book)
- 9 IEEE 442: Guide for Soil Thermal Resistivity Measurements
- 10 IEEE 576: Recommended Practice for Installation, Termination, and Testing of Insulated Power Cable as Used in Industrial and Commercial Applications
- 11 IEEE 1185: Recommended Practice for Cable Installation in Generating Stations and Industrial Facilities
- 12 IEEE 1584: Guide for Performing Arc Flash Hazard Calculations
- 13 IEEE 1584a: Guide for Performing Arc-Flash Hazard Calculations--Amendment 1
- 14 IEEE 1584b: Guide for Performing Arc-Flash Hazard Calculations--Amendment 2: Changes to Clause 4
- D Underwriters' Laboratories
 - 1 UL 1: Flexible Metal Conduits
 - 2 UL 4: Armored Cable
 - 3 UL 6: Electrical Rigid Metal Conduit – Steel
 - 4 UL 13: Power Limited Circuit Cables
 - 5 UL 83: Thermoplastic Insulated Wires and Cables
 - 6 UL 310: Electrical Quick-connect Terminals
 - 7 UL 360: Liquid Tight Flexible Steel Conduit
 - 8 UL 444: Communications Cables
 - 9 UL 467: Grounding and Bonding Equipment
 - 10 UL 486A: Wire Connectors
 - 11 UL 486B: Wire Connectors
 - 12 UL 486C: Splicing Wire Connectors
 - 13 UL 486D: Sealed Wire Connector Systems
 - 14 UL 486E: Equipment Wiring Terminals for Use with Aluminum and/or Copper Conductors
 - 15 UL 493: Thermoplastic Insulated Underground Feeder and Branch Circuit Cables
 - 16 UL 510: Polyvinyl Chloride, Polyethylene, and Rubber Insulating Tape
 - 17 UL 514A: Metallic Outlet Boxes
 - 18 UL 514B: Conduit, Tubing, and Cable Fittings
 - 19 UL 514C: Nonmetallic Outlet Boxes, Flush-device Boxes, and Covers
 - 20 UL 514D: Cover Plates for Flush-mounted Wiring Devices
 - 21 UL 568: Nonmetallic Cable Tray System
 - 22 UL 635: Insulating Bushings
 - 23 UL 651: Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings
 - 24 UL 797: Electrical Metallic Tubing – Steel
 - 25 UL 854: Service Entrance Cables
 - 26 UL 870: Wireways, Auxiliary Gutters, and Associated Fittings
 - 27 UL 969: Marking and Labeling Systems

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- 28 UL 1242: Standard for Electrical Intermediate Metal Conduit - Steel
- 29 UL 1332: Organic Coatings for Steel Enclosures for Outdoor Use Electrical Equipment
- 30 UL 1446: Systems of Insulating Materials – General
- 31 UL 1479: Fire Tests of Through Penetration Firestops
- 32 UL 1565: Position Devices (includes cable ties and clamps)
- 33 UL 1581: Reference Standard for Electrical Wires, Cables, and Flexible Cords
- 34 UL 1652: Flexible Metallic Tubing
- 35 UL 1685: Vertical-tray Fire Propagation and Smoke Release Test for Electrical and Optical Fiber Cables
- 36 UL 1773: Standard for Termination Boxes
- 37 UL 1977: Component Connectors for Use in Data, Signal, Control, and Power Applications
- 38 UL 2024: Standard for Signaling, Optical Fiber and Communications Raceways and Cable Routing Assemblies
- 39 UL 2196: Test for Fire Resistive Cables
- 40 UL 2239: Hardware for the Support of Conduit, Tubing, and Cable
- 41 UL 2256: Nonmetallic Sheathed Cable Interconnects
- 42 UL 2257: Identification Tests for Jacket and Insulation Materials Used in Plenum Cables
- 43 UL 2277: Flexible Motor Supply Cable and Wind Turbine Tray Cable
- 44 UL 2459: Insulated Multi-pole Splicing Wire Connectors
- 45 UL 2556: Wire and Cable Test Methods

1.4 QUALITY ASSURANCE

- A Equipment and accessories shall be the product of a manufacturer regularly engaged in its manufacture.
- B Supply equipment and accessories new, free from defects.
- C Equipment and accessories in compliance with the applicable standards listed in Article 1.3 of this section and with applicable national, state and local codes.
- D Items of a given type shall be the products of the same manufacturer.
- E Deliver, store and protect products under provisions of Section 016000.
- F Ship equipment in its original packages, to prevent damaging or entrance of foreign matter. Perform handling and shipping in accordance with manufacturer's recommendations. Provide protective covering during construction.
- G Replace at no expense to Owner, equipment or material damaged during storage or handling, as directed by the engineer.
- H Tag items with a weatherproof tag identifying equipment by name and purchase order number. Include packing and shipping lists.

1.5 SUBMITTALS

- A Submit under provisions of Section 013000 or 013300.
- B Submittals shall include the following:
 - 1 Table of contents
 - 2 A complete set of detailed manufacturer's specifications describing and illustrating all standard and special components and materials

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- 3 Part numbers
- 4 Evidence of compliance with the applicable standards listed under Article 1.3 of this section
- 5 Maintenance instructions and intervals
- 6 Calibration procedures and intervals
- 7 A complete set of drawings for any special items
- 8 Wiring diagrams
- C Electronic submittals shall be searchable
- D Seismic Restraint and Anchorage: Provide complete seismic anchorage and bracing for the lateral and vertical support of conduit and electrical equipment in accordance with CBC, Title 24, Part 2, Section 1616A.1 and ASCE 7-10 Section 13.6, and all provisions of this Section.
 - 1 Submit calculations prepared and signed by a Structural Engineer licensed in the State of California, showing compliance with the above for all electrical equipment weighing more than 50 pounds, excepting items corresponding exactly in configuration and weight to those specified and detailed. Where anchorage details are not shown on drawings, the field installation shall be subject to the approval of the Electrical Engineer.
 - 2 All equipment mounted on concrete shall be secured with post-installed concrete requiring a drilled hole. Power driven anchors are not acceptable. Minimum spacing shall be 10 diameter center to center and 5 diameters center to edge of concrete. Maximum allowable loads for tension and shear shall be as determined in compliance with ACI 318-14 Chapter 17 and the anchor's ICC or IAPMO evaluation report. Acceptable manufacturers are Hilti, Red Head, and Simpson Strong Tie.
 - 3 Conduit and suspended equipment shall be provided with supports and seismic restraints in accordance with Unistrut, Inc. Seismic Bracing Guide, or Super Strut Inc., Seismic Restraint System guide. Support requirements shall be based upon similar equipment; i.e., water piping as equivalent to conduit with wire fill. A copy of the guide shall be on the job site during construction.
- E The submittal shall be substantially complete for all items and equipment furnished under this section.
- F Individual drawings and data sheets submitted at random intervals will not be accepted for review.
- G Substitutions: Items of same function and performance shall be submitted in conformance with Division 1.

1.6 OPERATION AND MAINTENANCE MANUALS

- A Submit operation and maintenance manuals in accordance with Section 260000.
- B The manuals shall, at minimum, include the following:
 - 1 Table of contents
 - 2 Manufacturer (including contact information)
 - 3 Model number
 - 4 Voltage ratings
 - 5 Current ratings
 - 6 List of capabilities
 - 7 Environmental ratings
 - 8 NEMA enclosure type
 - 9 Maintenance instructions and intervals
 - 10 Calibration procedures and intervals

- 11 Installation instructions
- 12 Repair instructions (where applicable)
- 13 As-built drawings
- C Provide manuals in one of the following formats
 - 1 Three hardcopies
 - 2 PDF

PART 2 – PRODUCTS

2.1 CONDUIT AND OTHER RACEWAYS

- A Rigid Conduit, also referred to as Galvanized Rigid Steel Conduit (GRS)
 - 1 Material: High strength steel
 - 2 Coating
 - a All uses: hot-dipped galvanized
 - b Underground or corrosive areas
 - 1 40-mil, UV stabilized PVC coated
 - 2 Coating shall conform to NEMA RN-1
 - 3 Fittings shall be threaded.
 - 4 Conduit shall be UL-6 listed.
- B Intermediate Metal Conduit (IMC)
 - 1 Material: Steel
 - 2 Coating
 - a All uses: hot-dipped galvanized
 - b Underground or corrosive areas
 - 1 40-mil, UV stabilized PVC coated
 - 2 Coating shall conform to NEMA RN-1
 - 3 Conduit shall be UL-1242 listed.
- C Electrical Metallic Tubing (EMT)
 - 1 Material: Steel
 - 2 Coating
 - a All uses: hot-dipped galvanized
 - b Underground or corrosive areas
 - 1 40-mil, UV stabilized PVC coated
 - 2 Coating shall conform to NEMA RN-1
 - 3 Fittings shall be threaded.
 - 4 Connectors and couplings
 - a Water tight, steel compression type exterior and in wet locations. Use ETP Fittings InspectoRidge or approved equal when possible.
 - b Steel set screw type in interior, dry locations.
- D Non-metallic conduit
 - 1 Conduit shall be schedule 40 PVC (minimum)
 - 2 Approved for use as non-metallic raceway with 90°C conductors
 - 3 Comply with NEMA TC-2 and NEMA TC-3
- E Flexible Metallic Conduit
 - 1 Material: High strength, hot-dipped galvanized steel
 - 2 Construction: Interlocked
 - 3 Conduits in damp, wet, or corrosive areas shall be liquid tight type with PVC jacket extruded over the steel conduit.
- F Fittings and accessories

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- 1 Fittings and accessories for all conduit types shall be approved for the purpose and equal in all respects to the conduit or raceway.
- 2 Fittings and accessories for metallic conduits shall be made of ferrous metal and galvanized after fabrication.
- G Pull lines
 - 1 Pull line shall be 1/8 inch diameter, yellow color.
 - 2 Pull lines shall be Tubbs Cordage "Polyline" or approved equal.
- H Wireways
 - 1 NEMA type
 - a NEMA-1 for dry locations
 - b NEMA-3R or NEMA-4 for damp and wet locations
 - c NEMA-4X for corrosive locations
 - 2 Metal type
 - a Non-corrosive locations: mild steel
 - b Corrosive locations: stainless steel
 - 3 Thicknesses
 - a 6"x6" cross-section and smaller: 16 gauge
 - b 8"x8" cross-section and larger: 14 gauge
 - 4 Finish: The entire enclosure shall be finished as follows:
 - a Degreasing
 - b Cleaning
 - c Phosphatizing
 - d Electrostatic deposition of polymer polyester powder coating followed by baking to produce a hard durable finish.
 - 1 The average thickness of the paint film shall be 2.0 mils.
 - 2 Paint film shall be uniform in color and free from blisters, sags, flaking and peeling
 - e Finish shall conform to UL 50 and UL 50E.
 - f Color shall match surrounding area.
 - 5 Covers
 - a Wireways shall have hinged covers.
 - b NEMA 3R, 4 and 4X wireways shall be a gasket on the inside of the cover to seal the wireway when cover is closed.
 - c Covers shall have latches to secure the cover in the closed position.
 - 6 Wireways shall be UL listed.
- I Raceways shall be UL listed.

2.2 WIRE AND CABLE

- A Conductors for power and lighting systems 600V or less:
 - 1 Conductors shall be 90°C rated.
 - 2 Conductors size #12 AWG and larger shall be stranded copper.
 - 3 Type:
 - a THWN for wet or underground locations
 - b THHN for dry locations.
 - c 90°C rated
 - 4 Minimum conductor size for voltage drop:
 - a Minimum size #12 AWG for runs 50 feet or less for 208/120V systems or 100 feet or less for 480/277V systems
 - b Increase conductor by one size by one method below:

- 1 For each additional 50 feet for 208/120V systems or 100 feet for 480/277V systems.
- 2 Calculate voltage drop and size as directed by CEC Voltage Drop Restrictions.
- c Underground circuits shall be #8 AWG minimum wire, unless otherwise noted.
- d Once the contractor has determined conductors' route, calculate the minimum size to meet maximum voltage drop allowed per CEC using $D_{min} = C * L * I / (V_D * N)$.
 - 1 D_{min} is the minimum diameter (circular mills)
 - 2 $C=24$ for copper, $C=39$ for aluminum
 - 3 L is conductor length (feet)
 - 4 I is the current (amps)
 - 5 V_D is the maximum allowable voltage drop (volts)
 - 6 N is the quantity of parallel conductors per phase
- 5 Minimum size conductors for OCPD shall be determined from CEC Table 310.16 with ampacity corrected for 115°F.
- 6 Conductor size shall the largest size to meet maximum voltage drop (2.2 A 4) and to meet CEC ampacity requirements (2.2 A 5).
- B For Signal and Communication Circuits:
 - 1 Special Cables: As specified on Drawings.
 - 2 Conductors for general communications use: Stranded copper conductor, #16 AWG minimum, with THWN insulation for underground or wet locations and THHN insulation for dry locations.
 - 3 Ends of stranded conductors shall be tinned.

2.3 OUTLET BOXES, JUNCTION BOXES, AND PULL BOXES

- A Above ground locations
 - 1 Outlet Boxes
 - a Hot-dipped galvanized after fabrication
 - b Of required size, minimum 4 inches square, for flush mounted devices and lighting fixtures
 - c Cast type with gasketed covers for outdoor or wet locations.
 - d Device and fixture back boxes shall be 2-1/4" deep, minimum.
 - 2 Junction and Pull Boxes
 - a Use outlet boxes with appropriate covers as junction boxes wherever possible.
 - b Larger junction and pull boxes
 - 1 Sheet steel, hot dipped galvanized after fabrication, finished gray baked enamel
 - 2 Sized according to code
 - 3 Screw-on covers.
- B In-ground pull boxes, handholes, and manholes
 - 1 Precast concrete type with required extension collars.
 - 2 Covers
 - a Lids shall be steel or reinforced concrete, as shown on plans. Pull box lids in traffic areas or large grassy areas subject to mowing by riding mowers shall traffic rated.
 - b Covers shall include hold down bolts.
 - c Top of cover shall be flush with top of box.

- d Covers shall be identified as ELECTRICAL, SIGNAL, or COMMUNICATIONS unless otherwise specified.
- 3 Size boxes as indicated on Drawings. If size is not indicated on Drawings, use CEC as a minimum requirement.
- 4 Boxes shall have 2" thick (minimum), reinforced concrete bottoms with 1" diameter drain hole over 12" of crushed rock.
- 5 Boxes shall have approved cable supports.
- 6 Concrete encased stubs for handholes extending five (5) feet beyond handhole.
- 7 All pull boxes shall be no smaller than a Christy N-9.
- 8 All pull boxes shall be set flush to finished grade and shall have an 8-inch wide by 3-inch thick concrete mow strip poured around it.
- 9 Manufacturer shall be Brooks Products, Oldcastle Enclosure Solutions (Christy), Jensen Precast, or approved equal.
- 10 All sections between box, extension rings, etc. and penetrations shall be sealed with mortar.
- C Floor Boxes
 - 1 Provide Walker or equal Modulink non-metallic floor box for concrete areas.
 - 2 Provide quantity of boxes required to accommodate each device.
 - 3 Provide Walker Wood Floor Boxes at wood floors provide quantity required to accommodate each device.
 - 4 Provide brass flip cover lids.
- D Outlet boxes, junction boxes, pull boxes, etc. recessed in a concrete wall shall be deep masonry boxes.

2.4 CONDUIT AND EQUIPMENT SUPPORTS

- A Conduit supports
 - 1 For Individual conduit runs not directly fastened to the structure: Rod hangers
 - 2 For multiple conduit runs: Trapeze type conduit support designed for maximum loading deflection not exceeding manufacturer's recommendations.
- B Materials
 - 1 All materials not otherwise noted:
 - a Steel with the finished part hot dipped galvanized
 - b Stainless steel for corrosive or damp environments
 - 2 All bolts and nuts shall be stainless steel.
- C Supports anchored to earth shall be anchored in a concrete base per details.
- D Manufacturers shall be Caddy, Unistrut, Powerstrut, or approved equal.
- E All exposed channels shall have end caps made by the channel manufacturer and designed for use with the channel.

2.5 WIRE CONNECTORS

- A For wire size #8 AWG and smaller: Insulated, screw type, rated 105°C, 600V for building wiring and 1000V for fixtures; Scotchlok, Ideal, or approved equal.
- B For wire size #6 AWG and larger: T&B or approved equal screw type with 3M "#33+" or Plymouth "Slipknot Gray" tape insulation.
- C Underground wire splices
 - 1 Connect ends of conductors with copper compression connectors, 3M Scotchlok or approved equal.
 - 2 Seal splice with inline resin splice kit approved for weather exposure, direct burial, and wet locations, 3M Scotchcast or approved equal.

- D Only set screw, compression type connectors may be used for MC cables. Fish hook/open tang connectors are prohibited.

2.6 GROUNDING

- A Ground Rods
 - 1 3/4 inch diameter
 - 2 Copper weld type
 - 3 10 feet in length.
- B Ground Wire: Conductors shall be medium-hard drawn, copper, and stranded, with sizes as shown on drawings.
- C Utilize CADWELD Multi-System Exothermic Welding for below grade ground connections.
- D Bolts, nuts, and washers shall be bronze, cadmium plated steel, or other corrosion resistant material approved for the purpose.

2.7 MISCELLANEOUS MATERIALS

- A All screws, bolts, nuts, and washers on equipment outdoors or in wet or corrosive environments shall be stainless steel.

2.8 SEALANTS

- A General purpose sealant: One part polysulfide or polyurethane, Federal Standard TT-S-00230c or two-part polyurethane, Federal Standard TT-SS-227E of Mameco Vulkem 116 or 227 or approved equal product manufactured by Products Research and Chemical Corporation. Pecora, Sika, Sonneborn, or Tremco may be substituted under provisions of Section 016000.
- B Conduit sealant
 - 1 Two part, self curing urethane
 - 2 Non-sagging
 - 3 Liquid and gas tight
 - 4 Chemically stable once cured
 - 5 Compatible with conduit and conductor materials
 - 6 Designed for use as conduit seal
- C Fire retardant sealant: Dow Corning Company, Type 3-6548 silicone RTV foam sealant, closed cell, 18 lb. density, 2-part system with UL certification. Type 96-081 one-part sealant shall be used for small spaces and cracks. 3M Fire Barrier Caulk CP25 is also acceptable.

2.9 IDENTIFICATION

- A Nameplates:
 - 1 White, acrylic plastic suitable for indoor or outdoor use
 - 2 Face colored as below with engraved, white, 3/16" minimum, Arial or similar font characters
 - a Equipment on normal systems: Black face
 - b Equipment on emergency systems: Red face
 - 3 Clear plastic overlay suitable for indoor or outdoor use that can be replaced if vandalized.
 - 4 Sign shall include device name, voltage, and size.

- 5 Outdoor nameplates shall be UV stable and fade resistant.
- B Pull line identification tags:
 - 1 Aluminum plate
 - 2 1/8" tall (minimum), Arial (or similar) font, identifying text stamped on plate
 - 3 Tags shall describe conduit's length, source, and destination.

PART 3 – EXECUTION

3.1 GENERAL

- A Electric system layouts indicated on the Drawings are generally diagrammatic but shall be followed as closely as actual construction and work of other trades will permit. Govern exact routing of cable and wiring and the locations of outlets by the structure and equipment served. Dimensions shall be taken from Architectural Drawings.
- B Consult all other Drawings. Verify scales and report any dimensional discrepancies or other conflicts to architect, or engineer if no architect is involved, before submitting bid.
- C Home runs to panelboards are indicated as starting from the outlet nearest the panel and continuing in the general direction of that panel. Continue such circuits to the panel as though the routes were completely indicated. Terminate homeruns of signal, alarm, and communications system in a similar manner.
- D Avoid cutting and boring holes through structure or structural members wherever possible. Obtain prior approval of Architect and conform to structural requirements when cutting or boring the structure is necessary or permitted.
- E Furnish and install necessary hardware, hangers, blocking, brackets, bracing, runners, required for equipment specified under this section.
- F Provide necessary backing required to insure rigid mounting of outlet boxes.
- G Install pull line in all conduits to remain that will have their conductors removed.

3.2 INSTALLATION OF CONDUIT

- A Run conduit concealed unless otherwise noted or shown on Drawings.
- B Run exposed conduit parallel to or at right angles to center lines of columns and beams.
- C Run no conduit in concrete slabs or floors except at point of penetration. Penetrations shall be at right angles to slab surfaces.
- D Install conduit above ceilings to avoid obstructing removal of ceiling tiles, lighting fixtures, air diffusers, etc.
- E Conduit shall not cross any duct shaft or area designated as future duct shaft. Coordinated with mechanical work to avoid any conflict.
- F Install pull line in empty conduit installed under this contract. Provide and install labels as describe in "Identification" sub-section.
- G Spare conduits shall be capped to prevent intrusion of moisture and foreign objects.
- H Minimum conduit size shall be 1/2 inches when installed above ground and 3/4 inches when installed underground or under building slabs. Increase conduit size as required for wiring. Size for conduit, unless specifically shown otherwise, shall be determined from Table 3 for all conductors, Chapter 9 of latest National Electric Code.
- I Conduit shall be rigid conduit, IMC, EMT, or plastic as follows:
 - 1 Above ground and dry locations: Use rigid conduit, IMC or EMT.
 - a Wet locations: Rigid conduit, IMC.
 - b Locations subject to mechanical injury: Rigid conduit or IMC only.
 - c In concrete walls or block walls: Rigid steel conduit or IMC only.

- d Dry locations and not subject to mechanical injury: EMT (interior locations only), IMC, or rigid conduit.
- 2 Underground: Use wrapped rigid steel or plastic.
 - a Schedule 40 PVC: For use underground where protected by concrete slabs, asphaltic pavement, or concrete walkways. Use steel elbows for plastic conduit runs penetrating floor slabs. Bends in plastic conduit other than normal long sweeps shall be made only with factory formed ells or curved segments. Heat bending may not be used. Sections of rigid steel conduit runs are required where direction changes. In all cases where use of plastic conduit is allowed or specified, Contractor may, at his option, use rigid steel conduit.
 - b Underground conduits shall have red 4" wide identifying caution tape reading "CAUTION ELECTRICAL LINE BELOW", length as required and installed 12" above all conduits runs.
 - c Do not install plastic conduit in rock base.
 - d Underground conduit entering building shall be provided with one (1) 10 foot section of rigid steel conduit at point of penetration of foundation, footing or basement wall, with approximately equal lengths inside and outside building line, unless otherwise noted.
- 3 Bends
 - a Make risers to grade with rigid steel long radius sweep conduit and rigid steel elbow fittings only.
 - b Minimum radius of sweeps shall be 24 inches.
- J Burial depth of conduit shall be as follows:
 - 1 Concrete encased: 24 inch minimum for 600V or lower systems to top of concrete encasement.
 - 2 Conduit without concrete encasement or cap: 24 inch minimum to top of conduit.
 - 3 When installed under buildings, the above minimum depth shall be 18 inches below bottom of floor slab.
- K Use flexible steel conduit in the following applications:
 - 1 Recessed lighting fixtures.
 - 2 Motor connections.
 - 3 Connection between fan plenum and structure.
 - 4 At expansion joints.
 - 5 At transformers and other equipment which produce vibration.
- L Provide junction boxes/pull boxes as required to limit any power system conduit run to a maximum of four (4) 90 degree bends (two (2) 90 degree bends for signal communication system conduit runs) or to avoid "U" bends.
- M Conduit Supports:
 - 1 Support conduit with Underwriters' Laboratories listed conduit support intervals required by the California Electric Code.
 - 2 Wire or sheet metal strips are not acceptable for conduit not directly fastened to structure or for multiple conduit runs.
 - 3 Individual conduit 1/2 inch and 3/4 inch size may be supported from ceiling support wire with Caddy clips only if acceptable to local code. Only one conduit is permitted to be attached to any ceiling support wire. Hang such conduit so as not to affect level of ceiling.
 - 4 Avoid attaching conduit to fan plenums. When it is necessary to support conduit from fan plenum, provide a length of flexible conduit between the section attached to the fan plenum and other sections. Provide a length of flexible

- conduit between the portion attached to the building to minimize transmission of vibration to the building structure.
- N Conduit penetration of roof, walls, floors and ceilings shall be sealed to preserve the integrity of waterproofing, fire rating and soundproofing for which the roof, wall, floor or ceiling is designed. Materials and methods used shall conform to that specified under Architectural sections.
- O Underground conduit and ducts 2 inches and larger shall be proven clear by pulling through a mandrel 1/4 inch smaller than the inside diameter.
- P Where flush branch circuit panelboards or terminal cabinets are shown on walls, stub a minimum of four (4) 1 inch empty conduit into overhead ceiling spaces and four (4) 1 inch empty conduit into space below floor (if any) in addition to conduit required for circuit wiring.
- Q Paint all exposed conduit to match its surroundings.
- R Plastic conduits exposed to sun light shall be UV stabilized.
- S Where rigid steel conduit runs in direct contact with the earth, conduit shall be wrapped with 10-mil PVC tape to form 40 mil of protection, or shall have factory applied PVC coating.
- T Label all conduits at each terminus, pull box, and junction box.
- U All conduits shall have a minimum of one pull line.
- V All pull lines shall be tagged at both ends so as to indicate the length of the conduit run, source, and the destination.

3.3 INSTALLATION OF WIRE

- A Install all wiring in raceway unless specifically shown or noted otherwise.
- B Pull no wire into any portion of the conduit system until construction work which may damage the wire has been completed.
- C Install wire continuous from outlet to outlet or terminal to terminal. Splices in cables when required shall be made in handholes, pull boxes or junction boxes. Make branch circuit splices in outlet boxes with 8 inches of correctly color-coded tails left in the box.
- D Make splices in wires and cables utilizing specified materials and methods.
- E Cables and wires passing through handholes shall be full looped inside the handhole (360 degree) and supported on galvanized steel racks, beginning 10" above the bottom of the handhole. Leave handhole in clean condition with debris removed.
- F Make ground, neutral, and line connections to receptacle and wiring device terminals as recommended by manufacturer. Provide ground jumper from outlet box to ground terminal of devices when the device is not approved for grounding through the mounting screws.
- G Provide Brady wire markers where number of conductors in a box exceed four (4).
- H Wiring shall be tested for continuity (600V and below). All systems shall be entirely free from grounds, short circuits, and any or all defects.
- I Measure and record the insulation resistance of 600 volt insulated conductors size #4/0 AWG and larger using a 500 volt megger for one minute. Make tests with circuits isolated from source and load.
- J All conductor bends must have a radius greater than or equal to the manufacturer's listed bending radius.
- K Label all conductors at each terminus, pull box, and junction box.

3.4 WIRE COLOR CODE

- A Color code conductors. Wire sized #8 AWG and smaller shall have integral color coded insulation. Wire sizes #6 AWG and larger may have black insulation but shall be identified by color coded electrical tape at junction, splice, pull and termination points. Apply color tape with 1/2 lap to at least 6 inches of the conductor.
- B Color code wire as follows:
- | | | |
|------------|----------|--|
| Conductors | 208/120V | 480/277V |
| Phase A | Black | Brown |
| Phase B | Red | Orange |
| Phase C | Blue | Yellow |
| Neutral | White | White or Gray (consistent throughout facility) |
| Ground | Green | Green |

3.5 CONNECTIONS TO EQUIPMENT

- A General:
- 1 Furnish and install required power supply conduit and wiring to equipment. See below for other wiring required.
 - 2 Furnish and install a disconnect switch immediately ahead of and adjacent to each magnetic motor starter or appliance unless the motor or appliance is located adjacent to and within sight of the serving panelboard, circuit breaker or switch. Verify equipment nameplate current ratings prior to installation.
 - 3 Mount motor starters including those furnished under other sections or specifications and provide power wiring to them.
 - 4 Install rough-in work for equipment from approved shop drawings to suit the specific requirements of the equipment.
 - 5 Furnish and install magnetic motor starters that are shown on the Drawings or specified under other divisions to be furnished under this division of work. Verify equipment nameplate ratings prior to installation and furnish adequately rated starters for the loads.
 - 6 Furnish and install manual thermal protection for motors not integrally equipped with thermal protection.
 - 7 Furnish and install 120V power to each control panel and time switch requiring a source of power to operate.
- B Heating, ventilating, and air conditioning equipment:
- 1 Coordinate with mechanical contractor for sizes, locations and details of motors, heating units, and control requirements.
 - 2 Provide required power supply conduit and wiring to equipment.
 - 3 Provide a suitable means of disconnect switch immediately ahead of and adjacent to each motor and appliance unless the motor or appliance is located adjacent and within sight of the service panelboard, circuit breaker or switch at a distance allowed by codes. Verify equipment nameplate current ratings prior to installation. Provide a disconnect means at each magnetic motor starter.
 - 4 Provide magnetic motor starters required under this division of work.
 - 5 Provide manual thermal protection for motors not integrally equipped with thermal protection.
 - 6 Line and low voltage temperature control and interlock wiring, conduit, and required connections are a part of other divisions unless specifically shown or noted on the Drawings as to be furnished under this section.
 - 7 Provide 120V power supply to control panels, time switch furnished and installed under other divisions of work.

- 8 Furnish and install 120V power to each duct detector scheduled for operation of fire dampers or shut down of mechanical equipment. Coordinate the exact quantity and locations with the mechanical drawings.
- C Plumbing and other contractor-furnished and Owner-furnished equipment:
 - 1 Required power and control conduit, wiring and connections are included under this section of the work. Control sensing and alarm devices will be furnished under the respective section of the contract supplying the equipment unless noted otherwise. These devices will be located in pipes, ducts, vessels, tanks, etc., and will be mounted in a place by the Contractor furnishing the devices. Other devices shall be mounted under this section of the work.
 - 2 Control panels for packaged equipment will be furnished under the respective section of the contract supplying the equipment unless otherwise noted. Installation and connection of the control panels are under this section of the work.

3.6 SYSTEM NEUTRAL GROUND

- A Ground the neutral conductor of each transformer to limit the maximum potential above ground due to normal operating voltage and limit the voltage level due to abnormal conditions.
- B Ground transformers with secondary voltage 600V class or less as follows: 3 phase, 4 wire wye connected: ground neutral point.
- C For transformers 75kVA size or lower with primary voltage 480V or lower, the primary equipment ground conductor may be used for grounding the secondary neutral provided it is adequately sized in accordance with CEC system ground conductor size.

3.7 EQUIPMENT GROUND

- A Ground non-current carrying metal parts of electrical equipment enclosures, frames, or conductor raceways to provide a low impedance path for line to ground fault current and to bond all non current carrying metal parts together. Install a ground conductor in each raceway system. Equipment ground conductor shall be electrically and mechanically continuous from the electrical circuit source to the equipment to be grounded. Size ground conductors per CEC 250.95 unless otherwise shown on drawings.
- B Grounding conductors shall be identified with green insulation. Where green insulation is not available, on larger sizes, black insulation shall be used and suitably identified with green tape at each junction box or enclosure device.
- C Install metal raceway couplings, fittings and terminations secure and tight to insure good ground continuity. Provide grounding bushing and bonding jumper where metal raceway is not directly attached to equipment metal enclosure and at concentric knockouts.
- D Lighting fixtures shall be securely connected to equipment ground conductors. Outdoor lighting standards shall have a factory installed ground for terminating the ground wire.
- E Motors shall be connected to equipment ground conductors with a conduit grounding bushing and with a bolted solderless lug connection on the metal frame.

