

SPECIFICATIONS

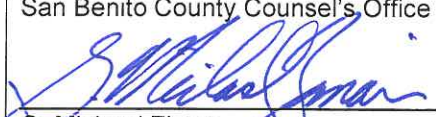


County of San Benito
RESOURCE MANAGEMENT AGENCY

NEW BEHAVIORAL HEALTH CENTER

PROJECT #PWB-1810

MODULAR BID SET SUBMITTAL
November 9, 2018

APPROVED AS TO LEGAL FORM: San Benito County Counsel's Office

G. Michael Ziman, Deputy County Counsel
Date <u>November 26, 2018</u>

APPROVED: San Benito County Board of Supervisors
Anthony Botelho, Chair
Date _____

PROJECT MANAGER

ADAM GOLDSTONE, R.A.
COUNTY OF SAN BENITO
2301 TECHNOLOGY PKWY.
HOLLISTER, CA 95023
T 831.636.4170
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PROJECT MANUAL

For

San Benito County New Behavioral Health Center

1131 San Felipe Road
Hollister, CA 95023

Modular Bid Set Submittal

Date: November 9, 2018

Hibser Yamauchi Architects, Inc.
4602 2nd Street
Davis, CA 95618
Tel: (530)758-1270 Fax: (530)758-4789



San Benito County New Behavioral Health Center

1131 San Felipe Road
Hollister, CA 95023

Architectural

Civil

Structural

Mechanical

Electrical

Landscape

Date: November 9, 2018

Hibser Yamauchi Architects, Inc.
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CONTRACTING REQUIREMENTS

Notice to Contractors 1

Project Directory 3

Instructions to Bidders 5

Index to General Conditions 6

General Conditions 8

Supplemental Conditions 41

Sample Contract..... 44

Sample Payment Bond 49

Sample Faithful Performance Bond..... 51

A copy of the Prevailing Wage Scale is available at the following web site:
http://www.dir.ca.gov/DLSR/statistics_research.html#PWD

COUNTY OF SAN BENITO RESOURCE MANAGEMENT AGENCY



2301 Technology Parkway • Hollister, CA 95023-3840
831.636.4170 • 831.636.4176 fax • www.cosb.us

NOTICE TO CONTRACTORS

San Benito County New Behavioral Health Center – Modular Bid

PROJECT: PWB-1810

Sealed Bids shall be delivered to the San Benito County Resource Management Agency, 2301 Technology Parkway, Hollister, California, 95023-3840, no later than **2:00 P.M. on Thursday, January 10, 2019**. Bids will be opened and will be publicly read in the **RMA conference room, 2301 Technology Parkway, Hollister, California at 2:00 P.M.** or thereafter. This project is for licensed **contractors with a Type B license**. The Contractor shall complete all or any designated portions of the work called for under the contract in all parts and requirements within 150 calendar days (except as modified in the technical specifications). The County of San Benito and its Board of Supervisors reserves the right to reject any or all Bids received as the public good may require.

Each contractor shall include in their Bid all labor, tools, and materials for a complete and working project for each trade component in conformance with the intent shown on the plans and specifications and specified herein.

Plans, Specifications and Bid forms to be used for bidding on this project can only be obtained by going to the San Benito County website at www.cosb.us. On the right-hand side, under Quicklinks, you will see "Bids & RFPs". Click on this link, and go down the page until you see "Listing of Advertised Projects". Click on this link and it will take you to E-Bid Board, where you will find the project name. Click on the name to see the IFB, plans and specs for this job. If you have any questions, please call the San Benito County Resource Management Agency, Public Works Division at (831) 636-4170.

Prospective Bidders must be fully qualified, licensed, certified, and insured to perform the work requested. All work performed must meet all current applicable laws and regulations.

Each Bidder must submit a Bid for the project for which they intend to bid to the Administrative Office on the standard forms enclosed. Said Bid shall be accompanied by a cashier's check, a certified check or Bidder's bond of ten percent (10%) of the amount of the Bid submitted, to be made payable to the County of San Benito. Bid bonds shall be issued by a corporate surety duly admitted and authorized to issue bonds and undertakings by the State of California.

Pursuant to Section 1700, and following, of the California Labor Code, the Contractor shall pay not less than the prevailing rate of per diem wages as determined by the Director of the California Department of Industrial Relations. Copies of such prevailing rate of per diem wages are available at the following web site: http://www.dir.ca.gov/DLSR/statistics_research.html#PWD. Those copies shall be made available to any interested party upon request. The Contractor shall forfeit, as penalty, to the County of San Benito, twenty-five dollars (\$25.00) for each calendar day or portion thereof, for each workman paid less than the stipulated prevailing rates for any work done under the contract by it or by any subcontractor under it, in violation of the provisions of such Labor Code.

County will be the sole judge as to the technical acceptability of any Bids and any award will be as determined most advantageous to the County considering such factors as completeness and responsiveness to this Invitation for Bids, experience, references, and anticipated costs. The County reserves the right to reject any or all Bids or parts thereof and to waive any informality or irregularity in any Bid or the bidding process.

Insurance requirements for the project shall be the amounts set forth in the General Conditions, Section 19, unless expressly modified below:

Commercial General Liability Insurance	\$ _____
All Risk Property Coverage or Builders Risk Insurance	\$ _____
Business Automobile Liability Insurance	\$ _____

PROJECT DIRECTORY

OWNER:

SAN BENITO COUNTY

1131 San Felipe Rd
Hollister, CA 95023
Phone: (831) 902-2207
Contact: Adam Goldstone

ARCHITECTS:

HIBSER YAMAUCHI ARCHITECTS, INC.

4602 2ND Street, Suite 3
Davis, CA 95618
Phone: (530) 758-1270
Fax: (530) 758-4789
Contact: Ken Yamauchi

STRUCTURAL:

B & B STRUCTURAL ENGINEERS

600 Q Street, Suite 200
Sacramento, CA 95814
Phone: (916) 443-0303
Contact: Brian Reil

MECHANICAL:

LIST ENGINEERING MECHANICAL CONSULTANTS

9699 Blue Larkspur lane Suite 203
Monterey, CA 93940
Phone: (831) 373-4390
Contact: Ronald Blue

**ELECTRICAL/
COMMUNICATIONS:**

EDGE ELECTRICAL CONSULTING

431 30TH Street
Sacramento, CA 95816
Phone: (916) 256-2460
Contact: Donny Lee

INSTRUCTIONS TO BIDDERS

1) All portions of the Bid must be completed before the Bid is submitted. Failure to do so may result in the Bid being rejected as nonresponsive. Attached to and submitted with this Bid, Bidder must provide: (1) the Bid Schedule; (2) Names and Titles Form; (3) Bidder's Bond; (4) Reference List; (5) Subcontractor List; (6) Noncollusion Affidavit, completed and signed by Bidder; (7) Statement of Compliance, completed and signed by Bidder; (8) Bidder's Qualifications, completed and signed by Bidder; (9) Guaranty, completed and signed by Bidder; (10) Contractor's Certificate as to Worker's Compensation, completed and signed by Bidder; and, (11) Affidavit Concerning Employment of Undocumented Aliens, completed and signed by Bidder. Failure to submit all required documents may result in the Bid being rejected as nonresponsive.

2) An original of the Bid form shall be filled in and submitted as the Bid.

3) County of San Benito has obtained report(s) that may contain facts that may materially effect Bidders' Bids. County of San Benito has constructed other public works projects throughout the County of San Benito, and obtained reports and other information in the course of the design and construction of those other public works construction projects, all of which may contain facts that may materially effect Bidders' Bids. Bidders are strongly encouraged to inspect applicable County of San Benito reports, records and documents. Said reports and documents will be made available upon written request at the Administrative Office, 481 Fourth Street, Hollister, California, 95023 for inspection and copying at Bidders' sole cost and expense, during normal working hours, Monday through Friday, 9:00 a.m. through 5:00 p.m..

4) If a pre-bid conference has been scheduled at the site of the work, all Bidders, subcontractors, material suppliers, and others who may be working on the work of improvement are strongly encouraged to attend this pre-bid conference. Due to the facts and circumstances of this particular project, the on-site pre-bid conference may be the only opportunity to conduct the pre-bid investigation of the site and satisfy the pre-bid obligations set forth in these Contract Documents. If a Bidder (or others) attend the entirety of a scheduled pre-bid on-site conference and need additional time to complete their investigation of the site or other pre-bid obligations set forth in these Contract Documents, Bidder must notify the County of San Benito in writing, via certified or registered mail, within three (3) days of the on-site pre-bid conference, to request additional time to complete its investigation of the site. The written request must include an estimate of the amount of additional time required by Bidder at the site. County of San Benito retains discretion to determine additional time requirements, if any.

5) Investigations of subsurface conditions or otherwise, are made for the purpose of design, and the County of San Benito assumes no responsibility whatsoever with respect to the sufficiency or accuracy of borings, the log of test borings, or other preliminary investigations, or of the interpretation thereof, and there is no guaranty, either expressed or implied, that the conditions indicated are representative of those existing throughout the work, or any part of it, or that unanticipated conditions may not occur. When a log of test borings or other report is made available to Contractor or included in the Contract Documents, it is expressly understood and agreed that said log of test borings or other reports does not constitute a part of the Contract, and represents only an opinion of the County of San Benito as to the character of the materials to be encountered, and is made available or included in the Contract Documents only for the convenience of the Bidders. Bidders must satisfy themselves, through their own investigation, as to conditions to be encountered.

6) In addition to other minimum qualifications, the County of San Benito has determined that the successful lowest responsive, responsible Bidder must demonstrate to the satisfaction of the County of San Benito, the following minimum experience to be qualified to perform the work described in the Contract Documents:

a. Have possessed a valid, active and in good standing, State of California Department of Consumer Affairs, Contractor's License Board license, appropriate for trade being bid, for a minimum of five (5) continuous years prior to the date of Bid opening.

b. Not have any pending disciplinary proceedings or investigations by the Contractor's State License Board.

c. Currently (as of the date of Bid opening) or within the past year, not have any suspensions, disbarments, or similar proceedings (including stipulated agreements), restricting, limiting or prohibiting Bidder from bidding or performing other public works projects for any other public agency.

7) Following the opening of Bids, the County of San Benito may request in writing that the apparent lowest responsive, responsible Bidder complete a Contractor Qualifications Questionnaire and furnish all required supporting documentation to enable the County of San Benito to determine whether the apparent lowest responsive, responsible Bidder is qualified to perform the work described in the Contract Documents. By submission of a Bid, Bidder agrees to complete the Contractor Qualifications Questionnaire, furnish all required attachments, sign the Contractor Qualifications Questionnaire, all in strict conformance with the requirements of the Contract Documents and Contractor Qualifications Questionnaire, and return to the County of San Benito within ten (10) days of County of San Benito's written request. If Bidder fails or refuses to complete the Contractor Qualifications Questionnaire, furnish all required attachments, sign the Contractor Qualifications Questionnaire, or return it to the County of San Benito within ten (10) days of date of dispatch of County of San Benito's written request, Bidder may not be considered for award of the contract, and further, Bidder agrees that the County of San Benito may either award the work to another Bidder or call for new Bids. In such event, the Bidder shall be liable to the County of San Benito for the difference between the amount of the disqualified Bid and the larger amount for which the County of San Benito procures the work plus all of the County of San Benito's costs, damages, expenses, and liabilities.

8) If for any reason the County of San Benito elects to not award the contract to the apparent lowest responsive, responsible Bidder, the County of San Benito may request in writing that the apparent second lowest responsive, responsible Bidder complete the Contractor Qualifications Questionnaire and furnish all required supporting documentation to enable the County of San Benito to determine whether the second lowest responsive, responsible Bidder is qualified to perform the work described in the Contract Documents. If for any reason the County of San Benito elects to not award the contract to the apparent second lowest responsive, responsible Bidder, the County of San Benito may request the third lowest responsive, responsible Bidder complete the Contractor Qualifications Questionnaire and furnish all required supporting documentation, and so on.

9) If the County of San Benito receives from a Bidder within the time set forth in these Contract Documents, a complete Contractor Qualifications Questionnaire and all required supporting documentation as required by the Contract Documents, and if the County of San Benito determines that a Bidder is not qualified to perform the work required by the Contract Documents, and if the County of San Benito elects to not award the Contract to that Bidder, the County of San Benito will promptly return that Bidder's Bid security.

10) Bid protests shall be filed in writing with the County Administrative Officer, County of San Benito, Administrative Office, 481 Fourth Street, Hollister, California, 95023, by certified or registered mail, not later than three (3) days after the Bid opening or, if the protest is based on the selection of the apparent lowest responsive responsible Bidder, not later than three (3) days after selection of the apparent lowest responsive, responsible Bidder. The protest shall specify the reasons and facts upon which the protest is based.

INDEX TO GENERAL CONDITIONS:

PAGE NO.

1.	BASIC DEFINITIONS.....	8
2.	CONTRACT DOCUMENTS	8
3.	EXAMINATION OF CONTRACT DOCUMENTS AND SITE OF WORK.....	8
4.	ADDENDA	9
5.	BID.....	10
6.	LIST OF SUBCONTRACTORS.....	10
7.	WITHDRAWAL OF BID	10
8.	OPENING OF BIDS	10
9.	BIDDER'S BOND	10
10.	CONSIDERATION OF BIDS	11
11.	COMPETENCY OF BIDDER.....	11
12.	DISQUALIFICATION OF BIDDERS	11
13.	RELIEF OF BIDDERS.....	11
14.	AWARD OF CONTRACT	11
15.	RETURN OF BID GUARANTEES.....	11
16.	SIGNING OF CONTRACT	11
17.	CONTRACT BONDS	12
18.	NOTIFICATION OF SURETY COMPANIES	12
19.	INSURANCE	12
20.	PRE-CONSTRUCTION CONFERENCE	14
21.	INTENT OF PLANS AND SPECIFICATIONS.....	14
22.	CLARIFICATION OF CONTRACT DOCUMENTS	15
23.	PLANS AND SPECIFICATIONS TO BE FURNISHED	15
24.	SUPPLEMENTAL DRAWINGS AND INSTRUCTIONS	15
25.	CONFORMANCE WITH CODES AND STANDARDS.....	15
26.	PERSONAL ATTENTION AND SUPERINTENDENCE	16
27.	BEGINNING OF WORK.....	16
28.	PROGRESS SCHEDULE.....	16
29.	RESPONSIBILITY FOR ACCURACY	17
30.	EFFECT OF INSPECTION OR USE.....	17
31.	INSPECTION	17
32.	REMOVAL OF REJECTED MATERIALS OR WORK.....	17
33.	USE OF COMPLETED PORTIONS	18
34.	MEANS AND METHODS	18
35.	DELAYS.....	18
36.	EFFECT OF EXTENSION OF TIME	18
37.	CLAIMS.....	18
38.	FALSE CLAIMS	20
39.	CHANGES	20
40.	PAYMENTS	22
41.	COST AND PRICING DATA	24
42.	PROCEED WITH WORK.....	24
43.	ACCESS TO RECORDS.....	24
44.	DISMISSAL OF UNSATISFACTORY EMPLOYEES	25
45.	TERMINATION OF UNSATISFACTORY SUBCONTRACTS.....	25
46.	TEMPORARY SUSPENSION OF WORK	25

INDEX TO GENERAL CONDITIONS:

PAGE NO.