3.8 STRUCTURAL GROUND

- A Concrete encased electrode shall be 2 inches above the bottom of concrete footing where shown on drawings. See drawings for details.

- B Domestic, chilled and hot water mains and fire protection metallic water pipes shall be connected to the ground bus with #4/0 AWG bare copper conductor at a minimum of two points.
- C Miscellaneous metal objects including piping, vessels and structural shapes within six feet of metallic objects connected to the ground system and which are not interconnected mechanically with the grounding system, shall be interconnected with a minimum #6 AWG bare copper conductor.

3.9 IDENTIFICATION

- A Provide and install nameplates on all switchboards, distribution boards, panels, motor starters, VFDs, transformers, safety switches/disconnects, push buttons, selector switches, pilot lights, and other similar devices. Fasten nameplates to equipment with one sheet metal screw at each corner.
- B Provide and install labels on lighting switches and convenience and special purpose receptacles to show panel and circuit number to which the device is connected.
- C Provide and install identification tags on all conduit pull.
- D Provide label meeting ANSI Z535 standards on motors reading:
WARNING
AUTOMATIC EQUIPMENT
MAY START AT ANY TIME

3.10 CIRCUIT BREAKER ELECTRICAL COORDINATION STUDY

- A If required, contractor shall provide a coordination study to determine trip settings of circuit breakers.
- B Contractor may elect to have the engineer of record provide such services at the contractor's expense.

3.11 ARC FLASH STUDY

- A If required, contractor shall provide a study to determine potential arc flash energy.
- B Contractor may elect to have the engineer of record provide such services at the contractor's expense.

END OF SECTION

SECTION 26 05 26 GROUNDING

PART 1 – GENERAL

1.1 SECTION INCLUDES

Materials, equipment fabrication, installation and tests in conformity with equipment applicable to this project, applicable codes and authorities having jurisdiction, for grounding

1.2 RELATED SECTIONS

- A All included sections under Division 1
- B All included sections under Division 26
- C Plans
- D Manufacturers' manuals, product bulletins, etc.

1.3 REFERENCE STANDARDS

Published specifications standards, tests or recommended methods of trade, industry or government organizations apply to work in this section as cited in Section 16000.

1.4 QUALITY ASSURANCE

- A Equipment and accessories shall be the product of a manufacturer regularly engaged in its manufacture.
- B Supply equipment and accessories new, free from defects.
- C Supply equipment and accessories in compliance with the applicable standards listed in Article 1.3 of this section and with applicable national, state and local codes.
- D Items of a given type shall be the products of the same manufacturer.

1.5 SUBMITTALS

- A Submit under provisions of Section 01330. Provide detailed description of items supplied, including specifications, performance characteristics, materials, wiring diagrams and schedules.
 - 1 Submit evidence that products satisfy seismic requirements for the State of California.
 - 2 Submit evidence of compliance with the applicable standards listed under Article 1.3 of this section.
- B Manufacturer's Instructions: Submit manufacturer's installation instructions.
- C Product Data: Submit manufacturer's descriptive literature.
- D Shop Drawings: Submit complete fabrication details, elevations and sections of switchboard, dimensions, space available for conduit, rating, short circuit withstand ability of bus and lowest rated device, circuit schedule showing circuit number, device description, device frame ampere rating and trip, fuse clip ampere rating, termination lug size, feeder and circuit identification, conductor ratings and one-line and wiring diagrams. Include both elementary diagram and terminal to terminal wiring diagrams.
- E Substitutions: Items of same function and performance shall be in conformance with Division 1.
- F Submit field test and operations check report for circuit breakers and motor starters under provisions of Section 16080.

1.6 OPERATION AND MAINTENANCE DATA

- A Submit operation instructions, maintenance and repair data under provisions of Division 1.
- B Ship equipment in its original packages to prevent damaging or entrance of foreign matter. Perform handling and shipping in accordance with manufacturer's recommendations. Provide protective covering during construction.
- C Replace at no expense to Owner, equipment or material damaged during storage or handling, as directed by the engineer.
- D Tag items with a weatherproof tag identifying equipment by name and purchase order number. Include packing and shipping lists.

PART 2 – PRODUCTS

2.1 GROUND RODS

Ground rods shall be:

- A. 3/4 inch diameter
- B. Copper weld type
- C. 10 feet in length.
- D. Ground rings

2.2 BARE COPPER GROUND WIRE

Conductors shall be medium-hard drawn, copper, and stranded, with sizes as shown on drawings.

2.3 BELOW GRADE GROUND CONNECTIONS

Utilize CADWELD Multi-System Exothermic Welding.

2.4 HARDWARE

Bolts, nuts and washers shall be bronze, cadmium plated steel, or other non-corrosive material, approved for the purpose.

PART 3 – EXECUTION

3.1 SYSTEM NEUTRAL GROUND

- A Ground the neutral conductor of each transformer to limit the maximum potential above ground due to normal operating voltage and limit the voltage level due to abnormal conditions.
- B Ground transformers with secondary voltage 600V class or less as follows: 3-phase, 4-wire wye connected: ground neutral point.
- C For transformers 75kVA size or lower with primary voltage 480V or lower, the primary equipment ground conductor may be used for grounding the secondary neutral provided it is adequately sized in accordance with CEC system ground conductor size.

3.2 EQUIPMENT GROUND

- A Ground non-current carrying metal parts of electrical equipment enclosures, frames, or conductor raceways, structural metal supports for the mechanical and plumbing equipment

to provide a low impedance path for line-to-ground fault current and to bond all non-current carrying metal parts together. Install a ground conductor in each raceway system. Equipment ground conductor shall be electrically and mechanically continuous from the electrical circuit source to the equipment to be grounded. Size ground conductors per CEC 250-95 unless otherwise shown on drawings.

- B Grounding conductors shall be identified with green insulation. Where green insulation is not available, on larger sizes, black insulation shall be used and suitably identified with green tape at each junction box or enclosure device.
- C Install metal raceway couplings, fittings and terminations secure and tight to insure good ground continuity. Provide grounding bushing and bonding jumper where metal raceway is not directly attached to equipment metal enclosure and at concentric knockouts.
- D Lighting fixtures shall be securely connected to equipment ground conductors. Outdoor lighting standards shall have a factory installed ground for terminating the ground wire.
- E Motors shall be connected to equipment ground conductors with a conduit grounding bushing and with a bolted solderless lug connection on the metal frame.

3.3 STRUCTURAL GROUND

- A Concrete encased electrode shall be 2 inches above the bottom of concrete footing where shown on drawings. See drawings for details.
- B Domestic, chilled and hot water mains and fire protection metallic water pipes shall be connected to the ground bus with #3/0 AWG bare copper conductor at a minimum of two points.
- C Miscellaneous metal objects including piping, vessels and structural shapes within six feet of metallic objects connected to the ground system and which are not interconnected mechanically with the grounding system, shall be interconnected with a minimum #3/0 AWG bare copper conductor.

3.4 GROUND RESISTANCE TEST

- A Building ground electrode resistance testing shall be accomplished with a ground resistance, direct reading, single test meter utilizing the Fall-of-Potential method and two (2) referenced electrodes. Perform test prior to interconnection to other grounding system. Orient the concrete encased ground electrode to be tested and the two referenced electrodes in straight line spaces fifty (50) feet apart. Drive the two (2) reference electrodes ten (10) feet deep.
- B Test results shall be in writing, and shall show temperature, humidity and condition of the soil at the time of the tests. In the case where the ground resistance exceeds 25 ohms, add an additional ground rod and retest. Add additional ground rods when necessary in order to bring the ground resistance below 25 Ohms. All testing shall be done prior to concrete pour and in the presence of the inspector of record. Provide test results for engineer review.

END OF SECTION

SECTION 26 05 29 HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Hangers and supports for electrical equipment and systems.
- B. Construction requirements for concrete bases.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A Division 1
 - 1 Section 013000: Administrative Requirements
 - 2 Section 013300: Submittal Procedures
 - 3 Section 014000: Quality Requirements
 - 4 Section 016000: Product Requirements
 - 5 Section 017000: Execution and Closeout Requirements
 - 6 All other included sections under Division 1
- B All included sections under Division 26
- C All included sections under Division 27
- D All included sections under Division 28
- E Plans
- F Manufacturers' manuals, product bulletins, etc.

1.3 REFERENCE STANDARDS AND CODES

- A Published specifications standards, tests or recommended methods of trade, industry or government organizations apply to work in this section as cited in Section 260000.
- B American Society for Testing and Materials (ASTM)
 - 1 ASTM A36/A36M: Standard Specification for Carbon Structural Steel
 - 2 ASTM A167: Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip
 - 3 ASTM A276: Standard Specification for Stainless Steel Bars and Shapes
 - 4 ASTM A325: Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 KSI Minimum Tensile Strength
 - 5 ASTM A563: Standard Specification for Carbon and Alloy Steel Nuts
 - 6 ASTM B221: Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes
 - 7 ASTM B632: Standard Specification for Aluminum-Alloy Rolled Tread Plate
 - 8 ASTM B633: Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel
 - 9 ASTM E488: Standard Test Methods for Strength of Anchors in Concrete Elements
 - 10 ASTM F594: Standard Specification for Stainless Steel Nuts
- C American Welding Society (AWS)
 - 1 AWS D1.1: Structural Welding Code - Steel
- D California Building Safety Codes (CBSC)
 - 1 California Building Code (CBC)
 - 2 California Electrical Code (CEC)
- E General Services Administration
 - 1 FF-S-325

- 2 W-C-582: Conduit, Raceway, Metal and Fittings: Surface
- 3 WW-H-171: Hanger and Support, Pipe
- F ICC Evaluation Service (ICC-ES)
 - 1 ESR-1917
- G Manufacturers Standardization Society (MSS)
 - 1 MSS SP-58: Pipe Hangers and Supports – Materials, Design, Manufacture, Selection, Application, and Installation
 - 2 MSS SP-69: Pipe Hangers and Supports – Selection and Application
- H Metal Framing Manufacturers' Association
 - 1 MFMA-4: Metal Framing Standard Publication
 - 2 MFMA-101: Guidelines for the Use of Metal Framing
- I National Electrical Contractors Association
 - 1 NECA 1: Standard Practice of Good Workmanship in Electrical Construction
 - 2 NECA 101: Standard for Installing Steel Conduits (Rigid, IMC, EMT)
- J Underwriters' Laboratories
 - 1 UL 2239: Hardware for the Support of Conduit, Tubing, and Cable

1.4 QUALITY ASSURANCE

- A. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Comply with latest editions of the California Building Code and California Electric Code

1.5 SUBMITTALS

- A. Submit under provisions of Section 013000 or 013300.
- B. Submittals shall include the following:
 - 1. Table of contents
 - 2. A complete set of detailed manufacturer's specifications describing and illustrating all standard and special components and materials
 - 3. Part numbers
 - 4. Evidence of compliance with the applicable standards listed under Article 1.3 of this section
 - 5. Maintenance instructions and intervals
 - 6. A complete set of drawings for any special items
- C. Electronic submittals shall be searchable
- D. Shop drawings shall be stamped and signed by a licensed structural engineer. Show fabrication and installation details and include calculations for the following:
 - 1. Trapeze hangers: include product data for components
 - 2. Steel slotted channel systems: include product data for components
 - 3. Equipment supports
- E. Welding certificates
- F. The submittal shall be substantially complete for all items and equipment furnished under this section.
- G. Individual drawings and data sheets submitted at random intervals will not be accepted for review.
- H. Substitutions: Items of same function and performance shall be submitted in conformance with Division 1.

1.6 OPERATION AND MAINTENANCE MANUALS

- A Submit manuals at close out.
- B The manuals shall, at minimum, include the following:
 - 1 Manufacturer (including contact information)
 - 2 Model number
 - 3 Load ratings
 - 4 Material type(s)
 - 5 Environmental ratings
 - 6 Maintenance requirements
 - 7 Installation instructions
 - 8 Repair instructions (where applicable)
- C Provide manuals in one of the following formats
 - 1 Three hardcopies
 - 2 PDF

1.7 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design supports for multiple raceways, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. Design supports for multiple raceways capable of supporting combined weight of supported systems and its contents.
- C. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
- D. Rated Strength: Adequate in tension, shear, and pullout force to resist maximum loads calculated or imposed for this Project, with a minimum structural safety factor of five times the applied force.

PART 2 – PRODUCTS

2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

- A. Steel Slotted Support Systems
 - 1. Comply with MFMA-4, factory-fabricated components for field assembly.
 - 2. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
 - 3. Nonmetallic Coatings:
 - a. PVC, polyurethane, or polyester coating applied according to MFMA-4.
 - b. Minimum thickness shall be 40 mils.
 - 4. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.
 - 5. Channel Dimensions: Selected for applicable load criteria.
 - 6. Manufacturers:
 - a. Cooper B-Line, Inc.
 - b. ERICO International Corporation
 - c. Hilti Corporation
 - d. Thomas & Betts Corporation
 - e. Unistrut
 - f. Approved equal
- B. Raceway and Cable Supports: As described in NECA 1 and NECA 101.

- C. Conduit and Cable Support Devices: Steel hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.
- D. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for non-armored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be malleable iron.
- E. Structural Steel for Fabricated Supports and Restraints: ASTM A36/A36M, steel plates, shapes, and bars; black and galvanized.
- F. Mounting, Anchoring, and Attachment Components:
 - 1. General:
 - a. Anchors shall be steel with corrosion resistant, durable coating or stainless steel
 - b. Select anchors with strength required for anchor and as tested according to ASTM E488.
 - c. Minimum length shall be eight times diameter.
 - d. Tension, shear, and pullout capacities shall be appropriate for supported loads and building materials used
 - e. Post installed anchors must be listed in a current evaluation report issued by one of the following:
 - 1. International Code Council Evaluation Service (ICC-ES)
(<http://www.icc-es.org/reports/index.cfm?search=search>)
 - 2. City of Los Angeles Research Report
 - 2. Powder-Actuated Fasteners:
 - a. Threaded-steel stud, for use in hardened portland cement concrete, steel, or wood
 - b. Manufacturers:
 - 1. Hilti Corporation
 - 2. Simpson Strong-Tie Co., Inc.
 - 3. Approved equal
 - 3. Mechanical-Expansion Anchors:
 - a. Insert-wedge-type, stainless steel, for use in hardened portland cement
 - b. Anchors shall meet the descriptive part of Federal Specifications FF-S-325 Group II, Type 2, Class 2, Style 1.
 - c. Anchors shall be equivalent to Hilti Kwik-Bolt TZ.
 - 4. Concrete inserts shall be steel or malleable-iron, slotted support system units similar to MSS Type 18; complying with MFMA-4 or MSS SP-58
 - 5. Clamps for attachment to steel structural elements: MSS SP-58, type suitable for attached structural element
 - 6. Through bolts shall be structural type, hex head, high strength and comply with ASTM A325
 - 7. Toggle Bolts: All-steel springhead type
 - 8. Hanger Rods: Threaded steel

2.2 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

- A. Description: Welded or bolted, structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.
- B. Materials:

1. Comply with requirements with ASTM A36 (ferrous metals), ASTM A167 and ASTM A276 (stainless steel), and ASTM B221 and B632 (aluminum) for shapes and plates.
2. Hot dipped galvanized steel
3. Stainless steel for corrosive areas

2.3 CONCRETE BASES

- A. Concrete Pad
 1. Concrete shall have strength of 3000 PSI within 28 days.
 2. The pad shall be large enough to achieve the following:
 - a. Edge of anchor bolt holes shall be a minimum of 10 times the bolt diameter from edge of pad.
 - b. Edge of equipment shall be a minimum of 8 inches from edge.
 3. Minimum thickness shall be 12 inches with 3 inch deep by 12 inch wide footing around perimeter
 4. Bottom of footings shall be a minimum of 8" below finished grade.
 5. Pad shall include #4 rebar at 10 inch intervals in both x direction and y direction.
- B. Concrete Pole Bases: Refer to Typical Details

PART 3 – EXECUTION

3.1 APPLICATION

- A. Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems except if requirements in this Section are stricter.
- B. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMT, IMC, and RMC as required by California Electrical Code. Minimum rod size shall be 1/4 inch (6 mm) in diameter.
- C. Multiple Raceways or Cables:
 1. Install trapeze-type supports fabricated with steel slotted support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.
 2. Secure raceways and cables to these supports with two-bolt conduit clamps
- D. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch (38-mm) and smaller raceways serving branch circuits and communication systems above suspended ceilings and for fastening raceways to trapeze supports.

3.2 SUPPORT INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this Article.
- B. Raceway Support Methods: In addition to methods described in NECA 1, EMT, IMC, and RMC may be supported by openings through structure members, as permitted in California Electric Code.
- C. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb (890 N).

- D. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code.
1. Wood framing: Fasten with lag screws or through bolts.
 2. Light gauge steel framing: self tapping screws
 3. Steel beams: beam clamps
 4. Concrete: expansion fasteners

3.3 CONDUIT SUPPORTS

- A Conduit supports
- 1 For Individual conduit runs not directly fastened to the structure: Rod hangers
 - 2 For multiple conduit runs: Trapeze type conduit support designed for maximum loading deflection not exceeding manufacturer's recommendations.
 - 3 Wire or sheet metal strips are not acceptable for conduit not directly fastened to structure or for multiple conduit runs.
- B Support conduit with Underwriters' Laboratories listed conduit support intervals required by the California Electric Code.
- C Individual conduit 1/2 inch and 3/4 inch size may be supported from ceiling support wire with Caddy clips only if acceptable to local code. Only one conduit is permitted to be attached to any ceiling support wire. Hang such conduit so as not to affect level of ceiling.
- D Avoid attaching conduit to fan plenums. When it is necessary to support conduit from fan plenum, provide a length of flexible conduit between the section attached to the fan plenum and other sections. Provide a length of flexible conduit between the portion attached to the building and the rest of the conduit run to minimize transmission of vibration to the building structure.
- E Supports anchored to earth shall be anchored in a concrete base per details.

3.4 INSTALLATION OF POST-INSTALLED ANCHORS

- A. Minimum distances
1. Bolt hole edge to edge of concrete: 10 times bolt diameter
 2. Bolt center to bolt center: 12 times bolt diameter
- B. Expansion type anchors
1. Anchor shall be installed and torque per manufacturer's recommendations.
 2. Setting verification:
 - a. Torque-controlled anchors: Following attainment of 10% of the required torque, torque-controlled anchors shall not require more than six (6) additional complete turns of the nut during installation to achieve the manufacturer's specified installation torque. The extent of bolt projection after installation shall be measured to confirm that this requirement has been met.
 - b. Displacement-controlled anchors: The position of the plug in the anchor shell shall be checked with the manufacturer-supplied installation tool or other appropriate device. The position of the plug shall conform to the manufacturer's specifications.
 3. Allowable loads
 - a. Anchors not installed in underside of beam/slab:
 1. When tested in accordance with AC01, Section 5.6: Values listed in ICC-ES report

2. When not tested in accordance with AC01, Section 5.6: 80% of values listed in ICC-ES report
- b. Anchors installed in underside of beam/slab:
 1. When tested in accordance with AC01, Section 5.6: Values for anchor without special inspection or in cracked concrete in ICC-ES report
 2. When not tested in accordance with AC01, Section 5.6: 80% of values for anchor without special inspection or in cracked concrete in ICC-ES report
- C. Epoxy-type (adhesive) Anchors
 1. Allowable loads: values from ICC-ES report when compliant with AC58.
- D. Anchors must receive special inspection per CBC Section 1704.15.

3.5 TESTING AND INSPECTION OF POST-INSTALLED ANCHORS

- A. General
 1. Post-installed anchors shall be tested in accordance with the provisions of 2001 California Building Code Section 1923A.3.5, by an authority having jurisdiction accepted testing facility, unless approval of an alternative individual is obtained in advance from the authority having jurisdiction.
 2. If any anchor fails testing, test all anchors of the same type, not previously tested until twenty (20) consecutive anchors pass, then resume the initial test frequency. If the anchors are used for the support and bracing of non-structural components (pipe, duct or conduit), the twenty (20) shall be only those anchors installed by the same trade.
 3. Test equipment (including torque wrenches) is to be calibrated by an approved testing laboratory in accordance with standard recognized procedures.
 4. Regardless of which test method is chosen, test values and all appropriate criteria shall be shown on the contract documents.
 5. Anchor diameter refers to the thread size for the wedge and sleeve categories, and to the anchor outside diameter for the sleeve category.
 6. Apply proof test loads to wedge and sleeve anchors without removing the nut if possible. If not, remove nut and install a threaded coupler to the same tightness as the original nut using a torque wrench to apply the test load.
 7. For sleeve/shell internally threaded categories, verify that the anchor is not prevented from withdrawing by a baseplate or other fixtures. If restraint is found, loosen and shim or remove fixture(s) prior to testing.
 8. Reaction loads from test fixtures may be applied close to the anchor being tested, provided the anchor is not restrained from withdrawing by the fixture(s).
 9. Alternate torque test procedures and test values for shell type anchors may be submitted to the enforcement agency for review and approval on a case-by-case basis when test procedures are submitted and approved by the enforcement agency.
 10. Required test loads may be determined by either of the following methods:
 - a. Twice the allowable tension load from Part 3.4.
 - b. Tension or torque test values from the table and procedures.

Test Values (Hardrock or Lightweight Concrete)							
Anchor	Wedge		Sleeve		Shell		Screw
Diameter (in)	Load (lbs)	Torque (ft. lbs)	Load (lbs)	Torque (ft. lbs)	Load (lbs)	Torque (ft. lbs)	Torque (ft. lbs)
1/4	800	10	400	4	1000	-	-
5/16	-	-	400	5	1400	-	-
3/8	1100	25	700	10	1800	-	10
1/2	2000	50	900	20	2700	-	10
5/8	2300	80	1100	45	3700	-	10
3/4	3700	150	1400	90	5400	-	20
1	5800	250	-	-	-	-	-

11. If the manufacturer's recommended installation torque is less than the test torque noted in the table, the manufacturer's recommended installation torque should be used in lieu of the tabulated values.

B. Expansion-type Anchors

1. The test load may be applied by any method that will effectively measure the tension in the anchor, such as direct pull with a hydraulic jack, calibrated spring-loaded devices, or a calibrated torque wrench. Displacement-controlled anchors such as drop-ins shall not be tested using a torque wrench.
2. Anchors tested with a hydraulic jack should exhibit no discernable movement during the tension test, e.g., as evidenced by loosening of the washer under the nut.
3. Anchors tested with a calibrated torque wrench must attain the specified torque within 1/2 turn of the nut.
4. Exceptions: Undercut anchors that are so designed to allow visual confirmation of full set, need not be tension or torque tested. If the manufacturer's installation torque is less than the specified test torque, use the manufacturer's specified installation torque for testing the anchor.
5. Apply proof test loads to wedge and sleeve anchors without removing the nut if possible. If not, remove nut and install a threaded coupler to the same tightness as the original nut using a torque wrench to apply the test load.
6. For sleeve/shell internally threaded categories, verify that the anchor is not prevented from withdrawing by a baseplate or other fixtures. If restraint is found, loosen and shim or remove fixture(s) prior to testing.
7. Reaction loads from test fixtures may be applied close to the anchor being tested, provided the anchor is not restrained from withdrawing by the fixture(s).
8. Shell type anchors should be tested as follows:
 - a. Visually inspect 25% for full expansion as evidenced by the location of the expansion plug in the anchor body. Plug location of a fully expanded anchor should be as recommended by the manufacturer, or, in the absence of such recommendation, as determined on the job site following the manufacturer's installation instructions. At least 5% of the anchors shall be proof loaded as indicated in the table above, but not less than three anchors per day for each different person or crew installing anchors, or;
 - b. Test installed anchors per current edition of the CBC Section 1913A.7.

C. Epoxy-type (adhesive) Anchors

1. Epoxy-type (adhesive) anchors shall be tension tested per current edition of the CBC Section 1913A.7. The tension test load shall equal twice the allowable load for the specific location of the anchor to be tested (i.e., accounting for edge distance) or 80% of the yield strength of the bolt ($0.8A_bF_y$), whichever is less. The

- test procedures for expansion-type anchors in the attached table shall also be used for epoxy-type (adhesive) anchors. Torque testing of epoxy-type (adhesive) anchors is not permitted.
2. Where epoxy-type (adhesive) anchors are used as shear dowels across cold joints in slabs on grade and the slab is not part of the structural system, testing of those dowels is not required.
 3. Anchors shall exhibit no discernible movement during the tension test.
- D. Screw-type Anchors
- E. The following criteria apply for the acceptance of installed anchors:
1. Hydraulic ram method: The anchor should have no observable movement at the applicable test load. For wedge and sleeve type anchors, a practical way to determine observable movement is that the washer under the nut becomes loose.
 2. Torque wrench method: The applicable test torque must be reached within the following limits:
 - a. Wedge or Sleeve type: One-half (1/2) turn of the nut.
 - b. One-quarter (1/4) turn of the nut for the 3/8 in. sleeve anchor only.

3.6 PAINTING

- A. Touchup:
1. Clean field welds and abraded areas of shop paint.
 2. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting.
 3. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils (0.05 mm).
 4. Comply with the following requirements
 - a. Architectural painting specifications
 - b. SSPC-PA 1 requirements for touching up field-painted surfaces.
- B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A780.

END OF SECTION

SECTION 26 05 48 VIBRATION AND SEISMIC CONTROLS FOR ELECTRICAL SYSTEMS

PART 1 – GENERAL

1.1 SECTION INCLUDES

Anchoring and vibration isolation equipment for electrical equipment:

- A. Isolation pads
- B. Spring isolators
- C. Restrained spring isolators
- D. Channel support systems
- E. Restraint cables
- F. Hanger rod stiffeners
- G. Anchorage bushings and washers

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A Division 1
 - 1 Section 013000: Administrative Requirements
 - 2 Section 013300: Submittal Procedures
 - 3 Section 014000: Quality Requirements
 - 4 Section 016000: Product Requirements
 - 5 Section 017000: Execution and Closeout Requirements
 - 6 All other included sections under Division 1
- B All included sections under Division 26
- C All included sections under Division 27
- D All included sections under Division 28
- E Plans
- F Manufacturers' manuals, product bulletins, etc.

1.3 REFERENCE STANDARDS AND CODES

- A Published specifications standards, tests or recommended methods of trade, industry or government organizations apply to work in this section as cited in Section 260000.
- B American Society for Testing and Materials (ASTM)
 - 1 ASTM A36/A36M: Standard Specification for Carbon Structural Steel
 - 2 ASTM A325: Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 KSI Minimum Tensile Strength
 - 3 ASTM A563: Standard Specification for Carbon and Alloy Steel Nuts
 - 4 ASTM B633: Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel
 - 5 ASTM E488: Standard Test Methods for Strength of Anchors in Concrete Elements
 - 6 ASTM F594: Standard Specification for Stainless Steel Nuts
- C American Welding Society (AWS)
 - 1 AWS D1.1: Structural Welding Code - Steel
- D California Building Safety Codes (CBSC)
 - 1 California Building Code (CBC)
 - 2 California Electrical Code (CEC)
- E General Services Administration

- 1 FF-S-325
- 2 W-C-582: Conduit, Raceway, Metal and Fittings: Surface
- 3 WW-H-171: Hanger and Support, Pipe
- F ICC Evaluation Service (ICC-ES)
 - 1 ESR-1917
- G National Electrical Contractors Association
 - 1 NECA 1: Standard Practice of Good Workmanship in Electrical Construction
- H Underwriters' Laboratories

1.4 QUALITY ASSURANCE

- A. Comply with seismic-restraint requirements in the IBC unless requirements in this Section are more stringent.
- B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- C. Seismic-restraint devices shall have horizontal and vertical load testing and analysis and shall bear anchorage preapproval OPA number from OSHPD, preapproval by ICC-ES, or preapproval by another agency meeting requirements of Part 1.6, showing maximum seismic-restraint ratings. Ratings based on independent testing are preferred to ratings based on calculations. If preapproved ratings are not available, submittals based on independent testing are preferred. Calculations (including combining shear and tensile loads) to support seismic-restraint designs must be signed and sealed by a qualified professional engineer.
- D. Comply with latest editions of the California Building Code and California Electric Code

1.5 SUBMITTALS

- A. Submit under provisions of Section 013000 or 013300.
- B. Submittals shall include the following:
 - 1. Table of contents
 - 2. A complete set of detailed manufacturer's specifications describing and illustrating all standard and special components and materials
 - 3. Part numbers
 - 4. Evidence of compliance with the applicable standards listed under Article 1.3 of this section
 - 5. Maintenance instructions and intervals
 - 6. A complete set of drawings for any special items
 - 7. Include rated load, rated deflection, and overload capacity for each vibration isolation device.
 - 8. Illustrate and indicate style, material, strength, fastening provision, and finish for each type and size of seismic-restraint component used.
 - a. Tabulate types and sizes of seismic restraints, complete with report numbers and rated strength in tension and shear as evaluated by an agency meeting requirements of Part 1.6.
 - b. Annotate to indicate application of each product submitted and compliance with requirements.
 - 9. Restrained-Isolation Devices: Include ratings for horizontal, vertical, and combined loads.
- C. Electronic submittals shall be searchable
- D. Delegated-Design Submittal: For vibration isolation and seismic-restraint details indicated to comply with performance requirements and design criteria, including

analysis data signed and sealed by the qualified licensed structural engineer responsible for their preparation.

1. Design Calculations:
 - a. Calculate static and dynamic loading due to equipment weight and operation, seismic forces required to select vibration isolators and seismic restraints.
 - b. Coordinate design calculations with wind-load calculations required for equipment mounted outdoors. Comply with requirements in other electrical Sections for equipment mounted outdoors.
2. Indicate materials and dimensions and identify hardware, including attachment and anchorage devices.
3. Field-fabricated supports.
4. Seismic-Restraint Details:
 - a. Design Analysis: To support selection and arrangement of seismic restraints. Include calculations of combined tensile and shear loads.
 - b. Details: Indicate fabrication and arrangement. Detail attachments of restraints to the restrained items and to the structure. Show attachment locations, methods, and spacing. Identify components, list their strengths, and indicate directions and values of forces transmitted to the structure during seismic events. Indicate association with vibration isolation devices.
 - c. Preapproval and Evaluation Documentation: By an agency meeting requirements of Part 1.6, showing maximum ratings of restraint items and the basis for approval (tests or calculations).
- E. Welding certificates.
- F. Field quality-control test reports.
- G. The submittal shall be substantially complete for all items and equipment furnished under this section.
- H. Individual drawings and data sheets submitted at random intervals will not be accepted for review.
- I. Substitutions: Items of same function and performance shall be submitted in conformance with Division 1.