47.	TERMINATION OF CONTRACTOR'S CONTROL OVER THE WORK.....	25
48.	FINAL INSPECTION, FIELD ACCEPTANCE, AND ACCEPTANCE	26
49.	CLEANING UP	26
50.	COMPLIANCE WITH LAWS AND REGULATIONS	26
51.	RESPONSIBILITY OF THE CONTRACTOR.....	30
52.	INDEMNIFICATION	31
53.	PERMITS AND LICENSES	31
54.	PROTECTION OF COUNTY AGAINST PATENT CLAIMS	32
55.	PROTECTION OF WORKERS	32
56.	PROTECTION OF MATERIALS AND EQUIPMENT	33
57.	SANITARY PROVISIONS	33
58.	EXISTING UTILITIES.....	33
59.	COOPERATION WITH OTHERS.....	33
60.	AIR POLLUTION CONTROL	34
61.	WATER POLLUTION.....	34
62.	SOUND CONTROL REQUIREMENTS	34
63.	UNFAVORABLE WEATHER AND OTHER CONDITIONS.....	34
64.	WEEKEND, HOLIDAY, AND NIGHT WORK.....	34
65.	OVERLOADING.....	35
66.	SUBCONTRACTING AND ASSIGNMENT	35
67.	NON-RECOGNITION OF SUBCONTRACTORS	35
68.	LANDS AND RIGHTS OF WAY	35
69.	LIABILITY OF DISTRICT OFFICIALS	35
70.	CONTRACTOR NOT AN AGENT OF THE COUNTY	35
71.	THIRD-PARTY CLAIMS.....	35
72.	GUARANTEE.....	35
73.	ASSIGNMENT OF ANTITRUST ACTIONS.....	36
74.	LEGAL ADDRESS OF THE CONTRACTOR	36
75.	SURVEYS.....	36
76.	MATERIALS OR EQUIPMENT SPECIFIED BY NAME	36
77.	PROPERTY RIGHTS IN MATERIAL.....	37
78.	CONTRACTOR'S EQUIPMENT.....	37
79.	MISCELLANEOUS PROVISIONS.....	37
80.	PUBLIC CONTRACT CODE SECTION 20104, ET SEQ.....	37

GENERAL CONDITIONS

1) BASIC DEFINITIONS:

A. The term "Change Order" shall refer to a written agreement in the form included in these Contract Documents, signed by the County, Owner's Representative, Construction Manager, and Contractor, modifying the Contract.

B. The term "Claim" (see Paragraph 39).

C. The term "Construction Change Directive" (C.C.D.) shall refer to a written directive, signed by County, directing Contractor to perform and/or omit certain work as specified within the Construction Change Directive. The Contractor shall promptly comply with the Construction Change Directive and promptly perform and/or omit the work specified in the Construction Change Directive.

D. The term "Contract" means the Contract Documents.

E. The term "Contract Documents" consists of all documents listed in Paragraph 2, Contract Documents, of these General Conditions.

F. The term "Contract Sum" means the total compensation specified in the Contract. The Contract Sum may be adjusted by Change Order.

G. The term "Contract Time" means the number of days set forth in the Bid within which the full completion of the Contractor's work must be achieved. The Contract Time may be adjusted by Change Order.

H. The term "Contractor" means the person or firm identified as such in the Contract, or its authorized representative.

I. The term "County" means the County of San Benito, its trustees, officers, and employees.

J. The term "Owner's Representative" means the County of San Benito, its officers, employees, and designees. The County may, at any time, without prior notice to or approval by Contractor, replace Owner's Representative with a new Owner's Representative. Upon Contractor's receipt of notice from County of such replacement, Contractor shall recognize such person or firm as Owner's Representative for all purposes under the Contract Documents.

K. The term "Project" means the total of the work and obligations agreed to be performed by Contractor under the Contract.

L. The term "day" means a calendar day unless otherwise specifically noted.

M. The term "Architect" means the design professional that prepared the Contract Documents and serves as an authorized representative. The Architect will assist the County with administration of the Contract.

2) CONTRACT DOCUMENTS: The Contract Documents consist of the Notice to Contractors; Instructions to Bidders; Bid; Bidder's Bond; Names and Titles Form; Noncollusion Affidavit; Statement of Compliance; Designation of Subcontractors; Bidder's Qualifications; Guaranty; Contractor's Certificate as to Worker's Compensation; Affidavit Concerning Employment of Undocumented Aliens; Contract; General Conditions; **Plans dated November 9, 2018 and Specifications dated November 9, 2018**; any addenda issued; Change Orders; and any other documents described as such within these Contract Documents.

3) EXAMINATION OF CONTRACT DOCUMENTS AND SITE OF WORK: Each Bidder shall examine carefully the site of the work and the Contract Documents, and shall satisfy itself as to the character, quality, and quantity of the surface and subsurface materials or obstacles to be encountered.

The submission of a Bid shall be conclusive evidence that the Contractor has satisfied itself through Contractor's own investigation as to the conditions to be encountered; the character, quality, and scope of work to be performed; the materials and equipment to be furnished; and all requirements of the Contract Documents.

Where investigations of subsurface conditions have been made with respect to foundation or other structural design, and that information is made available to Contractor or shown in the Contract Documents, said information represents only the statement as to the character of materials which have been actually encountered by it in its investigation, and is only made available or included for the convenience of Bidders.

Investigations of subsurface conditions are made for the purpose of design, and the County assumes no responsibility whatsoever with respect to the sufficiency or accuracy of borings, the log of test borings, or other preliminary investigations, or of the interpretation thereof, and there is no guaranty, either expressed or implied, that the conditions indicated are representative of those existing throughout the work, or any part of it, or that unanticipated conditions may not occur. When a log of test borings is made available to Contractor or included in the Contract Documents, it is expressly understood and agreed that said log of test borings does not constitute a part of the Contract, and represents only an opinion of the County as to the character of the materials to be encountered, and is made available or included in the Contract Documents only for the convenience of the Bidders. Making such information available to Bidders is not to be construed in any way as a waiver of the provisions of the first two paragraphs of this section, and Bidders must satisfy themselves, through their own investigations, as to conditions to be encountered.

The Contractor shall promptly, and before the following conditions are disturbed, notify the County and Owner's Representative, in writing, of any:

- A. Material that the Contractor believes may be material that is hazardous waste, as defined in Section 25117 of the Health and Safety Code, that is required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law, including but not limited to PCB's, lead or asbestos.
- B. Subsurface or latent physical conditions at the site differing from those indicated.
- C. Unknown physical conditions at the site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract.

The County shall promptly cause an investigation of the conditions, and if it finds that the conditions do materially so differ, or do involve hazardous waste, and cause a decrease or increase in the Contractor's cost of, or the time required for, performance of any part of the work, shall issue a Change Order or Construction Change Directive.

In the event that a dispute arises between the County and the Contractor whether the conditions materially differ, or involve hazardous waste, or cause a decrease or increase in the Contractor's cost of, or time required for, performance of any part of the work, the Contractor shall not be excused from any scheduled completion date required by the Contract, but shall proceed with all work to be performed under the Contract.

Nothing contained within this Section or the Contract Documents relieves the Contractor of its obligations set forth in the first two paragraphs of this Section.

4) ADDENDA: If discrepancies or apparent errors are found in the Contract Documents prior to the date of Bid opening, Bidders shall submit a written request for clarification, which response to said request will be given in the form of addenda to all Bidders, if time permits. Otherwise, in figuring the work, Bidders shall consider that any discrepancies or conflict between Contract Documents shall be governed by Paragraph 21, Intent of Plans and Specifications, and Paragraph 25, Conformance with Codes and Standards, of the General Conditions.

The correction of any discrepancies in, or omissions from the drawings, specifications, or other Contract Documents, or any interpretation thereof, during the bidding period will be made only by an addendum issued by the Owner's Representative. Each such addendum issued by the Owner's Representative shall be made a part of the Contract. Any other interpretation or explanation of such documents will not be considered binding.

5) BID: The Contractor's Bid shall be made on the form provided, with all items filled out, and properly signed. The Bid shall be signed in longhand; by the Contractor if an individual, by a member of the partnership, or by an officer of a corporation authorized to sign contracts in its behalf. If made by a corporation, the Bid shall show the name of the State under the laws of which the corporation is chartered or organized.

Bidders are warned against making erasures or alterations of any kind on their Bid. Bids which contain omissions, erasures, alterations, conditions, or additions not called for may be rejected.

The Bid shall be enclosed in a sealed envelope having the name of the Project, as it appears on the Bid, and the name and address of the Bidder shown thereon.

6) LIST OF SUBCONTRACTORS: In accordance with California Public Contract Code, Chapter 4 (commencing with Section 4100), Part 1, Division 2 of the Public Contract Code of the State of California (Subletting and Subcontracting Fair Practices Act), each Bid shall have listed on the form provided with the Bid: (a) the name and location of the place of business of each subcontractor who will perform work or labor or render service to the prime contractor, in or about the construction of the work or improvement, or a subcontractor licensed by the State of California, who, under subcontract to the prime contractor, specially fabricates and installs a portion of the work or improvement according to detailed drawings contained in the plans and specifications, in an amount in excess of one-half of one percent (0.5%) of the prime contractor's total Bid, and (b) the portion of the work which will be done by each subcontractor. The Contractor shall list only one subcontractor for each such portion as defined by the Contractor in Contractor's Bid.

If Contractor fails to specify a subcontractor for any portion of the work to be performed under this Contract in excess of one-half of one percent (0.5%) of the total Bid, Contractor agrees to perform that portion itself.

7) WITHDRAWAL OF BID: A Bid may be withdrawn at any time prior to the hour fixed in the Notice to Contractors for the opening of Bids by a written request of the Bidder, filed with the County. The withdrawal of a Bid will not prejudice the right of a Bidder to file a new Bid within the time prescribed.

8) OPENING OF BIDS: Bids will be opened and then read publicly at the time and place indicated in the Notice to Contractors, or as soon thereafter as is reasonable. Bidders or their representatives and others interested are invited to be present.

9) BIDDER'S BOND: The Bid must be accompanied by a Bidder's Bond, certified check, or cashier's check in an amount not less than ten percent (10%) of the amount bid. The Bidder's Bond must be signed in favor of the County, and the certified check or cashier's check must be made payable to the County of San Benito. The Contractor shall pay to the County such sums from said bond, certified check, or cashier's check as necessary to reimburse the County for costs incurred for failure of the successful Bidder to complete, sign and return in strict compliance with these Contract Documents, if requested to do so, Contractor Qualifications Questionnaire, or enter into a contract. The amount of said bond, certified check, or cashier's check shall not be deemed to constitute a penalty or liquidated damages. The County shall not be precluded by such bond, certified check, or cashier's check from recovering from the defaulting Bidder damages in excess of the amount of said

bond, certified check, or cashier's check incurred as a result of the failure of the successful Bidder to complete, sign and return in strict compliance with these Contract Documents, if requested to do so, Contractor Qualifications Questionnaire, or enter into a contract.

10) CONSIDERATION OF BIDS: After the Bids have been opened and read, they will be checked for accuracy and compliance with these Contract Documents.

Bid prices shall include everything necessary for the completion of fulfillment of the Contract, including, but not limited to, furnishing all materials, equipment, tools, labor and services, except as may be provided otherwise in the Contract Documents. When a price is quoted in both words and figures, the words shall prevail in case of a discrepancy.

Bid prices shall include allowance for all taxes, including, but not limited to, all Federal, State, and local taxes.

The County reserves the right to reject any and all Bids; to waive any minor irregularity in a Bid; and to accept one schedule of a Bid and reject another.

11) COMPETENCY OF BIDDER: The Bidder shall be licensed under the provisions of Chapter 9, Division 3, of the Business and Professions Code of the State of California to do the type of work contemplated in the Project, and shall be skilled and regularly engaged in the general class or type of work called for under this contract, with at least five (5) years of experience in the project type.

12) DISQUALIFICATION OF BIDDERS: More than one Bid in the same project trade component from any individual, firm, partnership, corporation, or association, under the same or different names, will not be considered. Reasonable grounds for believing that any Bidder is interested in more than one Bid for the work will cause the rejection of all Bids in which such Bidder is interested. If there is reason to believe that collusion exists among the Bidders, none of the participants in such collusion will be considered. Any Bid in which the prices obviously are unbalanced may be rejected.

13) RELIEF OF BIDDERS: Attention is directed to the provisions of Public Contract Code section 5100, and following, concerning relief of Bidders, and in particular to the requirement therein that if the Bidder claims a mistake was made in Contractor's Bid, the Bidder shall give the County written notice within five (5) days after opening of the Bids of the alleged mistake, specifying in the notice in detail how the mistake occurred.

14) AWARD OF CONTRACT: Award of the Contract, if awarded at all, will be to the lowest responsive, responsible Bidder whose Bid complies with the specified requirements. The award, if it be awarded, will be made by the County within sixty (60) days after opening of the Bids.

The lowest responsive, responsible Bid will be determined by the Base Bid. The County reserves the right to include in the Contract, if a Contract is awarded, the Base Bid only, or the Base Bid plus any alternate Bid or combinations of alternates Bid.

15) RETURN OF BID GUARANTEES: When the award of the contract has been made, the Bid guarantees accompanying the three lowest responsive, responsible Bids shall be retained. All other guarantees for Bids not to be further considered in making the award will be returned. The retained guarantees will be returned when the Contract has been fully signed.

16) SIGNING OF CONTRACT: A Contract shall be signed by the successful Bidder in triplicate on the form provided and returned to the County, within ten (10) days after date of dispatch of the Contract forms. After signing by the County, one copy will be delivered to the Owner's Representative, and one copy shall be returned to the Contractor.

If the Bidder to whom the award is made fails or refuses to enter into the Contract within ten (10) calendar days from the time the Contract forms are dispatched by the County, Paragraph 9, Bidder's Bond, of these General Conditions shall apply. The County may then award the Contract to the next lowest responsive, responsible Bidder. This will be done after the failure or refusal of the lowest responsive, responsible Bidder to enter into the Contract, as is convenient for the County. If the next lowest responsive, responsible Bidder fails or refuses to enter into the Contract, then Paragraph 9, Bidder's Bond, of these General Conditions shall apply. The County may then award the Contract to the next lowest responsive, responsible Bidder.

17) CONTRACT BONDS: Within ten (10) days of County's dispatch of Notice of Award, the Contractor shall furnish corporate surety bonds to the benefit of the County, issued by a surety company acceptable to the County and authorized and admitted to do business in the State of California, as follows:

A. Faithful Performance Bond -- In a sum not less than one hundred percent (100%) of the total contract price as set forth in the Contract to guarantee the Contractor's faithful performance of all covenants and stipulations of the Contract. The bond shall contain a provision that the surety thereon waives the provisions of Sections 2819 and 2845 of the Civil Code of the State of California.

B. Payment Bond -- In a sum not less than one hundred percent (100%) of the total contract price as set forth in the Contract to guarantee the payment of wage, and bills contracted for materials, supplies, or equipment used in the performance of the Contract. The bond shall be in accordance with the provisions of Sections 3225, 3226, and 3247 to 3252, inclusive, of the Civil Code of the State of California, and Section 13020 of the Unemployment Insurance Code of the State of California. Said bond shall also contain a provision that the surety thereon waives the provisions of Sections 2819 and 2845 of the Civil Code of the State of California.

Faithful Performance Bond and Payment Bond samples are contained within these Contract Documents.

18) NOTIFICATION OF SURETY COMPANIES: The surety companies shall familiarize themselves with all provisions and conditions of the Contract. It is understood and agreed that the surety or sureties waive the right of special notification of any modifications or alterations, omissions or reductions, extra or additional work, extensions of time, or any other act or acts by the County or its authorized agents under the terms of the Contract; and failure to so notify the surety companies of such changes shall in no way relieve the surety or sureties of their obligations under this Contract. The surety expressly waives the provisions of Sections 2819 and 2845 of the Civil Code of the State of California.