1.6 OPERATION AND MAINTENANCE MANUALS

- A Submit manuals at close out.
- B The manuals shall, at minimum, include the following:
 - 1 Manufacturer (including contact information)
 - 2 Model number
 - 3 Load ratings
 - 4 Material type(s)
 - 5 Environmental ratings
 - 6 Maintenance requirements
 - 7 Installation instructions
 - 8 Repair instructions (where applicable)
- C Provide manuals in one of the following formats
 - 1 Three hardcopies
 - 2 PDF

1.7 PERFORMANCE REQUIREMENTS

Seismic-Restraint Loading:

- A. Site Class as Defined in the CBC: Refer to structural plans
- B. Assigned Seismic Use Group or Building Category as Defined in the CBC: Refer to structural plans
 - 1. Component Importance Factor: Refer to structural plans
 - 2. Component Response Modification Factor: Refer to structural plans
 - 3. Component Amplification Factor: Refer to structural plans
- C. Mapped Spectral Acceleration for Short Period (0.2 Second): S_S Refer to structural plans
- D. Site Coefficient for Short Period: F_a Refer to structural plans
- E. Maximum Spectral Response Acceleration for Short Period: S_{MS} Refer to structural plans
- F. Design Spectral Response Acceleration for Short Period: S_{DS} Refer to structural plans
- G. Mapped Spectral Acceleration for 1 Second Period: S_1 Refer to structural plans
- H. Site Coefficient for 1 Second Period: F_v Refer to structural plans
- I. Maximum Spectral Response Acceleration for 1 Second Period: S_{M1} Refer to structural plans
- J. Design Spectral Response Acceleration for 1 Second Period: S_{D1} Refer to structural plans

1.8 QUALIFICATIONS OF TESTING AGENCY

The testing agency shall meet the following requirements:

- A. Federal OSHA criteria for accreditation of testing laboratories, Standard Number 1910.7 (Definition and Requirements for a nationally recognized testing laboratory). Membership in the National Electrical Testing Association constitutes proof of meeting such criteria.
- B. Acceptable to authorities having jurisdiction.

PART 2 – PRODUCTS

2.1 VIBRATION ISOLATORS

- A. Pads:
 - 1. Arrange in single or multiple layers of sufficient stiffness for uniform loading over pad area, molded with a nonslip pattern and galvanized-steel baseplates, and factory cut to sizes that match requirements of supported equipment.
 - 2. Resilient Material: Oil and water resistant, waffle embossed neoprene.
- B. Spring Isolators: Freestanding, laterally stable, open-spring isolators.
 - 1. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
 - 2. Minimum Additional Travel: 50 percent of the required deflection at rated load.
 - 3. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
 - 4. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.
 - 5. Baseplates: Factory drilled for bolting to structure and bonded to 1/4-inch- (6-mm-) thick, rubber isolator pad attached to baseplate underside. Baseplates shall limit floor load to 500 psig (3447 kPa).
 - 6. Top Plate and Adjustment Bolt: Threaded top plate with adjustment bolt and cap screw to fasten and level equipment.
- C. Restrained Spring Isolators: Freestanding, steel, open-spring isolators with seismic or limit-stop restraint.

1. Housing: Steel with resilient vertical-limit stops to prevent spring extension due to weight being removed; factory-drilled baseplate bonded to 1/4-inch- (6-mm-) thick, neoprene or rubber isolator pad attached to baseplate underside; and adjustable equipment mounting and leveling bolt that acts as blocking during installation.
2. Restraint: Seismic or limit-stop as required for equipment and authorities having jurisdiction.
3. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
4. Minimum Additional Travel: 50 percent of the required deflection at rated load.
5. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
6. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.

2.2 SEISMIC-RESTRAINT DEVICES

- A. General Requirements for Restraint Components: Rated strengths, features, and application requirements shall be as defined in reports by an agency meeting requirements of Part 1.6.
- B. Structural Safety Factor: Allowable strength in tension, shear, and pullout force of components shall be at least four (verify with structural engineer) times the maximum seismic forces to which they will be subjected.
- C. Channel Support System: MFMA-3, shop- or field-fabricated support assembly made of slotted steel channels with accessories for attachment to braced component at one end and to building structure at the other end and other matching components and with corrosion-resistant coating; and rated in tension, compression, and torsion forces.
- D. Restraint Cables: ASTM A 492 stainless-steel cables with end connections made of steel assemblies with thimbles, brackets, swivels, and bolts designed for restraining cable service; and with a minimum of two clamping bolts for cable engagement.
- E. Hanger Rod Stiffener: Steel tube or steel slotted-support-system sleeve with internally bolted connections or reinforcing steel angle clamped to hanger rod. Do not weld stiffeners to rods.
- F. Bushings for Floor-Mounted Equipment Anchor: Neoprene bushings designed for rigid equipment mountings and matched to type and size of anchors and studs.
- G. Bushing Assemblies for Wall-Mounted Equipment Anchorage: Assemblies of neoprene elements and steel sleeves designed for rigid equipment mountings and matched to type and size of attachment devices.
- H. Resilient Isolation Washers and Bushings: One-piece, molded, oil- and water-resistant neoprene, with a flat washer face.
- I. Mounting, Anchoring, and Attachment Components: Refer to Section 260529.
- J. Steel parts shall be hot dipped galvanized after fabrication for dry areas or stainless steel for damp or wet locations.

PART 3 – EXECUTION

3.1 APPLICATIONS

- A. Multiple Raceways or Cables: Secure raceways and cables to trapeze member with clamps approved for application by an agency meeting requirements of Part 1.6.

- B. Hanger Rod Stiffeners: Install hanger rod stiffeners where indicated or scheduled on Drawings to receive them and where required to prevent buckling of hanger rods due to seismic forces.
- C. Strength of Support and Seismic-Restraint Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static and seismic loads within specified loading limits.

3.2 SEISMIC-RESTRAINT DEVICE INSTALLATION

- A. Equipment and Hanger Restraints:
 - 1. Install restrained isolators on electrical equipment.
 - 2. Install resilient, bolt-isolation washers on equipment anchor bolts where clearance between anchor and adjacent surface exceeds 0.125 inch (3.2 mm).
 - 3. Install seismic-restraint devices using methods approved by an agency meeting requirements of Part 1.6 providing required submittals for component.
- B. Install bushing assemblies for mounting bolts for wall-mounted equipment, arranged to provide resilient media where equipment or equipment-mounting channels are attached to wall.
- C. Attachment to Structure: If specific attachment is not indicated, anchor bracing to structure at flanges of beams, at upper truss chords of bar joists, or at concrete members.
- D. Drilled-in Anchors:
 - 1. Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Do not damage existing reinforcing or embedded items during coring or drilling. Notify the structural engineer if reinforcing steel or other embedded items are encountered during drilling. Locate and avoid prestressed tendons, electrical and telecommunications conduit, and gas lines.
 - 2. Do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.
 - 3. Wedge Anchors: Protect threads from damage during anchor installation. Heavy-duty sleeve anchors shall be installed with sleeve fully engaged in the structural element to which anchor is to be fastened.
 - 4. Adhesive Anchors: Clean holes to remove loose material and drilling dust prior to installation of adhesive. Place adhesive in holes proceeding from the bottom of the hole and progressing toward the surface in such a manner as to avoid introduction of air pockets in the adhesive.
 - 5. Set anchors to manufacturer's recommended torque, using a torque wrench.
 - 6. Install zinc-coated steel anchors for interior and stainless-steel anchors for exterior applications.

3.3 ACCOMMODATION OF DIFFERENTIAL SEISMIC MOTION

Install flexible connections in runs of raceways, cables, wireways, cable trays, and busways where they cross seismic joints, where adjacent sections or branches are supported by different structural elements, and where they terminate with connection to equipment that is anchored to a different structural element from the one supporting them as they approach equipment.

3.4 FIELD QUALITY CONTROL

Tests and Inspections:

- A. Obtain Architect's approval before transmitting test loads to structure. Provide temporary load-spreading members.

- B. Test at least 10% of each type and size of installed anchors and fasteners selected by Architect.
- C. Test to 90 percent of rated proof load of device.
- D. Measure isolator restraint clearance.
- E. Measure isolator deflection.
- F. Verify snubber minimum clearances.
- G. If a device fails test, modify all installations of same type and retest until satisfactory results are achieved.
- H. Remove and replace malfunctioning units and retest as specified above.
- I. Prepare test and inspection reports.

3.5 ADJUSTING

- A. Adjust isolators after isolated equipment is at operating weight.
- B. Adjust limit stops on restrained spring isolators to mount equipment at normal operating height. After equipment installation is complete, adjust limit stops so they are out of contact during normal operation.
- C. Adjust active height of spring isolators.
- D. Adjust restraints to permit free movement of equipment within normal mode of operation.

3.6 ELECTRICAL VIBRATION-CONTROL AND SEISMIC-RESTRAINT DEVICE SCHEDULE

- A. Provide the owner with a schedule of all major supported or suspended electrical equipment. Include the following.
 - 1. Equipment Location
 - 2. Pads:
 - a. Material
 - b. Thickness
 - c. Durometer
 - d. Number of Pads
 - 3. Isolator Type
 - 4. Component Importance Factor
 - 5. Component Response Modification Factor
 - 6. Component Amplification Factor
- B. Provide the owner with cut sheets for all other support equipment.

END OF SECTION

SECTION 26 08 00 COMMISSIONING OF ELECTRICAL SYSTEMS

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A Testing in conformity with equipment applicable to this project, applicable codes and authorities having jurisdiction
- B Test equipment requirements listed in this section shall apply to testing required by all other sections in Division 26, Division 27, and Division 28.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A Division 1
 - 1 Section 013000: Administrative Requirements
 - 2 Section 013300: Submittal Procedures
 - 3 Section 014000: Quality Requirements
 - 4 Section 016000: Product Requirements
 - 5 Section 017000: Execution and Closeout Requirements
 - 6 All other included sections under Division 1
- B All included sections under Division 26
- C All included sections under Division 27
- D All included sections under Division 28
- E Plans
- F Manufacturers' manuals, product bulletins, etc.

1.3 REFERENCE STANDARDS AND CODES

- A Published specifications standards, tests or recommended methods of trade, industry or government organizations apply to work in this section as cited in Section 260000.
- B California Electrical Code
- C International Electrical Testing Association (NETA)
 - 1 NETA ATS: for Acceptance Testing Specifications for Electrical Power Equipment and Systems
- D Institute of Electrical and Electronic Engineers
 - 1 IEEE 81: Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System Part 1: Normal Measurements
 - 2 IEEE 82: Standard Test Procedure for Impulse Voltage Tests on Insulated Conductors
 - 3 IEEE 95: Standard Test Procedure for Impulse Voltage Tests on Insulated Conductors
 - 4 IEEE 112: Standard Test Procedure for Polyphase Induction Motors and Generators
 - 5 IEEE 114: Standard Test Procedure for Single-Phase Induction Motors
 - 6 IEEE 115: IEEE Guide for Test Procedures for Synchronous Machines Part I—Acceptance and Performance Testing Part II—Test Procedures and Parameter Determination for Dynamic Analysis
 - 7 IEEE 141: Recommended Practice for Electric Power Distribution for Industrial Plants
 - 8 IEEE 142: Recommended Practice for Grounding of Industrial and Commercial Power Systems

- 9 IEEE 241: Recommended Practice for Electric Power Systems in Commercial Buildings
- 10 IEEE 242: Recommended Practice for Protection and Coordination of Industrial and Commercial Power Systems (IEEE Buff Book)
- 11 IEEE 252: Standard Test Procedure for Polyphase Induction Motors Having Liquid in the Magnetic Gap
- 12 IEEE 259: Standard Test Procedure for Evaluation of Systems of Insulation for Dry-Type Specialty and General-Purpose Transformers
- 13 IEEE 389: Recommended Practice for Testing Electronics Transformers and Inductors
- 14 IEEE 393: Test Procedures for Magnetic Cores
- 15 IEEE 399: Recommended Practice for Industrial and Commercial Power Systems Analysis (Brown Book)
- 16 IEEE 400: Guide for Field Testing and Evaluation of the Insulation of Shielded Power Cable Systems Rated 5 kV and Above
- 17 IEEE 442: Guide for Soil Thermal Resistivity Measurements
- 18 IEEE 495: Guide for Testing Faulted Circuit Indicators
- 19 IEEE 576: Recommended Practice for Installation, Termination, and Testing of Insulated Power Cable as Used in Industrial and Commercial Applications
- 20 IEEE 1188: Recommended Practice for Maintenance, Testing, and Replacement of Valve-Regulated Lead-Acid (VRLA) Batteries for Stationary Applications
- 21 IEEE 1234: Guide for Fault Locating Techniques on Shielded Power Cable Systems
- 22 IEEE 1415: Guide for Induction Machinery Maintenance Testing and Failure Analysis
- 23 IEEE 1458: Recommended Practice for the Selection, Field Testing, and Life Expectancy of Molded Case Circuit Breakers for Industrial Applications
- E National Institute of Standards and Technology (NIST)
- F Underwriters' Laboratories
 - 1 UL 1244: Electrical and Electronic Measuring and Testing Equipment
 - 2 UL 1436: Outlet Circuit Testers and Similar Indicating Devices
 - 3 UL 61010-2-030: Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 2-030: Particular requirements for testing and measuring circuits
 - 4 UL 61010B-1: Electrical Measuring and Test Equipment – Part 1: General Requirements
 - 5 UL 61010B-2-031: Electrical Equipment for Measurement, Control, and Laboratory Use – Part 2: Particular Requirements for Hand-Held Probe Assemblies for Electrical Measurement and Test
 - 6 UL 61010B-2-032: Electrical Equipment for Measurement, Control, and Laboratory Use – Part 2: Particular Requirements for Hand-Held Current Clamps for Electrical Measurement and Test

1.4 QUALITY ASSURANCE

- A The Contractor shall engage and pay for the services of a recognized independent testing laboratory for the purpose of performing inspections and tests as herein specified.
- B The testing laboratory shall provide all material, equipment, labor and technical supervision to perform switch tests and inspections.

- C It is the intent of these tests to assure that all electrical equipment, both Contractor and Owner supplied, is operational within industry and manufacturer's tolerances and is installed in accordance with design specifications.
- D The tests and inspections shall determine the suitability for energizing.
- E Schedule tests and give a minimum of two weeks advance notice to the Owner.

1.5 SUBMITTALS

- A List of tests preformed
- B Test procedures
- C Test results
- D The submittal shall be substantially complete for all items and equipment furnished under this section.
- E Individual drawings and data sheets submitted at random intervals will not be accepted for review.

1.6 QUALIFICATIONS OF TESTING AGENCY

The testing agency shall meet federal OSHA criteria for accreditation of testing laboratories, Standard Number 1910.7 (Definition and Requirements for a nationally recognized testing laboratory). International Electrical Testing Association (NETA) accreditation constitutes proof of meeting such criteria.

1.7 TEST INSTRUMENT TRACEABILITY

- A The testing laboratory shall have a calibration program which maintains all applicable test instrumentation within rated accuracy.
- B The accuracy shall be traceable to the National Institute of Standards and Technology (NIST) in an unbroken chain.
- C Instruments shall be calibrated in accordance with the following frequency schedule:
 - 1 Field instruments: 6 months maximum.
 - 2 Laboratory instruments: 12 months.
 - 3 Leased specialty equipment: 12 months
- D Dated calibration labels shall be visible on all test equipment.

1.8 FINAL SETTINGS

- A The test report shall include the following: summary of project, description of equipment tested, description of test, list of test equipment used in calibration and calibration date, test results, conclusions and recommendations, and appendix, including appropriate test forms.
- B The test report shall be bound and its contents certified.
- C Submit three copies of the completed report to the architect, or engineer if no architect is involved, no later than fifteen (15) days after completion of test, unless otherwise directed.

1.9 FAILURE TO TEST

- A Any system material or workmanship which is found defective on the basis of acceptance tests shall be reported directly to the architect or engineer if no architect is involved.
- B Contractor shall replace the defective material or equipment and have test repeated until test proves satisfactory without additional cost to the Owner.

PART 2 – PRODUCTS: [NOT USED]

PART 3 – EXECUTION

3.1 GROUND RESISTANCE TEST

- A Building ground electrode resistance testing shall be accomplished with a ground resistance, direct-reading, single test meter utilizing the Fall-of-Potential method and two (2) referenced electrodes. Perform test prior to interconnection to other grounding system. Orient the concrete-encased ground electrode to be tested and the two referenced electrodes in straight line spaces fifty (50) feet apart. Drive the two (2) reference electrodes ten (10) feet deep.
- B Test results shall be in writing, and shall show temperature, humidity and condition of the soil at the time of the tests. In the case where the ground resistance exceeds 25 ohms, add an additional ground rod and retest. Add additional ground rods when necessary in order to bring the ground resistance below 25 Ohms. All testing shall be done prior to concrete pour and in the presence of the inspector of record. Provide test results for engineer review.

3.2 MISCELLANEOUS TESTING

- A Functional and operational testing to the fire alarm, security system, telephone system, paging/intercom system, and all electrical components upon completion of electrical work.
- B Perform an insulation resistance test on all switchboard busses, bus ducts; feeder conductors, including neutrals, using a megohmmeter. Minimum value for each conductor shall be 20 megohms.

3.3 ELECTRICAL DISTRIBUTION EQUIPMENT OPERATIONAL CHECK

- A Electrical distribution equipment operational check includes main switchboards, distribution boards, panelboards, panels, switchgear, etc.
- B Verify proper operating condition of all equipment mechanically and electrically including, but not limited to verifying operation of each circuit breaker trip device with a rating of 100A or more using an accurately metered timed instrument (by passing 300% rated current through each pole).
- C If any equipment is found defective during operational check, it shall be replaced by the Contractor without cost to the Owner. The tests shall be repeated by the Contractor without cost to the owner until satisfactory results are obtained.

END OF SECTION

SECTION 26 22 00 LOW VOLTAGE (0-600V) TRANSFORMERS

PART 1 – GENERAL

1.1 SECTION INCLUDES

This section includes minimum requirement for low voltage transformers.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A All included specifications included within the plans.
- B Plans
- C Manufacturers' manuals, product bulletins, etc.

1.3 REFERENCE STANDARDS AND CODES

- A Transformers 750kVA and smaller shall be listed by Underwriters Laboratories.
- B Institute of Electrical and Electronics Engineers (IEEE)
 - 1 IEEE 259: Standard Test Procedure for Evaluation of Systems of Insulation for Dry-Type Specialty and General-Purpose Transformers
 - 2 IEEE 295: Electronics Power Transformers
 - 3 IEEE 389: Recommended Practice for Testing Electronics Transformers and Inductors
 - 4 IEEE 393: Test Procedures for Magnetic Cores
 - 5 IEEE C57.12.01: Standard General Requirements for Dry-Type Distribution and Power Transformers Including Those with Solid Cast and/or Resin Encapsulated Windings
 - 6 IEEE C57.12.28: Pad Mounted Equipment Enclosure Integrity
 - 7 IEEE C57.12.28: Pad Mounted Equipment Enclosure Integrity for Coastal Applications (where applicable)
 - 8 IEEE C57.12.34: Three Phase, Pad Mounted, Distribution Transformers
 - 9 IEEE C57.12.38: Single Phase, Pad Mounted, Distribution Transformers
 - 10 IEEE C57.12.60: Standard Test Procedure for Thermal Evaluation of Insulation Systems for Dry-Type Power and Distribution Transformers, Including Open-Wound, Solid-Cast, and Resin-Encapsulated Transformers
 - 11 IEEE C57.12.91: Standard Test Code for Dry-type Distribution and Power Transformers
 - 12 IEEE C57.98: Guide for Transformer Impulse Tests
- C National Electrical Manufacturers' Association
 - 1 Transformers shall be manufactured and tested in accordance with NEMA ST20.
- D National Fire Protection Association
 - 1 NFPA 70: National Electrical Code
- E ANSI C57.110 and ANSI C57.12.22 requirements for pad mounted, compartmental type, self cooled, three phase distribution transformers and applicable provisions of other ANSI standards C57 Series.
- F Underwriters' Laboratories
 - 1 UL 50: Enclosures for Electrical Equipment, Non-environmental Considerations
 - 2 UL 50E: Enclosures for Electrical Equipment, Environmental Considerations
 - 3 UL 467: Grounding and Bonding Equipment
 - 4 UL 486E: Equipment Wiring Terminals for Use with Aluminum and/or Copper Conductors

- 5 UL 1332: Organic Coatings for Steel Enclosures for Outdoor Use Electrical Equipment
- 6 UL 1446 Systems of Insulating Materials – General
- 7 UL 1561: Dry-type General Purpose and Power Transformers
- 8 UL 2763: Energy Efficient Harmonic Cancellation Transformers
- 9 UL 5085-1: Low Voltage Transformers – Part 1: General Requirements
- 10 UL 5085-2: Low Voltage Transformers – Part 2: General Purpose Transformers

1.4 QUALITY ASSURANCE

- A Equipment and accessories shall be the product of a manufacturer regularly engaged in its manufacture.
- B Supply equipment and accessories new, free from defects.
- C Supply equipment and accessories in compliance with the applicable standards listed in Article 1.3 of this section and with applicable national, state and local codes.
- D Items of a given type shall be the products of the same manufacturer.
- E Ship equipment in its original packages to prevent damaging or entrance of foreign matter. Perform handling and shipping in accordance with manufacturer's recommendations. Provide protective covering during construction.
- F Replace at no expense to Owner, equipment or material damaged during storage or handling, as directed by the engineer.
- G Tag items with a weatherproof tag identifying equipment by name and purchase order number. Include packing and shipping lists.

1.5 SUBMITTALS

- A Submittals shall include the following:
 - 1 Table of contents
 - 2 A complete set of detailed manufacturer's specifications describing and illustrating all standard and special components and materials
 - 3 Part numbers
 - 4 Evidence of compliance with the applicable standards listed under Article 1.3 of this section
 - 5 Maintenance instructions and intervals
 - 6 A complete set of drawings for any special items
 - 7 Wiring diagrams
 - 8 Drawings shall include designations, dimensions, operating controls, instruments, riser diagrams, routing diagrams etc.
- B Electronic submittals shall be searchable.
- C Shop drawings required: drawings and descriptions containing information of weight, dimensions, rated kVA, sound level, impedance, voltage regulation and efficiency. Provide manufacturer's literature describing the product.
- D Test report of transformer furnished as hereinafter specified.
- E The submittal shall be substantially complete for all items and equipment furnished under this section.
- F Individual drawings and data sheets submitted at random intervals will not be accepted for review.
- G Substitutions: Items of same function and performance shall be submitted in conformance with Division 1.

1.6 OPERATION AND MAINTENANCE MANUALS

- A Submit operation and maintenance manuals in accordance with Section 260000.
- B The manuals shall, at minimum, include the following:
 - 1 Manufacturer (including contact information)
 - 2 Model number
 - 3 Manufacturer's data sheets – When data sheets include more than one model the model(s) used shall be noted
 - 4 Manufacturer's user and maintenance manual(s), including trouble-shooting guidelines
 - 5 Configuration settings
 - 6 Wiring diagrams
 - 7 Voltage ratings
 - 8 Current ratings
 - 9 Calibrated range
 - 10 List of capabilities
 - 11 Environmental ratings
 - 12 NEMA enclosure type
 - 13 Maintenance requirements
 - 14 Installation instructions
 - 15 Repair instructions
- C Provide manuals in one of the following formats
 - 1 Three hardcopies
 - 2 PDF

PART 2 – PRODUCTS

2.1 DISTRIBUTION TRANSFORMERS

- A General
 - 1 Except as otherwise indicated, provide manufacturer's standard materials and components, as indicated by published product information, designed and constructed as recommended by manufacturer and as required for complete installation.
 - 2 Temperature
 - a 150°C rise
 - b Self-cooled type
 - c The maximum temperature of the top of the enclosure shall not exceed 50°C rise above a 40°C ambient.
 - 3 Impedance shall be manufacturer's standard.
 - 4 All insulating materials used shall be in accordance with NEMA ST20 or NEMA TR27 standards and be rated for 220°C UL component recognized insulation system.
 - 5 The core of the transformer shall be visibly grounded to the enclosure by means of a flexible grounding conductor sized in accordance with applicable NEMA, IEEE and ANSI standards.
 - 6 Primary voltage, secondary voltage, and kVA capacity shall be as shown on the single line or three line diagram(s).
 - 7 All windings shall be copper.
- B Manufacturer:

- 1 Square D
 - 2 General Electric
 - 3 Eaton
 - 4 MGM
 - 5 Approved equal
- C Enclosure
- 1 Dead front
 - 2 Transformers 25 kVA and larger shall be in a heavy gauge, sheet steel, ventilated enclosure
 - 3 Provide wire fabric rodent guard over ventilated openings and designed to prevent accidental access to live parts in accordance with UL, NEMA, and California Electric Code standards for ventilated enclosures.
 - 4 Mounting
 - a Transformers 15 kVA through 75 kVA shall be designed so they can be either floor or wall mounted.
 - b Transformers above 75 kVA shall be floor mounted.
 - 5 Corrosion resistant coating
 - a The completed enclosure shall be degreased and cleaned.
 - b After the cleaning process is finished, the enclosure shall be phosphatized.
 - c After the phosphatizing, the enclosure shall receive an electrostatic deposition of polyester powder coating followed by baking to produce a hard, durable finish.
 - 1 The minimum thickness of the paint film shall be 2.0 mils.
 - 2 For the exterior of transformer tank, interior and exterior of primary and secondary cable compartments the minimum total dry film thickness shall be 3.5 mils.
 - 3 Paint film shall be uniform in color and free from blisters, sags, flaking and peeling
 - d Finish shall conform to UL 50 and UL 50E.
 - e Color shall be ANSI 61 Gray.
 - f Coat underside surfaces of equipment outdoors or in damp locations with a corrosion resistant coating.
- D Sound: Sound levels shall be guaranteed by the manufacturer not to exceed the following.
- 1 15-50 kVA 45 dB
 - 2 51-150 kVA 50 dB
 - 3 151-300 kVA 55 dB
 - 4 301-500 kVA 60 dB
 - 5 501-700 kVA 62 dB
 - 6 701-1000 kVA 64 dB
 - 7 1000-1500 kVA 65 dB
 - 8 1501-2000 kVA 66 dB
- E Efficiency: Transformers shall be low loss type with minimum efficiencies per DOE 2016.
- F The transformer(s) shall supply phase shift of 0° or 30°.
- G Transformers shall be supplied with quality, full width electrostatic shields resulting in a maximum effective coupling capacitance between primary and secondary of 33 picofarads. With transformers connected under normal, loaded operating conditions, the attenuation of line noise and transients shall equal or exceed the following limits.

- 1 Common Mode: 0 to 1.5kHz - 120dB; 1.5kHz to 10kHz - 90dB; 10kHz to 100kHz - 65dB; 100kHz to 1MHz - 40dB
- 2 Transverse Mode: 1.5kHz to 10kHz - 52dB; 10kHz to 100kHz - 30dB; 100kHz to 1MHz - 30dB

2.2 BUCK-BOOST TRANSFORMERS

- A. Where the available voltage is above the acceptable range (including taps), provide and install a bucking transformer.
- B. Where the available voltage is below the acceptable range (including taps), provide and install a boosting transformer.
- C. Voltage at secondary of buck or boost transformer shall be as close as possible to the nominal voltage of the system. Coordinate secondary voltage of buck or boost transformer, quantity of buck or boost transformers, and use of taps on distribution transformer to achieve this.
- D. Transformer shall be compatible with the voltage.
- E. Temperature rise, enclosure, efficiencies, and sound levels shall meet the requirements of the distribution transformers.

2.3 CONTROLS TRANSFORMERS

- A. Control transformers shall provide secondary voltage within limits of the equipment that it supplies.
- B. Transformer shall be completely enclosed or have OEM covers for all exposed, live parts. Covers shall be securely mounted transformer.
- C. When transformers are mounted within a control panel, the transformer shall be mounted at the top, near a vent.
- D. Whenever possible, the transformer shall be mounted outside of hazardous areas. When not possible, the transformer shall be listed for use within the classification of the hazardous area.
- E. Temperature rise, enclosure, efficiencies, and sound levels shall meet the requirements of the distribution transformers.

2.4 CONSTRUCTION

- A Transformer coils shall be of copper windings, continuous wound construction, and shall be impregnated with non-hygroscopic, thermosetting varnish.
- B All cores shall be constructed with low hysteresis and eddy current losses. Magnetic flux densities are to be kept well below the saturation point to prevent core overheating. Cores for transformers greater than 500kVA shall be clamped utilizing insulated bolts through the core laminations to ensure proper pressure throughout the length of the core. The completed core and coil shall be bolted to the base of the enclosure but isolated by means of rubber vibration-absorbing mounts. There shall be no metal-to-metal contact between the core and coil and the enclosure except for a flexible safety ground strap. Sound isolation systems requiring the complete removal of all fastening devices will not be acceptable.
- C The core of the transformer shall be visibly grounded to the enclosure by means of a flexible grounding conductor sized in accordance with applicable UL and NEC standards.
- D The transformer enclosures shall be ventilated and be fabricated of heavy gauge, sheet steel construction. The entire enclosure shall be finished utilizing a continuous process consisting of degreasing, cleaning, and phosphatizing; followed by electrostatic

deposition of polymer polyester powder coating and baking cycle to provide uniform coating of all edges and surfaces. The coating shall be UL recognized for outdoor use. The coating color shall be ANSI 49.

PART 3 – EXECUTION

3.1 ANCHORING

- A Install transformers as indicated, complying with manufacturers written instructions, applicable requirements of CEC, NEMA, ANSI, and IEEE standards, and in accordance with recognized industry practices to ensure that products fulfill requirements.
- B Floor and roof mounted transformers shall be mounted on steel plates cemented to neoprene pads with a bolt hole through both. Refer to details. Conduit entering transformers shall be isolated from case with oversize hole, ground wire, and rubber grommet.
- C Anchor transformer to concrete pad with 3/4" minimum diameter anchor bolts. Bolts and washers shall be galvanized. Strength of materials used to secure the transformer shall be sufficient to resist shear and uplift produced by force equal to one half of the equipment mass applied horizontally at center of gravity.

3.2 GROUNDING

Provide equipment grounding connections, sufficiently tight, to assure permanent and effective ground, for transformers as indicated.

3.3 TESTING

Upon completion of installation of transformers, energize primary circuit at rated voltage and frequency from normal power source and test transformers, including, but not limited to, audible sound levels, to demonstrate capability and compliance with requirements. Where possible, correct malfunctioning units at the site, then retest to demonstrate compliance; otherwise, remove and replace with new units and proceed with re-testing.

END OF SECTION

SECTION 26 24 16 PANELBOARDS

PART 1 – GENERAL

1.1 SECTION INCLUDES

Lighting and Appliance Panelboards

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A Division 1
 - 1 Section 013000: Administrative Requirements
 - 2 Section 013300: Submittal Procedures
 - 3 Section 014000: Quality Requirements
 - 4 Section 016000: Product Requirements
 - 5 Section 017000: Execution and Closeout Requirements
 - 6 All other included sections under Division 1
- B All included sections under Division 26
- C All included sections under Division 27
- D All included sections under Division 28
- E Plans
- F Manufacturers' manuals, product bulletins, etc.