19) INSURANCE: Within ten (10) days of County's dispatch of Notice of Award, the Contractor shall furnish a Certificate of Insurance substantiating the fact that Contractor has taken out the insurance hereinafter set forth for the period covered by the Contract with an insurance carrier acceptable to the County and under terms satisfactory to the County. Insurance industry's standard Accord Certificate of Insurance or binder forms shall bear an endorsement precluding the cancellation or reduction of coverage of any policy covered by such Certificate or binder before the expiration of thirty (30) days after the County shall have received notification of such cancellation, suspension, reduction, or voided coverage. Contractor shall immediately furnish copies of its insurance policies required under this Contract to the County upon request. In the event Contractor does not have a Certificate of Insurance or binder evidencing the proper insurance coverages, the Contractor shall not be allowed on the work site.

All insurance policies shall by endorsement include the County of San Benito, its officers, employees, agents, inspectors, construction managers, project managers, consultants, subconsultants, their officers and employees, and each of them, as additional insureds to protect, as well as to provide the defense of, from all suits, actions, damages, liability, or claims of every type and description to which they may be subjected or put by reason of, or resulting from, the Contractor's performance of the Contract. Contractor's insurance shall apply as primary insurance, and any other insurance carried by the additional insureds identified above shall apply as excess and will not contribute with this insurance.

Each insurance policy shall include the following provisions: (1) The standard severability of interest clause in the policy and when applicable the cross liability insurance coverage provision which specifies that the inclusion of more than one insured shall not operate to impair the rights of one insured against another insured, and the coverages afforded shall apply as though separate policies had been issued to each insured; (2) It acts as primary insurance, and that no insurance held or owned by the County shall be called upon to cover, either in full or in part, any loss covered under the policy acquired by Contractor; and (3) The stated limits of liability coverage for Commercial/Comprehensive General Liability, and Business Automobile Liability, assumes that the standard "supplementary payments" clause will pay in addition to the applicable limits of liability and that these supplementary payments "are not included as part of the insurance policies limits of liability." If any of the policies indicate that defense costs are included in the general aggregate limit, then the required general aggregate limits shall be a minimum of \$2,000,000 or more at the County's discretion.

If the Contractor fails to maintain such insurance, the County may take out insurance to cover damages of the below-mentioned classes for which the County might be held liable on account of the Contractor failing to pay such damages and deduct and retain the amount of the premium for such insurance from any sums due the Contractor under the Contract. Failure of the County to obtain such insurance shall in no way relieve the Contractor from any of its responsibilities under the Contract.

Without limiting Contractor's duty to indemnify, the minimum insurance coverages to be obtained by the Contractor as hereinabove referred to are as follows:

A. Commercial General Liability Insurance, including but not limited to premises and operations, including coverage for Bodily Injury and Property Damage, Personal Injury, Contractual Liability, Broadform Property Damage, Independent Contractors, Products and Completed Operations, with a combined single limit for Bodily Injury and Property Damage of not less than \$2,000,000 per occurrence. The required endorsement form for Commercial General Liability Additional Insured is ISO Form CG 20 10 11 85 or CG 20 10 10 01 in tandem with CG 20 37 10 01 (2000).

B. All Risk Property Coverage or Builders Risk Insurance in an amount equal to or greater than the contract amount and shall cover the full replacement cost of the building and improvements in the event of loss, damage, or destruction by fire or other perils commonly covered by standard extended coverage. Such amount shall be adjusted in accordance with adjustments in the contract amount. The subject insurance policy shall protect the interest of County, Contractor, subcontractors and sub-subcontractors with respect to work performed under this contract, and shall provide broad form all-risks coverage, including insuring against perils of fire, theft, flood, vandalism, malicious mischief, collapse and debris removal. Contractor shall be responsible for all losses to the work performed under this contract until completion of the work and final payment by owner. Contractor shall maintain property insurance until such final payment has been made by owner.

C. Business Automobile Liability Insurance, covering all motor vehicles, including owned, leased, non-owned, and hired vehicles, used in providing services under this Agreement, with a combined single limit for Bodily Injury and Property Damage of not less than

\$1,000,000 per occurrence. The required endorsement form for Automobile Additional Insured endorsement is ISO Form CA 20 48 02 99.

D. Workers' Compensation Insurance, The Contractor shall be a qualified self-insurer or shall carry full Workers' Compensation and Employers' Liability insurance coverage, either through the State Compensation Insurance Fund or a standard approved policy obtained from a licensed insurance carrier for all persons employed, either directly or through subcontractors, in carrying out the work under this Contract in accordance with the "Workers' Compensation and Insurance Act," Division IV thereof. Employers' limits of liability shall be the prevailing statutory limits of liability.

Any exceptions to the provisions of this section must be delineated in the Contract Documents. In addition, it is understood and agreed that an excess insurance policy or an umbrella policy (following form) may be utilized to meet the above-required limits of liability for Commercial/Comprehensive General Liability, Business Automobile Liability policy, and the Workers' Compensation Employers' Liability.

20) PRE-CONSTRUCTION CONFERENCE: Prior to the start of construction, a conference will be called by the County or Owner's Representative for the purpose of reviewing the construction program with the Contractor. At this conference, the sequence of work, methods of access to the construction site and temporary facilities shall be reviewed by the Contractor and County. Coordination of utilities within the project limits, including relocations and maintenance of existing facilities and additions thereto, shall be confirmed in writing by utility representatives and the Contractor at this conference, or within five (5) working days thereafter.

21) INTENT OF PLANS AND SPECIFICATIONS: It is the intent of these Contract Documents that the work performed under the Contract shall result in a complete operating system in satisfactory working condition with respect to the functional purposes of the installation, and no extra compensation will be allowed for anything omitted but fairly implied. The prices paid for the various items in the Bid shall include full compensation for furnishing all labor, materials, tools, equipment, overhead, profit, incidentals, and doing all work necessary to complete the finished product as provided in the Contract Documents.

The specifications and drawings are intended to be explanatory of each other. Any work shown on the drawings, and not in the specifications, or vice versa, is to be treated as if indicated in both. In the case of conflict or inconsistency, the Supplementary Conditions (if any) shall control over the General Conditions, the General Conditions shall control over the Technical Specifications, and the Technical Specifications shall control over the drawings. Figured dimensions shall control over scaled measurements. In all cases, the more costly or expensive interpretation is deemed to control and be the interpretation incorporated into the Contract Documents and Contract Sum.

Organization of the specifications into various subdivisions and the arrangement of the drawings shall not control Contractor in dividing the work among subcontractors or in establishing the extent of work to be performed by any trade.

Unless otherwise stated in the Contract Documents, technical words and abbreviations contained in the Contract Documents are used in accordance with commonly understood construction industry meanings, and nontechnical words and abbreviations are used in accordance with their commonly understood meanings.

The Contract Documents may omit modifying words such as "all" and "any", and articles such as "the" and "an", but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement. The use of the word "including," when following any general statement, shall not be construed to limit such statement to specific items

or matters set forth immediately following such word or to similar items or matters, whether or not nonlimiting language (such as "without limitation," "but not limited to," or words of similar import) is used with reference thereto, but rather shall be deemed to refer to all other items or matters that could reasonably be deemed to fall within the broadest possible scope of such general statement.

Whenever the context so requires, the use of the singular number shall be deemed to include the plural and vice versa. Each gender shall be deemed to include any other gender, and each shall include corporation, partnership, trust, or other legal entity whenever the context so requires. The captions and headings of the various subdivisions of the Contract Documents are intended only as a matter of reference and convenience, and in no way define, limit, or prescribe the scope or intent of the Contract Documents or any subdivision thereof.

Contractor shall assume responsibility for design of systems and fabrications needed to meet performance criterion described in the Contract Documents. Design by Contractor shall include, but is not limited to, concrete form work, casework joinery, fire sprinkler systems, mechanical and electrical systems represented diagrammatically on Contract Drawings. Design shall be governed by descriptive criterion specified for each item. Contractor shall also assume responsibility for temporary structures used to implement construction such as shoring and scaffolding.

22) CLARIFICATION OF CONTRACT DOCUMENTS: Should it appear that the work to be done, or any of the matters relative thereto, are not sufficiently detailed or explained in the Contract Documents, or in the event of any doubt or question arising respecting the true meaning of the Contract Documents, the Contractor shall apply to the Owner's Representative for such further explanations as may be necessary. The Contractor shall thoroughly review all Requests for Information (RFI's) submitted by subcontractors prior to submission to the Owner's Representative to determine whether such RFI is already answered in the Contract Documents. Contractor represents to County and Owner's Representative, that by submission of an RFI, Contractor has thoroughly reviewed the RFI and thoroughly reviewed the Contract Documents, and determined that the RFI is not answered or reasonably inferable in the Contract Documents, and that the RFI pertains to an unforeseen condition or circumstance that is not described in the Contract Documents, that there is a conflict or discrepancy in the Contract Documents, or there is an omission in the Contract Documents. In the event any RFI is answered or reasonably inferable from the Contract Documents, Contractor agrees to pay the Owner's Representative and County the reasonable cost for their time and expenses associated with reviewing and responding to RFI's which are already answered or reasonably inferable from the Contract Documents. In the event of a disagreement over such compensation, the judgment of the Owner's Representative shall control.

23) PLANS AND SPECIFICATIONS TO BE FURNISHED: The Contractor will be furnished, free of charge, *three (3)* copies of the Contract Documents. The Contractor shall retain an approved complete set of Contract Documents on the job at all times during the progress of the work.

24) SUPPLEMENTAL DRAWINGS AND INSTRUCTIONS: In addition to the drawings incorporated in the Contract at the time of signing, the architect or engineer may furnish such working drawings and supplemental drawings from time to time as may be necessary to make clear, or to define in greater detail, the intent of the Contract drawings and specifications. In furnishing such additional drawings and/or instructions, the architect or engineer shall have authority to make minor changes in the work, not involving extra cost, and not inconsistent with the nature of the work. These working drawings and supplemental drawings shall become a part of the Contract Documents, and the Contractor shall make its work conform to them.

25) CONFORMANCE WITH CODES AND STANDARDS: All work and materials shall be in full accordance with the latest adopted standards and regulations of the State Fire Marshal; the California Building Code; the California Electrical Code; the California Plumbing Code; Americans With Disabilities Act; Cal OSHA; and all other applicable codes, laws, or regulations. Nothing in these

Contract Documents is to be construed to permit work not conforming to these requirements. Contractor agrees that immediately upon signing of the Contract, Contractor will diligently review the Contract Documents and determine if any work described or inferred within the Contract Documents is not in conformance with these requirements. Should Contractor discover work within the Contract Documents not in conformance with these requirements, Contractor agrees to immediately notify Owner's Representative in writing of said nonconformance, and to not proceed with nonconforming work. When the work detailed in the Contract Documents differs from governing codes, it is understood and agreed that the Contract Sum is based upon the more costly or expensive standard.

26) PERSONAL ATTENTION AND SUPERINTENDENCE: The Contractor shall give Contractor's personal attention to, and shall supervise the work to the end that it shall be faithfully prosecuted. Contractor shall keep on the work at all times throughout its progress, a competent superintendent who shall represent the Contractor in Contractor's absence, and shall have complete authority to represent and act for the Contractor. Whenever the Contractor or Contractor's superintendent is not present on a particular part of the work, the Owner's Representative or County may stop the work until the Contractor or Contractor's superintendent arrives.

The Contractor shall be liable for the faithful observation of any instructions delivered to Contractor or to Contractor's authorized representatives. Any order given by the Owner's Representative not otherwise required by the specifications to be in writing will, on request of the Contractor, be given or confirmed by the Owner's Representative in writing.

27) BEGINNING OF WORK: The Notice to Proceed shall constitute authority for the Contractor to enter upon the site of the work and to begin operations, upon condition that the Contractor has strictly complied with all requirements of these Contract Documents, including but not limited to, furnishing all required documentation and certificates of insurance. If Contractor has not provided County with all documents required by these Contract Documents as of the date of the Notice to Proceed, Contractor shall not be allowed on the site of the work or allowed to start work on the Project, notwithstanding the issuance of a Notice to Proceed.

When the Contractor has started work on the Project, the Contractor shall diligently prosecute the work to completion within the time limit provided in the Contract Documents.

The Contractor shall give the County and Owner's Representative at least two (2) working days' notice of Contractor's intention to start work, specifying the time, date, and location at which the Contractor intends to begin.

Contract time shall begin five (5) days after the date of dispatch of the Notice to Proceed, whether or not Contractor is allowed on the work site due to Contractor's failure to furnish County with all documentation required by these Contract Documents. In no event shall there be a period of time greater than thirty (30) days, from the time the Contract is dispatched by the County to the Contractor and the commencement of the Contract Time, regardless of the receipt or lack thereof by County of all documents required by these Contract Documents.

28) PROGRESS SCHEDULE: The County's receipt of a proposed progress schedule and monthly updated progress schedules, all in strict compliance with these Contract Documents shall be conditions precedent to the Owner's Representative's or County's approval of the Contractor's periodic pay requests and/or the County's obligation to request payment be issued to Contractor.

The Contractor shall, to every reasonable extent, carry on the work of construction of the various elements of the project concurrently, and shall not defer construction of any portion of the work in favor of any other portion without the express written approval of the Owner's Representative or County.

29) RESPONSIBILITY FOR ACCURACY: The Contractor shall obtain all necessary measurements for and from the work, and shall check dimensions, elevations, and grades for all layout and construction work and shall supervise such work, the accuracy for all of which Contractor shall be responsible. Each subcontractor shall adjust, correct, and coordinate Contractor's work with the work of others so that no discrepancies will result in the whole work.

Contractor shall be responsible for verifying that all information and data contained and set forth in all of Contractor's submittals that may be required by the Contract Documents, comply in all respects with the Contract Documents.

30) EFFECT OF INSPECTION OR USE: Neither the inspection by an inspector, County, Owner's Representative, construction manager, architect, engineer, or anyone acting in their behalf, nor any measurement, approved modification, submittal, shop drawing, order, or certificate, nor acceptance of any part or whole of the work, nor payment of money, nor any possession or use by the County or its agents, shall operate as a waiver of any provisions of the Contract or of any power or authority reserved therein, or of any right to damages thereunder; nor shall the waiver of any breach of this Contract be held to be a waiver of any subsequent or other breach.

31) INSPECTION: All work done and all materials and equipment furnished under this Contract shall be subject to the inspection and approval of the Owner's Representative and/or County. They shall at all times have access to the work during its construction, and shall be furnished with every reasonable facility and assistance for ascertaining that the materials and workmanship are in accordance with the requirements and intent of the Contract Documents. Any work constructed without inspection as provided above, except with the specific written consent or approval of the Owner's Representative and Construction Manager, or constructed contrary to the instructions or orders of the Owner's Representative, Construction Manager, or his or her authorized representative, must, if requested by the Owner's Representative or County, be uncovered for examination and properly restored at the Contractor's expense.

The inspection of the work by County, the County's inspector(s), Construction Manager, architect, engineer, consultants or anyone acting in their behalf, does not relieve the Contractor of any of Contractor's obligation to fulfill the Contract as prescribed. Any work, materials, or equipment not meeting the requirements and intent of the Contract Documents shall be rejected, and unsuitable work or materials shall be made good, notwithstanding the fact that such work or materials may have previously been inspected or approved and payment therefor may have been made. If nonconforming work, materials, or equipment not meeting the requirements and intent of the Contract Documents is discovered, and the Contractor fails to remedy the nonconforming work, materials, or equipment, or the County agrees in writing to accept the nonconforming work, materials, or equipment, Contractor agrees to sign a Change Order or otherwise reimburse County in a sum equal to the cost to remedy the nonconforming work, materials, or equipment. It is expressly understood and agreed that the County will be entitled to recover from Contractor the full cost of remedying nonconforming work, materials, or equipment, and that diminution in value will not be considered as a method for valuing the County's damages for nonconforming work, materials, or equipment, and further that the doctrine of economic waste will not be a defense to the County's recovery from Contractor of the full and complete cost and expense of remedying nonconforming work, materials, or equipment.

Re-examination of any work may be ordered by the County, Construction Manager and/or the Owner's Representative, and such work must be uncovered by the Contractor. The Contractor shall pay the entire cost of such uncovering, re-examination, and replacement if the work does not conform to the Contract Documents.

32) REMOVAL OF REJECTED MATERIALS OR WORK: The Contractor shall, upon request and without delay, remove from the site of the work, all rejected or condemned materials of any kind brought to, or incorporated in, the work. No such rejected or condemned materials shall again be

offered for use in any work under the Contract. All work which has been rejected shall be remedied, or removed and replaced, by the Contractor in a manner acceptable to the County at Contractor's expense.

Upon failure of the Contractor to comply within forty-eight (48) hours with any written order of the County or Owner's Representative made under this section, or to make satisfactory progress in so doing, the County may cause such rejected materials to be removed, or such rejected work to be remedied, or removed and replaced, and deduct and retain the costs from any sums due or to become due to the Contractor.

33) USE OF COMPLETED PORTIONS: The County shall have the right at any time during the progress of this work to take over and place in service any completed or partially completed portion of the work, notwithstanding the time for completion of the entire work or such portions which may not have expired; but such taking possession thereof shall not be deemed an acceptance of any of the work, nor work on those portions not completed in accordance with the Contract Documents.

34) MEANS AND METHODS: Neither Owner's Representative nor County will have control over, be in charge of, nor be responsible for construction means, methods, techniques, sequences, or procedures, or for the safety precautions and programs in connection with the work, since these are solely Contractor's responsibility, unless otherwise required by the Contract Documents.

35) DELAYS: The Contractor agrees to complete all of its work required in the Contract Documents, or any subsequent revisions or modifications thereto, within the time specified in the Bid, subject to Change Orders increasing or decreasing the time specified. It is agreed by the parties to this Contract that time is of the essence to the performance of this Contract by Contractor, and that in case all work called for under the Contract is not completed in all respects and requirements within the time called for in the Contract Documents, plus any agreed upon extensions of time, damage will be sustained by the County.

36) EFFECT OF EXTENSION OF TIME: The granting of an extension of time for the completion of the work on account of delays which, in the judgment of the County, are unavoidable delays, or granted for the performance of extra or additional work, shall in no way operate as a waiver on the part of the County of any of its rights under this Contract.

37) CLAIMS: A Claim is any request by Contractor to adjust, alter, modify, or otherwise change the Contract Sum or the Contract Time, or both. A Claim must be stated with specificity, including identification of the event or occurrence giving rise to the Claim, the date of the event, and the asserted effect on the Contract Sum and the Contract Time, if any. The Claim shall include adequate supporting data. Adequate supporting data for a Claim for an adjustment of the Contract Time shall include scheduling data demonstrating the impact of the event on the critical path and completion of the Project. Adequate supporting data for a Claim for an adjustment in the Contract Sum shall include a detailed cost breakdown of items included within the Claim and documentation supporting each item of cost.

Contractor shall submit all Claims to the County before proceeding to perform the work, or portions of the work, giving rise to such Claim. Contractor hereby expressly waives any Claims of which Contractor was aware, whether or not the exact amounts of such Claims were ascertainable, and that are not submitted to the County prior to Contractor proceeding to perform the work, or portions of the work, giving rise to such Claims.

All Claims shall be submitted to County and Owner's Representative for decision within fifteen (15) days after the event or occurrence giving rise to the Claim. Contractor hereby expressly waives all Claims not made within the aforesaid time limit.

Claims must be submitted to County before the date of final payment. Contractor hereby expressly waives all Claims not submitted, in complete and proper form, on or before the date of final payment.

Contractor expressly waives any Claims for delay or adjustment to the Contract Time if the Contractor fails to provide written notice to County within three (3) days of the event or occurrences giving rise to the delay. Said written notice shall include the event or occurrence giving rise to the delay, the estimated duration of the delay, and the impact of the event or occurrence upon the critical path and completion of the Project. Contractor will not be entitled to adjustments to the Contract Time for delays attributable to weather, unless such delays are attributable to weather which is abnormal and delays the completion of the Project. A determination of abnormal weather is to be based upon locally recognized annual weather patterns for the month in which the abnormal weather occurs.

As used herein, the following terms shall have the following meanings:

"Excusable Delay" means any delay of the completion of the Project beyond the expiration of the Contract Time caused by conditions beyond the control and without the fault or negligence of the Contractor such as strikes, embargoes, fire, unavoidable casualties, unusual delays in transportation, national emergency, and stormy and inclement weather conditions in which the work cannot continue. The financial inability of the Contractor or any subcontractor and default of any subcontractor, without limitation, shall not be deemed conditions beyond the Contractor's control. An Excusable Delay may entitle the Contractor to an adjustment in the Contract Time.

"Compensable Delay" means any delay of the completion of the work beyond the expiration date of the Contract Time caused by the gross negligence or willful acts of the County or Owner's Representative, and which delay is unreasonable under the circumstances involved, and not within the contemplation of the parties. A Compensable Delay may entitle the Contractor to an extension of the Contract Time and/or Contract Sum. Except as provided herein, the Contractor shall have no claim for damage or compensation for any delay, interruption, hindrance, or disruption.

"Inexcusable Delay" means any delay of the completion of the Project beyond the expiration of the Contract Time resulting from causes other than those listed above. An Inexcusable Delay shall not entitle the Contractor to an extension of the Contract Time or an adjustment of the Contract Sum.

The Contractor may make a Claim for an extension of the Contract Time, for an Excusable Delay or a Compensable Delay, subject to the following:

A. If an Excusable Delay and a Compensable Delay occur concurrently, the maximum extension of the Contract Time shall be the number of days from the commencement of the first delay to the cessation of the delay which ends last.

B. If an Inexcusable Delay occurs concurrently with either an Excusable Delay or a Compensable Delay, the maximum extension of the Contract Time shall be the number of days, if any, by which the Excusable Delay or the Compensable Delay exceeds the Inexcusable Delay.

C. If an Inexcusable Delay occurs concurrently with both an Excusable Delay and a Compensable Delay, the maximum extension in the Contract Time shall be the number of days, if any, by which the number of days determined pursuant to Subparagraph (a) exceeds the number of days of the Inexcusable Delay.

D. For a Compensable Delay, the Contractor shall only be entitled to an adjustment in the Contract Sum in an amount equal to the actual additional labor costs, material costs, and unavoidable equipment costs incurred by the Contractor as a result of the Compensable Delay,

plus the actual additional wages or salaries and fringe benefits and payroll taxes of supervisory and administrative personnel necessary and directly employed at the Project site for the supervision of the work during the period of Compensable Delay. Except as provided herein, the Contractor shall have no claim for damage or compensation for any delay, interruption, hindrance, or disruption. There shall be no Compensable Delay unless the event or occurrence giving rise to the Compensable Delay extends the actual completion of the Project past the Contract Time.

The parties agree that the County's exercise of its rights to order changes in the work, regardless of the extent and number of changes, or to suspend the work, is within the contemplation of the parties and shall not be the basis for any Claim for Compensable Delay. The rights of the Contractor to adjustments of the Contract Time and the Contract Sum, based on changes ordered in the work or suspension of the work, shall be solely governed by this provision.

38) FALSE CLAIMS: California Penal Code section 72, provides that any person who presents for payment with intent to defraud any County board or officer, any false or fraudulent claim, bill, account, voucher, or writing, is punishable by fines not exceeding ten thousand dollars (\$10,000.00) and/or imprisonment in the state prison.

Government Code sections 12650, et seq., pertains to civil penalties that may be recovered from persons (including corporations, etc.) for presenting a false claim for payment or approval, presents a false record or statement to get a false claim paid or approved, or other acts, to any officer or employee of any political subdivision of the State of California. Any person or corporation violating the provisions of Government Code sections 12650, et seq., shall be liable for three times the amount of the damages of the political subdivision, plus a civil penalty, plus costs.

All Claims by Contractor, shall include the following certification, properly completed and executed by Contractor or an officer of Contractor:

I, _____, BEING THE _____ (MUST BE AN OFFICER) OF _____ (CONTRACTOR), DECLARE UNDER PENALTY OF PERJURY UNDER THE LAWS OF THE STATE OF CALIFORNIA, AND DO PERSONALLY CERTIFY AND ATTEST THAT: I HAVE THOROUGHLY REVIEWED THE ATTACHED CLAIM FOR ADDITIONAL COMPENSATION AND/OR EXTENSION OF TIME, AND KNOW ITS CONTENTS, AND SAID CLAIM IS TRUTHFUL AND ACCURATE; THAT THE AMOUNT REQUESTED ACCURATELY REFLECTS THE CONTRACT ADJUSTMENT FOR WHICH THE OWNER IS LIABLE; AND, FURTHER, THAT I AM FAMILIAR WITH CALIFORNIA PENAL CODE SECTION 72 AND CALIFORNIA GOVERNMENT CODE SECTION 12650, ET SEQ, PERTAINING TO FALSE CLAIMS, AND FURTHER KNOW AND UNDERSTAND THAT SUBMISSION OR CERTIFICATION OF A FALSE CLAIM MAY LEAD TO FINES, IMPRISONMENT AND/OR OTHER SEVERE LEGAL CONSEQUENCES.

Submission of a Claim, in conformance with all of these requirements of this Contract, and rejection of all or part of said Claim by County, is a condition precedent to any action by Contractor against County, including but not limited to, the filing of a lawsuit or making demand for arbitration, if arbitration is expressly provided for in this Contract.

39) CHANGES: The County may request that Contractor provide County with estimated costs for proposed changes to the work. Contractor agrees to promptly provide County with detailed, itemized costs for proposed changes to the work and scheduling data demonstrating the impact, if any, of the proposed changes to the work on the Contract Time. Adjustments, if any, in the amount to be paid the Contractor by reason of any modifications of the work as set forth in a Contract Change Order, Construction Change Directive, or arising from Claims shall be determined by one or more of the following methods as elected by the County:

- A. Lump Sum Price - By an acceptable lump proposal from the Contractor.
- B. Unit Prices - By unit prices fixed by agreement between the County and the Contractor.

C. Force Account - By ordering the Contractor to proceed with the work and to keep and present in such form as the Owner's Representative or County may direct, a correct account of the cost of the change, together with all vouchers and associated documentation therefor. The Contractor will be paid for labor, materials, and equipment rental actually used on the Change Order work as follows:

(1) Labor - the Contractor will be paid the reasonable cost of labor for the workmen (including foremen when authorized by the Owner's Representative), used in the actual and direct performance of the work. The cost of labor, whether the employer is the Contractor, subcontractor, or other forces, will be the sum of the following:

(1-1) Actual Wages - The actual wages paid shall include any reasonable employer payments to or on behalf of the workmen for health and welfare, pension, vacation, and similar purposes.

(1-2) Labor Surcharge - The labor surcharge to be added to the actual wages shall be the reasonable cost of all additional payments made to, or on behalf of the workers, other than actual wages, as required by State or Federal laws, including by way of example but not limited to, workers' compensation, SUTA, FUTA and FICA.

(1-3) Subsistence and Travel Allowance - The actual reasonable and necessary subsistence and travel allowance paid to such workers.

(2) Materials - The actual cost of the materials to the purchaser, whether the Contractor, a subcontractor, or other forces. If the Contractor does not furnish satisfactory evidence of the cost of such materials, it shall be deemed to be the lowest current wholesale price at which such materials are available in the quantities concerned delivered to the job site. The County reserves the right to furnish such materials as it deems advisable, and the Contractor shall have no claims for costs or profit on such County furnished materials.

(3) Equipment - The use of equipment shall be paid for at the rates listed for such equipment in the current compilation of rental rates of the State of California, Department of Transportation (CalTrans) Division of Highways, applicable to San Benito County or competitive local rental rates of established rental agencies serving the area of the work, whichever is less. If the equipment is not shown on the above-mentioned list, Contractor shall be paid such hourly rental rates as are agreed upon by the Contractor and the Owner's Representative prior to use of the equipment, except that in no case shall such agreed hourly rate exceed the rental rates of established distributors or equipment rental agencies serving the area, plus thirty-three and one-third percent (33-1/3%) for the cost of fuel, oil, lubrication, and field repairs and maintenance.

If the equipment is moved on to the work and used exclusively for extra work, the Contractor will be paid for the cost of transporting it to the job and returning it to its original location. The rental period shall begin when the equipment is unloaded at the site of the extra work, and shall include each day that the equipment is at the site of, and performing or utilized for, such extra work, excluding Saturdays, Sundays, and legal holidays, unless extra work is performed on such days, and shall terminate at the end of

the day on which such extra work is completed or the Owner's Representative directs the Contractor to discontinue the use of such equipment.

The rental time to be paid for equipment already on the work, or which is used for other than such extra work, shall be the actual time the equipment is in operation on the extra work, plus the time required to move the equipment to the site of the extra work and return it to its original location.

To the totals as computed above, shall be added the following percentages for profit and overhead:

Labor	Fifteen Percent (15%)
Materials	Fifteen Percent (15%)
Equipment Rental	Fifteen Percent (15%)

For Change Order work performed by a subcontractor, compensation for such work shall be based on all direct costs as listed in the subcontractor's portion of the proposal plus the above percentages. The Contractor may add ten percent (10%) to the subcontractor's proposal for Contractor's overhead and profit. Contractor may also add actual cost of subcontractor's bond (if any) and a markup on such bond not to exceed one percent (1%). Overhead and profit for all tiers of Contractor and subcontractors shall in no event exceed fifteen percent (15%) of the cost of the work. Distribution of the overhead and profit among the Contractor and the subcontractors is the responsibility of the Contractor.

The allowances for overhead and profit as enumerated in the preceding subparagraphs shall include full compensation for any and all items of overhead including but not limited to, superintendence, field overhead, home office overhead (absorbed and unabsorbed), Contractor bonds, insurance, general conditions, clean-up, safety meetings, mandated programs and processing of Claim and Change Order documents.

The amount of payment agreed upon or, in the absence of agreement, selected by the County shall be set forth in the Change Order or Construction Change Directive.

40) PAYMENTS: Within ten (10) days after signing the Contract, but in any event prior to the first application for payment, Contractor shall submit to Owner's Representative and County a cost breakdown of the Contract Sum. The cost breakdown shall itemize, as separate line items, the cost of each work activity and all other costs, including warranties, record documents, insurance, bonds, overhead expenses, and the total allowance for profit, the total of which shall equal the Contract Sum. The cost breakdown shall include a separate line item cost for each activity listed on Contractor's initial (as-planned) schedule. The cost breakdown, when accepted by the County and Owner's Representative, shall become the basis for determining the cost of work performed for the Contractor's applications for payment.