1.3 REFERENCE STANDARDS AND CODES

- A Published specifications standards, tests or recommended methods of trade, industry or government organizations apply to work in this section as cited in Section 260000.
- B California Electrical Code
- C California Building Code
- D Institute of Electrical and Electronic Engineers (IEEE)
 - 1 IEEE 81: Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System
 - 2 IEEE 100: The Authoritative Dictionary of IEEE Standards Terms
 - 3 IEEE C2 National Electrical Safety Code
 - 4 IEEE C12.16: Solid-State Electricity Meters
 - 5 IEEE C37.13: Standard for Low-Voltage AC Power Circuit Breakers Used in Enclosures
 - 6 IEEE C37.20.1: Standard for Metal-Enclosed Low-Voltage Power Circuit-Breaker Switchgear
 - 7 IEEE C37.90.1: Standard for Surge Withstand Capability (SWC) Tests for Relays and Relay Systems Associated with Electric Power Apparatus
 - 8 IEEE C57.12.28: Standard for Pad-Mounted Equipment - Enclosure Integrity
 - 9 IEEE C57.13: Standard Requirements for Instrument Transformers
- E National Electrical Manufacturers' Association
 - 1 NEMA 250: Enclosures for Electrical Equipment (1000 Volts Maximum)
 - 2 NEMA PB 2: Deadfront Distribution Switchboards
 - 3 NEMA PB 2.1: General Instructions for Proper Handling, Installation, Operation and Maintenance of Deadfront Distribution Switchboards Rated 600 V or Less
 - 4 NEMA ST 20: Standard for Dry-Type Transformers for General Applications
 - 5 NEMA 12.10: Physical Aspects of Watthour Meters - Safety Standards
- F National Electrical Testing Association (NETA)

- 1 NETA ATS: Standard for Acceptance Testing Specifications for Electrical Power Equipment and Systems
- G Underwriters' Laboratories (UL)
 - 1 UL 50: Enclosures for Electrical Equipment, Non-environmental Considerations
 - 2 UL 50E: Enclosures for Electrical Equipment, Environmental Considerations
 - 3 UL 467: Grounding and Bonding Equipment
 - 4 UL 486A: Wire Connectors
 - 5 UL 486B: Wire Connectors
 - 6 UL 486E: Equipment Wiring Terminals for Use with Aluminum and/or Copper Conductors
 - 7 UL 489: Molded Case Circuit Breakers, Molded Case Switches, and Circuit Breaker Enclosures
 - 8 UL 891: Switchboards
 - 9 UL 1053: Ground-fault Sensing and Relaying Equipment
 - 10 UL 1059: Terminal Blocks
 - 11 UL 1558: Standard for Metal-Enclosed Low-Voltage Power Circuit Breaker Switchgear
 - 12 UL 2735: Electric Utility Meters
 - 13 UL 60947-1: Low-Voltage Switchgear and Controlgear – Part 1: General Rules
 - 14 UL 60947-7-1: Low-voltage switchgear and controlgear – Part 7-1: Ancillary equipment - Terminal blocks for copper conductors
 - 15 UL 60947-7-2: Low-Voltage Switchgear and Controlgear - Part 7-2: Ancillary Equipment - Protective Conductor Terminal Blocks for Copper Conductors

1.4 QUALITY ASSURANCE

- A Equipment and accessories shall be the product of a manufacturer regularly engaged in its manufacture.
- B Supply equipment and accessories new, free from defects.
- C Supply equipment and accessories in compliance with the applicable standards listed in Article 1.3 of this section and with applicable national, state and local codes.
- D Items of a given type shall be the products of the same manufacturer.
- E Ship equipment in its original packages to prevent damaging or entrance of foreign matter. Perform handling and shipping in accordance with manufacturer's recommendations. Provide protective covering during construction.
- F Replace at no expense to Owner, equipment or material damaged during storage or handling, as directed by the engineer.
- G Tag items with a weatherproof tag identifying equipment by name and purchase order number. Include packing and shipping lists.

1.5 SUBMITTALS

- A Submit under provisions of Section 013000 or 013300.
- B Submittals shall include the following:
 - 1 Table of contents
 - 2 A complete set of detailed manufacturer's specifications describing and illustrating all standard and special components and materials
 - 3 Part numbers
 - 4 Evidence of compliance with the applicable standards listed under Article 1.3 of this section
 - 5 Maintenance instructions and intervals

- 6 Calibration procedures and intervals
- C Submit shop drawings that include:
 - 1 Complete fabrication details
 - 2 Elevations and sections of enclosure(s)
 - 3 Dimensions of enclosure(s)
 - 4 Space available for conduits
 - 5 Voltage, ampacity, short circuit, and enclosure ratings
 - 6 Short circuit withstand ability of bus and lowest rated device,
 - 7 Circuit schedule showing circuit number, device description, circuit breaker frame ampere rating and trip or fuse clip ampere rating
 - 8 Termination lug size
 - 9 Feeder identification
 - 10 Single line diagram
 - 11 Include both elementary diagram and terminal to terminal wiring diagrams.
- D Electronic submittals shall be searchable
- E The submittal shall be substantially complete for all items and equipment furnished under this section.
- F Individual drawings and data sheets submitted at random intervals will not be accepted for review.
- G Substitutions: Items of same function and performance shall be in conformance with Division 1. The Contractor shall provide a comparison of the proposed substitute with the specified equipment for review by the Engineer.
- H Submit field test and operations check report for circuit breakers under provisions of Section 260500.

1.6 OPERATION AND MAINTENANCE MANUALS

- A Submit operation and maintenance manuals in accordance with Section 260000.
- B The manuals shall, at minimum, include the following:
 - 1 Manufacturer (including contact information)
 - 2 Model number
 - 3 Manufacturer's data sheets – When data sheets include more than one model the model(s) used shall be noted
 - 4 Manufacturer's user and maintenance manual(s), including trouble-shooting guidelines
 - 5 Configuration settings
 - 6 Wiring diagrams
 - 7 Voltage ratings
 - 8 Current ratings
 - 9 List of capabilities
 - 10 Environmental ratings
 - 11 NEMA enclosure type
 - 12 Maintenance requirements
 - 13 Installation instructions
 - 14 Repair instructions
- C Provide manuals in one of the following formats
 - 1 Three hardcopies
 - 2 PDF

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A Square D Company
 - 1 I-LINE
 - 2 NQ
 - 3 NF
- B Equals
 - 1 General Electric
 - 2 Eaton/Cutler-Hammer
 - 3 Approved equal

2.2 TYPE NQ PANELBOARD

- A Interior
 - 1 Shall be type NQ panelboard or approved equal rated for 240V_{AC}/48V_{DC} maximum. Continuous main current ratings, as indicated on associated schedules, not to exceed 600 amperes maximum.
 - 2 Minimum short circuit current rating: 22000AIC as indicated in rms symmetrical amperes at 240V_{AC}.
 - 3 Provide one (1) continuous bus bar per phase. Each bus bar shall have sequentially phased branch circuit connectors suitable for plug-on or bolt-on branch circuit breakers. The bussing shall be fully rated. Panelboard bus current ratings shall be determined by heat-rise tests conducted in accordance with UL 67. Bussing rated 100-400 amperes shall be copper. Bussing shall be copper as standard construction.
 - 4 Interior trim shall be of dead-front construction to shield user from energized parts. Dead-front trim shall have pre-formed twistouts covering unused mounting space.
- B Main Circuit Breaker
 - 1 Main circuit breakers shall have an over-center, trip-free, toggle mechanism which will provide quick-make, quick-break contact action. Circuit breakers shall have a permanent trip unit with thermal and magnetic trip elements in each pole. Each thermal element shall be true rms sensing and be factory calibrated to operate in a 40°C ambient environment. Thermal elements shall be ambient compensating above 40°C.
 - 2 Two- and three-pole circuit breakers shall have common tripping of all poles. Circuit breakers frame sizes above 100 amperes shall have a single magnetic trip adjustment located on the front of the circuit breaker which allows the user to simultaneously select the desired trip level of all poles. Circuit breakers shall have a push-to-trip button for maintenance and testing purposes.
 - 3 Breaker handle and faceplate shall indicate rated ampacity. Standard construction circuit breakers shall be UL Listed for reverse connection without restrictive line or load markings.
 - 4 Lugs shall be UL Listed to accept solid or stranded copper and aluminum conductors 90°C rated wire, sized according to the 75°C temperature rating per CEC Table 310-16.
- C Enclosures

- 1 Type 1 Boxes
 - a Boxes shall be galvanized steel constructed in accordance with UL 50 requirements.
 - b Boxes shall have removable end walls with knockouts located on one end. Boxes shall have welded interior mounting studs. Interior mounting brackets are not required.
 - c Box width shall be 20 in wide.
- 2 Type 1 Fronts
 - a Front shall meet strength and rigidity requirements per UL 50 standards.
 - b Front shall have cylindrical tumbler type lock with catch and spring-loaded stainless steel door pull. All lock assemblies shall be keyed alike. Two (2) keys shall be provided with each lock. A clear plastic directory card holder shall be mounted on the inside of door.
 - c All electrical busses shall be copper.
- 3 Type 3R, 5, and 12
 - a Enclosures shall be constructed in accordance with UL 50 requirements
 - b All doors shall be gasketed and equipped with a tumbler type vault lock. All lock assemblies shall be keyed alike. One (1) key shall be provided with each lock. A clear plastic directory card holder shall be mounted on the inside of door.
 - c Maximum enclosure dimensions shall not exceed 20 in wide and 6.5 in deep.

2.3 TYPE NF PANELBOARD

- A Interior
 - 1 Shall be type NF panelboard for 480Y/277V_{AC} maximum. Continuous main current ratings, as indicated on associated schedules, not to exceed 600 amperes maximum.
 - 2 Minimum Short Circuit Rating: 14000 as indicated rms symmetrical amperes at 480Y/277V_{AC}.
 - 3 Provide one (1) continuous bus bar per phase. Each bus bar shall have sequentially phased branch circuit connectors limited to bolt-on branch circuit breakers. The bussing shall be fully rated. Panelboard bus current ratings shall be determined by heat-rise tests conducted in accordance with UL 67. Bussing rated 100-400 amperes shall be copper. Bussing rated for 600 amperes shall be copper as standard construction.
 - 4 Interior trim shall be of dead-front construction to shield user from energized parts. Dead-front trim shall have pre-formed twistouts covering unused mounting space.
- B Main Circuit Breaker
 - 1 Main circuit breakers shall have an over-center, trip-free, toggle mechanism which will provide quick-make, quick-break contact action. Circuit breakers shall have a permanent trip unit with thermal and magnetic trip elements in each pole. Each thermal element shall be true rms sensing and be factory calibrated to operate in a 40°C ambient environment. Thermal elements shall be ambient compensating above 40°C.
 - 2 Two- and three-pole circuit breakers shall have common tripping of all poles. Circuit breakers frame sizes above 100 amperes shall have a single magnetic trip adjustment located on the front of the breaker which allows the user to

- simultaneously select the desired trip level of all poles. Circuit breakers shall have a push-to-trip button for maintenance and testing purposes.
 - 3 Circuit breaker handle and faceplate shall indicate rated ampacity. Standard construction circuit breakers shall be UL Listed for reverse connection without restrictive line or load markings.
 - 4 Lugs shall be UL Listed to accept solid or stranded copper and aluminum conductors. Lugs shall be suitable for 90°C rated wire, sized according to the 75°C temperature rating per CEC Table 310-16.
- C Enclosures
 - 1 Type 1 Boxes
 - a Boxes shall be galvanized steel constructed in accordance with UL 50 requirements.
 - b Boxes shall have removable end walls with knockouts located on one end. Boxes shall have welded interior mounting studs. Interior mounting brackets are not required.
 - 2 Type 1 Fronts
 - a Front shall meet strength and rigidity requirements per UL 50 standards.
 - b Front shall have flat latch type lock with catch and spring loaded stainless steel door pull. All lock assemblies shall be keyed alike. One (1) key shall be provided with each lock. A clear plastic directory card holder shall be mounted on the inside of door.
 - 3 Type 3R, 5, and 12
 - a Enclosures shall be constructed in accordance with UL 50 requirements
 - b All doors shall be gasketed and equipped with a tumbler type vault lock and two (2) additional trunk type latches. All lock assemblies shall be keyed alike. One (1) key shall be provided with each lock. A clear plastic directory card holder shall be mounted on the inside of door.
 - c Maximum enclosure dimensions shall not exceed 21 inches wide and 8 inches deep.

2.4 ENCLOSURE FINISH

- A The completed enclosure shall be degreased and cleaned.
- B After the cleaning process is finished, the enclosure shall be phosphatized.
- C After the phosphatizing, the enclosure shall receive an electrostatic deposition of polyester powder coating followed by baking to produce a hard durable finish.
 - 1 The minimum thickness of the paint film shall be 2.0 mils.
 - 2 For the exterior of transformer tank, interior and exterior of primary and secondary cable compartments the minimum total dry film thickness shall be 3.5 mils.
 - 3 Paint film shall be uniform in color and free from blisters, sags, flaking and peeling
- D Finish shall conform to UL 50 and UL 50E.
- E Color shall be ANSI 61 Gray.
- F Coat underside surfaces of equipment outdoors or in damp locations with a corrosion resistant coating.

2.5 NAMEPLATES

Provide and install nameplates per Section 260500.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. Install all equipment per manufacturers' instructions.
- B. Test all equipment per manufacturer's instructions.
- C. Mount panelboards with center of top circuit breaker handle no higher than 78" above finished floor. Install flush mounted panelboards as indicated on architectural interior elevation drawings. Provide all necessary blocking, channels and other hardware for securing panelboards to wall, column or other parts of building structure.
- D. Submit three copies of the certified list for permanent record to be referenced to in the event of failure of any motor either within or beyond expiration of the warranty period.

3.2 GROUNDING

- A. Ground equipment per manufacturer's instructions, Section 260500, and applicable codes.
- B. Minimize resistance from device to ground.
- C. Resistance from device to ground shall not exceed 25 ohms.

3.3 LOAD BALANCING

If the contractor changes circuiting from the panel schedule on the approved plans, the contractor shall be responsible to ensure that the loads on any two phases differ by no more than 5%.

3.4 IDENTIFICATION

- A. Provide nameplate identifying panel on exterior of panel per requirements in Section 260500.
- B. Provide type written panel schedule on interior of door.

END OF SECTION

SECTION 26 27 00 LOW VOLTAGE (0-600V) DISTRIBUTION EQUIPMENT

PART 1 – GENERAL

1.1 SECTION INCLUDES

Materials, equipment fabrication, installation and tests in conformity with applicable codes and authorities having jurisdiction, for the following:

- A Wiring devices
- B Terminal cabinets
- C Power distribution terminal blocks

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A Division 1
 - 1 Section 013000: Administrative Requirements
 - 2 Section 013300: Submittal Procedures
 - 3 Section 014000: Quality Requirements
 - 4 Section 016000: Product Requirements
 - 5 Section 017000: Execution and Closeout Requirements
 - 6 All other included sections under Division 1
- B All included sections under Division 26
- C All included sections under Division 27
- D All included sections under Division 28
- E Plans
- F Manufacturers' manuals, product bulletins, etc.

1.3 REFERENCE STANDARDS

Published specification standards, tests or recommended methods of trade, industry or government organizations apply to work in this section as cited in Section 260000.

- A California Building Code
- B California Electrical Code
- C Underwriters' Laboratories
 - 1 UL 20: General Use Snap Switches
 - 2 UL 50: Enclosures for Electrical Equipment, Non-environmental Considerations
 - 3 UL 50E: Enclosures for Electrical Equipment, Environmental Considerations
 - 4 UL 111: Multi-Outlet Assemblies
 - 5 UL 231: Power Outlets
 - 6 UL 486A: Wire Connectors
 - 7 UL 486B: Wire Connectors
 - 8 UL 486E: Equipment Wiring Terminals for Use with Aluminum and/or Copper Conductors
 - 9 UL 498: Attachment Plugs and Receptacles
 - 10 UL 514A: Metallic Outlet Boxes
 - 11 UL 514C: Nonmetallic Outlet Boxes, Flush-device Boxes, and Covers
 - 12 UL 514D: Cover Plates for Flush-mounted Wiring Devices
 - 13 UL 917: Clock Operated Switches
 - 14 UL 943: Ground Fault Circuit Interrupters
 - 15 UL 1681: Wiring Devices Configurations

- 16 UL 1773: Standard for Termination Boxes
- 17 UL 1953: Power Distribution Terminal Blocks
- 18 UL 2255: Standard for Receptacle Closures
- 19 UL 2682: Switch Rated Plugs and Receptacles

1.4 QUALITY ASSURANCE

- A Equipment and accessories shall be the product of a manufacturer regularly engaged in its manufacture.
- B Supply equipment and accessories new, free from defects.
- C Equipment and accessories in compliance with the applicable standards listed in Article 1.3 of this section and with applicable national, state and local codes.
- D Items of a given type shall be the products of the same manufacturer.
- E Deliver, store and protect products under provisions of Section 016200.
- F Ship equipment in its original packages, to prevent damaging or entrance of foreign matter. Perform handling and shipping in accordance with manufacturer's recommendations. Provide protective covering during construction.
- G Replace at no expense to Owner, equipment or material damaged during storage or handling, as directed by the engineer.
- H Tag items with a weatherproof tag identifying equipment by name and purchase order number. Include packing and shipping lists.

1.5 SUBMITTALS

- A Submit under provisions of Section 013000 or 013300.
- B Submittals shall include the following:
 - 1 Table of contents
 - 2 A complete set of detailed manufacturer's specifications describing and illustrating all standard and special components and materials
 - 3 Part numbers
 - 4 Evidence of compliance with the applicable standards listed under Article 1.3 of this section
 - 5 Maintenance instructions and intervals
 - 6 Calibration procedures and intervals
 - 7 A complete set of drawings for any special items
 - 8 A single line block diagram showing exactly the manner in which the contractor proposes to layout the system.
 - 9 Wiring diagrams
 - 10 Illustrations and scale drawing of the racks, equipment layouts etc.
 - 11 Drawings shall include designations, dimensions, operating controls, instruments, riser diagrams, routing diagrams etc.
 - 12 The contractor shall also submit a copy of his valid state contractor's license and show proof that he is a distributor of the submitted equipment.
- C Electronic submittals shall be searchable
- D The submittal shall be substantially complete for all items and equipment furnished under this section.
- E Individual drawings and data sheets submitted at random intervals will not be accepted for review.
- F Substitutions: Items of same function and performance shall be submitted in conformance with Division 1.

1.6 OPERATION AND MAINTENANCE MANUALS

- A Submit operation and maintenance manuals in accordance with Section 260000.
- B The manuals shall, at minimum, include the following:
 - 1 Manufacturer (including contact information)
 - 2 Model number
 - 3 Manufacturer's data sheets – When data sheets include more than one model the model(s) used shall be noted
 - 4 Manufacturer's user and maintenance manual(s), including trouble-shooting guidelines
 - 5 Configuration settings
 - 6 Wiring diagrams
 - 7 Voltage ratings
 - 8 Current ratings
 - 9 List of capabilities
 - 10 Environmental ratings
 - 11 NEMA enclosure type
 - 12 Maintenance requirements
 - 13 Installation instructions
 - 14 Repair instructions
- C Provide manuals in one of the following formats
 - 1 Three hardcopies
 - 2 PDF

PART 2 – PRODUCTS

2.1 WIRING DEVICES

- A Wall (Local) Switches
 - 1 Totally enclosed
 - 2 AC rated
 - 3 20A rated
 - 4 Silent type, unless noted otherwise on the plans
 - 5 Manufacturers
 - a Hubbell Premise Wiring
 - b Leviton
 - 6 Specification Grade
- B Receptacles
 - 1 Duplex receptacles shall be 20A, 125V_{AC} rated, 3-wire, grounded
 - 2 Receptacle shall include a LED that indicates it has power.
 - 3 Receptacles shall be tamperproof.
 - 4 Manufacturers
 - a Hubbell Premise Wiring
 - b Leviton
 - 5 Specification Grade
 - 6 Exterior receptacle plates shall have steel, weatherproof, vandal-resistant while-in-use cover with key lockable/locking cover with keys to match owner standards.
 - 7 All automatically switched receptacles shall be marked per 2016 CEC 406.3(E).
- C Other special purpose receptacles shown on Drawings shall be of same quality.

- D GFI receptacles shall self test every 3 seconds and indicate if the GFI protection has passed or failed the test.
- E Wall Plates:
 - 1 Commercial: Satin finish stainless steel
 - 2 Educational and medical: Satin finish stainless steel
 - 3 Medical: Satin finish stainless steel
 - 4 Residential:
 - a Material: Nylon
 - b Color: Match wall color
- F Switch and receptacle colors shall be as noted below unless otherwise specified.
 - 1 Job type dependant:
 - a Educational and medical: Gray
 - b Commercial: White
 - c Residential: Match wall color
 - 2 Feature type dependant (not job type dependant):
 - a Isolated Ground (IG) receptacle: Orange
 - b Equipment on emergency system: Red
 - c Receptacle with surge suppression: Blue
 - d Isolated ground receptacles with feature dependant color (other than orange) shall have orange triangle.
 - 3 Follow the facility has a color code scheme if the facility has one. Verify with owner.

2.2 TERMINAL CABINETS

- A Construction
 - 1 Fabricated from code gauge steel, size as indicated on drawings, with flush latch and concealed hinges and mounting screws.
 - 2 Enclosure for flush mounted cabinets shall be designed for flush mounting.
 - 3 Enclosure for surface mounted cabinets shall be designed for surface mounting.
- B Where size is not indicated, the minimum size shall be 24 inches wide x 30 inches high x 4 inches deep.
- C Cabinet shall be Square D "Mono-Flat Fronts", or approved equal.
- D Terminal cabinets shall include a backboard at inside back of cabinet.
 - 1 The backboard shall be 3/4" inch thick plywood
 - 2 Paint backboard with 3 coats of fire retardant paint.
- E Provide and install one terminal point for each wire within the terminal cabinet.
- F NEMA type:
 - 1 Interior, non-corrosive, non-hazardous (classified) locations: NEMA 1
 - 2 Exterior locations with vents: NEMA 3R
 - 3 Cooled enclosures: NEMA 4
 - 4 Enclosures containing electronics in dusty areas or outdoors: NEMA 4
 - 5 Enclosures in hazardous (classified) locations: NEMA 4 or 4X (corrosive locations) listed for hazardous classification
 - 6 Enclosure in corrosive locations: NEMA 4X
 - 7 All seams on NEMA 3R, 4, and 4X enclosures shall be continuously welded with welds ground smooth.
- G Coating
 - 1 The completed enclosure shall be degreased and cleaned.
 - 2 After the cleaning process is finished, the enclosure shall be phosphatized.

- 3 After the phosphatizing, the enclosure shall receive an electrostatic deposition of polyester powder coating followed by baking to produce a hard durable finish.
 - a The minimum thickness of the paint film shall be 2.0 mils.
 - b For the exterior of transformer tank, interior and exterior of primary and secondary cable compartments the minimum total dry film thickness shall be 3.5 mils.
 - c Paint film shall be uniform in color and free from blisters, sags, flaking and peeling
- 4 Finish shall conform to UL 50 and UL 50E.
- 5 Color shall be ANSI 61 Gray.
- 6 Coat underside surfaces of equipment outdoors or in damp locations with a corrosion resistant coating.

2.3 POWER DISTRIBUTION TERMINAL BLOCKS

- A Power distribution terminal blocks (PDTB) shall be finger-safe, NEMA 1 type.
- B Conducting material shall be copper.
- C Current rating and short circuit rating of PDTBs shall be no lower than upstream overcurrent protective device.
- D Terminals
 - 1 Each terminal shall be screw type and be designed for wire size connecting to it.
 - 2 PDTB shall have one terminal for each wire connected to it on both load and line sides.
- E Load wire sizes and OCPD shall comply with CEC 240.21(B) and 240.92(B) as well as all other applicable codes.
- F PDTBs shall have provisions for panel or DIN rail mounting.
- G PDTBs shall be mounted within enclosure unless otherwise noted.

2.4 NAMEPLATES

Provide and install nameplates per Section 260500.

PART 3 – EXECUTION

3.1 GENERAL

- A Electric system layouts indicated on the Drawings are generally diagrammatic, but shall be followed as closely as actual construction and work of other trades will permit. Govern exact routing of cable and wiring and the locations of outlets by the structure and equipment served. Dimensions shall be taken from Architectural Drawings.
- B Consult all other Drawings. Verify scales and report any dimensional discrepancies or other conflicts to architect, or engineer if no architect is involved, before submitting bid.
- C Home runs to panelboards are indicated as starting from the outlet nearest the panel and continuing in the general direction of that panel. Continue such circuits to the panel as though the routes were completely indicated. Terminate homeruns of signal, alarm, and communications system in a similar manner.
- D Avoid cutting and boring holes through structure or structural members wherever possible. Obtain prior approval of Architect and conform to structural requirements when cutting or boring the structure is necessary or permitted.

- E Furnish and install necessary hardware, hangers, blocking, brackets, bracing, runners, required for equipment specified under this section.
- F Provide necessary backing required to insure rigid mounting of outlet boxes.
- G Outlet boxes shall be plumb.
- H Back of wall plates shall be flush with wall finish. Gaps between wall plates and wall or wall plates not parallel to wall are not acceptable.

3.2 CONNECTIONS TO EQUIPMENT

- A General:
 - 1 Furnish and install required power supply conduit and wiring to equipment. See below for other wiring required.
 - 2 Install rough-in work for equipment from approved shop drawings to suit the specific requirements of the equipment.
 - 3 Furnish and install magnetic motor starters that are shown on the Drawings or specified under other divisions to be furnished under this division of work. Verify equipment nameplate ratings prior to installation and furnish adequately rated starters for the loads.
 - 4 Furnish and install manual thermal protection for motors not integrally equipped with thermal protection.
 - 5 Furnish and install 120V power to each control panel and time switch requiring a source of power to operate.
- B Heating, ventilating, and air conditioning equipment:
 - 1 Coordinate with mechanical contractor for sizes, locations and details of motors, heating units, and control requirements.
 - 2 Provide required power supply conduit and wiring to equipment.
 - 3 Provide a suitable means of disconnect switch immediately ahead of and adjacent to each motor and appliance unless the motor or appliance is located adjacent and within sight of the service panelboard, circuit breaker or switch at a distance allowed by codes. Verify equipment nameplate current ratings prior to installation. Provide a disconnect means at each magnetic motor starter.
 - 4 Provide magnetic motor starters required under this division of work.
 - 5 Provide manual thermal protection for motors not integrally equipped with thermal protection.
 - 6 Line and low voltage temperature control and interlock wiring, conduit, and required connections are a part of other divisions unless specifically shown or noted on the Drawings as to be furnished under this section.
 - 7 Provide 120V power supply to control panels, time switch furnished and installed under other divisions of work.
 - 8 Furnish and install 120V power to each duct detector scheduled for operation of fire dampers or shut down of mechanical equipment. Coordinate the exact quantity and locations with the mechanical drawings.
- C Plumbing and other contractor-furnished and Owner-furnished equipment:
 - 1 Required power and control conduit, wiring and connections are included under this section of the work. Control sensing and alarm devices will be furnished under the respective section of the contract supplying the equipment unless noted otherwise. These devices will be located in pipes, ducts, vessels, tanks, etc., and will be mounted in a place by the Contractor furnishing the devices. Other devices shall be mounted under this section of the work.

- 2 Control panels for packaged equipment will be furnished under the respective section of the contract supplying the equipment unless otherwise noted. Installation and connection of the control panels are under this section of the work.

3.3 IDENTIFICATION

Refer to Section 260500.

END OF SECTION

SECTION 26 28 00 LOW VOLTAGE (0-600V) CIRCUIT PROTECTIVE DEVICES

PART 1 – GENERAL

1.1 SECTION INCLUDES

Materials, equipment fabrication, installation and tests in conformity with applicable codes and authorities having jurisdiction, for overcurrent protective devices

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A Division 1
 - 1 Section 013000: Administrative Requirements
 - 2 Section 013300: Submittal Procedures
 - 3 Section 014000: Quality Requirements
 - 4 Section 016000: Product Requirements
 - 5 Section 017000: Execution and Closeout Requirements
 - 6 All other included sections under Division 1
- B All included sections under Division 26
- C All included sections under Division 27
- D All included sections under Division 28
- E Plans
- F Manufacturers' manuals, product bulletins, etc.

1.3 REFERENCE STANDARDS AND CODES

Published specification standards, tests or recommended methods of trade, industry or government organizations apply to work in this section as cited in Section 260000.

- A California Building Code
- B California Electrical Code
- C Institute of Electrical and Electronic Engineers
 - 1 IEEE 1015: Recommended Practice for Applying Low-Voltage Circuit Breakers Used in Industrial and Commercial Power Systems
 - 2 IEEE 1458: Recommended Practice for the Selection, Field Testing, and Life Expectancy of Molded Case Circuit Breakers for Industrial Applications
- D Underwriters' Laboratories
 - 1 UL 50: Enclosures for Electrical Equipment, Non-environmental Considerations
 - 2 UL 50E: Enclosures for Electrical Equipment, Environmental Considerations
 - 3 UL 98: Enclosed and Dead-front Switches
 - 4 UL 244A: Solid-state Controls for Appliances
 - 5 UL 363: Knife Switches
 - 6 UL 489: Molded-case Circuit Breakers, Molded-case Switches, and Circuit Breaker Enclosures
 - 7 UL 1066: Standard for Low-Voltage AC and DC Power Circuit Breakers Used in Enclosures
 - 8 UL 2367: Standard for Solid State Overcurrent Protectors
 - 9 UL 60947-7-3: Low-Voltage Switchgear and Controlgear - Part 7-3: Ancillary Equipment - Safety Requirements for Fuse Terminal Blocks

1.4 QUALITY ASSURANCE

- A Equipment and accessories shall be the product of a manufacturer regularly engaged in its manufacture.
- B Supply equipment and accessories new, free from defects.
- C Equipment and accessories in compliance with the applicable standards listed in Article 1.3 of this section and with applicable national, state and local codes.
- D Items of a given type shall be the products of the same manufacturer.
- E Deliver, store and protect products under provisions of Section 016200.
- F Ship equipment in its original packages, to prevent damaging or entrance of foreign matter. Perform handling and shipping in accordance with manufacturer's recommendations. Provide protective covering during construction.
- G Replace at no expense to Owner, equipment or material damaged during storage or handling, as directed by the engineer.
- H Tag items with a weatherproof tag identifying equipment by name and purchase order number. Include packing and shipping lists.

1.5 SUBMITTALS

- A Submit under provisions of Section 013000 or 013300.
- B Submittals shall include the following:
 - 1 Table of contents
 - 2 A complete set of detailed manufacturer's specifications describing and illustrating all standard and special components and materials
 - 3 Part numbers
 - 4 Evidence of compliance with the applicable standards listed under Article 1.3 of this section
 - 5 Maintenance instructions and intervals
 - 6 A complete set of drawings for any special items
 - 7 Wiring diagrams
- C Electronic submittals shall be searchable
- D The submittal shall be substantially complete for all items and equipment furnished under this section.
- E Individual drawings and data sheets submitted at random intervals will not be accepted for review.
- F Substitutions: Items of same function and performance shall be submitted in conformance with Division 1.

1.6 OPERATION AND MAINTENANCE MANUALS

- A Submit operation and maintenance manuals in accordance with Section 260000.
- B The manuals shall, at minimum, include the following:
 - 1 Manufacturer (including contact information)
 - 2 Model number
 - 3 Manufacturer's data sheets – When data sheets include more than one model the model(s) used shall be noted
 - 4 Manufacturer's programming, user, and maintenance manual(s), including trouble-shooting guidelines
 - 5 Configuration settings
 - 6 Wiring diagrams
 - 7 Voltage ratings
 - 8 Current ratings
 - 9 Calibrated range

- 10 List of capabilities
- 11 Environmental ratings
- 12 NEMA enclosure type
- 13 Maintenance requirements
- 14 Installation instructions
- 15 Repair instructions
- C Provide manuals in one of the following formats
 - 1 Three hardcopies
 - 2 PDF

PART 2 – PRODUCTS

2.1 CIRCUIT BREAKERS

- A Circuit breakers shall be constructed in accordance with the following standards:
 - 1 UL 489 or UL 1066
 - 2 Federal Specification W-C-375B/GEN
 - 3 NEMA AB1
 - 4 CSA 22.2, No. 5-M91
 - 5 IEC 157-1
 - 6 BS 4752
- B Construction
 - 1 Circuit breakers shall be constructed using glass reinforced polyester insulating material providing superior dielectric strength.
 - 2 Current-carrying components shall be completely isolated from the handle and the accessory mounting area.
 - 3 Breaker contact material shall be a non-weldable silver alloy.
 - 4 Breakers shall have arc-extinguishing chutes.
 - 5 Circuit breakers shall have an over-center, trip-free, toggle operating mechanism which will provide quick-make, quick-break contact action.
 - 6 Multiple pole breakers shall have a common trip element and a single operating handle.
 - 7 Circuit breakers for branch circuits shall be molded case
 - 8 Circuit breakers shall have bolt-on/plug-on type bus connectors.
- C Trip type
 - 1 Circuit breakers having a frame size of 150 amperes or less shall have thermal magnetic non-interchangeable, trip-free sealed trip units.
 - 2 Circuit breakers with a frame size of 175 amperes to 1200 amperes shall have interchangeable thermal and adjustable magnetic trip elements.
- D There shall be two forms of visible trip indication.
 - 1 The breaker handle shall reside in a position between ON and OFF.
 - 2 In addition, there shall be a red trip indicator appearing in the clear window of the circuit breaker housing.
- E Circuit breakers shall be UL Listed with amperage ratings, interrupting ratings, and number of poles as indicated on the panelboard schedules.
- F Circuit breakers faceplates shall be marked with the following
 - 1 Rated ampacity
 - 2 UL and IEC certification standards
 - 3 Applicable voltage systems and corresponding AIR ratings

- G Lugs shall be UL Listed to accept solid or stranded copper and aluminum conductors. Lugs shall be suitable for 90°C rated wire, sized according to the 75°C temperature rating per CEC Table 310-16.
- H Branch circuit breakers rated 30 amperes and below shall be UL Listed to accept 60°C rated wire.
- I The interrupting capacity of all main and feeder branch circuit breakers shall be a minimum of 42,000A_{RMS} symmetrical amperes.
- J All circuit breakers feeding HVAC units, motors, or circuit breakers supplying loads other than convenience receptacles or lights shall have lockout devices.
- K Standard circuit breakers up to 250A at 600V_{AC} shall be UL Listed with HACR ratings.
- L All circuit breakers feeding 120V, 15A and 20A branch circuits in dwellings shall be AFCI.
- M Circuit breakers with shunt-trip or low voltage release shall be switch duty rated.
- N All fixed trip circuit breakers 1200A or greater and adjustable trip circuits breakers with a maximum rating 1200A or greater shall be equipped with one of the following methods to reduce arc flash energy.
 - 1 Zone selective interlocking
 - 2 Differential relaying
 - 3 Arc flash detection and mitigation system in panel/board with the 1200A circuit breaker, refer to Section 260930

2.2 SAFETY SWITCHES (DISCONNECTS)

- A Switches shall be heavy duty type
- B Minimum voltage rating shall be 600V.
- C Minimum Size
 - 1 Switches for disconnecting motors shall be sized for the horsepower of for motor(s).
 - 2 All switches shall be sized per the overcurrent protective device protecting the switch.
- D Construction
 - 1 NEMA 1 for indoors
 - 2 NEMA 3R or NEMA 4 for outdoors
 - 3 Handle shall be lockable in the off/disconnected/open position.
- E The switch shall include a barrier between the fuse section and the switch section with separate doors for each section. The entire fuse section shall be de-energized when the switch is in the off position.
- F Switch shall be equivalent to Square D H-rated series.
- G Finish: The entire enclosure shall be finished as follows.
 - 1 Degreasing
 - 2 Cleaning
 - 3 Phosphatizing
 - 4 Electrostatic deposition of polymer polyester powder coating followed by baking to produce a hard, durable finish.
 - a The minimum thickness of the paint film shall be 2.0 mils.
 - b Paint film shall be uniform in color and free from blisters, sags, flaking and peeling
 - 5 Finish shall conform to UL 50 and UL 50E.
 - 6 Color shall be ANSI 61 Gray.
 - 7 Coat underside surfaces of equipment outdoors or in damp locations with a corrosion resistant coating

SECTION 26 50 00 LIGHTING

PART 1 – GENERAL

1.1 SECTION INCLUDES

This section includes materials, equipment fabrication, installation and tests in conformity with applicable codes and authorities having jurisdiction, for lighting fixtures and installation.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A Division 1
 - 1 Section 013000: Administrative Requirements
 - 2 Section 013300: Submittal Procedures
 - 3 Section 014000: Quality Requirements
 - 4 Section 016000: Product Requirements
 - 5 Section 017000: Execution and Closeout Requirements
 - 6 All other included sections under Division 1
- B All included sections under Division 26
- C All included sections under Division 27
- D All included sections under Division 28
- E Plans
- F Manufacturers' manuals, product bulletins, etc.

1.3 REFERENCE STANDARDS AND CODES

- A. Published specifications standards, tests or recommended methods of trade, industry or government organizations apply to work in this section as cited in Section 260000.
- B. California Electrical Code
- C. Illuminating Engineering Society: The Lighting Handbook
- D. Underwriters' Laboratories
 - 1. UL 50: Enclosures for Electrical Equipment, Non-environmental Considerations
 - 2. UL 50E: Enclosures for Electrical Equipment, Environmental Considerations
 - 3. UL 924: Emergency Lighting and Power Equipment
 - 4. UL 1598: Luminaires
 - 5. UL 2575: Standard for Lithium Ion Battery Systems for Use in Electric Power Tool and Motor Operated, Heating and Lighting Appliances
 - 6. UL 8750: Light Emitting Diode Equipment for Use in Lighting Products

1.4 QUALITY ASSURANCE

- A. Equipment and accessories shall be the product of a manufacturer regularly engaged in its manufacture.
- B. Supply equipment and accessories new, free from defects.
- C. Supply equipment and accessories in compliance with the applicable standards listed in Article 1.3 of this section and with applicable national, state and local codes.
- D. Items of a given type shall be the products of the same manufacturer.
- E. Ship equipment in its original packages to prevent damaging or entrance of foreign matter. Perform handling and shipping in accordance with manufacturer's recommendations. Provide protective covering during construction.

- F. Replace at no expense to Owner, equipment or material damaged during storage or handling, as directed by the engineer.
- G. Tag items with a weatherproof tag identifying equipment by name and purchase order number. Include packing and shipping lists.

1.5 SUBMITTALS

- A. Submit under provisions of Section 013000 or 013300.
- B. Submittals shall include the following:
 - 1. Table of contents
 - 2. A complete set of detailed manufacturer's specifications describing and illustrating all standard and special components and materials
 - 3. Part numbers
 - 4. Evidence of compliance with the applicable standards listed under Article 1.3 of this section
 - 5. Maintenance instructions and intervals
 - 6. Calibration procedures and intervals
 - 7. A complete set of drawings for any special items
 - 8. Wiring diagrams
 - 9. Drawings shall include designations, dimensions, operating controls, instruments, riser diagrams, routing diagrams etc.
- C. Electronic submittals shall be searchable
- D. The submittal shall be substantially complete for all items and equipment furnished under this section.
- E. Individual drawings and data sheets submitted at random intervals will not be accepted for review.
- F. Substitutions: Items of same function and performance shall be submitted in conformance with Division 1.
- G. Pole mounted fixtures, including complete data on the pole material, finish, handholes, anchoring and attachment. Support method shall be submitted for interior fixtures weighing more than fifty (50) pounds.

1.6 OPERATION AND MAINTENANCE MANUALS

- A. Submit operation and maintenance manuals in accordance with Section 260000.
- B. The manuals shall, at minimum, include the following:
 - 1. Manufacturer (including contact information)
 - 2. Model number
 - 3. Programming manual (where applicable)
 - 4. Wiring diagrams
 - 5. Trouble-shooting guidelines (where applicable)
 - 6. Voltage ratings
 - 7. Current ratings
 - 8. Calibrated range (where applicable)
 - 9. List of capabilities
 - 10. Environmental ratings
 - 11. NEMA enclosure type
 - 12. Maintenance requirements
 - 13. Installation instructions
 - 14. Repair instructions (where applicable)
- C. Provide manuals in one of the following formats

- 1 Three hardcopies
- 2 PDF

PART 2 – PRODUCTS

2.1 GENERAL

- A. Furnish and install all fixtures complete, including lamps, ballasts, whips, conductors, etc. and ready for service.
- B. Fixture Designation: Fixtures are designated on Drawings by means of letters. See Lighting Fixture Schedule. Where only one (1) fixture designation appears in a room or area, that designation applies to all fixtures in that room or area.
- C. Tandem wired units acceptable where appropriate.
- D. Manufacturers and models for fixtures, ballasts, and lamps shall be as shown on the fixture schedule or approved equal.

2.2 FIXTURES

- A Linear fixtures
 - 1 Fixture housings shall be steel.
 - 2 Housing shall be painted after fabrication with white, electro-statically deposited paint. Housing shall be completely covered with paint to prevent corrosion.
- B All lenses shall be clear, prismatic, 0.125", K12 pattern, acrylic lenses.
- C Louvers shall be semi-specular aluminum.
- D Open can light reflectors shall be semi-specular aluminum.
- E Fixtures installed in gyms and similar rooms, locker rooms, storage rooms, and warehouses shall include stainless steel wireguards to protect fixture from damage.
- F Fixtures shall direct a minimum of 75% of light within zone below 30 degrees below horizontal.

2.3 LAMPS

- A. All LED fixtures shall have a color rendering index (CRI) of 0.8 and color temperature of 4000°K unless otherwise noted on plan.

2.4 EXIT SIGNS

- A. All exit signs shall be connected to an unswitched source.
- B. Colors
 - 1. Face shall be white.
 - 2. Letters and arrows shall be green.
- C. Exit signs shall have arrows to indicate direction of exit where necessary.
- D. All exit signs shall include batteries to provide 90 minutes of illumination in the event of a power outage.

2.5 FIXTURE HANGERS AND SUPPORTS

- A. Provide proper supports and mounting accessories, such as hangers, stems, yokes, plaster frames, etc., as required by the type of ceiling installed.

- B. Where pendant mounted fixtures with stems are specified, provide swivel canopies or ball aligners in order to hang plumb regardless of ceiling slope.
- C. Entire assemblies shall comply with state earthquake resistance/ bracing guidelines.

2.6 POLES

- A. The minimum pole shall be capable of supporting the weights and effective projected areas listed below in 100 MPH winds:
 - 1. 20 foot tall: $W_{MAX}=390\text{lbs}$, $EPA_{MAX}=15.6\text{FT}^2$
 - 2. 25 foot tall: $W_{MAX}=495\text{lbs}$, $EPA_{MAX}=19.8\text{FT}^2$
 - 3. 30 foot tall: $W_{MAX}=550\text{lbs}$, $EPA_{MAX}=22.0\text{FT}^2$
 - 4. 35 foot tall: $W_{MAX}=363\text{bs}$, $EPA_{MAX}=14.5\text{FT}^2$
 - 5. 39 foot tall: $W_{MAX}=475\text{lbs}$, $EPA_{MAX}=19.0\text{FT}^2$
 - 6. 45 foot tall: $W_{MAX}=475\text{lbs}$, $EPA_{MAX}=19.0\text{FT}^2$
 - 7. 50 foot tall: $W_{MAX}=340\text{lbs}$, $EPA_{MAX}=13.6\text{FT}^2$
- B. Anchoring
 - 1. Concrete base depth and anchor bolt length shall be as shown on plans.
 - 2. In no case shall the concrete base embedment depth be less than 20% of the pole height.
 - 3. Minimum anchor bolt length is 10% of the pole height.
 - 4. Minimum anchor bolt diameter is 1 inch.
- C. Coordinate with architect for pole color.
- D. Poles shall be made of ATSM A595, Grade A steel.

2.7 GROUNDING

- A. Fixtures shall have factory installed grounding studs.
- B. All fixtures shall be capable of being grounded.

2.8 LIGHTING CONTROLS

Refer to Section 265700.

PART 3 – EXECUTION

3.1 GENERAL

- A. Verify ceiling type and conditions. Order fixtures designed for conditions and the type of ceiling installed.
- B. Architectural reflected ceiling plans shall be used to determine exact locations of lighting fixtures.
- C. Determine exact location and height of fixtures by the structural and mechanical limitations of the building. Install fixtures in such a manner as to avoid such obstructions and to give proper illumination result. Verify layouts with architect.
- D. All recessed lighting fixtures shall be wired from adjacent junction boxes utilizing 6' flexible metal conduit to permit future fixture relocation. Outlet box for surface or stem mounted fixtures shall be provided with fixture stud as well as tapped and drilled canopy covers. All outlets shall finish flush with walls or ceiling except where in ceiling tiles, locate these in the center of a tile or at the intersection of four (4) tiles.

- E. All building mounted fixtures shall be supported from the building structural members. Provide all necessary blocking and hardware so that fixtures installed suspended below grid type ceiling shall be supported independently of the grid system at a minimum of four (4) points per 4' long fixture.
- F. Minimum mounting provisions for closed ceiling (surface) mounted fluorescent lighting fixtures in ceilings other than grid type shall be as follows:
 - 1. 4' long fixture body: By a pair of 3/8" machine bolts separated by a maximum distance possible and located 4 inches in from each end of fixture - total of four (4) bolts per fixture.
- G. Support for fixtures installed in suspended ceilings shall conform to Section 4701 of Title 24, Part 2.
- H. When installed in grid type ceiling, a slack #12 gauge galvanized tie wire permanently attached to the structure shall be provide at four (4) corners of each 4' long fixture.
- I. At fire rated ceiling, provide sheet rock at top and at all sides of recessed mounted lighting fixtures.
- J. Ground all fixtures.

END OF SECTION

SECTION 26 57 00 LIGHTING CONTROLS

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Materials, equipment fabrication, installation and tests in conformity with equipment applicable to this project, applicable codes and authorities having jurisdiction.
- B. The work to be provided under these specifications consists of furnishing and installing a complete and operable lighting control system.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A Division 1
 - 1 Section 013000: Administrative Requirements
 - 2 Section 013300: Submittal Procedures
 - 3 Section 014000: Quality Requirements
 - 4 Section 016000: Product Requirements
 - 5 Section 017000: Execution and Closeout Requirements
 - 6 All other included sections under Division 1
- B All included sections under Division 26
- C All included sections under Division 27
- D All included sections under Division 28
- E Plans
- F Manufacturers' manuals, product bulletins, etc.

1.3 REFERENCE STANDARDS AND CODES

Published specifications standards, tests or recommended methods of trade, industry or government organizations apply to work in this section as cited in Section 260000.

- A California Electrical Code
- B Underwriters' Laboratories
 - 1 UL 20: General Use Snap Switches
 - 2 UL 50: Enclosures for Electrical Equipment, Non-environmental Considerations
 - 3 UL 50E: Enclosures for Electrical Equipment, Environmental Considerations
 - 4 UL 67: Panelboards
 - 5 UL 98: Enclosed and Dead-front Switches
 - 6 UL 467: Grounding and Bonding Equipment
 - 7 UL 486A: Wire Connectors
 - 8 UL 486B: Wire Connectors
 - 9 UL 489: Molded-case Circuit Breakers, Molded-case Switches, and Circuit Breaker Enclosures
 - 10 UL 773A: Nonindustrial Photoelectric Switches for Lighting Control
 - 11 UL 917: Clock Operated Switches
 - 12 UL 60730-2-7: Automatic Electrical Controls for Household and Similar Use – Part 2: Particular Requirements for Timers and Time Switches

1.4 QUALITY ASSURANCE

- A. Equipment and accessories to be the product of a manufacturer regularly engaged in its manufacture.

- B. Supply equipment and accessories new, free from defects.
- C. Equipment and accessories in compliance with the applicable standards listed in Article 1.1 of this section and with applicable national, state and local codes.
- D. Items of a given type shall be the products of the same manufacturer.

1.5 SUBMITTALS

- A Submit under provisions of Section 013000 or 013300.
- B Submittals shall include the following:
 - 1 Table of contents
 - 2 A complete set of detailed manufacturer's specifications describing and illustrating all standard and special components and materials
 - 3 Part numbers
 - 4 Evidence of compliance with the applicable standards listed under Article 1.3 of this section
 - 5 Maintenance instructions and intervals
 - 6 Calibration procedures and intervals
 - 7 A complete set of drawings for any special items
 - 8 A single line block diagram showing exactly the manner in which the contractor proposes to layout the system.
 - 9 Wiring diagrams
 - 10 Drawings shall include designations, dimensions, operating controls, instruments, riser diagrams, routing diagrams etc.
- C Electronic submittals shall be searchable
- D The submittal shall be substantially complete for all items and equipment furnished under this section.
- E Individual drawings and data sheets submitted at random intervals will not be accepted for review.
- F Substitutions: Items of same function and performance shall be submitted in conformance with Division 1.

1.6 OPERATION AND MAINTENANCE MANUALS

- A Submit operation and maintenance manuals in accordance with Section 260000.
- B The manuals shall, at minimum, include the following:
 - 1 Manufacturer (including contact information)
 - 2 Model numbers
 - 3 Programming manuals
 - 4 Wiring diagrams
 - 5 Trouble-shooting guidelines
 - 6 Voltage ratings
 - 7 Current ratings
 - 8 Calibrated range (where applicable)
 - 9 List of capabilities
 - 10 Environmental ratings
 - 11 NEMA enclosure type
 - 12 Maintenance requirements
 - 13 Installation instructions
 - 14 Repair instructions
- C Provide manuals in one of the following formats
 - 1 Three hardcopies

1.7 ABBREVIATIONS

- A. ATC Astronomical Time Clock
- B. LCP Lighting Control Panel
- C. LCS Lighting Control System

PART 2 – PRODUCTS

2.1 GENERAL

- A. The LCP size and quantity; and relay quantity shall be sufficient for all circuits with 25% spare circuits.
- B. Enclosures shall be NEMA 1 for interior, dry locations and NEMA 3R or NEMA 4 for exterior or wet locations.
- C. Energy Management Systems
 - 1. All LCPs with 12 or more switch legs shall be capable of communications with an Energy Management System via a minimum of one of the following protocols.
 - a. BACnet
 - b. LONWorks
 - c. Modbus
 - 2. Provide and install a communications gateway if LCP/LCS and EMS system do not have a common protocol.
- D. All equipment shall be rated for voltage used.

2.2 BUILDING LIGHTING CONTROL SYSTEMS

- A. Building lighting control systems shall be Wattstopper Digital Lighting Management system and consist of the following, except as allowed in Part B.
 - 1. Lighting control systems shall have the following capabilities and features.
 - a. Networkable (TCP/IP interface)
 - b. Scheduling controls
 - c. Astronomical time clock
 - d. Manual switches interfaces
 - e. Photocell interface
 - 2. Controllers where dimming is required:
 - a. System controller
 - 1. 100 or fewer sub-controllers and no more than three segments: Wattstopper LMSM-3E
 - 2. More than 100 sub-controllers or 3 segments: Wattstopper LMSM-6E
 - b. Switch leg relay sub-controller where dimming is required
 - 1. Wattstopper LMRC-210 series for 0-10V_{DC} dimming
 - 2. Wattstopper LMRC-220 series for line voltage dimming
 - c. Switch leg relay sub-controller where dimming is not required: Wattstopper LMRC-100 series
 - d. Provide Wattstopper LMBC-300 network bridge for each sub-controller.
 - 3. Switches: Wattstopper LMSW-100 series

4. Dimmers: Wattstopper LMDM-101
5. Switches and dimmers in multiple stall restrooms or where noted on plans shall have locking, stainless steel covers (Legrand #WP26L or approved equal).
6. Motion sensors (All motion sensors shall be dual technology [passive infrared and ultrasonic]).
 - a. Ceiling mounted: Wattstopper LMDC-100
 - b. Wall mounted: Wattstopper LMDX-100

2.3 OTHER DEVICES

- A. On/off Switches
 1. SPST switch for 120V or 277V
 2. DPST switch for 208V, 240V, or 480V
- B. Switches for use with sport lighting shall be 3 position, maintained position switch for on-off-automatic control.
- C. Astronomical time switch: Wattstopper RT-200
- D. Clock input
 1. 120V
 2. Six (6) months cumulative battery back-up
 3. SPDT dry contact
 4. Enclosure shall be fiberglass, suitable for outdoor/indoor UL listed.
 5. Digital LED display.
 6. Tork model K801Z or equal.
- E. Lighting Relays
 1. Electrically operated, mechanically held, specifically designed as lighting contactors
 2. 20A, 480V_{AC} rated, with 120V_{AC} controls unless otherwise specified
 3. Minimum of 4-pole
 4. Relays shall be mounted on shock absorbers within an acoustically treated enclosure to eliminate make and break noise.
 5. Install the relays in code gage cabinets 24"W x 36"H x 6"D with ¾" fire rated plywood backboards.
 6. Products: GE CR460 series, ASCO 917 series, or equivalent
 7. Contact response time shall be no more than 5 milliseconds.
- F. Lighting Relay panels Wattstopper or indicated on plan.

PART 3 – EXECUTION

3.1 COMPATIBILITY

The installing contractor shall insure to the Owner that all components installed are compatible with all other components within the lighting control system.

3.2 INSTALLATION PRACTICES

- A. All equipment shall be installed in a neat and workmanlike manner and to the satisfaction of an authorized representative.
- B. All equipment power wiring and grounding shall conform to the California Electrical Code and applicable local codes. Electronics equipment shall be grounded using a No. 6 solid copper wire.

- C. Cable shall be adequately supported, and connectors specifically designed for the type cable in use shall be installed.

3.3 SYSTEM PROOF OF PERFORMANCE

- A. Upon completion of the system installation, it shall be the responsibility of the contractor to perform the necessary adjustments.
- B. The system shall be physically inspected by an authorized representative of the customer to assure that all equipment is installed in a neat and workmanlike manner as called for by the plans and specifications.
- C. Before the contract shall be considered completed, the contractor shall conduct an operating test for approval. The system shall be demonstrated to operate in accordance with the requirements of these specifications. The test shall be performed in the presence of an authorized representative of the Owner. The contractor shall furnish all equipment and personnel required for the tests.
- D. Should such a demonstration of performance show that the system does not perform as intended, the contractor shall make all necessary changes or adjustments and a second performance demonstration shall be arranged.
- E. Should a second performance demonstration fail, the contractor agrees to correct the system deficiencies under the supervision of the owner's technical staff at no cost to the owner.
- F. Title 24 acceptance testing shall be performed by a technician licensed by an Acceptance Test Technician Certification Provider.

END OF SECTION

SECTION 27 11 00 COMMUNICATIONS EQUIPMENT ROOM FITTINGS

PART 1 – GENERAL

1.1 SECTION INCLUDES

This section includes material and workmanship requirements for intermediate data frames (IDFs), main data frames (MDFs), and signal and communications terminal backboards (SCTBs) including, but not limited to, cabinets, racks, patch panels, cable terminations, patch cables, and power distribution.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A Division 1
 - 1 Section 013000: Administrative Requirements
 - 2 Section 013300: Submittal Procedures
 - 3 Section 014000: Quality Requirements
 - 4 Section 016000: Product Requirements
 - 5 Section 017000: Execution and Closeout Requirements
 - 6 All other included sections under Division 1
- B All included sections under Division 26
- C All included sections under Division 27
- D All included sections under Division 28
- E Plans
- F Manufacturers' manuals, product bulletins, etc.

1.3 REFERENCE STANDARDS AND CODES

- A. Governing Codes and Conflicts: If the requirements of the Construction Documents exceed those of the governing codes and regulations, then the requirements of the Construction Documents shall prevail. Where a conflict exists, the governing codes and ordinances shall supersede all other requirements.
- B. ANSI: American National Standards Institute (ANSI)
- C. CEC: California Electrical Code
- D. Electronic Components Association (ECA)
 - 1. ECA-310-E: Cabinets, Racks, Panels, and Associated Equipment
- E. Institute of Electrical and Electronic Engineers (IEEE)
 - 1. IEEE 802.3: IEEE Standard for Ethernet
 - 2. IEEE 802.3ad: Link Aggregation
 - 3. IEEE 802.3ae: 10 Gigabit Ethernet
 - 4. IEEE 802.3af: Power over Ethernet
 - 5. IEEE 802.3an: 10 Gigabit Ethernet on Twisted Pair Copper Cable (10G Base T)
 - 6. IEEE 802.3aq: 10 Gigabit Ethernet on FDDI-Grade Multimode Fiber (10G Base LRM)
 - 7. IEEE 802.3at: Enhanced Power over Ethernet
- F. Telecommunications Industries Association (TIA)
 - 1. TIA-455: General Requirements for Standard Test Procedures for Optical Fibers, Cables, Transducers, Sensors, Connecting and Terminating Devices, and Other Fiber Optic Components
 - 2. TIA-472-0000: Generic Specification for Fiber Optic Cable

3. TIA-472-C000: Sectional Specification for Fiber Optic Communications Cable for Indoor Use
 4. TIA-472-D000: Sectional Specification for Optical Fiber Outside Plant Communications Cables
 5. TIA-472-E000: Sectional Specification for Indoor-Outdoor Optical Fiber Cable
 6. TIA-472-F000: Sectional Specification for Optical Fiber Drop Cable
 7. TIA-492-0000: Generic Specification for Optical Fibers
 8. TIA-492-AAAD: Detailed Specification for 850-nm, Laser Optimized, 50µm Core Diameter / 125µm Cladding Diameter, Class IA Graded-Index, Multimode Optical Fibers Suitable for Manufacturing OM4 Cabled Optical Fibers
 9. TIA-492-CAAB: Detailed Specification for Class IVA, Dispersion-Unshifted, Single-Mode, Optical Fibers with Low Water Peak
 10. TIA-526: Standard Test Procedures for Fiber Optic Systems
 11. TIA-526-2: Effective Transmitter Output Power Coupled into Single-Mode Fiber Optic Cable
 12. TIA-526-14: Optical Power Loss Measurements of Installed Multimode Fiber Cable Plant
 13. TIA-526-19: Optical Signal-to-Noise Ratio Measurement Procedures for Dense Wavelength – Division Multiplexed Systems
 14. TIA-568-C: Commercial Building Telecommunications Standard
 15. TIA-568-C.0: Generic Telecommunications Cabling for Customer Premises
 16. TIA-568-C.1: Commercial Building Telecommunications Cabling Standard
 17. TIA-568-C.2: Balanced Twisted-Pair Telecommunications Cabling and Components Standards
 18. TIA-568-C.3: Optical Fiber Cabling Components Standard
 19. TIA-568-C.3-1 Addendum 1: Addition of OM4 Cabled Optical Fiber and Array Connectivity
 20. TIA-569-C: Commercial Building Standard for Telecommunications Pathways and Spaces
 21. TIA-604: Fiber Optic Connector Interchangeability Standards
 22. TIA-606-B: Administration Standard for the Telecommunications Infrastructure of Commercial Buildings
 23. TIA-607-B: Commercial Building Grounding and Bonding Requirements for Telecommunications
 24. TIA-758-B: Customer Owned Outside Plant Telecommunications Infrastructure Standard
 25. TIA-TSB-36: Technical Systems Bulletin Additional Cable Specifications for Unshielded Twisted-Pair Cables
 26. TIA-TSB-62: Informative Test methods for Fiber-Optic Fibers, Cables, Opto-Electronic Sources and Detectors, Sensors, Connecting and Terminating Devices, and Other Fiber-Optic Components
 27. TIA-TSB-63: Reference Guide for Fiber Optic Test Procedures
 28. TIA-TSB-149: Generic Workmanship Guidelines for Fiber Optic Connector Interoperability
 29. TIA-TSB-4979: Practical Considerations for Implementation of Encircled Flux Launch Conditions in the Field
- G. Underwriters Laboratories, Inc.
1. UL 50: Enclosures for Electrical Equipment, Non-environmental Considerations
 2. UL 50E: Enclosures for Electrical Equipment, Environmental Considerations
 3. UL 489A: Circuit Breakers for Use in Communications Equipment
 4. UL 497: Protectors for Paired-conductor Communications Circuits

5. UL 497A: Secondary Protectors for Communications Circuits
6. UL 497B: Protectors for Data Communications and Fire Alarm Circuits
7. UL 497C: Protectors for Coaxial Communications Circuits
8. UL 497D: Component Secondary Protectors for Communications Circuits Used With Specified Voltage Suppression
9. UL 497E: Protectors for Antenna Lead-In Conductors
10. UL 1449: Surge Protective Devices
11. UL 1651: Standard for Optical Fiber Cable
12. UL 1655: Standard for Community-Antenna Television Cables
13. UL 1690: Standard for Data-Processing Cable
14. UL 1778: Uninterruptible Power Systems
15. UL 1801: Power Distribution Centers for Communications Equipment
16. UL 1863: Communications Circuit Accessories
17. UL 1977: Component Connectors for Use in Data, Signal, Control, and Power Applications
18. UL 2024: Standard for Signaling, Optical Fiber and Communications Raceways and Cable Routing Assemblies
19. UL 2269: Optical Fiber/Communications/Signaling/Coaxial Cable Outlet Boxes
20. UL 2416: Audio/Video, Information, and Communication Technology Equipment Cabinet, Enclosure, and Rack Systems
21. UL 2564: Low Voltage Surge Withstand Telecommunications Overcurrent Protector Components
22. UL 2566: Low Voltage Surge Withstand Telecommunications Fuses
23. UL 2567: Low Voltage Surge Withstand Telecommunications Polymer Positive Temperature Coefficient Thermistor (PPTC)
24. UL 2569: Low Voltage Surge Withstand Telecommunications Line Feed Resistor
25. UL 2570: Low Voltage Surge Withstand Telecommunications Electronic Current Limiters
26. UL 60950-1: Information Technology Equipment Safety – Part 1: General Requirements
27. UL 60950-22: Information Technology Equipment - Safety - Part 22: Equipment to be Installed Outdoors
28. UL 62368-1: Audio/video, information and communication technology equipment - Part 1: Safety requirements

1.4 QUALITY ASSURANCE

- A Contractor requirements:
 - 1 The Contractor shall have successfully completed a minimum of 5 telecommunications projects of the same size and scope.
 - 2 Project Manager
 - a The Project Manager shall have successfully completed a minimum of 5 telecommunications projects of the same size and scope.
 - b The contractor shall make the project manager available to the Owner/Owner's Representative before the start of this project for an interview. This person must be deemed acceptable by the Owner and/or their Representative before work can begin.
 - c Project Manager will be required to be available for scheduled on site project meetings at no additional cost to the Owner.