On or before the first (1st) day of the month, Contractor shall submit to Owner's Representative an itemized application for payment for the cost of the work in permanent place, as approved by the Owner's Representative, which has been completed in accordance with the Contract Documents as of the twentieth (20th) day of the preceding month, less amounts previously paid. The application for payment shall be prepared in a form acceptable to County and Owner's Representative, and shall contain itemized amounts in accordance with the cost breakdown. The applications for payment shall not include requests for payment on account of changes which have not been authorized by Change Orders, or for amounts Contractor does not intend to pay a subcontractor because of a dispute or other reason. By submission of an application for payment, Contractor represents to County that all work for which Contractor is seeking compensation, has been performed in strict compliance with these Contract Documents.

If requested by the County, an application for payment shall be accompanied by a summary showing payment that will be made to subcontractors covered by such application, and unconditional waivers and releases of claims and stop notices, from each subcontractor listed in the preceding application for payment covering sums disbursed pursuant to that preceding application for payment.

Contractor warrants that upon submittal of an application for payment, all work for which certificates of payment have been previously issued and payment has been received from County, shall be free and clear of all claims, stop notices, security interests, and encumbrances in favor of Contractor, subcontractors or other persons or firms entitled to make claims by reason of having provided labor, materials, or equipment related to the work.

Approval of all, or any part, of an application for payment may be withheld, a certificate of payment may be withheld, and all or part of a previous certificate for payment may be nullified and that amount withheld from a current certificate for payment, on account of any of the following:

- (a) Defective work not remedied;
- (b) Third-party claims against Contractor or County arising from the acts or omissions of Contractor or subcontractors;
- (c) Stop notices;
- (d) Failure of Contractor to make timely payments due to subcontractors for material or labor;
- (e) A reasonable doubt that the work can be completed for the balance of the Contract Sum then unpaid;
- (f) Damage to the County or others for which Contractor is responsible;
- (g) Reasonable evidence that the work cannot be completed within the Contract Time, and the unpaid balance of the Contract Sum would not be adequate to complete the work and cover County's damages for the anticipated delay;
- (h) Failure of Contractor to maintain, update, and submit record documents;
- (i) Failure of Contractor to submit schedules or their updates as required by the Contract Documents;
- (j) Performance of the work by Contractor without properly processed shop drawings;
- (k) Liquidated damages assessed;
- (l) Any other failure of Contractor to perform its obligations under the Contract Documents.

By action of the County's Board of Supervisors, a fund has been established, money encumbered in the current budget, and assigned to the account which is the sole source of funds available for payment of the Contract Sum. Contractor understands and agrees that Contractor will be paid only from this special fund and if for any reason this fund is not sufficient to pay Contractor, Contractor will not be entitled to payment. The availability of money in this fund, and County's ability to draw from this fund, are conditions precedent to County's obligation to make payments to Contractor.

Within thirty (30) days of receipt of an approved certificate for payment, properly executed by the Contractor, Owner's Representative, County's inspector of record for the Project (if any) and County's Auditor, County agrees to pay Contractor, subject to all of the terms and conditions of these Contract Documents, an amount equal to ninety-five percent (95%) of the sum of the following (less any amounts withheld as permitted by the Contract Documents):

- (a) Cost of the work in permanent place as of the end of the preceding month as set forth and approved on the certificate for payment;
- (b) Less amounts previously paid;
- (c) Less amounts withheld by County as allowed in the Contract Documents.

There shall be a retainage from said payments in an amount equal to five percent (5%) of the amount specified in the approved certificates for payment. If at any time thereafter the

progress of the work is not satisfactory, additional amounts may be retained. Upon substantial completion of the work, any amount retained may be paid to the Contractor. When the work has been substantially completed, the County may make additional payments, retaining at all times an amount sufficient to cover the estimated cost of the work to be completed. Payments will not be made that would deplete the retainage nor place in escrow any funds that are required for retainage nor invest the retainage for the benefit of the Contractor.

In lieu of County retaining a portion of progress payments due Contractor, the Contractor may elect to deposit qualifying securities equivalent to the amount to be withheld. Upon such deposit under an escrow agreement substantially in the form specified in section 22300(e) of the Public Contracts Code, the funds shall be released.

Within forty (40) days of recordation of a Notice of Completion, County agrees to, subject to all of the terms and conditions of these Contract Documents, pay the remaining contract balance, after all offsets and subject to the withholding of amounts due from Contractor.

41) COST AND PRICING DATA: All cost and pricing data submitted by the Contractor to the County with respect to any change, prospective or completed, or any claim for extra compensation shall be a true, complete, accurate, and current representation of actual cost and pricing of the work. The Owner's Representative or his or her authorized representative may require a formal certification as to cost and pricing data submitted by the Contractor. Certification shall be in the form acceptable to County.

42) PROCEED WITH WORK: Notwithstanding the making of any Claim or the existence of any dispute regarding any Claim, Contractor shall not cause any delay, cessation, or termination in or of Contractor's performance of the work, but shall diligently proceed with performance of the work in accordance with the Contract Documents.

43) ACCESS TO RECORDS: The Owner's Representative and/or County, or their authorized representatives, shall have access, upon reasonable notice, during normal business hours, to Contractor's and subcontractors' books, documents and accounting records, including but not limited to, Bid worksheets, Bids, subcontractor Bids, estimates, cost accounting data, accounting records, payroll records, time sheets, cancelled checks, profit and loss statements, balance sheets, project correspondence including but not limited to all correspondence between Contractor and its sureties and subcontractors/vendors, project files, scheduling information, and other records of the Contractor and all subcontractors directly or indirectly pertinent to the work, original as well as change and claimed extra work, to verify and evaluate the accuracy of cost and pricing data submitted with any Change Order, prospective or completed, or any Claim for which additional compensation has been requested or notice of potential Claim has been tendered.

Such access shall include the right to examine and audit such records, and make excerpts, transcriptions, and photocopies at County's cost.

The parties agree that in the event Contractor or any subcontractor fails to comply with this section, it would be difficult for the County to determine its actual damages; therefore, Contractor agrees to pay County, as liquidated damages, the sum of two hundred dollars (\$200.00), which Contractor agrees is reasonable under the circumstances, for each and every calendar day which Contractor or a subcontractor fails or refuses to provide the County, Owner's Representative, and/or their authorized representatives, access to the materials specified in this section.

Contractor agrees to impose upon its subcontractors by appropriate subcontract provision, the obligations of this section of the General Conditions.

44) DISMISSAL OF UNSATISFACTORY EMPLOYEES: If any person employed by the Contractor, or any subcontractor, shall fail or refuse to carry out the directions of the Owner's Representative or County; or, in the opinion of the Owner's Representative or County, is incompetent, unfaithful, intemperate, or disorderly; uses threatening or abusive language to any person representing the Owner's Representative or County on the work; or is otherwise unsatisfactory, he or she shall be removed from the work immediately, and shall not again be employed on the work.

45) TERMINATION OF UNSATISFACTORY SUBCONTRACTS: When any portion of the work which has been subcontracted by the Contractor is not being prosecuted in a satisfactory manner, the subcontract for such work shall be terminated immediately by the Contractor upon written notice from the Owner's Representative or County, and the subcontractor shall not again be employed on the type of work in which his or her performance was unsatisfactory.

46) TEMPORARY SUSPENSION OF WORK: The County shall have the authority to suspend the work wholly or in part for such period as it may deem necessary, due to unsuitable weather, lack of adherence to safety regulations, or to any other conditions it considers unfavorable for the suitable prosecution of the work, or for such time as it may deem necessary, due to the failure on the part of the Contractor to carry out orders given or to perform any provisions of the Contract, or for any other reason. The Contractor shall immediately comply with such written order of the County to suspend the work wholly or in part. The suspended work shall be resumed only when conditions are favorable or methods are corrected, as ordered or approved in writing by the County.

If a suspension of the work is ordered by the County due to the failure on the part of the Contractor to carry out orders or to perform any provisions of the Contract, the days on which the suspension order is in effect shall count against the Contract time, and shall not in any way modify or invalidate any of the provisions of this Contract, and the Contractor shall not be entitled to any damages or compensation on account of such suspension or delay.

47) TERMINATION OF CONTRACTOR'S CONTROL OVER THE WORK: Whenever, in the opinion of the County, the Contractor has failed to supply an adequate force of labor, equipment, or materials of proper quality, or has failed in any other respect to prosecute the work with the diligence specified in the Contract; or if Contractor should refuse or fail to comply with laws, ordinances, or directions of the Owner's Representative; or if Contractor should fail to make prompt payments to subcontractors or for labor or materials; or otherwise be in breach of this Contract; the County may give written notice of at least five (5) calendar days to the Contractor and Contractor's sureties that if the defaults are not remedied within a time specified in such notice, the Contractor's control over the work will be terminated.

If the Contractor should be adjudged bankrupt, or make an assignment for the benefit of Contractor's creditors, or if a receiver should be appointed on account of Contractor's insolvency, the County may declare the Contractor's control over the work terminated, and so notify the Contractor and Contractor's sureties.

Upon such termination, the County may take possession, and use all or any part, of the Contractor's materials, tools, equipment, and appliances upon the premises to complete the work; the County assuming responsibility for the final relinquishment of such equipment at the conclusion of the work, or sooner, at its option, in as good condition as when it was taken over, reasonable wear and tear excepted; and the County agrees to pay for such materials and the use of said equipment at a reasonable compensation.

Upon such termination or the County's declaration that the Contractor is in default, the County may direct the surety to complete, or cause to be completed, the Contract work, or the County may direct that all or any part of the work be completed by day labor, or by employment of other contractors on informal contracts, or both. If the County directs the surety to complete or cause to be completed,

the Contract work, Contractor's performance bond surety agrees to immediately undertake to complete or cause to be completed, all Contract work.

If the Contractor's control over the work is terminated as provided above, the Contractor is not entitled to receive any portion of the amount to be paid under the Contract until it is fully completed. After completion, if the unpaid balance exceeds the sum of the amount expended by the County in finishing the work, plus all damages sustained, or to be sustained, by the County, plus any unpaid claims on account of labor, materials, tools, equipment, or supplies contracted for by the Contractor for the work herein contemplated, the excess not otherwise required by these Contract Documents to be retained shall be paid the Contractor. If the sum so expended exceeds the unpaid balance, the Contractor and Contractor's surety are liable to the County for the amount of such excess. If the surety completes the Contract work as provided above, such surety shall be subrogated to money due under the Contract, and to money which shall become due in the course of completion by the surety. However, Contractor and Surety agree that any subrogation rights of surety are subordinate to and inferior to rights of County.

The County reserves the right to terminate the work for its convenience upon written notice to Contractor. In such event, the Contractor shall be paid its reasonable costs for that portion of the work performed to the date of termination, reasonable costs associated with demobilization, plus fifteen percent (15%) of all such costs for overhead and profit.

48) FINAL INSPECTION, FIELD ACCEPTANCE, AND ACCEPTANCE: The Contractor shall notify the Owner's Representative in writing of the completion of the work, and the architect, engineer or Construction Manager/designated County Inspector of record shall inspect the work. The Contractor, or Contractor's representatives, may be present at the inspection. The Contractor will be notified in writing of any defects or deficiencies to be remedied prior to final acceptance. Within ten (10) calendar days of such notification, the Contractor shall proceed to correct such defects or deficiencies. When notified that this work has been completed, the architect or engineer will again inspect the work to satisfy itself that all work has been done in accordance with the Contract Documents, and will issue a final acceptance letter, and will recommend to the County that they formally accept the work. Final acceptance by the County shall cause the commencement of guarantee periods. Within ten (10) days of final acceptance (approval by Board of Supervisors) of all work required by these Contract Documents, a Notice of Completion will be filed with the County Recorder of San Benito County.

49) CLEANING UP: Throughout the construction period, the Contractor shall keep the site of the work in a presentable and safe condition, dispose of any surplus materials, clean out all drainage ditches and structures, and repair any fences or other property damaged during the progress of the work, to the satisfaction of the Owner's Representative and County.

Upon completion of the work, and prior to requesting final inspection, the Contractor shall thoroughly clean the site of the work of all rubbish, excess material, and equipment, and all portions of the work shall be left in a neat and orderly condition. The final inspection will not be made until this has been accomplished.

If Contractor fails or refuses to fulfill these obligations to the County's satisfaction, County may, at its option, undertake these obligations, and withhold the cost of performing these obligations, plus an additional fee of twenty-five percent (25%) for administrative costs, from payments to Contractor.

50) COMPLIANCE WITH LAWS AND REGULATIONS: The Contractor shall keep itself fully informed of, and shall observe and comply with, and shall cause any and all persons, firms, or corporations employed by Contractor or under him, to observe and comply with all State and national laws, and County and municipal ordinances, regulations, orders, and decrees which in any manner

affect those engaged or employed in the work, or the materials used in the work, or which in any way affect the conduct of the work. Particular attention is called to the following:

A. HOURS OF LABOR - Eight (8) hours of labor shall constitute a legal days' work, and the Contractor or any subcontractor under him, in the performance of the Contract, shall not require more than eight (8) hours of labor in any calendar day, and forty (40) hours of labor in any calendar week, from any person employed by Contractor in the performance of the work under this Contract, except as permitted under the provisions of Section 1815 of the Labor Code of the State of California. The Contractor shall forfeit, as penalty to the County, twenty-five dollars (\$25.00) for each worker employed by Contractor or any subcontractor under Contractor in the performance of the Contract for each calendar day during which any workman is required or permitted to labor more than eight (8) hours and for each calendar week during which any workman is required or permitted to labor more than forty (40) hours, in violation of the provisions of such Labor Code.

No work other than overtime and shift work shall be done between the hours of 7:00PM and 7:00AM, except such work as is necessary for the proper care and protection of the work already performed or except in case of an emergency; excepting that overtime and/or shift work may be established by the Contractor with reasonable notice and the written permission of the Owner's Representative.

B. PREVAILING WAGE - Pursuant to Section 1770, and following, of the California Labor Code, the Contractor shall pay not less than the prevailing rate of per diem wages as determined by the Director of the California Department of Industrial Relations. A copy of the Prevailing Wage Scale is available at the following web site: http://www.dir.ca.gov/DLSR/statistics_research.html#PWD. Failure to pay such prevailing wages shall subject the employer to the penalties set forth in Labor Code Section 1775.

C. LABOR DISCRIMINATION - Contractor shall comply with Section 1735 of the Labor Code of the State of California, which prohibits discrimination in the employment of persons upon public works because of the race, religious creed, color, national origin, ancestry, physical handicap, medical condition, marital status, or sex of such persons.

D. APPRENTICES - Attention is directed to Section 1777.5 of the Labor Code of the State of California concerning employment of apprentices, and the Contractor is required to comply with the provisions of said Section.

E. TRAVEL AND SUBSISTENCE PAYMENTS - Attention is directed to the requirements of Section 1773.1 of the Labor Code of the State of California. The Contractor shall make travel and subsistence payments to each workman needed to complete the work in accordance with the requirements in said Section 1773.1.

F. WORKERS' COMPENSATION - Pursuant to the requirements of Section 1860 of the Labor Code, the Contractor is required to secure the payment of Workers' Compensation to Contractor's employees in accordance with the provisions of Section 3700 of the Labor Code.

Prior to the commencement of work, the Contractor shall sign and file with the Owner's Representative a certification in the following form:

"I am aware of the provisions of Section 3700 of the Labor Code, which requires every employer to be insured against liability for Workers' Compensation, or to undertake self insurance in accordance with the provisions of that Code, and I will comply with such provisions before commencing the performance of the work of this Contract."

Said certification is included in the Contract, and signature and return of the Contract as provided in Paragraph 16 of these General Conditions, "Signing of Contract," shall constitute signing and filing of the said certificate.