- d Project Manager will be required to be available to meet on site with the Owner/Owner's representative with a minimum of 24 hours notice for non-emergency issues, and a minimum of 4 hours for emergency issues at no additional cost to the Owner.
- 3 The work performed under this specification shall be of good quality and performed in a workmanlike manner. In this context 'good quality' means the work shall meet industry technical standards and quality of appearance. The Owner reserves the right to reject all or a portion of the work performed, either on technical or aesthetic grounds.
- 4 The Contractor shall provide all necessary materials and labor for a complete, functional Telecommunications cabling infrastructure in accordance with all applicable standards and the Construction Documents.
- B Material requirements
 - 1 All material and equipment to be installed on this project will be new and free from defects.
 - 2 Equipment and accessories shall be the product of a manufacturer regularly engaged in its manufacture.
 - 3 New material shall meet the following requirements.
 - a Manufactured within one year of the installation date.
 - b Undamaged
 - c Not previously installed
 - d Delivered to jobsite in original packaging
 - e No corrosion or other degradation of material
 - f In factory condition
 - g Unmodified
 - 4 If used material or equipment has been installed on this project the Contractor shall replace said materials and/or equipment with new products at no additional cost to the Owner.
 - 5 Equipment and accessories shall be in compliance with the applicable standards listed in Article 1.3 of this section and with applicable national, state and local codes.
 - 6 Items of a given type shall be the products of the same manufacturer.
 - 7 Deliver, store and protect products under provisions of Section 016200.
 - 8 Ship equipment in its original packages, to prevent damaging or entrance of foreign matter. Perform handling and shipping in accordance with manufacturer's recommendations. Provide protective covering during construction.
 - 9 Replace at no expense to Owner, equipment or material damaged during storage or handling, as directed by the engineer.
 - 10 Tag items with a weatherproof tag identifying equipment by name and purchase order number. Include packing and shipping lists.
- C Contractor shall warranty all materials, equipment, and workmanship for a minimum of one (1) year.
 - 1 Warranty shall provide repair/replacement of all defective or improperly installed materials at no additional cost to the Owner (including all costs to repair or replace the item(s)).
 - 2 Contractor shall provide a competent service technician and new materials to repair/replace defective items no later than 24 hours after notification.
- D The work performed under this specification shall be of good quality and performed in a workmanlike manner. In this context 'good quality' means the work shall meet industry technical standards and quality of appearance. The Owner reserves the right to reject all or a portion of the work performed, either on technical or aesthetic grounds.

- E The Contractor shall provide all necessary materials and labor for a complete, functional Telecommunications cabling infrastructure in accordance with all applicable standards and the Construction Documents.

1.5 SUBMITTALS

- A Submit under provisions of Section 013000 or 013300.
- B Submittals shall include the following:
 - 1 Table of contents
 - 2 A complete set of detailed manufacturer's specifications describing and illustrating all standard and special components and materials
 - 3 Part numbers
 - 4 Evidence of compliance with the applicable standards listed under Article 1.3 of this section
 - 5 Maintenance instructions and intervals
 - 6 A complete set of drawings for any special items
 - 7 A single line block diagram showing exactly the manner in which the contractor proposes to layout the system.
 - 8 Wiring diagrams
 - 9 Illustrations and scale drawing of the racks, equipment layouts etc.
 - 10 Drawings shall include designations, dimensions, operating controls, instruments, riser diagrams, routing diagrams etc.
- C Electronic submittals shall be searchable
- D The submittal shall be substantially complete for all items and equipment furnished under this section.
- E Individual drawings and data sheets submitted at random intervals will not be accepted for review.
- F Substitutions: Items of same function and performance shall be submitted in conformance with Division 1.

1.6 OPERATION AND MAINTENANCE MANUALS

- A Submit operation and maintenance manuals in accordance with Section 260000.
- B The manuals shall, at minimum, include the following:
 - 1 Table of contents
 - 2 Manufacturer (including contact information)
 - 3 Model number
 - 4 Programming manual (where applicable)
 - 5 Wiring diagrams
 - 6 Trouble-shooting guidelines (where applicable)
 - 7 Voltage ratings
 - 8 Current ratings
 - 9 Calibrated range (where applicable)
 - 10 List of capabilities
 - 11 Environmental ratings
 - 12 NEMA enclosure type
 - 13 Maintenance instructions and intervals
 - 14 Calibration procedures and intervals
 - 15 Installation instructions
 - 16 Repair instructions (where applicable)
 - 17 As-built drawings

- C Provide manuals in one of the following formats
 - 1 Three hardcopies
 - 2 PDF

1.7 DEFINITIONS

- A. Intermediate distribution frame (IDF): An intermediate distribution of horizontal cabling to other cabling (e.g. horizontal, backbone, or equipment).
- B. Main Distribution Frame (MDF): A main distribution for, 1st level backbone cables, entrance cables, and equipment cables. The Main Distribution-frame is often co-located in the building Entrance Facility (EF) and/or Equipment Room (ER) and consisting of riser cable terminals, utility service cables terminals, PBS terminals, and other equipment.

PART 2 – PRODUCTS

2.1 GENERAL

- A. All IDF, MDF, et cetera shall be enclosed unless open racks are called out on the plans.
- B. Top of wall mounted IDFs shall be 18” below ceiling.
- C. Provide all necessary mounting hardware.
- D. All material shall be UL listed for its application.

2.2 ENCLOSURES AND RACKS

- A. Manufacturers
 - 1. APC
 - 2. Black Box
 - 3. Chatsworth Products, Inc.
 - 4. Cooper B-Line
 - 5. Hoffman Enclosures
 - 6. Hubbell Premise Wiring
 - 7. Southwest Data Products
- B. Main Distribution Frames
 - 1. Four posts: Front and rear pairs of 3” deep C-shaped equipment mounting channels, 19” wide
 - 2. Minimum of 42 rack units
 - 3. 2000 pound static load capacity
 - 4. Provisions for anchoring to floor
 - 5. Zone 4 Seismic rated
 - 6. Provide and install a minimum of 6 shelves with the following requirements
 - a. 4 points of attachment
 - b. 200 pound capacity
 - c. Vented
 - 7. Mount a backboard on wall behind cabinet or rack
 - a. 48” wide by 96” high by 3/4” deep plywood
 - b. Mounting: 3/8”x2” long wood or self-tapping screw every 12” along wall stud
 - c. Paint with 3 coats of fire resistant paint.
 - 8. Fiber optic cable storage ring: Black Box FOSR24

9. MDFs shall be floor mounted unless otherwise noted.
- C. Intermediate Distribution Frames
 1. Four posts
 2. Minimum of 24 rack units
 3. 300 pound static load capacity
 4. Provisions for wall mounting
 5. Provide and install a minimum of 3 shelves with the following requirements
 - a. 4 points of attachment
 - b. 60 pound capacity
 - c. Vented
 6. 18" DIN rail
 7. Mount a backboard inside rear of cabinet (enclosed IDF) or on wall behind rack (open IDF)
 - a. 3/4" plywood
 - b. Mounting: 3/8"x2" long wood or self-tapping screw every 12" along wall stud
 - c. Paint with 3 coats of fire resistant paint.
 8. Fiber optic cable storage ring: Black Box FOSR12
 9. IDFs shall be wall mounted unless otherwise noted.
- D. Cabinets
 1. General
 - a. Material: Steel
 - b. 18" DIN rail
 - c. Wall mounted cabinets shall be composed of three sections:
 - 1) Rear panel mounted to wall
 - 2) Main section shall be hinged on rear panel and include lock to secure in closed position to rear panel.
 - 3) Front door shall be hinged on main section and lockable in the closed position.
 - d. Hinges shall be reversible to allow swing open from the right or left.
 - e. The front door shall have rounded edges and corners.
 - f. Floor mounted cabinets shall have locking front and rear doors.
 2. Enclosed rack/cabinet in cooled room
 - a. Top mounted ventilation fan(s)
 - 1) Minimum flow rate of 450 CFM for MDF cabinet
 - 2) Minimum flow rate of 225 CFM for IDF cabinet
 - b. MDF cabinets shall include 250 CFM enclosure blower.
 - c. Ventilation openings in sides or front
 - d. MDF cabinets shall have locking, mesh front and rear doors.
 - e. IDF cabinets shall have a locking front door with smoked poly-methyl-methacrylate window.
 - f. Install temperature switch in cabinet to turn the fan on at 100°F and off at 90°F.
 3. Coating
 - a. The completed rack or cabinet shall be degreased and cleaned.
 - b. After the cleaning process is finished, the rack or cabinet shall be phosphatized.
 - c. After the phosphatizing, the rack or cabinet shall receive an electrostatic deposition of polyester powder coating followed by baking to produce a hard durable finish.
 - 1) The minimum thickness of the paint film shall be 2.0 mils.

- 2) Paint film shall be uniform in color and free from blisters, sags, flaking and peeling
 - d. Finish shall conform to UL 50 and UL 50E.
 - e. Color shall be black for interior locations and ANSI 61 gray for exterior locations.
 - f. Coat underside surfaces of equipment outdoors or in damp locations with a corrosion resistant coating.
- E. Each rack unit space shall be identified on the racks/posts.
- F. The contractor shall calculate space requirements prior to ordering equipment. If the specified enclosure or rack is not large enough, the contractor shall order the size required for the equipment to be installed.

2.3 COPPER PATCH PANELS

- A. 48 Port, Category 6a patch panel: Panduit #CPP48WBLY
- B. Data ports
 - 1. RJ45 design
 - 2. Terminate 26AWG to 22 AWG, stranded or solid, Cat-6A cables without punch-down tool
 - 3. Suppress alien cross-talk
 - 4. Maintain 10GB/S performance in 48 port, 1RU patch panels
 - 5. T568B wiring scheme
 - 6. Meet or exceed Cat-6A requirements of TIA-568-C.2 and IEEE 802.3an.
 - 7. Compatible with IEEE 802.3at POE+
 - 8. Snap in, snap out modular design
 - 9. Conductor retention and strain relief
 - 10. Gold plated contacts
 - 11. Manufacturer and models
 - a. Black: Panduit #CJ6X88TGBL
 - b. Blue: Panduit #CJ6X88TGBU
 - c. Green: Panduit #CJ6X88TGGR
 - d. Purple: Panduit #CJ6X88TGVL
 - e. Red: Panduit #CJ6X88TGRD
 - f. White: Panduit #CJ6X88TGIW
 - g. Yellow: Panduit #CJ6X88TGYL
 - 12. Ports in patch panels shall be grouped by use (data, VOIP, clock/public address, etc.)
- C. Patch cords
 - 1. RJ45 design
 - 2. Four twisted, unshielded, 23 AWG, solid pairs (23 AWG UTP)
 - 3. Suppress alien cross-talk
 - 4. Maintain 10GB/S performance
 - 5. T568B wiring scheme
 - 6. Meet or exceed Cat-6A requirements of TIA-568-C.2 and IEEE 802.3an.
 - 7. SRL, Attenuation and NEXT results shall use Sweep Frequency test per TIA-568-C.
 - 8. Compatible with IEEE 802.3at POE+
 - 9. Snagless latch on plugs
 - 10. Length shall be 12 inches
 - 11. Manufacturer and models
 - a. Black: Panduit #UTP6A1BL

- b. Blue: Panduit #UTP6A1BU
 - c. Green: Panduit #UTP6A1GR
 - d. Purple: Panduit #UTP6A1VL
 - e. Red: Panduit #UTP6A1RD
 - f. White: Panduit #UTP6A1IW
 - g. Yellow: Panduit #UTP6A1YL
- D. Colors for RJ45 ports and patch cables shall be:
 - 1. Clocks: Green
 - 2. Data: Blue
 - 3. Energy management system: Purple
 - 4. Power distribution units: Black
 - 5. Servers: White
 - 6. Speakers: Green
 - 7. Surveillance: Red
 - 8. Uninterruptable power supplies: Black
 - 9. Wireless access points: Yellow
- E. Quantity: provide and install sufficient patch panels and patch cords to accommodate all devices with:
 - 1. 48 spare ports for MDFs
 - 2. 24 spare ports for IDFs
- F. Port identification: Panduit #C061X030FJJ

2.4 FIBER OPTIC PATCH PANELS

- A. Patch panel: Panduit #CFAPPBL1
- B. Fiber adapter panels (FAP)
 - 1. Multi-mode
 - a. OM4
 - b. 12 Duplex LC adapters per FAP
 - c. Zirconia ceramic, split sleeve ferrules
 - d. Color: Blue
 - e. Manufacturer: Panduit
 - 2. Single-mode
 - a. OS2
 - b. 12 Duplex LC adapters per FAP
 - c. Zirconia ceramic, split sleeve ferrules
 - d. Color: Green
 - e. Manufacturer: Panduit
- C. Install blank adapter panel in each unused space in the patch panel: Panduit #FAPB
- D. Fiber optic patch cords
 - 1. Cords shall have duplex LC connectors on one end and SFP connectors on other end.
 - 2. Length shall be 8 inches for patch panel adjacent to switch. Add 1.75 inches to length for each rack unit separating patch panel from switch.
 - 3. Multi-mode patch cords shall be OM4. Single-mode patch cords shall be OS2.
 - 4. Cord and connector colors shall match adapter colors.
- E. Quantity: provide and install sufficient devices to accommodate all backbone cable strands with:
 - 1. 36 spare terminals for MDFs
 - 2. 12 spare terminals for IDFs
- F. Port identification: Panduit #C061X030FJJ

2.5 TELCO SPLICE BLOCKS

- A. Where called out on plans provide and install a 50 pair, Type 66 Telco Splice Block; Black Box JP620 or equivalent.
- B. Quantity: provide and install sufficient splice blocks to accommodate 150% of phone lines terminating at MDF.
- C. All terminals shall be screw type.

2.6 POWER SUPPLIES

- A. IDF Uninterruptable Power Supply
 1. UPS shall be APC rack mountable Smart-UPS or Symmetra series.
 2. Refer to plans for size of UPS. If size is not shown on plans, size of UPS shall be 900VA per 48 port LAN switch.
 3. Provide and install APC AP9631 Network Management Card with Environmental Monitoring and APC AP9335TH temperature and humidity sensor.
 4. Provide and install Cat-6A patch cord from UPS to LAN switch.
- B. All UPS feeding data equipment shall have battery packs allowing for 30 minutes of runtime at full load during power outage.
- C. Power Distribution Units
 1. PDUs shall be rack mounted, switched outlet type with sequenced start-up.
 2. PDU(s) shall have a minimum of 8 5-15R and/or 5-20R per 2kVA of UPS capacity. Coordinate receptacle types with equipment being fed by PDU(s).
 3. Quantity of PDUs shall allow usage of full capacity of UPS.
 4. PDUs shall be capable of cycling power to each receptacle via network.
 5. Coordinate input type(s) of PDU(s) with output type(s) of UPS.
 6. Provide and install Cat-6A patch cord from each PDU to LAN switch.
- D. All UPSs and PDUs shall include the following features.
 1. Minimum of one RJ-45 Ethernet port
 2. SNMPv3, SSL, SSH
 3. Password protection
 4. User defined alarms with email alerting
 5. Load display
- E. Provide and install APC InfraStruxure Manager software and license for each UPS and PDU.

2.7 GROUNDING AND BONDING

- A. Grounding Busbar
 1. Grounding Busbars shall be 4" high by 12" wide by 0.25" thick solid copper bar.
 2. The busbar shall be 4" high and 12" long and shall have 18 attachment points (two rows of 9 each) for two-hole grounding lugs.
 3. The hole pattern for attaching grounding lugs shall meet the requirements of TIA-607-B and shall accept 30 lugs with 5/8" hole centers and 6 lugs with 1" hole centers.
 4. The busbar shall include wall-mount stand-off brackets, assembly screws and insulators.
 5. The busbar shall be UL Listed as grounding and bonding equipment.

- 6 Grounding Busbar shall be Chatsworth Products, Inc. 40153-012, or approved equal.
- B Vertical Rack Busbar
 - 1 Vertical, rack-mounted busbar shall be constructed of 1/4" thick by 5/8" wide, hard-drawn copper bar.
 - 2 Busbar shall be designed to mount into the channel of the rack without interfering with mounting of equipment on the rack.
 - 3 Bar shall have eight 6-32 tapped ground mounting holes on 1" intervals and four 0.281" holes for the attachment of two-hole grounding lugs.
 - 4 Busbars shall run entire height of rack.
 - 5 Busbars shall be Chatsworth Products, Inc. 40161-036 and/or 40161-072
- C Antioxidant Joint Compound
 - 1 Aluminum to copper: Chatsworth Products, Inc. 40166-xxx
 - 2 Copper to copper: Chatsworth Products, Inc. 40168-xxx

2.8 SURGE SUPPRESSION

- A. Provide and install a 10 GB/S data-line surge suppressor for each data and VOIP cable entering a building: Phoenix Contact #DT-LAN-CAT.6+
- B. Provide and install a telephone line surge suppressor for each analog telephone line entering a building: Black Box #SP365A-R2 or equivalent

PART 3 – EXECUTION

3.1 INSTALLATION

- A Cabinets, racks, and enclosures
 - 1 Mount all cabinets and racks to walls or floors according to the Typical Electrical Details.
 - 2 Rack mount screws not used for installing patch panels and other hardware shall be bagged and left with the rack upon completion of the installation.
- B Cable trays
 - 1 Cable trays must be securely attached to walls, backboards, and racks/cabinets to comply with all Zone 4 seismic requirements.
 - 2 Cable trays shall be installed so that there is a minimum of 8" of unobstructed clearance above rack.
 - 3 Cable trays shall be installed so that there is a minimum of 12" of clearance from all florescent lighting, electrical conduits/circuits, and fire alarm conduits/devices.
 - 4 Cable trays shall be NEMA class designation 12B.
- C Rack mounted equipment
 - 1 Securely fasten all rack mounted equipment to each rack rail with a minimum of two screws per rail and according to manufacturers' recommendations.
 - 2 Patch panels shall be mounted to front pair of rack rails.
 - 3 PDUs shall be mounted to rear pair of rack rails.
 - 4 All other equipment shall be mounted to both pairs of rack rails.
 - 5 Alternate patch panels and switches so that each port in the patch panel is adjacent to the corresponding port in the switch.
- D Cable management
 - 1 Install vertical cable management raceways on each post of freestanding racks.

- 2 Install fiber optic storage ring on backboard behind each IDF/MDF or in rear of IDF cabinet. Loop each fiber optic cable round ring 3 times. Install ID tag on loop of each cable.
- E Grounding and Bonding
 - 1 Each MDF and IDF shall be equipped with a grounding busbar.
 - 2 Each grounding busbar shall be connected to the building electrical grounding facility per plans.
 - 3 All metallic equipment, including but not limited to, each rack, metallic backboard, cable sheath, metallic strength member, splice case, cable tray shall be grounded to its respective grounding busbar using a minimum #6 AWG stranded copper bonding conductor with a green insulation and compression connectors.
 - 4 Wall mounted grounding busbars
 - a Attach busbars to the wall with appropriate hardware according to the manufacturer's installation instructions and Typical Electrical Details.
 - b Conductor connections to the grounding busbar shall be made with two-hole bolt-on compression lugs sized to fit the busbar and the conductors.
 - c Each lug shall be attached with stainless steel hardware after preparing the bond according to manufacturer recommendations and treating the bonding surface on the busbar with antioxidant to help prevent corrosion at the bond.
 - d The wall-mounted busbar shall be bonded to ground as part of the overall Telecommunications Bonding and Grounding System.
 - 5 Rack-Mount Busbars and Ground Bars
 - a Each rack and cabinet shall be equipped with a vertical grounding busbar.
 - b Attach rack-mount busbars and ground bars to racks according to the manufacturer's installation instructions.
 - c Bond the rack-mount grounding busbar to the rack, cabinet, and room's grounding busbar with appropriately sized hardware and conductor.
 - 6 Equipment Ground Jumper Kit
 - a Bond equipment to a vertical rack-mount grounding busbar using ground jumper according to the manufacturer's recommendations.
 - b Clean the surface and use antioxidant between the compression lugs on the jumper and the rack-mount grounding busbar to help prevent corrosion at the bond.
- F Program UPSs, PDUs, and software to set alarms for current overload, temperature out of limits, and humidity out of limits and send email notification of alarm conditions.

3.2 LABELING

- A. The contractor shall follow the Owner's labeling scheme.
- B. Each IDF and MDF shall be labeled.
- C. Each IDF, MDF, patch panel, port, switch, and cable shall have a unique identification.
- D. Label each port on the patch panel and faceplate with its identification.
- E. Label each cable at its beginning and end points no further than 6" behind termination on a section of cable that is easily accessible. Cable labels shall include the ids of both terminations and cable id.
- F. Label the plug end of each power cord with id of equipment it feeds.
- G. Each faceplate shall be machine labeled. The labeling shall be placed on the faceplate so that the individual jack can be clearly identified by its associated label.

- H. All labels shall be machine printed. Handwritten labels are not acceptable.
- I. All labeling information shall be recorded on the as-built drawings and all test documents.

3.3 SYSTEM CLOSEOUT AND AS-BUILT DOCUMENTATION

- A. Upon completion of the installation, the telecommunications contractor shall provide three (3) full documentation sets to the Owner's Representative/Engineer for approval. One (1) to be a hardcopy and two (2) to be electronic copies. Documentation shall include the items detailed in the sub-sections below.
- B. Documentation shall be submitted within ten (10) working days of the completion of each testing phase. This is inclusive of all test results and draft as-built drawings. Draft drawings may include annotations done by hand. Machine generated (final) copies of all drawings shall be submitted within 30 calendar days of the completion of each testing phase. At the request of the Owner's Representative/Engineer, the telecommunications contractor shall provide copies of the original test results.
- C. The Owner's Representative/Engineer will request that a 10% random field re-test be conducted on the cable system, at no additional cost, to verify documented findings. Tests shall be a repeat of those defined above. If findings contradict the documentation submitted by the telecommunications contractor, additional testing can be requested to the extent determined necessary by the Engineer, including a 100% re-test. This re-test shall be at no additional cost to the Owner.
- D. Test Results documentation shall be provided in two media, as listed above, one (1) hardcopy and one (1) on disk within three weeks after the completion of the project. The documentation shall be clearly marked on the outside front cover with the words "Project Test Documentation", the project name, and the date of completion (month and year). The results shall include a record of test frequencies, cable type, conductor pair and cable (or outlet) I.D., measurement direction, reference setup, and crew member name(s). The test equipment name, manufacturer, model number, serial number, software version and last calibration date will also be provided at the end of the document. Unless the manufacturer specifies a more frequent calibration cycle, a bi-annual calibration cycle is anticipated on all test equipment used for this installation. The test document shall detail the test method used and the specific settings of the equipment during the test as well as the software version being used in the field test equipment.
- E. Printouts generated for each cable by the wire test instrument shall be submitted as part of the documentation package.
- F. When repairs and re-tests are performed, the problem found and corrective action taken shall be noted, and both the failed and passed test data shall be documented.
- G. The As-Built drawings are to include cable routes, outlet locations and the approved labeling identifiers. Their sequential number as defined elsewhere in this document shall identify outlet locations. Numbering, icons, and drawing conventions used shall be consistent throughout all documentation provided. The Owner will provide floor plans in paper and electronic (DWG, AutoCAD 2008) formats on which as-built construction information can be added. These documents will be modified accordingly by the telecommunications contractor to denote as-built information as defined above and returned to the Owner.
- H. Contractor will provide one laminated 11"x17" drawing at each IDF and MDF that includes the building layout for that IDF or MDF, along with the outlet locations and all of the approved labeling.

END OF SECTION

SECTION 27 15 00 COMMUNICATIONS HORIZONTAL CABLING

PART 1 – GENERAL

1.1 SECTION INCLUDES

This section includes material and workmanship requirements for data, telephone (analog and VOIP), IP clocks, and IP speakers horizontal cabling.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A Division 1
 - 1 Section 013000: Administrative Requirements
 - 2 Section 013300: Submittal Procedures
 - 3 Section 014000: Quality Requirements
 - 4 Section 016000: Product Requirements
 - 5 Section 017000: Execution and Closeout Requirements
 - 6 All other included sections under Division 1
- B All included sections under Division 26
- C All included sections under Division 27
- D Plans
- E Manufacturers' manuals, product bulletins, etc.

1.3 REFERENCE STANDARDS AND CODES

- A. Governing Codes and Conflicts: If the requirements of the Construction Documents exceed those of the governing codes and regulations, then the requirements of the Construction Documents shall prevail. Where a conflict exists, the governing codes and ordinances shall supersede all other requirements.
- B. ANSI: American National Standards Institute (ANSI)
- C. CEC: California Electrical Code
- D. Institute of Electrical and Electronic Engineers (IEEE)
 - 1. IEEE 802.3: IEEE Standard for Ethernet
 - 2. IEEE 802.3ad: Link Aggregation
 - 3. IEEE 802.3af: Power over Ethernet
 - 4. IEEE 802.3at: Enhanced Power over Ethernet
- E. Insulated Cable Engineers Association (ICEA)
 - 1. ICEA S-84-608: Telecommunications Cables, Filled Polyolefin Insulated, Copper Conductor
 - 2. ICEA S-102-700: ICEA Standard for Category 6 Individually Unshielded, Twisted Pair Indoor Cables (With or Without an Overall Shield) for Use in Communications Wiring Systems Technical Requirements
- F. Telecommunications Industries Association (TIA)
 - 1. TIA-568-C: Commercial Building Telecommunications Standard
 - 2. TIA-568-C.0: Generic Telecommunications Cabling for Customer Premises
 - 3. TIA-568-C.1: Commercial Building Telecommunications Cabling Standard
 - 4. TIA-568-C.2: Balanced Twisted-Pair Telecommunications Cabling and Components Standards
 - 5. TIA-569-C: Commercial Building Standard for Telecommunications Pathways and Spaces

6. TIA-606-B: Administration Standard for the Telecommunications Infrastructure of Commercial Buildings
 7. TIA-607-B: Commercial Building Grounding and Bonding Requirements for Telecommunications
 8. TIA-758-B: Customer Owned Outside Plant Telecommunications Infrastructure Standard
 9. TIA-1152: Requirements for Field Test Instruments and Measurements for Balanced Twisted Pair Cabling
 10. TIA-1183: Measurement Methods and Test Fixtures for Balun-less Measurement of Balanced Components and Systems
 11. TIA-TSB-36: Technical Systems Bulletin Additional Cable Specifications for Unshielded Twisted-Pair Cables
 12. TIA-TSB-67: TIA Telecommunications Systems Bulletin, Additional Transmission Specifications for Unshielded Twisted-Pair Connecting Hardware
 13. TIA-TSB-184: Guidelines for Supporting Power Delivery Over Balanced Twisted-Pair Cabling
 14. TIA-TSB-1197: Mode Conversion Parameters for Balanced Twisted Pair Cabling
- G. Underwriters Laboratories, Inc.
1. UL 444: Communications Cables
 2. UL 1666: Standard for Test for Flame Propagation Height of Electrical and Optical-Fiber Cables Installed Vertically in Shafts
 3. UL 1690: Standard for Data-Processing Cable
 4. UL 1863: Communications Circuit Accessories
 5. UL 1977: Component Connectors for Use in Data, Signal, Control, and Power Applications
 6. UL 2024: Standard for Signaling, Optical Fiber and Communications Raceways and Cable Routing Assemblies
 7. UL 2269: Optical Fiber/Communications/Signaling/Coaxial Cable Outlet Boxes
 8. UL 62368-1: Audio/video, information and communication technology equipment - Part 1: Safety requirements

1.4 QUALITY ASSURANCE

- A Contractor requirements:
- 1 The Contractor shall have successfully completed a minimum of 5 telecommunications projects of the same size and scope.
 - 2 Project Manager
 - a The Project Manager shall have successfully completed a minimum of 5 telecommunications projects of the same size and scope.
 - b The contractor shall make the project manager available to the Owner/Owner's Representative before the start of this project for an interview. This person must be deemed acceptable by the Owner and/or their Representative before work can begin.
 - c Project Manager will be required to be available for scheduled on site project meetings at no additional cost to the Owner.
 - d Project Manager will be required to be available to meet on site with the Owner/Owner's representative with a minimum of 24 hours notice for non- emergency issues, and a minimum of 4 hours for emergency issues at no additional cost to the Owner.
 - 3 The work performed under this specification shall be of good quality and performed in a workmanlike manner. In this context 'good quality' means the

work shall meet industry technical standards and quality of appearance. The Owner reserves the right to reject all or a portion of the work performed, either on technical or aesthetic grounds.

- 4 The Contractor shall provide all necessary materials and labor for a complete, functional Telecommunications cabling infrastructure in accordance with all applicable standards and the Construction Documents.

B Material requirements

- 1 All material and equipment to be installed on this project will be new and free from defects.
- 2 Equipment and accessories shall be the product of a manufacturer regularly engaged in its manufacture.
- 3 New material shall meet the following requirements.
 - a Manufactured within one year of the installation date.
 - b Undamaged
 - c Not previously installed
 - d Delivered to jobsite in original packaging
 - e No corrosion or other degradation of material
 - f In factory condition
 - g Unmodified
- 4 If used material or equipment has been installed on this project the Contractor shall replace said materials and/or equipment with new products at no additional cost to the Owner.
- 5 Equipment and accessories shall be in compliance with the applicable standards listed in Article 1.3 of this section and with applicable national, state and local codes.
- 6 Items of a given type shall be the products of the same manufacturer.
- 7 Deliver, store and protect products under provisions of Section 016200.
- 8 Ship equipment in its original packages, to prevent damaging or entrance of foreign matter. Perform handling and shipping in accordance with manufacturer's recommendations. Provide protective covering during construction.
- 9 Replace at no expense to Owner, equipment or material damaged during storage or handling, as directed by the engineer.
- 10 Tag items with a weatherproof tag identifying equipment by name and purchase order number. Include packing and shipping lists.

C Contractor shall warranty all materials, equipment, and workmanship for a minimum of one (1) year.

- 1 Warranty shall provide repair/replacement of all defective or improperly installed materials at no additional cost to the Owner (including all costs to repair or replace the item(s)).
- 2 Contractor shall provide a competent service technician and new materials to repair/replace defective items no later than 24 hours after notification.

1.5 SUBMITTALS

A Submit under provisions of Section 013000 or 013300.

B Submittals shall include the following:

- 1 Table of contents
- 2 A complete set of detailed manufacturer's specifications describing and illustrating all standard and special components and materials
- 3 Part numbers

- 4 Evidence of compliance with the applicable standards listed under Article 1.3 of this section
- 5 Maintenance instructions and intervals
- 6 A complete set of drawings for any special items
- 7 A single line block diagram showing exactly the manner in which the contractor proposes to layout the system.
- 8 Wiring diagrams
- 9 Drawings shall include designations, dimensions, operating controls, instruments, riser diagrams, routing diagrams etc.
- C Electronic submittals shall be searchable
- D The submittal shall be substantially complete for all items and equipment furnished under this section.
- E Individual drawings and data sheets submitted at random intervals will not be accepted for review.
- F Substitutions: Items of same function and performance shall be submitted in conformance with Division 1.

1.6 OPERATION AND MAINTENANCE MANUALS

- A Submit operation and maintenance manuals in accordance with Section 260000.
- B The manuals shall, at minimum, include the following:
 - 1 Manufacturer (including contact information)
 - 2 Model number
 - 3 Programming manual (where applicable)
 - 4 Wiring diagrams
 - 5 Trouble-shooting guidelines (where applicable)
 - 6 Voltage ratings
 - 7 Current ratings
 - 8 Calibrated range (where applicable)
 - 9 List of capabilities
 - 10 Environmental ratings
 - 11 NEMA enclosure type
 - 12 Maintenance requirements
 - 13 Installation instructions
 - 14 Repair instructions (where applicable)
- C Provide manuals in one of the following formats
 - 1 Three hardcopies
 - 2 PDF

PART 2 – PRODUCTS

2.1 GENERAL

- A. All material shall be UL listed for its application.
- B. Cables shall be rated for its intended use, i.e. plenum, riser, wet location, etc.
- C. Cables, conductors, and all other components shall meet the requirements of standards listed in Section 1.3.

2.2 DATA AND VOIP HORIZONTAL CABLING

- A. Contractor shall provide, install, and test a Cat-6 cable link from each Data/VOIP Outlet directly to the IDF utilizing the hardware listed below (or approved equivalent) in full compliance with all applicable standards, local and national codes, manufacturers' recommendations, and otherwise noted within these specifications.
- B. Specifications:
 - 1. Four twisted, unshielded, 23 AWG, solid copper pairs (23 AWG UTP)
 - 2. Suppress cross-talk
 - 3. Maintain 10GB/S performance
 - 4. Meet or exceed Cat-6 requirements of TIA-568-C.2 and IEEE 802.3an.
 - 5. SRL, Attenuation and NEXT results shall use Sweep Frequency test per TIA-568-C.
 - 6. Have UL verification to Cat-6 specifications.
 - 7. Compatible with IEEE 802.3at POE+
 - 8. Color for cables shall be blue.
 - 9. Berk-Tek LANmark-2000 or approved equal
- C. Cables shall be rated for its intended use, i.e. plenum, riser, wet location, etc.
- D. Cables, conductors, and all other components shall meet the requirements of standards listed in Section 1.3.
- E. Provide all termination accessories, dressing accessories, enclosures, and testing for a complete fiber optic distribution system. Refer to Specification Section 271100.
- F. Identification
 - 1. Interior: Panduit S100X225YAJ self-laminating, polyester label
 - 2. Exterior: Panduit MT350W17-Q stainless steel tag with rounded edges & corners
- G. Contractor shall determine cable "link" quantities as shown on the Construction Documents.

2.4 OUTLET HARDWARE

- A Data and VOIP Ports:
 - 1 Category 6, RJ45 port: Panduit CJ688TGBUY
 - 2 Terminate 26AWG to 22 AWG, stranded or solid, Cat-6 cables without punch-down tool
 - 3 Suppress cross-talk
 - 4 Maintain 1GB/S performance in 48 port, 1RU patch panels
 - 5 T568B wiring scheme
 - 6 Meet or exceed Cat-6 requirements of TIA-568-C.2.
 - 7 Compatible with IEEE 802.3at POE+
 - 8 Snap in, snap out modular design
 - 9 Conductor retention and strain relief
 - 10 Gold plated contacts
- B Wallplates:
 - 1 Commercial , educational, industrial, and institutional
 - a Material: Satin finish stainless steel
 - b For data or telephone – one module space: Black Box WP370 or equivalent
 - c For data and telephone – two module spaces: Black Box WP371, Panduit CFPL2SY, or equivalent
 - d For data and telephone – two module spaces: Black Box WP373, Panduit CFPL4SY, or equivalent
 - 2 Residential:
 - a Material: Nylon

- b Color: Wallplate color shall closely match wall color.
- c For data or telephone – one module space: Panduit NK1FNWH or equivalent
- d For data and telephone – two module spaces: Panduit NK2FNWH or equivalent
- e Wallplate Specifications: The wallplate housing shall be a one-piece, single-gang flush mount style that fits standard NEMA openings, on four-square boxes with reducer. It should provide 1-port field-configurable with a variety of simplex snap-in ports/connectors. It must be made of high-impact, self-extinguishing plastic rated UL 94V-0, and be UL Listed, CSA certified, and compliant with FCC Part 68 and TIA-568-C specifications. Wallplate screws must match wallplate color.
- 3 Provide an install a blank module for each unused opening in the wallplates, Panduit CMBIG-X or equivalent.
- 4 Labels: Panduit C125X030YPT self-adhesive, polyester label
- C Back box: 4 inch square box with one gang plaster

2.5 MISCELLANEOUS MATERIALS

- A Conduits: Refer to Section 260500.
- B Supports: Refer to Section 260529.
- C J-Hooks shall be steel with closure and two bolt holes. Finished part shall be hot dipped galvanized.

2.6 IDENTIFICATION

- A Interior: Panduit #S100X225YAJ self-laminating, polyester label
- B Exterior: Panduit #MT350W17-Q stainless steel tag with rounded edges & corners

PART 3 – EXECUTION

3.1 INSTALLATION

- A Cables
 - 1 Cable shall be installed in accordance with manufacturer's recommendations and best industry practices.
 - 2 Contractor shall use Velcro strip to bundle cables together. Tie Wraps will not be allowed for supporting, bundling, and/or dressing of any cables.
 - 3 Contractor shall provide a three foot service loop for all cables. The service loop will be coiled and secured using Velcro in the accessible ceiling at the conduit stub to the work area outlet box.
 - 4 A 1/8" diameter, nylon pull cord shall be co-installed with all cable installed in any conduit.
 - 5 Cable raceways shall not be filled greater than the TIA-569-C maximum fill for the particular raceway type or 40%.
 - 6 Cables shall be installed in continuous lengths from origin to destination. Splices are not permitted.
 - 7 Do not exceed the manufacturer's minimum bend radius and maximum pulling tension for cables.

- 8 Any cable damaged or exceeding recommended installation parameters during installation shall be replaced by the contractor prior to final acceptance at no cost to the Owner.
- 9 Cables shall be dressed and terminated in accordance with the recommendations made in the TIA-568-C standards, manufacturer's recommendations, and best industry practices.
- 10 The cable jacket shall be maintained to within 1/2 inch of the termination point.
- 11 Vertical runs of cable shall be supported to messenger strand, cable ladder, or other method to provide proper support for the weight of the cable every 3 feet.
- 12 Large bundles of cables and/or heavy cables shall be attached using metal clamps and/or metal banding to support the cables.
- 13 All cables shall be neatly bundled and dressed continuously from the entrance point of the data room or cabinet to their respective panels. Each panel shall be fed by an individual bundle separated and dressed back to the point of cable entrance into the rack or frame. Cables in all other rooms shall be concealed.
- 14 Inside Buildings: Cable and conductors shall be routed in conduit, or surface mounted raceway, run overhead and parallel to the structure.
- a Conduit shall be rigid steel, IMC, or EMT as described elsewhere in these specifications.
 - b Plastic conduit shall not be used above grade.
 - c Cable may be used behind accessible T-bar ceilings without conduit. Mount cable at the roof joist (or bottom of floor above) on 1" wide 'J-hooks' or 'bridle-rings' at every 5'-0" or less. Support each cable within 1'-0" of its termination point. Run cable parallel and perpendicular to the building structure and provide mechanical support for vertical runs by using Unistrut channel securely fastened in place.
 - d Cable and conductors shall not be attached to the support wire of the T-bar ceiling or laid across the ceiling boards.
- 15 Between buildings: Cable and conductors shall be routed in conduit run underground.
- a Conduit shall be rigid steel, IMC, or plastic as described elsewhere in these specifications.
 - b The use of EMT is not acceptable.
- 16 On The Roof: Conduit shown on the drawings as being on the roof of the building or covered walkway shall be installed on 4" by 4" pressure treated wood blocking (sleepers) attached to the structure every 8'-0" or less.
- a Conduit shall be rigid steel or IMC as described elsewhere in these specifications.
 - b The use of EMT or plastic conduit is not acceptable.
- 17 Make all underground runs continuous without splices or taps. Use underground boxes for *pulling purposes only*.
- 18 Only use pulling grip approved by the cable manufacturer.
- 19 Clean conduit with mandrel prior to pulling.
- 20 Make all connections and splices in a clean environment.
- 21 Follow cable manufacturer's and device manufacturer's instructions for connections to devices.
- 22 Maximum combined cable length (patch cords and installed cable) from switch to end user equipment shall be 328 feet.
- 23 Stranded conductors shall be "tinned" with solder before terminations are made.
- 24 Make all terminations in cabinets and at terminal backboards on terminal blocks and/or Patch Panels as specified above.

- B Outlets Installation
 - 1 No more than 12" of cable shall be stored in an outlet box, modular furniture raceway, or insulated walls.
 - 2 Data jacks, unless otherwise noted in drawings, shall be located in the top position(s) of each faceplate. Data jacks in horizontally oriented faceplates shall occupy the left-most position(s).
 - 3 Voice jacks, unless otherwise noted in drawings, shall occupy the next position(s) below the data on the faceplate. Voice jacks in horizontally oriented faceplates shall occupy the position right of the data jack.
 - 4 All faceplates installed shall be level.

3.2 LABELING

- A. The contractor shall follow the Owner's labeling scheme.
- B. Label each cable at its beginning and end points no further than 6" behind termination on a section of cable that is easily accessible. Cable labels shall include the ids of both terminations and cable id.
- C. All labels shall be machine printed or embossed. Handwritten labels are not acceptable.
- D. All labeling information shall be recorded on the as-built drawings and all test documents.
- E. Label all cable beginning and terminating points.
- F. Labels for site cables and cables in multiple buildings shall feature the following.
 - 1. Identify origin (MDF or IDF and building), termination (IDF or port identifier), and next pull box.
 - 2. Cables in pull boxes shall have a label at entry into pull box and exit from pull box. Labels shall be stainless steel tags with embossed characters.

3.3 TESTING

- A. General
 - 1. All cables (including each fiber) and termination hardware shall be tested.
 - 2. Testing must comply with TIA standards for testing (refer to Section 1.3), plans, specifications, and manufacturer recommendations.
 - 3. Contractor shall notify the Owner or Owner's Representative 72 hours before commencement of testing.
 - 4. Upon receipt of the test documentation, the Customer reserves the right to have the contractor perform a 20% witnessed "spot testing" of the cabling system to validate test results provided in the test document, at no additional cost. If a significant amount of cables are marginal and/or fail during the "spot test" Contractor will retest the entire cable plant at no additional cost.
- B. Equipment
 - 1. All equipment must be properly calibrated and traceable to NIST.
 - 2. Equipment shall have been recalibrated within the previous 6 month prior to testing.
- C. Data Copper Cables:
 - 1. Each pair in each cable shall be tested in accordance with TIA-568-C series and TIA-TSB-67 for:
 - a. Opens
 - b. Shorts
 - c. Grounds
 - d. Continuity

- e. Polarity
 - f. DC resistance
 - g. DC resistance unbalance
 - h. Impulse noise
 - i. Signal attenuation
 - j. NEXT
 - k. PS-NEXT
 - l. ELFEXT
 - m. PS-ELFEXT
 - n. Return loss
 - o. Propagation delay
 - p. Delay skew
2. Each installed cable link shall be tested for installed length using a TDR type device. Cable lengths shall be recorded, referencing the cable identification number and circuit or pair number.
 3. Conductors and connectors shall be tested as a complete system.
 4. Testing of all horizontal cable, outlet ports, patch cords, and riser cable pairs shall include end-to-end tests using a Wavetech Lantek 100 or Fluke Network's DXT CableAnalyzer Series scanner.
 5. Test cables to check that they meet all IEEE and TIA Cat-6 and 1GB/S performance specifications (refer to Section 1.3).
 6. All installed cables must meet or exceed the defined standards for performance. The Contractor shall take all steps necessary to repair or replace any optic not meeting the standard.
 7. Test results shall be automatically evaluated by the equipment, using the most up-to-date criteria from the TIA standards.
 8. The test equipment shall provide a printed document for each test that is also available in a downloadable file using an application from the test equipment manufacturer. The printed test results shall include a print out of all tests performed, and the individual test results for each cable.

3.4 SYSTEM CLOSEOUT AND AS-BUILT DOCUMENTATION

- A Upon completion of the installation, the telecommunications contractor shall provide three (3) full documentation sets to the Owner's Representative/Engineer for approval. One (1) to be a hardcopy and two (2) to be electronic copies. Documentation shall include the items detailed in the sub-sections below.
- B Documentation shall be submitted within ten (10) working days of the completion of each testing phase. This is inclusive of all test results and draft as-built drawings. Draft drawings may include annotations done by hand. Machine generated (final) copies of all drawings shall be submitted within 30 calendar days of the completion of each testing phase. At the request of the Owner's Representative/Engineer, the telecommunications contractor shall provide copies of the original test results.
- C The Owner's Representative/Engineer will request that a 10% random field re-test be conducted on the cable system, at no additional cost, to verify documented findings. Tests shall be a repeat of those defined above. If findings contradict the documentation submitted by the telecommunications contractor, additional testing can be requested to the extent determined necessary by the Engineer, including a 100% re-test. This re-test shall be at no additional cost to the Owner.
- D Test Results documentation shall be provided in two media, as listed above, one (1) hardcopy and one (1) on disk within three weeks after the completion of the project. The

documentation shall be clearly marked on the outside front cover with the words "Project Test Documentation", the project name, and the date of completion (month and year). The results shall include a record of test frequencies, cable type, conductor pair and cable (or outlet) I.D., measurement direction, reference setup, and crew member name(s). The test equipment name, manufacturer, model number, serial number, software version and last calibration date will also be provided at the end of the document. Unless the manufacturer specifies a more frequent calibration cycle, a bi-annual calibration cycle is anticipated on all test equipment used for this installation. The test document shall detail the test method used and the specific settings of the equipment during the test as well as the software version being used in the field test equipment.

- E Printouts generated for each cable by the wire test instrument shall be submitted as part of the documentation package.
- F When repairs and re-tests are performed, the problem found and corrective action taken shall be noted, and both the failed and passed test data shall be documented.
- G The As-Built drawings are to include cable routes, outlet locations and the approved labeling identifiers. Their sequential number as defined elsewhere in this document shall identify outlet locations. Numbering, icons, and drawing conventions used shall be consistent throughout all documentation provided. The Owner will provide floor plans in paper and electronic (DWG, AutoCAD 2008) formats on which as-built construction information can be added. These documents will be modified accordingly by the telecommunications contractor to denote as-built information as defined above and returned to the Owner.
- H Contractor will provide one laminated 11"x17" drawing at each IDF and MDF that includes the building layout for that IDF or MDF, along with the outlet locations and all of the approved labeling.

END OF SECTION

Bid Summary
Fresno County Department of Public Works and Planning

Project: DPH Basement Renovation
Contract No.: 24-S-14

Bid Opening: 04/03/25
Scheduled Award Date: 05/20/25

Bidders

1. Better Enterprises, Inc.

1148 N Cypress Ave, Fresno, CA 93727-6871

2. Fortune-Ratliff General Contractors, Inc.

352 West Bedford Suite 107, Fresno, CA 93711

3. Katch Environmental, Inc. dba Katch General

929 L St, Fresno, CA 93721-2616

4. AMG & Associates, Inc.

26535 Summit Circle, Santa Clarita, CA 91350

Subcontractors

Better Flooring, Inc., Best Fire Protection, Western Building Materials Co., KC&S Construction Specialties, Inc., Fresno Roofing Co., Inc., Shelco Industries, Cencal Services, Inc., Alcal Specialty Contracting, Inc., Valley Air Conditioning & Repair, Inc., San Joaquin Glass, Frontline Plastering, Inc., Tarlton & Son, Inc., El Executive Interiors, Strategic Mechanical, Inc., The Boelter Companies, Inc., Meyers Constructors, Inc., A-C Electric Company

MD Concrete Cutting & Demo, A-C Electric Co., Celtic Construction, Inc., Doug De Leo Welding, Inc., Woodwork, Inc., Legacy Insulation, Legacy Insulation, KC&S Construction Specialties, Inc., San Joaquin Glass, Jackson-Young Drywall, Inc., JD Ballard & Sons Tile & Marble Co., Ceiling Experts, Amparan Flooring, Ro's Precise Painting, Partition Specialties, Inc., Shelco Industries, Johnson Fire Protection

Alcal Specialty Contracting Inc, Doug Deleo Welding Inc, D-One Drywall Services Inc, Woodwork Inc, Legacy Insulation Inc, KC&S Construction Specialties Inc, Fresno Shelfrac Specialties Inc Dba Shelco Industries, Fire System Solutions Inc, Ro's Precise Painting Inc, Optimal Tile Inc, Valley Unique Electric Inc Dba Valley Unique Electric, Ultra Ceiling Inc, DFS Flooring LP, Central Cal Plumbing Inc, Bay Cities Fire Protection Inc, Strategic Mechanical Inc, Cash & Lincoln Fence Co Dba Valley Fence Co

Celtic, Woodwork Inc, KC&S, San Joaquin Glass, D-One Drywall, J Dean Ballard, Western Building, Quality Carpets, Ro's Precise, Kroecker, Shelco, Johnson Fire, Fresno Plumbing, Strategic Mech, Valley Unique, Integrated, Alcal

	Total Bid
Architect's Estimate	\$8,800,000.00
1. Better Enterprises, Inc.	\$6,763,000.00
2. Fortune-Ratliff General Contractors, Inc.	\$7,800,000.00
3. Katch Environmental, Inc. dba Katch General	\$7,822,532.00
4. AMG & Associates, Inc.	\$8,268,000.00



BETTFOLO-01

JLOPER

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

6/2/2025

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Lodi-Alliant Insurance Services, Inc. 641 South Ham Ln Ste A Lodi, CA 95242	CONTACT NAME: Kristen Solari PHONE (A/C, No, Ext): FAX (A/C, No): E-MAIL ADDRESS: ksolari@alliant.com
	INSURER(S) AFFORDING COVERAGE INSURER A : Gemini Insurance Company INSURER B : American Fire and Casualty Company INSURER C : Navigators Specialty Insurance Company INSURER D : Southern Insurance Company INSURER E : Ascot Insurance Company INSURER F : Upland Specialty Insurance Company
INSURED Better Enterprises, Inc. 1148 N Cypress Ave Fresno, CA 93727	NAIC # 10833 24066 36056 19216 23752 16988

COVERAGES

CERTIFICATE NUMBER:

REVISION NUMBER: 1

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
A	☒ COMMERCIAL GENERAL LIABILITY ☐ CLAIMS-MADE ☒ OCCUR ☒ Owner's & Contractor GEN'L AGGREGATE LIMIT APPLIES PER: ☐ POLICY ☒ PROJECT ☐ LOC OTHER:	X	X	VCGP033731	4/1/2025	4/1/2026	EACH OCCURRENCE \$ 1,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$ 50,000 MED EXP (Any one person) \$ 5,000 PERSONAL & ADV INJURY \$ 1,000,000 GENERAL AGGREGATE \$ 2,000,000 PRODUCTS - COMP/OP AGG \$ 2,000,000
B	☒ AUTOMOBILE LIABILITY ☒ ANY AUTO OWNED AUTOS ONLY ☐ SCHEDULED AUTOS ☐ HIRED AUTOS ONLY ☐ NON-OWNED AUTOS ONLY	X	X	BAA58944335	4/1/2025	4/1/2026	COMBINED SINGLE LIMIT (Ea accident) \$ 1,000,000 BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$
C	☒ UMBRELLA LIAB ☒ OCCUR ☒ EXCESS LIAB ☐ CLAIMS-MADE DED ☐ RETENTION \$	X	X	AZ25EXC862987IC	4/1/2025	4/1/2026	EACH OCCURRENCE \$ 5,000,000 AGGREGATE \$ 5,000,000
D	☒ WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) ☐ Y / N If yes, describe under DESCRIPTION OF OPERATIONS below	N/A	X	OWP1011929	4/1/2025	4/1/2026	☒ PER STATUTE ☐ OTH-ER E.L. EACH ACCIDENT \$ 1,000,000 E.L. DISEASE - EA EMPLOYEE \$ 1,000,000 E.L. DISEASE - POLICY LIMIT \$ 1,000,000
E	Builders Risk			IMMA2510002507-01	6/2/2025	9/2/2026	Limit 6,763,000
F	Excess Liability			USXSL0157225	6/2/2025	4/1/2026	Limit 3,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

Re: 24-S-14 Department of Public Health Basement Renovation.

The County of Fresno, its officers, officials, employees, and volunteers are named additional insured per the attached endorsements. Waivers of subrogation apply per the attached endorsements. 30 day notice of cancellation applies.

CERTIFICATE HOLDER

CANCELLATION

County of Fresno Dept of Public Works and Planning 2220 Tulare St., 8th Floor Fresno, CA 93721	SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS. AUTHORIZED REPRESENTATIVE

WAIVER OF OUR RIGHT TO RECOVER FROM OTHERS ENDORSEMENT

We have the right to recover our payments from anyone liable for an injury covered by this policy. We will not enforce our right against the person or organization named in the Schedule. (This agreement applies only to the extent that you perform work under a written contract that requires you to obtain this agreement from us.)

This agreement shall not operate directly or indirectly to benefit anyone not named in the Schedule.

Schedule

Any person or organization as required by written contract

This endorsement changes the policy to which it is attached and is effective on the date issued unless otherwise stated.

(The information below is required only when this endorsement is issued subsequent to preparation of the policy.)

Endorsement Effective **4/1/2024**
Insured **Better Enterprises, Inc.**

Policy No. **OWP1010417**

Endorsement No.
Premium

Insurance Company **Southern Insurance Company** Countersigned by _____

WC 00 03 13
(Ed. 4-84)

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

WAIVER OF TRANSFER OF RIGHTS OF RECOVERY AGAINST OTHERS TO US

This endorsement modifies insurance provided under the following:

Commercial General Liability Coverage Part

SCHEDULE

Name Of Person Or Organization: Any person or organization when you and such person or organization have agreed in writing in a contract, prior to an occurrence that causes "bodily injury", "property damage" or "personal and advertising injury", that you would provide such person or organization a waiver of transfer of rights of recovery against others to us on your policy.

Information required to complete this Schedule, if not shown above, will be shown in the Declarations.

The following is added to Paragraph **8. Transfer Of Rights Of Recovery Against Others To Us** of **Section IV ☐ Conditions:**

We waive any right of recovery we may have against the person or organization shown in the Schedule above because of payments we make for injury or damage arising out of your ongoing operations or "your work" done under a contract with that person or organization and included in the "products-completed operations hazard". This waiver applies only to the person or organization shown in the Schedule above.

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

**ADDITIONAL INSURED ☐ OWNERS, LESSEES OR
CONTRACTORS-SCHEDULED PERSON
OR ORGANIZATION**

This endorsement modifies insurance provided under the following:

**COMMERCIAL GENERAL LIABILITY COVERAGE PART
PRODUCTS/COMPLETED OPERATIONS LIABILITY COVERAGE PART**

SCHEDULE

Name of Person Or Organization:

For Non-Residential and Non-Mixed use projects only. Any person or organization when you and such person or organization have agreed in writing in a contract, prior to an occurrence that causes "bodily injury", "property damage" or "personal and advertising injury", that such person or organization be added as an additional insured on your policy For Non-Residential and Non-Mixed use projects only. All locations for which you and the additional insured have agreed in writing in a contract prior to an occurrence that causes "bodily injury", "property damage" or "personal and advertising injury".

(If no entry appears above, information required to complete this endorsement will be shown in the Declarations as applicable to this endorsement.)

A. Section II ☐ Who is An Insured is amended to include as an insured the person or organization shown in the Schedule, but only with respect to liability arising out of your ongoing operations performed for that insured.

B. With respect to the insurance afforded to these additional insureds, the following exclusion is added:

2. Exclusions

This insurance does not apply to ☐bodily injury☐or ☐property damage☐occurring after;

(1) All work, including materials, parts or equipment furnished in connection with such work, on the project (other than service, maintenance or repairs) to be performed by or on behalf of the additional insured(s) at the site of the covered operations has been completed; or

(2) That portion of ☐your work☐out of which the injury or damage arises has been put to its intended use by any person or organization other than another contractor or subcontractor engaged in performing operations for a principal as a part of the

same project.

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY

**ADDITIONAL INSURED ☐ OWNERS, LESSEES OR
CONTRACTORS ☐ COMPLETED OPERATIONS**

This endorsement modifies insurance provided under the following:

**COMMERCIAL GENERAL LIABILITY COVERAGE PART
SCHEDULE**

Name of Person or Organization:

For Non-Residential and Non-Mixed use projects only. Any person or organization when you and such person or organization have agreed in writing in a contract, prior to an occurrence that causes "bodily injury", "property damage" or "personal and advertising injury", that such person or organization be added as an additional insured on your policy.

Location And Description of Completed Operations:

For Non-Residential and Non-Mixed use projects only. All locations and completed operations for which you and the additional insured have agreed in writing in a contract prior to an occurrence that causes "bodily injury", "property damage" or "personal and advertising injury".

Additional Premium:

Included

(If no entry appears above, information required to complete this endorsement will be shown in the Declarations as applicable to this endorsement.)

Section II ☐ Who Is An Insured is amended to include as an insured the person or organization shown in the Schedule, but only with respect to liability arising out of "your work" at the location designated and described in the schedule of this endorsement performed for that insured and included in the "products-completed operations hazard"☐

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

**PRIMARY AND NONCONTRIBUTORY ☐
OTHER INSURANCE CONDITION**

This endorsement modifies insurance provided under the following:

Commercial General Liability Coverage Part

The following is added to the **Other Insurance** Condition and supersedes any provision to the contrary:

Primary And Noncontributory Insurance

This insurance is primary to and will not seek contribution from any other insurance available to an additional insured under your policy provided that:

- (1) The additional insured is a Named Insured under such other insurance; and
- (2) You have agreed in writing in a contract or agreement that this insurance would be primary and would not seek contribution from any other insurance available to the additional insured.

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

**DESIGNATED CONSTRUCTION PROJECT(S)
GENERAL AGGREGATE LIMIT ☐ SUBJECT TO A
MAXIMUM AGGREGATE**

This endorsement modifies insurance provided under the following:

Commercial General Liability Coverage Part

SCHEDULE

Designated Construction Project(s): All construction projects for which you have agreed in writing in a contract, prior to an occurrence that causes "bodily injury", "property damage" or "personal and advertising injury", to provide project specific limits.

- A.** For all sums which the insured becomes legally obligated to pay as damages caused by "occurrences" under Section I ☐ Coverage **A**, and for all medical expenses caused by accidents under Section I ☐ Coverage **C**, which can be attributed only to ongoing operations at a single designated construction project shown in the Schedule above:
1. A separate Designated Construction Project General Aggregate Limit applies to each designated construction project, and that limit is equal to the amount of the General Aggregate Limit shown in the Declarations.
 2. The Designated Construction Project General Aggregate Limit is the most we will pay for the sum of all damages under Coverage **A**, except damages because of "bodily injury" or "property damage" included in the "products-completed operations hazard", and for medical expenses under Coverage **C** regardless of the number of:
 - a. Insureds;
 - b. Claims made or "suits" brought; or
 - c. Persons or organizations making claims or bringing "suits".
 3. Any payments made under Coverage **A** for damages or under Coverage **C** for medical expenses shall reduce the Designated Construction Project General Aggregate Limit for that designated construction project. Such payments shall not reduce the General Aggregate Limit shown in the Declarations nor shall they reduce any other Designated Construction Project General Aggregate Limit for any other designated construction project shown in the Schedule above.

4. The limits shown in the Declarations for Each Occurrence, Damage To Premises Rented To You and Medical Expense continue to apply. However, instead of being subject to the General Aggregate Limit shown in the Declarations, such limits will be subject to the applicable Designated Construction Project General Aggregate Limit.

5. All payments under this endorsement are subject to the Maximum Aggregate Limit of:

\$ 5,000,000 Policy Cap

The Maximum Aggregate Limit is the most we will pay under this endorsement regardless of the number of Designated Construction Project General Aggregate Limits. The Maximum Aggregate Limit is not available to pay for damages or expenses other than as set forth in the endorsement.

B. For all sums which the insured becomes legally obligated to pay as damages caused by "occurrences" under Section I ☐ Coverage A, and for all medical expenses caused by accidents under Section I ☐ Coverage C, which cannot be attributed only to ongoing operations at a single designated construction project shown in the Schedule above:

1. Any payments made under Coverage A for damages or under Coverage C for medical expenses shall reduce the amount available under the General Aggregate Limit or the Products-completed Operations Aggregate Limit, whichever is applicable; and

2. Such payments shall not reduce any Designated Construction Project General Aggregate Limit.

C. When coverage for liability arising out of the "products-completed operations hazard" is provided, any payments for damages because of "bodily injury" or "property damage" included in the "products-completed operations hazard" will reduce the Products-completed Operations Aggregate Limit, and not reduce the General Aggregate Limit nor the Designated Construction Project General Aggregate Limit.

D. If the applicable designated construction project has been abandoned, delayed, or abandoned and then restarted, or if the authorized contracting parties deviate from plans, blueprints, designs, specifications or timetables, the project will still be deemed to be the same construction project.

E. The provisions of Section III ☐ Limits Of Insurance not otherwise modified by this endorsement shall continue to apply as stipulated.

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

DESIGNATED INSURED - NONCONTRIBUTING

This endorsement modifies insurance provided under the following:

BUSINESS AUTO COVERAGE FORM
GARAGE COVERAGE FORM
MOTOR CARRIER COVERAGE FORM
TRUCKERS COVERAGE FORM

With respect to coverage provided by this endorsement, the provisions of the Coverage Form apply unless modified by this endorsement.

This endorsement identifies person(s) or organization(s) who are "insureds" under the Who Is An Insured Provision of the Coverage Form. This endorsement does not alter coverage provided in the Coverage Form.

Schedule

Name of Person(s) or Organization(s):

Regarding Designated Contract or Project:

Each person or organization shown in the Schedule of this endorsement is an "insured" for Liability Coverage, but only to the extent that person or organization qualifies as an "insured" under the Who Is An Insured Provision contained in Section II of the Coverage Form.