G. USE OF PESTICIDES - The Contractor shall comply with all rules and regulations of the Department of Food and Agriculture, the Department of Health, the Department of Industrial Relations, the County Integrated Pest Management (IPM) program, and all other agencies which govern the use of pesticides required in the performance of the work on the Contract.

Pesticides shall include, but shall not be limited to, herbicides, insecticides, fungicides, rodenticides, germicides, nematocides, bactericides, inhibitors, fumigants, defoliant, desiccants, soil sterilants, and repellents.

Any substance or mixture of substances intended for preventing, repelling, mitigating, or destroying weeds, insects, diseases, rodents, or nematodes, and any substance or mixture of substances intended for use as a plant regulator, defoliant, or desiccant shall be considered a pesticide.

H. PAYROLL RECORDS - Attention is directed to Section 1776 of the California Labor Code, a portion of which is quoted below. Regulations implementing said Section 1776 are located in Section 16000, and Sections 16401 through 16403 of Title 8, California Code of Regulations. The Contractor shall be responsible for compliance by Contractor's subcontractors.

(1) Each contractor and subcontractor shall keep accurate payroll records showing the name, address, Social Security number, work classification, straight time and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker or other employee employed by him or her in connection with the public work. Each payroll record shall contain or be verified by a written declaration that it is made under penalty of perjury, stating both the following:

(a) The information contained in the payroll record is true and correct.

(b) The employer has complied with the requirements of Sections 1771, 1811, and 1815 for any work performed by his or her employees on the public works project.

(2) The payroll records enumerated under subdivision (a) [of Labor Code Section 1776 (paragraph 50.H(1) above)] shall be certified and shall be available for inspection at all reasonable hours at the principal office of the Contractor on the following basis:

(a) A certified copy of an employee's payroll record shall be made available for inspection or furnished to the employee or his or her authorized representative on request.

(b) A certified copy of all payroll records enumerated in subdivision (a) [of Labor Code Section 1776 (paragraph 50.H(1) above)] shall be made available for inspection or furnished upon request to a representative of the body awarding the contract and the Division of Labor Standards Enforcement of the Department of Industrial Relations.

(c) A certified copy of all payroll records enumerated in subdivision (a) [of Labor Code Section 1776 (paragraph 50.H(1) above)] shall be made available upon request by the public for inspection of for copies thereof. However, a

request by the public shall be made through either the body awarding the contract or the Division of Labor Standards Enforcement. If the requested payroll records have not been provided pursuant to paragraph (b)(2) [of Labor Code Section 1776 (paragraph 50.H(2)(b) above)], the requesting party shall, prior to being provided the records, reimburse the costs of preparation by the contractor, subcontractors, and the entity through which the request was made. The public may not be given access to the records at the principal office of the contractor.

(3) Unless required to be furnished directly to the Labor Commissioner in accordance with paragraph (3) of subdivision (a) of Section 1771.4 [of the Labor Code], the certified payroll records shall be on forms provided by the Division of Labor Standards Enforcement or shall contain the same information as the forms provided by the division. The payroll records may consist of printouts or payroll data that are maintained as computer records, if the printouts contain the same information as the forms provided by the division and the printouts are verified in the manner specified in subdivision (a) [of Section 1771.4].

(4) A contractor or subcontractor shall file a certified copy of the records enumerated in subdivision (a) [of Labor Code Section 1776 (paragraph 50.H(1) above)] with the entity that requested the records within ten (10) days after receipt of a written request.

(5) Except as provided in subdivision (f) [of Labor Code Section 1776], any copy of records made available for inspection as copies and furnished upon request to the public or any public agency by the awarding body or the Division of Labor Standards Enforcement shall be marked or obliterated to prevent disclosure of an individual's name, address, and Social Security number. The name and address of the contractor awarded the contract or the subcontractor performing the contract shall not be marked or obliterated. Any copy of records made available for inspection by, or furnished to, a multiemployer Taft-Hartley trust fund (29 U.S.C. Sec. 186(c)(5)) that requests the records for the purpose of allocating contributions to participants shall be marked or obliterated only to prevent disclosure of an individual's full Social Security number, but shall provide the last four (4) digits of the Social Security number. Any copy of records made available for inspection by, or furnished to, a joint labor-management committee established pursuant to the federal Labor Management Cooperation Act of 1978 (29 U.S.C. Sec. 175a) shall be marked or obliterated only to prevent disclosure of an individual's Social Security number.

...

(6) The contractor shall inform the body awarding the contract of the location of the records enumerated under subdivision (a) [of Labor Code Section 1776 (paragraph 50.H(1) above)], including the street address, city, and county, and shall, within five (5) working days provide a notice of a change of location and address.

(7) The contractor or subcontractor has ten (10) days in which to comply subsequent to receipt of a written notice requesting the records enumerated in subdivision (a) [of Labor Code Section 1776 (paragraph 50.H(1) above)]. In the event that the contractor or subcontractor fails to comply within the 10-day period, he or she shall, as a penalty to the state or political subdivision on whose behalf the contract is made or awarded, forfeit one hundred dollars (\$100.00) for each calendar day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Division of Labor Standards Enforcement, these penalties shall be withheld from

progress payments then due. A contractor is not subject to a penalty assessment pursuant to this section due to the failure of a subcontractor to comply with this section.

...

The penalties specified in subdivision (h) of Labor Code Section 1776 for noncompliance with the provisions of said Section 1776 may be deducted from any moneys due or which may become due to the Contractor.

I. REPORTING REQUIREMENTS AND SANCTIONS - Failure to deliver to County specific information, records, reports, certifications, or any other documents required for compliance with these Contract Documents shall be considered noncompliance.

Contractors found by the County to be in noncompliance are to be advised of the specific deficiencies and urged to make immediate corrections. They should also be advised that monetary deductions may be made for failure to effect corrections or delinquencies.

If the Contractor fails to correct a deficiency within fifteen (15) days after notification, a deduction may be made. In such cases, the deduction shall be ten percent (10%) of the estimated value of the work done during the month, except that the deduction will not exceed ten thousand dollars (\$10,000.00), nor be less than one thousand dollars (\$1,000.00), and shall be deducted from the next progress payment.

Deductions for noncompliance will be in addition to all other deductions provided for in this Contract, and will apply irrespective of the number of instances of noncompliance. Deductions may be made separately and additively for each estimate period in which a new deficiency appears. When all deficiencies for a period have been corrected, the deduction covering that period will be released on the next progress payment. Otherwise, the deduction will be retained.

51) RESPONSIBILITY OF THE CONTRACTOR: The Contractor shall do all of the work and furnish all labor, materials, tools, equipment, and appliances, except as otherwise herein expressly stipulated, necessary, or proper for performing and completing the work herein required, including any Change Order work, disputed work or extra work directed by the County or Owner's Representative, within the time specified.

If the Contractor discovers any discrepancies during the course of the work between the Contract Documents and conditions in the field, or any errors or omissions in the Contract Documents and conditions in the field, or any errors or omissions in the Contract drawings, specifications, or layout given by stakes, points, or instructions, it shall be the Contractor's duty to inform the Owner's Representative immediately, and the Owner's Representative shall promptly verify the same. Any work done after such discovery until authorized in writing by the Owner's Representative will be done at the Contractor's risk.

In no case shall the use of subcontractors in any way alter the position of the Contractor or Contractor's sureties with relation to this Contract. When a subcontractor is used, the responsibility for every portion of the work shall still remain with the Contractor.

The Contractor shall pay, when due, all valid claims of subcontractors, suppliers, and workmen with respect to the project.

The mention herein of any specific duty or responsibility imposed upon the Contractor shall not be construed as a limitation or restriction of any other responsibility or duty imposed upon the

Contractor by the Contract, said reference being made herein merely for the purpose of explaining the specific duty or responsibility.

52) INDEMNIFICATION:

A. CONTRACTOR'S PERFORMANCE: Contractor shall defend, indemnify, and save harmless County and Owner's Representative (including their inspectors, construction managers, project managers, trustees, officers, agents, members, employees, affiliates, consultants, subconsultants, and representatives), and each of them, of and from any and all claims, demands, suits, causes of action, damages, costs, expenses, attorneys' fees, losses, or liability, in law or in equity, of every kind and nature whatsoever arising out of, or in connection with, Contractor's operations to be performed under this Contract, including, but not limited to:

(1) Personal injury (including, but not limited to, bodily injury, emotional injury or distress, sickness, or disease) or death to persons, including, but not limited to, any employees or agents of Contractor, County, Owner's Representative, Construction Manager, or any subcontractor, or damage to property of anyone including the work itself (including loss of use thereof), caused or alleged to be caused in whole or in part by any negligent act or omission of Contractor, County, or Owner's Representative, or anyone directly or indirectly employed by them, or anyone for whose acts they may be liable;

(2) Penalties threatened, sought, or imposed on account of the violation of any law, order, citation, rule, regulation, standard, ordinance, or statute, caused by the action or inaction of Contractor;

(3) Alleged infringement of any patent rights which may be brought arising out of Contractor's work;

(4) Claims and liens for labor performed or materials used or furnished to be used on the job, including all incidental or consequential damages from such claims or liens;

(5) Contractor's failure to fulfill any of the covenants set forth in these Contract Documents;

(6) Failure of Contractor to comply with the provisions of the Contract Documents relating to insurance; and,

(7) Any violation or infraction by Contractor of any law, order, citation, rule, regulation, standard, ordinance, or statute in any way relating to the occupational, health, or safety of employees.

The indemnities set forth in this section shall not be limited by the insurance requirements set forth in these Contract Documents.

Contractor's indemnification of County will not include indemnification for claims which arise as the result of the active negligence of County, or the sole negligence or willful misconduct of County, its agents, employees or independent contractors who are directly responsible to County, or for defects in design furnished by such persons.

53) PERMITS AND LICENSES: The Contractor shall procure all permits and licenses necessary for the normal conduct of its business and construction operations, and all costs associated therewith shall be paid by Contractor.

The Environmental Quality Act of 1970 may be applicable to permits, licenses, and other authorizations which the Contractor must obtain from local agencies in connection with performing the work of the Contract. The Contractor shall comply with the provisions of said statutes in obtaining such permits, licenses, and other authorizations, and they shall be obtained in sufficient time to prevent delays to the work.

In the event that the County has obtained permits, licenses, or other authorizations applicable to the work in conformance with the requirements in said Environmental Quality Act of 1970, the Contractor shall comply with the provisions of said permits, licenses, and other authorizations.

54) PROTECTION OF COUNTY AGAINST PATENT CLAIMS: The Contractor shall assume all costs arising from the use of patented materials, equipment, devices, or processes used on or incorporated in the work.

55) PROTECTION OF WORKERS: The Contractor shall conform to the rules and regulations pertaining to safety established by the California Division of Industrial Safety and any other governing body having jurisdiction over the work. The Contractor shall immediately replace or repair any unsafe ladder, scaffolding, shoring, or bracing, or correct any other dangerous or hazardous situation that may exist or that the Owner's Representative may indicate. Failure of the Owner's Representative to suspend the work or notify the Contractor of the inadequacy of the safety precautions or noncompliance with the law shall not relieve the Contractor of this responsibility.

The Contractor is warned that when the work involves existing sewers and appurtenances that have been exposed to sewage and industrial wastes, these facilities shall be considered contaminated with disease-causing organisms. Personnel in contact with contaminated facilities, debris, waste water, or similar items shall be advised by the Contractor of the necessary precautions that must be taken to avoid becoming diseased. It is the Contractor's responsibility to urge his/her personnel to observe a strict regimen of proper hygienic precautions, including any inoculations recommended by the local public health officer.

Because of the potential danger of solvents, gasoline, and other hazardous material in the existing sewers and storm drain pipes, these areas shall be considered hazardous. The Contractor shall be aware of these dangers and shall comply with Article 108, "Confined Spaces," of the General Industrial Safety Orders contained in Title 8 of the California Code of Regulations.

In the event that this Contract requires the excavation of any trench or trenches in excess of five (5) feet in depth, Contractor shall prepare a detailed design plan showing the design of shoring, bracing, sloping, or other provisions to be made for worker protection from the hazard of caving ground during the excavation of such trenches. Said detailed design plan and subsequent excavating operations shall fully comply with all local, state and federal regulations including, but not limited to, the Construction Safety Orders, Section 1539, Permits and Section 1540 et seq., Excavation.

A. Safety Program. When requested by County, Contractor shall submit a proposed safety program which outlines the precautions to be taken by contractor to insure the safety of County employees and the public.

B. Material Safety Data Sheets.

(1) Contractor shall provide the County with copies of current Material Safety Data Sheets (MSDS) on all products subject to the requirements of Title 8, California Code of Regulations Section 5144. The MSDS submittals will be required prior to the issue of a Notice to Proceed.

(2) Contractor shall conduct operations in such a way as to comply with manufacturers' recommendations contained in Material Safety Data Sheets.

56) PROTECTION OF MATERIALS AND EQUIPMENT: The Contractor shall protect the work, materials, and equipment from damage due to the nature of the work, the action of the elements, trespassers, or other causes. The Contractor shall properly store materials and equipment, and erect such temporary structures as are required to protect them from damage, including, but not limited to, construction fencing.

57) SANITARY PROVISIONS: The necessary sanitary conveniences for the use of the workers on the project, properly obscured from public observance, shall be constructed and maintained by the Contractor.

58) EXISTING UTILITIES: It is recognized by the Contractor that the location of existing utility facilities as shown on Contract drawings and specifications are approximate; their exact location is unknown.

Recognition is given to the fact that there may be additional utilities existing on the property unknown to either party to the Contract. Location of utilities as shown on drawings and specifications represent the best information obtainable from utility maps and other information furnished by the various agencies involved. The County warrants neither the accuracy nor the extent of actual installations as shown on the drawings and specifications.

Because of this uncertainty, it may become necessary for the Owner's Representative to make adjustments in the line or grade of sewers or storm drains. Installation of such adjusted lines shall be made at the regular unit price bid for the work, and no additional compensation will be paid therefor, unless the scope and character of the work has been changed.

The Contractor agrees and is required to coordinate and fully cooperate with the County and utility owners for the location, relocation, and protection of services and utilities. The Contractor's attention is directed to the existence of services and utilities, underground and overhead, necessary for normal house and commercial service for all buildings along the line of work. The Contractor shall make arrangements with utility owners and Underground Service Alert (USA) for the location of all service or utility lines in advance of the actual construction and for the relocation of such facilities, if necessary, by the utility owner or the Contractor.

In accordance with Section 4215 of the Government Code of the State of California, the County shall make provisions to compensate the Contractor for the costs of locating, repairing damage not due to the failure of the Contractor to exercise reasonable care, and removing or relocating such main and trunk line utility facilities not indicated in the plans and specifications with reasonable accuracy, and for equipment on the project necessarily idled during such work. Compensation will be in accordance with Paragraph 39, Changes, and subject to all of the requirements of Paragraph 37, Claims, of the General Conditions. In the event the Contractor discovers utilities not identified in the Contract Documents, the Contractor shall immediately notify the Owner's Representative and the utility owner by the most expeditious means available and later confirm in writing.

It is understood and agreed that the failure of the Contractor or its subcontractor to comply fully with these provisions constitutes failure of the Contractor to exercise reasonable care and precludes Contractor's recovery from County for any related costs or damages.

59) COOPERATION WITH OTHERS: The County or adjacent property owner may perform other work adjacent to or within the project area, concurrent with the Contractor's operations. The Contractor shall cooperate fully with County in all operations which coincide with other work being performed, and provide County with such scheduling and other information as may be required by

County to perform such other work. The Contractor shall conduct operations to minimize interference with the work of other forces or contractors performing such work. This work performed by a second contractor may include work which is incomplete or in dispute with the Contractor.