The following is added to the Other Insurance Condition:

If you have agreed in a written agreement that this policy will be primary and without right of contribution from any insurance in force for an Additional Insured for liability arising out of your operations, and the agreement was executed prior to the "bodily injury" or "property damage", then this insurance will be primary and we will not seek contribution from such insurance.

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.**BUSINESS AUTO COVERAGE ENHANCEMENT ENDORSEMENT**

This endorsement modifies insurance provided under the following:

BUSINESS AUTO COVERAGE FORM

With respect to coverage afforded by this endorsement, the provisions of the policy apply unless modified by the endorsement.

COVERAGE INDEX

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SECTION II – LIABILITY COVERAGE is amended as follows:**1. BROAD FORM INSURED**SECTION II – LIABILITY COVERAGE, paragraph **A.1.** –WHO IS AN INSURED is amended to include the following as an insured:

- d.** Any legally incorporated entity of which you own more than 50 percent of the voting stock during the policy period. However, “insured” does not include any organization that:

- (1)** Is a partnership or joint venture; or
- (2)** Is an insured under any other automobile policy; or
- (3)** Has exhausted its Limit of Insurance under any other automobile policy.

Paragraph **d. (2)** of this provision does not apply to a policy written to apply specifically in excess of this policy.

- e.** Any organization you newly acquire or form, other than a partnership or joint venture, of which you own more than 50 percent of the voting stock. This automatic coverage is afforded only for 180 days from the date of acquisition or formation. However, coverage under this provision does not apply:

- (1)** If there is similar insurance or a self-insured retention plan available to that organization;

- (2) If the Limits of Insurance of any other insurance policy have been exhausted; or
- (3) To "bodily injury" or "property damage" that occurred before you acquired or formed the organization.

2. EMPLOYEES AS INSURED

SECTION II – LIABILITY COVERAGE, paragraph A.1. –WHO IS AN INSURED is amended to include the following as an insured:

- f. Any "employee" of yours while using a covered "auto" you do not own, hire or borrow, but only for acts within the scope of their employment by you. Insurance provided by this endorsement is excess over any other insurance available to any "employee".
- g. An "employee" of yours while operating an "auto" hired or borrowed under a written contract or agreement in that "employee's" name, with your permission, while performing duties related to the conduct of your business and within the scope of their employment. Insurance provided by this endorsement is excess over any other insurance available to the "employee".

3. ADDITIONAL INSURED BY CONTRACT, AGREEMENT OR PERMIT

SECTION II – LIABILITY COVERAGE, paragraph A.1. –WHO IS AN INSURED is amended to include the following as an insured:

- h. Any person or organization with respect to the operation, maintenance or use of a covered "auto", provided that you and such person or organization have agreed in a written contract, agreement, or permit issued to you by governmental or public authority, to add such person, or organization, or governmental or public authority to this policy as an "insured".

However, such person or organization is an "insured":

- (1) Only with respect to the operation, maintenance or use of a covered "auto";
- (2) Only for "bodily injury" or "property damage" caused by an "accident" which takes place after you executed the written contract or agreement, or the permit has been issued to you; and
- (3) Only for the duration of that contract, agreement or permit

4. SUPPLEMENTARY PAYMENTS

SECTION II – LIABILITY COVERAGE, Coverage Extensions, 2.a. Supplementary Payments, paragraphs (2) and (4) are replaced by the following:

- (2) Up to \$3,000 for cost of bail bonds (including bonds for related traffic violations) required because of an "accident" we cover. We do not have to furnish these bonds.
- (4) All reasonable expenses incurred by the insured at our request, including actual loss of earnings up to \$500 a day because of time off from work.

5. AMENDED FELLOW EMPLOYEE EXCLUSION

In those jurisdictions where, by law, fellow employees are not entitled to the protection afforded to the employer by the workers compensation exclusivity rule, or similar protection, the following provision is added:

SECTION II – LIABILITY, exclusion B.5. FELLOW EMPLOYEE does not apply if the "bodily injury" results from the use of a covered "auto" you own or hire.

SECTION III – PHYSICAL DAMAGE COVERAGE is amended as follows:

6. HIRED AUTO PHYSICAL DAMAGE

Paragraph A.4. Coverage Extensions of SECTION III – PHYSICAL DAMAGE COVERAGE, is amended by adding the following:

If hired "autos" are covered "autos" for Liability Coverage, and if Comprehensive, Specified Causes of Loss or Collision coverage are provided under the Business Auto Coverage Form for any "auto" you own, then the Physical Damage coverages provided are extended to "autos":

- a. You hire, rent or borrow; or

- b. Your “employee” hires or rents under a written contract or agreement in that “employee’s” name, but only if the damage occurs while the vehicle is being used in the conduct of your business,

subject to the following limit and deductible:

- A. The most we will pay for “loss” in any one “accident” or “loss” is the smallest of:
- (1) \$50,000; or
 - (2) The actual cash value of the damaged or stolen property as of the time of the “loss”; or
 - (3) The cost of repairing or replacing the damaged or stolen property with other property of like kind and quality, minus a deductible.
- B. The deductible will be equal to the largest deductible applicable to any owned “auto” for that coverage.
- C. Subject to the limit, deductible and excess provisions described in this provision, we will provide coverage equal to the broadest coverage applicable to any covered “auto” you own.
- D. Subject to a maximum of \$1,000 per “accident”, we will also cover the actual loss of use of the hired “auto” if it results from an “accident”, you are legally liable and the lessor incurs an actual financial loss.
- E. This coverage extension does not apply to:
- (1) Any “auto” that is hired, rented or borrowed with a driver; or
 - (2) Any “auto” that is hired, rented or borrowed from your “employee”.

For the purposes of this provision, SECTION V – DEFINITIONS is amended by adding the following:

“Total loss” means a “loss” in which the cost of repairs plus the salvage value exceeds the actual cash value.

7. TOWING AND LABOR

SECTION III – PHYSICAL DAMAGE COVERAGE, paragraph **A.2.** Towing, is amended by the addition of the following:

We will pay towing and labor costs incurred, up to the limits shown below, each time a covered “auto” classified and rated as a private passenger type, “light truck” or “medium truck” is disabled:

- a. For private passenger type vehicles, we will pay up to \$50 per disablement.
- b. For “light trucks”, we will pay up to \$50 per disablement. “Light trucks” are trucks that have a gross vehicle weight (GVW) of 10,000 pounds or less.
- c. For “medium trucks”, we will pay up to \$150 per disablement. “Medium trucks” are trucks that have a gross vehicle weight (GVW) of 10,001 – 20,000 pounds.

However, the labor must be performed at the place of disablement.

8. PHYSICAL DAMAGE - ADDITIONAL TRANSPORTATION EXPENSE COVERAGE

Paragraph **A.4.a.**, Coverage Extension of SECTION III – PHYSICAL DAMAGE COVERAGE, is amended to provide a limit of \$50 per day and a maximum limit of \$1,500

9. RENTAL REIMBURSEMENT

SECTION III – PHYSICAL DAMAGE COVERAGE, **A. COVERAGE**, is amended by adding the following:

- a. We will pay up to \$75 per day for rental reimbursement expenses incurred by you for the rental of an “auto” because of “accident” or “loss”, to an “auto” for which we also pay a “loss” under Comprehensive, Specified Causes of Loss or Collision Coverages. We will pay only for those expenses incurred after the first 24 hours following the “accident” or “loss” to the covered “auto.”
- b. Rental Reimbursement will be based on the rental of a comparable vehicle, which in many cases may be substantially less than \$75 per day, and will only be allowed for the period of time it should take to repair or replace the vehicle with reasonable speed and similar quality, up to a maximum of 30 days.
- c. We will also pay up to \$500 for reasonable and necessary expenses incurred by you to remove and replace your tools and equipment from the covered “auto”.
- d. This coverage does not apply unless you have a business necessity that other “autos” available for your use and operation cannot fill.
- e. If “loss” results from the total theft of a covered “auto” of the private passenger type, we will pay under this coverage only that amount of your rental reimbursement expenses which is not already provided under Paragraph 4. Coverage Extension.
- f. No deductible applies to this coverage.

For the purposes of this endorsement provision, materials and equipment do not include “personal effects” as defined in provision 11.

10. EXTRA EXPENSE - BROADENED COVERAGE

Under SECTION III – PHYSICAL DAMAGE COVERAGE, **A. COVERAGE**, we will pay for the expense of returning a stolen covered “auto” to you. The maximum amount we will pay is \$1,000.

11. PERSONAL EFFECTS COVERAGE

A. SECTION III – PHYSICAL DAMAGE COVERAGE, **A. COVERAGE**, is amended by adding the following:

If you have purchased Comprehensive Coverage on this policy for an “auto” you own and that “auto” is stolen, we will pay, without application of a deductible, up to \$600 for “personal effects” stolen with the “auto.”

The insurance provided under this provision is excess over any other collectible insurance.

B. SECTION V – DEFINITIONS is amended by adding the following:

For the purposes of this provision, “personal effects” mean tangible property that is worn or carried by an insured.” “Personal effects” does not include tools, equipment, jewelry, money or securities.

12. ACCIDENTAL AIRBAG DEPLOYMENT

SECTION III – PHYSICAL DAMAGE COVERAGE, **B. EXCLUSIONS** is amended by adding the following:

If you have purchased Comprehensive or Collision Coverage under this policy, the exclusion for “loss” relating to mechanical breakdown does not apply to the accidental discharge of an airbag.

Any insurance we provide shall be excess over any other collectible insurance or reimbursement by manufacturer’s warranty. However, we agree to pay any deductible applicable to the other coverage or warranty.

13. AUDIO, VISUAL AND DATA ELECTRONIC EQUIPMENT COVERAGE

SECTION III – PHYSICAL DAMAGE COVERAGE, **B. EXCLUSIONS**, exception paragraph **a.** to exclusions **4.c.** and **4.d.** is deleted and replaced with the following:

Exclusion **4.c.** and **4.d.** do not apply to:

- a. Electronic equipment that receives or transmits audio, visual or data signals, whether or not designed solely for the reproduction of sound, if the equipment is permanently installed in the covered "auto" at the time of the "loss" and such equipment is designed to be solely operated by use of the power from the "auto's" electrical system, in or upon the covered "auto" and physical damage coverages are provided for the covered "auto"; or

If the "loss" occurs solely to audio, visual or data electronic equipment or accessories used with this equipment, then our obligation to pay for, repair, return or replace damaged or stolen property will be reduced by a \$100 deductible.

14. LOAN / LEASE GAP COVERAGE

- A. Paragraph **C.**, LIMIT OF INSURANCE of SECTION III – PHYSICAL DAMAGE COVERAGE is amended by adding the following:

The most we will pay for a "total loss" to a covered "auto" owned by or leased to you in any one "accident" is the greater of the:

1. Balance due under the terms of the loan or lease to which the damaged covered "auto" is subject at the time of the "loss" less the amount of:
 - a. Overdue payments and financial penalties associated with those payments as of the date of the "loss",
 - b. Financial penalties imposed under a lease due to high mileage, excessive use or abnormal wear and tear,
 - c. Costs for extended warranties, Credit Life Insurance, Health, Accident or Disability Insurance purchased with the loan or lease,
 - d. Transfer or rollover balances from previous loans or leases,
 - e. Final payment due under a "Balloon Loan",
 - f. The dollar amount of any unrepaired damage which occurred prior to the "total loss" of a covered "auto",
 - g. Security deposits not refunded by a lessor,
 - h. All refunds payable or paid to you as a result of the early termination of a lease agreement or as a result of the early termination of any warranty or extended service agreement on a covered "auto",
 - i. Any amount representing taxes,
 - j. Loan or lease termination fees; or
2. The actual cash value of the damage or stolen property as of the time of the "loss".

An adjustment for depreciation and physical condition will be made in determining the actual cash value at the time of the "loss". This adjustment is not applicable in Texas.

- B. **ADDITIONAL CONDITIONS**

This coverage applies only to the original loan for which the covered "auto" that incurred the loss serves as collateral, or lease written on the covered "auto" that incurred the loss.

- C. SECTION V – DEFINITIONS is changed by adding the following:

As used in this endorsement provision, the following definitions apply:

"Total loss" means a "loss" in which the cost of repairs plus the salvage value exceeds the actual cash value.

A "balloon loan" is one with periodic payments that are insufficient to repay the balance over the term of the loan, thereby requiring a large final payment.

15. GLASS REPAIR - WAIVER OF DEDUCTIBLE

Paragraph **D. Deductible** of SECTION III – PHYSICAL DAMAGE COVERAGE is amended by the addition of the following:

No deductible applies to glass damage if the glass is repaired rather than replaced.

16. PARKED AUTO COLLISION COVERAGE (WAIVER OF DEDUCTIBLE)

Paragraph **D. Deductible** of SECTION III – PHYSICAL DAMAGE COVERAGE is amended by the addition of the following:

The deductible does not apply to “loss” caused by collision to such covered “auto” of the private passenger type or light weight truck with a gross vehicle weight of 10,000 lbs. or less as defined by the manufacturer as maximum loaded weight the “auto” is designed to carry while it is:

- a. In the charge of an “insured”;
- b. Legally parked; and
- c. Unoccupied.

The “loss” must be reported to the police authorities within 24 hours of known damage.

The total amount of the damage to the covered “auto” must exceed the deductible shown in the Declarations.

This provision does not apply to any “loss” if the covered “auto” is in the charge of any person or organization engaged in the automobile business.

17. TWO OR MORE DEDUCTIBLES

Under SECTION III PHYSICAL DAMAGE COVERAGE, if two or more company policies or coverage forms apply to the same accident, the following applies to paragraph D. Deductible:

- a. If the applicable Business Auto deductible is the smaller (or smallest) deductible it will be waived; or
- b. If the applicable Business Auto deductible is not the smaller (or smallest) deductible it will be reduced by the amount of the smaller (or smallest) deductible; or
- c. If the loss involves two or more Business Auto coverage forms or policies the smaller (or smallest) deductible will be waived.

For the purpose of this endorsement company means any company that is part of the Liberty Mutual Group.

SECTION IV – BUSINESS AUTO CONDITIONS is amended as follows:

18. UNINTENTIONAL FAILURE TO DISCLOSE HAZARDS

SECTION IV- BUSINESS AUTO CONDITIONS, Paragraph **B.2.** is amended by adding the following:

If you unintentionally fail to disclose any hazards, exposures or material facts existing as of the inception date or renewal date of the Business Auto Coverage Form, the coverage afforded by this policy will not be prejudiced.

However, you must report the undisclosed hazard of exposure as soon as practicable after its discovery, and we have the right to collect additional premium for any such hazard or exposure.

19. AMENDED DUTIES IN THE EVENT OF ACCIDENT, CLAIM, SUIT, OR LOSS

SECTION IV – BUSINESS AUTO CONDITIONS, paragraph **A.2.a.** is replaced in its entirety by the following:

- a. In the event of “accident”, claim, “suit” or “loss”, you must promptly notify us when it is known to:
 - 1. You, if you are an individual;
 - 2. A partner, if you are a partnership;
 - 3. Member, if you are a limited liability company;
 - 4. An executive officer or the “employee” designated by the Named Insured to give such notice, if you are a corporation.

To the extent possible, notice to us should include:

- (1) How, when and where the “accident” or “loss” took place;
- (2) The “insureds” name and address; and
- (3) The names and addresses of any injured persons and witnesses.

→ **20. WAIVER OF TRANSFER OF RIGHTS OF RECOVERY AGAINST OTHERS TO US**

SECTION IV – BUSINESS AUTO CONDITIONS, paragraph **A.5.**, Transfer of Rights of Recovery Against Others to Us, is amended by the addition of the following:

If the person or organization has waived those rights before an “accident” or “loss”, our rights are waived also.

21. HIRED AUTO COVERAGE TERRITORY

SECTION IV – BUSINESS AUTO CONDITIONS, paragraph **B.7.**, Policy Period, Coverage Territory, is amended by the addition of the following:

- f. For “autos” hired 30 days or less, the coverage territory is anywhere in the world, provided that the insured’s responsibility to pay for damages is determined in a “suit”, on the merits, in the United States, the territories and possessions of the United States of America, Puerto Rico or Canada or in a settlement we agree to.

This extension of coverage does not apply to an “auto” hired, leased, rented or borrowed with a driver.

SECTION V – DEFINITIONS is amended as follows:

22. BODILY INJURY REDEFINED

Under SECTION V – DEFINITIONS, definition **C.** is replaced by the following:

“Bodily injury” means physical injury, sickness or disease sustained by a person, including mental anguish, mental injury, shock, fright or death resulting from any of these at any time.

COMMON POLICY CONDITIONS

23. EXTENDED CANCELLATION CONDITION

COMMON POLICY CONDITIONS, paragraph **A.**– CANCELLATION condition applies except as follows:

If we cancel for any reason other than nonpayment of premium, we will mail to the first Named Insured written notice of cancellation at least 60 days before the effective date of cancellation. This provision does not apply in those states which require more than 60 days prior notice of cancellation.



County of Fresno

DEPARTMENT OF PUBLIC WORKS AND PLANNING
STEVEN E. WHITE, DIRECTOR

July 1, 2025

Marc Kerkochian, President
Better Enterprises, Inc.
1148 N Cypress Ave
Fresno, CA 93727

Transmitted by email to: marc@betterenterprisesinc.com

Dear Marc Kerkochian:

Subject: Notice of Approval, Department of Public Health Basement Renovation
Contract No. 24-S-14

The contract between your firm and the County of Fresno for the referenced project became operative on June 24, 2025. A copy of the executed contract is enclosed.

A "Notice to Proceed" authorizing commencement of the work will be issued by the Construction Engineer.

DIR Project ID 20250583882 is assigned to Contract No. 24-S-14

The enclosed copy of Section 41 of the Charter of the County of Fresno is for your reference and compliance. If you have any questions contact Jennica Geddert at jgeddert@fresnocountyca.gov or (559) 353-4919.

Sincerely,

Mohammad Alimi, Ph.D., P.E.
Design Division Engineer

Jennica Geddert
Senior Staff Analyst

Enclosures

cc: Board of Supervisors
Auditor – Controller
Financial Services
Construction Management
Design Division – Design Services

(Complete and return with Performance and Payment Bonds)

Contact Person Joyce Tahira **Phone No.** (925) 413-8028

SURETY COMPANY (Exact Name Style, Home Office Address)

NATIONWIDE MUTUAL INSURANCE COMPANY

1100 Locust St., Ste. 2006

Des Moines, IA 50391

AGENT / BROKER

Attorney-in-fact Karen Amin  **Phone No.** (209) 333-1136

Firm ALLIANT INSURANCE SERVICES, INC.

Mail Address 641 S. Ham Ln., Ste. B

City, State, ZIP Lodi, CA 95242

CA Dept of Insurance License No. 0C02028 Expires 03 / 31 / 2027
(or attach copy of License)

Owner's use only

Received / / By

Surety admitted _____ / _____ / _____

Surety Best's Class _____ Rating _____

Comments

**PAYMENT BOND - PUBLIC WORK
SECTIONS 3247 - 3252, CIVIL CODE
(CALIFORNIA)**

NATIONWIDE MUTUAL INSURANCE
COMPANY SURETY COMPANY

Bond No. 7901171549

Premium: \$59,591.00

KNOW ALL MEN BY THESE PRESENTS:

THAT WHEREAS, The COUNTY OF FRESNO has awarded to BETTER ENTERPRISES, INC.
Department of Public Health Basement Renovation
as Contractor, a contract for the work described as follows: Contract No. 24-S-14

AND WHEREAS, Said Contractor is required to furnish a bond in connection with said contract, to secure the payment of claims of laborers, mechanics, materialmen, and other persons as provided by law.

NOW, THEREFORE, We the undersigned Contractor and Surety are held and firmly bound unto the County of Fresno in the amount required by law, the sum of \$ **6,763,000.00**, for which payment well and truly to be made we bind ourselves, our heirs, executors and administrators, successors and assigns, jointly and severally, firmly by these presents.

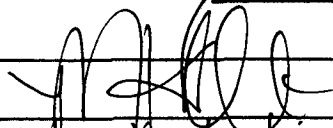
THE CONDITION OF THIS OBLIGATION IS SUCH,

That if said Contractors shall fail to pay (1) Any of the persons named in Civil Code Section 3181, (2) amounts due under the Unemployment Insurance Code for work or labor performed in connection with said contract by any such claimant, or (3) any amounts required to be deducted, withheld and paid over to the Employment Development Department and to the Franchise Tax Board from wages of the employees of Contractor and his sub-contractors with respect to such work and labor, pursuant to Section 13020 of the Unemployment Insurance Code, then the Surety or Sureties herein will pay for the same in an aggregate amount not exceeding the sum specified in this bond, and also in case suit is brought upon the bond, a reasonable attorney's fee, to be fixed by the court, otherwise the above obligation shall be void.

This bond shall inure to the benefit of any of the persons named in Civil Code Section 3181 so as to give a right of action to such persons or their assigns in any suit brought upon this bond.

This bond is executed and filed to comply with the provisions of the act of Legislature of the State of California as designated in Civil Code, Sections 3247 - 3252 inclusive, and all amendments thereto.

IN WITNESS WHEREOF, We have hereunto set our hands and seals on this 21st day of May, 2025.

BETTER ENTERPRISES, INC.

By Marc Kerhochian, President Contractor

NATIONWIDE MUTUAL INSURANCE
COMPANY SURETY COMPANY
By  Karen Amin, Attorney-in-Fact

ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California

County of Fresno

On 05-27-2025 before me, Ben Emerzian
(insert name and title of the officer)

personally appeared Marc Kerkochian
who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

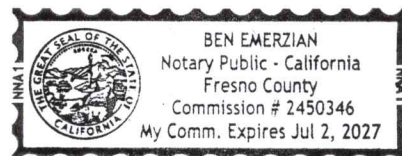
I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature

Ben Emerzian

(Seal)



ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California

County of San Joaquin)

On May 21, 2025 before me, Jennifer Loper, Notary Public
(insert name and title of the officer)

personally appeared Karen Amin,
who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/~~are~~
subscribed to the within instrument and acknowledged to me that ~~he~~/she/~~they~~ executed the same in
~~his~~/her/~~their~~ authorized capacity(~~ies~~), and that by ~~his~~/her/~~their~~ signature(s) on the instrument the
person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

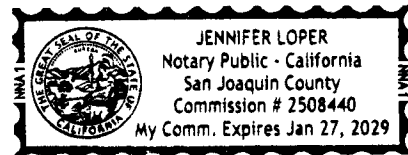
I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature

Jennifer Loper

(Seal)



Bond No. 7901171549

Premium: Included in Conjunction with
Performance Bond

Document A312™ – 2010

Conforms with The American Institute of Architects AIA Document 312

Performance Bond

CONTRACTOR:

(Name, legal status and address)

BETTER ENTERPRISES, INC.
1148 N. Cypress Avenue
Fresno, CA 93727

SURETY:

(Name, legal status and principal place of business)

NATIONWIDE MUTUAL INSURANCE COMPANY
1100 Locust St., Ste. 2006
Des Moines, IA 50391

Mailing Address for Notices

NATIONWIDE MUTUAL INSURANCE COMPANY
1100 Locust St., Ste. 2006
Des Moines, IA 50391

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

OWNER:

(Name, legal status and address)

COUNTY OF FRESNO
2220 Tulare Street, 6th Floor
Fresno, CA 93721

CONSTRUCTION CONTRACT

Date: May 20, 2005

Amount: \$ 6,763,000.00

Description:

(Name and location) Department of Public Health Basement Renovation
Contract No. 24-S-14

BOND

Date: May 21, 2005

(Not earlier than Construction Contract Date)

Amount: \$ 6,763,000.00

Modifications to this Bond:

☒ None

☐ See Section 16

CONTRACTOR AS PRINCIPAL

Company:

BETTER ENTERPRISES, INC. (Corporate Seal)

Signature: _____

Name
and Title:

Marc Karbochian
President

SURETY

Company: NATIONWIDE MUTUAL (Corporate Seal)
INSURANCE COMPANY

Signature: _____

Name
and Title: Karen Amin
Attorney-in-Fact

(Any additional signatures appear on the last page of this Performance Bond.)

(FOR INFORMATION ONLY — Name, address and telephone)

AGENT or BROKER:

ALLIANT INSURANCE SERVICES, INC.
641 S. Ham Ln., Ste. B
Lodi, CA 95242
(209) 333-1136

OWNER'S REPRESENTATIVE:

(Architect, Engineer or other party:) n/a

§ 1 The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

§ 2 If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Section 3.

§ 3 If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond shall arise after

- .1 the Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice shall indicate whether the Owner is requesting a conference among the Owner, Contractor and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Section 3.1 shall be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default;
- .2 the Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and
- .3 the Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.

§ 4 Failure on the part of the Owner to comply with the notice requirement in Section 3.1 shall not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

§ 5 When the Owner has satisfied the conditions of Section 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

§ 5.1 Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;

§ 5.2 Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;

§ 5.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Section 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

§ 5.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances:

- .1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or
- .2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

§ 6 If the Surety does not proceed as provided in Section 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Section 5.4, and the Owner refuses the payment or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

§ 7 If the Surety elects to act under Section 5.1, 5.2 or 5.3, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication, for

- .1 the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;
- .2 additional legal, design professional and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Section 5; and
- .3 liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

§ 8 If the Surety elects to act under Section 5.1, 5.3 or 5.4, the Surety's liability is limited to the amount of this Bond.

§ 9 The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors and assigns.

§ 10 The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

§ 11 Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

§ 12 Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears.

§ 13 When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

§ 14 Definitions

§ 14.1 Balance of the Contract Price. The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made, including allowance to the Contractor of any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

§ 14.2 Construction Contract. The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

§ 14.3 Contractor Default. Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

§ 14.4 Owner Default. Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

§ 14.5 Contract Documents. All the documents that comprise the agreement between the Owner and Contractor.

§ 15 If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

§ 16 Modifications to this bond are as follows:

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)

CONTRACTOR AS PRINCIPAL

Company: _____
(Corporate Seal)

SURETY

Company: _____
(Corporate Seal)

Signature: _____
Name and Title: _____
Address _____

Signature: _____
Name and Title: _____
Address _____

ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California

County of Fresno

On 05-27-2025 before me, Ben Emerzian
(insert name and title of the officer)

personally appeared Marc Kerkochian
who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

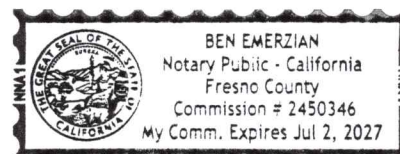
I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature

Ben Emerzian

(Seal)



ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California
County of San Joaquin

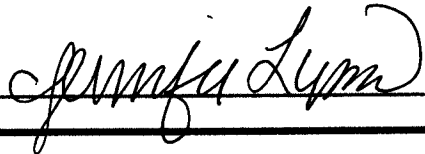
On May 21, 2025 before me, Jennifer Loper, Notary Public
(insert name and title of the officer)

personally appeared Karen Amin
who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

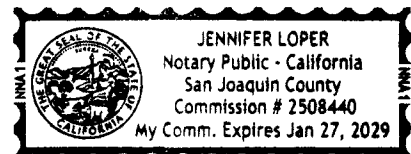
I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature



(Seal)



Power of Attorney

KNOW ALL MEN BY THESE PRESENTS THAT:

Nationwide Mutual Insurance Company, an Ohio corporation

hereinafter referred to severally as the "Company" and collectively as "the Companies" does hereby make, constitute and appoint:
DANIEL M CONNOLLY; JENNIFER LOPER; KAREN AMIN;

each in their individual capacity, its true and lawful attorney-in-fact, with full power and authority to sign, seal, and execute on its behalf any and all bonds and undertakings, and other obligatory instruments of similar nature, in penalties not exceeding the sum of

UNLIMITED

and to bind the Company thereby, as fully and to the same extent as if such instruments were signed by the duly authorized officers of the Company; and all acts of said Attorney pursuant to the authority given are hereby ratified and confirmed.

This power of attorney is made and executed pursuant to and by authority of the following resolution duly adopted by the board of directors of the Company:

"RESOLVED, that the president, or any vice president be, and each hereby is, authorized and empowered to appoint attorneys-in-fact of the Company, and to authorize them to execute and deliver on behalf of the Company any and all bonds, forms, applications, memorandums, undertakings, recognizances, transfers, contracts of indemnity, policies, contracts guaranteeing the fidelity of persons holding positions of public or private trust, and other writings obligatory in nature that the business of the Company may require; and to modify or revoke, with or without cause, any such appointment or authority; provided, however, that the authority granted hereby shall in no way limit the authority of other duly authorized agents to sign and countersign any of said documents on behalf of the Company."

"RESOLVED FURTHER, that such attorneys-in-fact shall have full power and authority to execute and deliver any and all such documents and to bind the Company subject to the terms and limitations of the power of attorney issued to them, and to affix the seal of the Company thereto; provided, however, that said seal shall not be necessary for the validity of any such documents."

This power of attorney is signed and sealed under and by the following bylaws duly adopted by the board of directors of the Company.

Execution of Instruments. Any vice president, any assistant secretary or any assistant treasurer shall have the power and authority to sign or attest all approved documents, instruments, contracts, or other papers in connection with the operation of the business of the company in addition to the chairman of the board, the chief executive officer, president, treasurer or secretary; provided, however, the signature of any of them may be printed, engraved, or stamped on any approved document, contract, instrument, or other papers of the Company.

IN WITNESS WHEREOF, the Company has caused this instrument to be sealed and duly attested by the signature of its officer the 20th day of August, 2021.

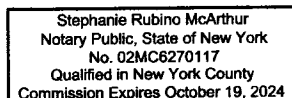


Antonio C. Albanese, Vice President of Nationwide Mutual Insurance Company

ACKNOWLEDGMENT

STATE OF NEW YORK COUNTY OF NEW YORK: ss

On this 20th day of August, 2021, before me came the above-named officer for the Company aforesaid, to me personally known to be the officer described in and who executed the preceding instrument, and he acknowledged the execution of the same, and being by me duly sworn, deposes and says, that he is the officer of the Company aforesaid, that the seal affixed hereto is the corporate seal of said Company, and the said corporate seal and his signature were duly affixed and subscribed to said instrument by the authority and direction of said Company.

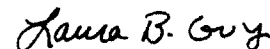


Notary Public
My Commission Expires
October 19, 2024

CERTIFICATE

I, Laura B. Guy, Assistant Secretary of the Company, do hereby certify that the foregoing is a full, true and correct copy of the original power of attorney issued by the Company; that the resolution included therein is a true and correct transcript from the minutes of the meetings of the boards of directors and the same has not been revoked or amended in any manner; that said Antonio C. Albanese was on the date of the execution of the foregoing power of attorney the duly elected officer of the Company, and the corporate seal and his signature as officer were duly affixed and subscribed to the said instrument by the authority of said board of directors; and the foregoing power of attorney is still in full force and effect.

IN WITNESS WHEREOF, I have hereunto subscribed my name as Assistant Secretary, and affixed the corporate seal of said Company this 21st day of May, 2025.



Assistant Secretary