Any disputes or conflicts which may arise between the Contractor and any other forces or contractors retained by the County, causing delays or hindrance to each other, shall be referred to the Owner's Representative for resolution.

If the work of the Contractor is delayed because of any acts or omissions of any other forces or contractor, the Contractor shall on that account have no claim against the County other than for an extension of time.

60) AIR POLLUTION CONTROL: The Contractor shall comply with all air pollution control rules, regulations, ordinances, and statutes which apply to any work performed pursuant to the Contract, including any air pollution control rules, regulations, ordinances, and statutes specified in Section 11017 of the Government Code.

Unless otherwise provided in the Contract Documents, material to be disposed of shall not be burned.

61) WATER POLLUTION: The Contractor shall comply with all rules, regulations, ordinances, and statutes which apply to water pollution, including but not limited to, erosion control and Section 7-1.G of the State specifications.

62) SOUND CONTROL REQUIREMENTS: The Contractor shall comply with all sound control and noise level rules, regulations, and ordinances which apply to any work performed pursuant to the Contract.

Each internal combustion engine, used for any purpose on the job or related to the job, shall be equipped with a muffler of a type recommended by the manufacturer. No internal combustion engine shall be operated on the project without said muffler.

63) UNFAVORABLE WEATHER AND OTHER CONDITIONS: During unfavorable weather and other conditions, the Contractor shall pursue only such portions of the work as will not be damaged thereby. No portions of the work the satisfactory quality or efficiency of which will be affected by any unfavorable conditions shall be constructed while these conditions remain, unless, by special means or precautions acceptable to the Owner's Representative, the Contractor shall be able to overcome these conditions.

64) WEEKEND, HOLIDAY, AND NIGHT WORK: No work shall be done between the hours of 7:00PM and 7:00AM, or on Sundays or legal holidays, except with written permission of the County and Owner's Representative. Requests to work between 7:00PM and 7:00AM, or on Sundays or legal holidays, must be submitted in writing at least two (2) working days in advance of the intended work. In case of an emergency, the Contractor will be allowed to work at night or on Sundays or legal holidays, but must notify the Owner's Representative immediately. An emergency shall be considered an unforeseen event that poses a danger to the public or to the uncompleted work.

It is understood, however, that two (2) or three (3) shift operations may be established as a regular procedure by the Contractor if Contractor first obtains written permission from the County and Owner's Representative. Such permission may be revoked by the County or Owner's Representative at any time, without cause, or if the Contractor fails to maintain adequate force and equipment for reasonable prosecution and to justify inspection of the work, or fails to provide sufficient artificial light to permit the work to be carried on properly and safely and to permit proper inspection.

The Contractor shall give the County and Owner's Representative two (2) working days prior written notice of any work to be done on a Saturday, with the location and type of work to be done specified; and any work done without such notice and without the supervision of an inspector may be ordered removed and replaced at the Contractor's expense.

65) OVERLOADING: The Contractor shall determine safe loading capacities and shall not overload any structure beyond its safe capacity during construction. In addition to assuming full responsibility for bodily injury resulting from any such overloading, the Contractor shall repair to the Owner's Representative's satisfaction or reimburse the County for the costs of repairing damage resulting therefrom.

66) SUBCONTRACTING AND ASSIGNMENT: The performance of the Contract may not be assigned except upon written consent of the County, and no assignment shall be permitted which would relieve the original Contractor or Contractor's surety of their responsibilities under the Contract.

67) NON-RECOGNITION OF SUBCONTRACTORS: No subcontractor will be recognized as such, and all persons engaged in the work under this Contract will be considered as employees of the Contractor, and their work shall be subject to all the provisions of the Contract. The County and its representatives will deal only with the Contractor, who shall be responsible for the proper performance of the entire work. Except as otherwise provided in the Contract Documents, or when direct communications have been specifically authorized, the County and Contractor shall communicate through Owner's Representative. Communications by Contractor with the County's consultants and architect or engineer's consultants shall be through the Owner's Representative. Communications by the Owner's Representative with subcontractors shall be through the Contractor.

68) LANDS AND RIGHTS OF WAY: The County shall provide the lands, rights of way, and easements upon which the work under this Contract is to be done, and such other lands as may be designated on the Contract drawings for the use of the Contractor, and the Contractor shall confine Contractor's operations to within these limits.

The Contractor shall provide, at Contractor's own expense, any additional land and access thereto that may be required for temporary construction facilities or storage of materials.

69) LIABILITY OF COUNTY OFFICIALS: Neither the Owner's Representative, nor officers, employees, agents, or representatives of the County, nor any of them, shall be responsible for any liability arising under this Contract, except such obligations as are specifically set forth herein.

70) CONTRACTOR NOT AN AGENT OF THE COUNTY: The right of general supervision shall not make the Contractor an agent of the County, and the liability of the Contractor for all damages to persons or to public or private property arising from the performance of the work shall not be lessened because of such general supervision.

71) THIRD-PARTY CLAIMS: The Contractor shall be responsible for all third-party claims, and for costs or injuries incurred by a third party which result from the operations of the Contractor, or its performance under the Contract.

72) GUARANTEE: Should any failure of the work occur within a period of one year after recordation of the notice of completion of the project or portions thereof or within any designated warranty period, which can be attributed to faulty materials, poor workmanship, or defective equipment, the Contractor shall promptly make the needed repairs at Contractor's expense.

The County is hereby authorized to make such repairs if the Contractor fails to make or undertake with due diligence the aforesaid repairs within ten (10) days after Contractor is given written notice of such failure and without notice to the surety provided, however, that in case of emergency

where, in the opinion of the County, delay would cause serious loss or damages, or a serious hazard to the public, the repairs may be made or lights, signs, and barricades erected, without prior notice to the Contractor or surety, and the Contractor shall pay the entire costs thereof.

73) ASSIGNMENT OF ANTITRUST ACTIONS: Pursuant to Section 4552 of the Government Code of the State of California, the following provisions shall be a part of this Contract:

In entering into a public works contract or a subcontract to supply goods, services, or materials pursuant to a public works contract, the contractor or subcontractor offers and agrees to assign to the County all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Sec. 15), or under the Cartwright Act (Chapter 2, commencing with Section 16700) of Part 2 of Division 7 of the California Business and Professions Code), arising from purchases of goods, services, or materials pursuant to the public works contract or the subcontract. This assignment shall be made and become effective at the time the County tenders final payment to the contractor without further acknowledgment by the parties.

74) LEGAL ADDRESS OF THE CONTRACTOR: Both the address given in the Bid and the Contractor's office in the vicinity of the work are hereby designated as places to either of which drawings, letters, notices, or other articles or communications to the Contractor may be mailed, transmitted electronically or delivered. The mailing, electronic transmission, or delivery to either of these places shall be deemed sufficient notice thereof upon the Contractor. Nothing herein contained shall be deemed to preclude the service of any drawing, letter, notice, article, or communication to, or upon, the Contractor or Contractor's representative personally. The address named in the Bid may be changed at any time by written notice from the Contractor to the Owner's Representative.

75) SURVEYS: When set forth in the Contract Documents that the Contractor is to provide all staking and engineering services, the Contractor shall be responsible to do all necessary staking and engineering services to layout and control the work to the elevations, lines, and dimensions shown on the plans. Any deviations must receive prior written acceptance of the Owner's Representative. All staking and engineering services affecting the line or elevation of underground drainage, sewers, or utilities, and all other work within public rights of way or easements shall be performed by or under the direction and supervision of a Registered Civil Engineer or Licensed Land Surveyor, licensed by the state of California.

The Contractor shall keep the Owner's Representative informed, at least two (2) working days in advance, of the times and places at which Contractor will need lines, elevations, and reference points. Unless authorized by the Owner's Representative, any work done without line and grade will be done at the Contractor's risk. The Contractor shall be responsible for the accuracy of Contractor's own layout work, and shall be liable for the preservation of all established lines and grades. Stakes damaged or destroyed by the operations of the Contractor will be replaced at Contractor's expense.

76) MATERIALS OR EQUIPMENT SPECIFIED BY NAME: When any materials or equipment is indicated or specified by patent or proprietary name or by the name and catalogue number of the manufacturer, it shall be considered as used for convenience in describing the material or equipment desired. The use of an alternative material or equipment which is of equal quality and of the required characteristics for the purpose intended may be permitted. Request for such substitution shall be made in writing by the Contractor within thirty (30) days of the Notice to Proceed. Failure by the Contractor to request substitution within thirty (30) days of the Notice to Proceed constitutes an agreement by Contractor to furnish only the materials or equipment listed in the Contract Documents. Until and unless such substitutions are accepted by the Owner's Representative, no deviations from the specifications shall be allowed. The burden of proof as to the quality and suitability of the alternative shall be upon the Contractor. The County shall be the sole judge as to the quality and suitability of alternative materials or equipment, and its decision shall be final.

77) PROPERTY RIGHTS IN MATERIAL: Nothing in this Contract shall be construed as vesting in the Contractor any right of property in the materials used, after they have been installed, attached, or affixed to the work, but all such materials shall be the property of the Contractor and the County jointly as their interest may appear, and cannot be removed from the work without the consent of the County.

78) CONTRACTOR'S EQUIPMENT: The Contractor shall provide adequate and suitable equipment and means of construction to meet all the requirements of the work, including completion within the time allotted. Only equipment suitable to produce the quality of work required will be permitted to operate on the project, and specific types of equipment may be requested on component parts of the work.

In any case where the use of a particular type or piece of equipment has been banned, or in cases where the Owner's Representative has condemned for use on the work, any piece or pieces of equipment, the Contractor shall promptly remove such equipment from the site of the work. Failure to do so within a reasonable time may be considered a breach of contract.

79) MISCELLANEOUS PROVISIONS: This Contract shall bind and inure to the heirs, devisees, assignees, and successors in interest of Contractor, and to the successors in interest of County, in the same manner as if such parties had been expressly named herein.

If any claim or dispute arises between the parties, the claim or dispute shall first be submitted to mediation utilizing the services of a neutral mediator. If the parties cannot agree upon the selection of a neutral mediator, the matter shall be submitted to Judicial Arbitration and Mediation Services for the selection of a neutral mediator. The parties shall share equally the costs associated with the mediation.

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

If any one or more of the provisions contained in the Contract should be invalid, illegal, or unenforceable in any respect, the validity, legality, and enforceability of the remaining provisions contained herein shall not in any way be affected or impaired thereby.

This Contract constitutes the full and complete understanding of the parties, and supersedes any previous agreements or understandings, oral or written, with respect to the subject matter hereof. The Contract may only be modified by a written instrument signed by both parties.

Contractor hereby assigns to County all its first-tier subcontracts now or hereafter entered into by Contractor for performance of any part of the work. The assignment will be effective upon acceptance by County in writing, and only as to those subcontracts which County designates in writing. Such assignment is part of the consideration to County for entering into the Contract with Contractor, and may not be withdrawn.

80) PUBLIC CONTRACT CODE SECTION 20104, ET SEQ.:

Public Contract Code section 20104, et seq., requires that the following language be set forth in the specifications:

§ 20104 Application of article; provisions included in plans and specifications

(a) (1) This article applies to all public works claims of three hundred seventy-five thousand dollars (\$375,000) or less which arise between a contractor and a local agency.

(2) This article shall not apply to any claims resulting from a contract between a contractor and a public agency when the public agency has elected to resolve any disputes pursuant to Article 7.1 (commencing with Section 10240) of Chapter 1 of Part 2 [of the Public Contract Code].

(b) (1) "Public work" means "public works contract" as defined in Section 1101 [of the Public Contract Code], but does not include any work or improvement contracted for by the state or the Regents of the University of California.

(2) "Claim" means a separate demand by the contractor for (A) a time extension, (B) payment of money or damages arising from work done by, or on behalf of, the contractor pursuant to the contract for a public work and payment of which is not otherwise expressly provided for or the claimant is not otherwise entitled to, or (C) an amount the payment of which is disputed by the local agency.

(c) The provisions of this article or a summary thereof shall be set forth in the plans or specification for any work which may give rise to a claim under this article.

(d) This article applies only to contracts entered into on or after January 1, 1991.

§ 20104.2. Claims; requirements; tort claims excluded

For any claim subject to this article, the following requirements apply:

(a) The claim shall be in writing and include the documents necessary to substantiate the claim. Claims must be filed on or before the date of final payment. Nothing in this subdivision is intended to extend the time limit or supersede notice requirements otherwise provided by contract for the filing of claims.

(b) (1) For claims of less than fifty thousand dollars (\$50,000), the local agency shall respond in writing to any written claim within 45 days of receipt of the claim, or may request, in writing, within 30 days of receipt of the claim, any additional documentation supporting the claim or relating to defenses to the claim the local agency may have against the claimant.

(2) If additional information is thereafter required, it shall be requested and provided pursuant to this subdivision, upon mutual agreement of the local agency and the claimant.

(3) The local agency's written response to the claim, as further documented, shall be submitted to the claimant within 15 days after receipt of the further documentation or within a period of time no greater than that taken by the claimant in producing the additional information, whichever is greater.

(c) (1) For claims of over fifty thousand dollars (\$50,000) and less than or equal to three hundred seventy-five thousand dollars (\$375,000), the local agency shall respond in writing to all written claims within 60 days of receipt of the claim, or may request, in writing, within 30 days of receipt of the claim, any additional documentation supporting the claim or relating to defenses to the claim the local agency may have against the claimant.

(2) If additional information is thereafter required, it shall be requested and provided pursuant to this subdivision, upon mutual agreement of the local agency and the claimant.

(3) The local agency's written response to the claim, as further documented, shall be submitted to the claimant within 30 days after receipt of the further documentation, or within a period of time no greater than that taken by the claimant in producing the additional information or requested documentation, whichever is greater.

(d) If the claimant disputes the local agency's written response, or the local agency fails to respond within the time prescribed, the claimant may so notify the local agency, in writing, either within 15 days of receipt of the local agency's response or within 15 days of the local agency's failure to respond within the time prescribed, respectively, and demand an informal conference to meet and confer for settlement of the issues in dispute. Upon a demand, the local agency shall schedule a meet and confer conference within 30 days for settlement of the dispute.

(e) Following the meet and confer conference, if the claim or any portion remains in dispute, the claimant may file a claim as provided in Chapter 1 (commencing with Section 900) and Chapter 2 (commencing with Section 910) of Part 3 of Division 3.6 of Title 1 of the Government Code. For purposes of those provisions, the running of the period of time within which a claim must be filed shall be tolled from the time the claimant submits his or her written claim pursuant to subdivision (a) until the time that claim is denied as a result of the meet and confer process, including any period of time utilized by the meet and confer process.

(f) This article does not apply to tort claims and nothing in this article is intended nor shall be construed to change the time periods for filing tort claims or actions specified by Chapter 1 (commencing with Section 900) and Chapter 2 (commencing with Section 910) of Part 3 of Division 3.6 of Title 1 of the Government Code.

§ 20104.4. Civil action procedures; mediation and arbitration; trial de novo; witnesses

The following procedures are established for all civil actions filed to resolve claims subject to this article:

(a) Within 60 days, but no earlier than 30 days, following the filing of responsive pleadings, the court shall submit the matter to nonbinding mediation unless waived by mutual stipulation of both parties. The mediation process shall provide for the selection within 15 days by both parties of a disinterested third person as mediator, shall be commenced within 30 days of the submittal, and shall be concluded within 15 days from the commencement of the mediation unless a time requirement is extended upon a good cause showing to the court or by stipulation of both parties. If the parties fail to select a mediator within the 15-day period, any party may petition the court to appoint the mediator.

(b) (1) If the matter remains in dispute, the case shall be submitted to judicial arbitration pursuant to Chapter 2.5 (commencing with Section 1141.10) of Title 3 of Part 3 of the Code of Civil Procedure, notwithstanding Section 1141.11 of that code. The Civil Discovery Act (Title 4 (commencing with Section 2016.010) of Part 4 of the Code of Civil Procedure) shall apply to any proceeding brought under this subdivision consistent with the rules pertaining to judicial arbitration.

(2) Notwithstanding any other provision of law, upon stipulation of the parties, arbitrators appointed for purposes of this article shall be experienced in construction law, and, upon stipulation of the parties, mediators and arbitrators shall be paid necessary and reasonable hourly rates of pay not to exceed their customary rate, and such fees and expenses shall be paid equally by the parties, except in the case of arbitration where the arbitrator, for good cause, determines a different division. In no event shall these fees or expenses be paid by state or county funds.

(3) In addition to Chapter 2.5 (commencing with Section 1141.10) of Title 3 of Part 3 of the Code of Civil Procedure, any party who after receiving an arbitration award requests a trial de novo but does not obtain a more favorable judgment shall, in addition to payment of costs and fees under that chapter, pay the attorney's fees of the other party arising out of the trial de novo.

(4) The court may, upon request by any party, order any witnesses to participate in the mediation or arbitration process.

§ 20104.6. Payment on undisputed portion of claim; interest on arbitration awards or judgments

(a) No local agency shall fail to pay money as to any portion of a claim which is undisputed except as otherwise provided in the contract.

(b) In any suit filed under Section 20104.4 [of the Public Contract Code], the local agency shall pay interest at the legal rate on any arbitration award or judgment. The interest shall begin to accrue on the date the suit is filed in a court of law.

SUPPLEMENTAL CONDITIONS

1) TIME OF COMPLETION. The Contractor shall complete all or any designated portions of the work called for under the contract in all parts and requirements within 150 calendar days (except as modified in the technical specifications). The contractor shall submit a time line for construction within ten (10) working days upon award of the contract. Contract time shall begin five (5) days after the date of dispatch of the Notice to Proceed.

It is the intent of the County to minimize disruptions to ongoing County operations during construction projects. A total of 150 calendar days have been allowed for this project.

The bidding and construction schedule for this project is as follows:

December 11, 2018 – January 10, 2019	Bidding Period
January 10, 2019 @ 2:00pm	Bid Opening
January 22, 2019	Construction Award (Anticipated)
January 25, 2019 – March 15, 2019	Construction Notice to Proceed (CDs)(Anticipated) HY (MEP) & Modular company develop 100% CDs
March 18, 2019 – July 22, 2019	Permit Period (Anticipated)
July 23, 2019 – June 26, 2020	Construction period (Anticipated)

For the purpose of computing liquidated damages all days in excess of the allowed number of construction days, that the contract is in the construction phase, shall be considered in excess of the allowed number of calendar days for the overall project.

2) LIQUIDATED DAMAGES. Time is of the essence in this contract. It is agreed by the parties to the contract that in case all the work called for under the contract in all parts and requirements is not finished or completed within the number of calendar days as set forth in the Special Conditions, damage will be sustained by the County, and that it is and will be impracticable and extremely difficult to ascertain and determine the actual damage which the County will sustain in the event of and by reason of such delay; and it is therefore agreed that the Contractor will pay to the County the sum set forth below per day for each and every calendar day's delay in finishing the work in excess of the number of calendar days prescribed; and the Contractor agrees to pay said liquidated damages herein provided for, and further agrees that the County may deduct the amount thereof from any moneys due or that may become due the Contractor under the contract.

If adverse weather conditions are the basis for a Claim for additional time, such claim shall be documented by data substantiating that weather conditions were abnormal for the period of time and could not have been reasonably anticipated and that weather conditions had an adverse effect on the critical path schedule.

Claims due to adverse weather, when approved, shall be excusable but not compensable.

It is further agreed that in the event the Contractor fails to complete work and all requirements under this Agreement within the number of calendar days specified, the County shall have the right (but not the obligation) to increase the number of calendar days, as the County may in its sole discretion deem best to serve its interests.

The Contractor will be granted an extension of time and will not be assessed with liquidated damages for any portion of the delay in completion of the work beyond the time named in the Special Conditions for the completion of the work caused by acts of God or of the public enemy, fire, storms, floods, tidal waves, earthquakes, shortage of materials and freight embargoes, provided that the Contractor shall

notify the Engineer in writing of the causes of delay within fifteen (15) days from the beginning of any such delay. The Engineer shall ascertain the facts and the extent of the delay, and his findings thereon shall be final and conclusive.

The Contractor shall pay to the County of San Benito a sum of five hundred dollars (\$500) per day for each and every calendar day's delay in finishing the work in excess of the number of calendar days prescribed in the Time of Completion. Completion of the project includes correction of any punch list items identified by the Project Design Team.

3) FACILITIES WITH ASBESTOS CONTAINING MATERIALS The County of San Benito has conducted limited surveys of its facilities to determine the presence of Asbestos Containing Materials (ACM).

The contractor shall be responsible for ensuring that any subcontractors, workmen, or others associated with the work on this project have been notified of the presence of asbestos containing materials at the construction site if known, and have been properly instructed to approach all work with caution. If during the course of construction, materials are discovered that are suspected to contain ACM, the contractor shall stop work and notify the County project manager immediately. Within one (1) week of the project manager's notification to the Occupational Safety and Health Division (OSH) of the County, material will be sampled and the results posted at the construction site. Construction shall not resume until approval to proceed has been obtained from OSH. The time accrued during the period when the contractor first notifies the County of a bona fide suspicion that a project area contains ACM until the time when construction is allowed to proceed, shall not count towards the required time of completion as indicated in Section 1 of the Supplemental Conditions, provided the contractor is unable to perform work as specified during the delay and all other provisions of the specifications.

The contractor shall be responsible for informing all subcontractors, workmen or other persons associated with the project of the contents of this notification letter and any special safety precautions to be taken. If no notification letter is attached, then either the building area has not been surveyed or no ACM have been detected in areas sampled. The contractor shall bring any questions or concerns regarding ACM to the immediate attention of the County project manager.

Asbestos notification letters are included in these Invitation for Bid documents for any ACM previously discovered in the area of construction. The asbestos notification letter identifies areas that have been surveyed for asbestos. However, it should be noted that the surveys conducted are not comprehensive wall-to-wall surveys. Any materials not surveyed and noted within the letters may be suspect to contain asbestos.

Under no circumstances shall a contractor remove asbestos on County facilities, unless that contractor is properly licensed and has been specifically hired by the County for the sole purpose of asbestos abatement as directed by the County's Occupational Safety & Health Division.

4) SAFETY REQUIREMENTS ON ALL COUNTY PROJECTS All General or Prime Contractors will be responsible for their Employees, and subcontractors. It will be up to them to enforce all safety regulations set forth by the County and Cal-OSHA. This will include all safety ware and equipment necessary to provide a safe work environment for all workers and the public in and around the job site.

1. The use of safety ware and equipment, such as eye protection, ear protection, and other required safety equipment would be strictly enforced.
2. Work areas will be marked off and safe paths provided for county employees and the general public.
3. Noise and dust will need to be contained and kept to a minimum when working in occupied areas, and may require after hours work.

4. When work above the floor or ground is required, proper use of ladders and safety harness or railing will be enforced.
5. All welding, cutting or brazing will require a fire-watch with a fire extinguisher.
6. All Contractors are responsible for their equipment and must ensure that it is safe and in good working order. All electrical equipment to be used on site will be checked by the Project Manager.
7. All Contractors are required to clean up their work area daily. Materials not used will be stored neatly or removed from the site.
8. Material Safety Data Sheets for any materials used on the project are required per OSHA standards. **No storage or disposal of hazardous materials on site is allowed.**
9. For any work site/facility that is equipped with a security system, or that has doors that must remain locked, the entering of this site/facility or shutdown of the security system will need to be authorized by the Project Manager and/or the Building Maintenance Superintendent.
10. The Project Manager will explain all policies and procedures regarding emergency alarms and exits and will also give a tour of the fire exits.
11. A dress code is required within the county facilities. Work attire will be neat and clean, and will meet OSHA requirements. No t-shirts, shorts, or open-toed shoes will be permitted.
12. The County of San Benito has all non-smoking facilities. Smoking is permitted only in designated areas outside of work site.

5) CLAYTON ACT / CARTWRIGHT ACT In entering into a public works contract or a subcontract to supply goods, services, or materials pursuant to a public works contract, the contractor or subcontractor offers and agrees to assign to the awarding body all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Sec. 15) or under the Cartwright Act (Chapter 2 (commencing with Section 16700) of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, services, or materials pursuant to the public works contract or the subcontract. This assignment shall be made and become effective at the time the awarding body tenders final payment to the contractor, without further acknowledgment by the parties.

6) TRENCHING / EXCAVATIONS On any public works contract of a local public entity which involves digging trenches or other excavations that extend deeper than four feet below the surface (a) the contractor shall promptly, and before the following conditions are disturbed, notify the local public entity, in writing, of any:

- (1) Material that the contractor believes may be material that is hazardous waste, as defined in Section 25117 of the Health and Safety Code, that is required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law.
- (2) Subsurface or latent physical conditions at the site differing from those indicated by information about the site made available to bidders prior to the deadline for submitting bids.
- (3) Unknown physical conditions at the site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the contract.

(b) That the local public entity shall promptly investigate the conditions, and if it finds that the conditions do materially so differ, or do involve hazardous waste, and cause a decrease or increase in the contractor's cost of, or the time required for, performance of any part of the work shall issue a change order under the procedures described in the contract.

(c) That, in the event that a dispute arises between the local public entity and the contractor whether the conditions materially differ, or involve hazardous waste, or cause a decrease or increase in the contractor's cost of, or time required for, performance of any part of the work, the contractor shall not be excused from any scheduled completion date provided for by the contract, but shall proceed with all work to be performed under the contract. The contractor shall retain any and all rights provided either by contract or by law which pertain to the resolution of disputes and protests between the contracting parties.

(7) TRENCHING / EXCAVATIONS (PCC 6705) No contract for public works involving an estimated expenditure in excess of twenty-five thousand dollars (\$25,000), for the excavation of any

trench or trenches five feet or more in depth, shall be awarded unless it contains a clause requiring submission by the contractor and acceptance by the awarding body or by a registered civil or structural engineer, employed by the awarding body, to whom authority to accept has been delegated, in advance of excavation, of a detailed plan showing the design of shoring, bracing, sloping, or other provisions to be made for worker protection from the hazard of caving ground during the excavation of such trench or trenches. If such plan varies from the shoring system standards, the plan shall be prepared by a registered civil or structural engineer.

Nothing in this section shall be deemed to allow the use of a shoring, sloping, or protective system less effective than that required by the Construction Safety Orders.

Nothing in this section shall be construed to impose tort liability on the awarding body or any of its employees.

The terms public works and awarding body, as used in this section, shall have the same meaning as in Sections 1720 and 1722, respectively, of the Labor Code.



COUNTY OF SAN BENITO
STATE OF CALIFORNIA

THIS CONTRACT, made and entered into this ____ day of _____, 20 between County of San Benito, a political subdivision of the State of California, hereinafter referred to as County, and _____, hereinafter referred to as Contractor;

WHEREAS, the San Benito County Board of Supervisors caused plans and specifications for the work hereinafter mentioned to be prepared, and approved and adopted the plans and specifications; and

WHEREAS, the San Benito County Board of Supervisors caused to be noticed for the time and in the manner required by law a Notice inviting sealed Bids for the performance of the work described in the adopted plans and specifications; and

WHEREAS, Contractor, in response to the Notice, submitted a sealed Bid for the performance of the work specified in the adopted plans and specifications to the San Benito County Board of Supervisors within the time and in the manner specified in the Notice; and

WHEREAS, in the manner provided by law, the San Benito County Board of Supervisors received, publicly opened and canvassed the Bids submitted in response to the Notice, including the Bid submitted by Contractor; and

WHEREAS, Contractor was the lowest responsive, responsible Bidder for the performance of said work, and the San Benito County Board of Supervisors, as a result of the canvass of Bids submitted, determined and declared Contractor to be the lowest responsive, responsible Bidder for the work and awarded to it a contract therefore.

NOW, THEREFORE, in consideration of the above, it is mutually agreed between the parties hereto as follows:

1. The CONTRACTOR will commence and complete the construction of the following public work project:

NEW BEHAVIORAL HEALTH CENTER – MODULAR BID #PWB-1810

2. The CONTRACTOR shall do all of the work and furnish all of the materials, supplies, tools, equipment, labor, and other services necessary to construct and complete in a good, workmanlike and substantial manner and to the COUNTY'S satisfaction, the project as described in the Invitation for Bids package, including all of the CONTRACT DOCUMENTS.

3. The CONTRACTOR will commence the work required by the CONTRACT DOCUMENTS within 5 calendar days after the date of the Notice To Proceed and will complete the same within 60 calendar days unless the period for completion is extended otherwise by the CONTRACT DOCUMENTS.

4. The CONTRACTOR agrees to perform all of the work described in the CONTRACT DOCUMENTS and comply with the terms therein for the sum of _____ (\$_____).

5. The term "CONTRACT DOCUMENTS" means and includes the following, all of which documents are incorporated herein by reference:
- a. INVITATION FOR BIDS "THE BID PACKAGE" INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
 - (1) INVITATION FOR BIDS
 - (2) CONTRACTING AND PROCUREMENT REQUIREMENTS INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
 - (a) NOTICE TO CONTRACTORS
 - (b) INSTRUCTIONS TO BIDDERS
 - (c) GENERAL CONDITIONS
 - (d) SUPPLEMENTAL CONDITIONS
 - (3) SPECIFICATIONS AND REQUIREMENTS
 - (4) PLANS
 - (5) ADDENDA:
No. _____, dated _____, 20____ No. _____, dated _____, 20____
 - b. THE ACCEPTED BID INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
 - (1) SIGNATURE SHEET
 - (2) BID SCHEDULE
 - (3) NAMES AND TITLES FORM
 - (4) BIDDER'S BOND
 - (5) REFERENCE LIST
 - (6) SUBCONTRACTOR LIST
 - (7) NON-COLLUSION AFFIDAVIT
 - (8) STATEMENT OF COMPLIANCE
 - (9) BIDDER QUALIFICATIONS
 - (10) GUARANTY
 - (11) CERTIFICATE AS TO WORKER'S COMPENSATION
 - (12) AFFIDAVIT CONCERNING EMPLOYMENT OF UNDOCUMENTED ALIENS
 - c. NOTICE OF AWARD
 - d. CONTRACT, SIGNED BY THE COUNTY AND THE CONTRACTOR

- e. PERFORMANCE BOND
- f. PAYMENT BOND
- g. NOTICE TO PROCEED
- h. FUTURE CHANGE ORDERS

All CONTRACT DOCUMENTS are intended to cooperate, so that any work called for in one and not mentioned in another is to be executed the same as if mentioned in all. However, should there be any conflict between the terms of this instrument and the CONTRACTOR'S Bid, then this instrument shall control. It is further expressly agreed by and between the parties hereto that should there be any conflict between the terms of this instrument and the CONTRACTOR'S Bid, then this instrument shall control and nothing herein shall be considered as an acceptance of the said terms of the Bid conflicting herewith. Where the specific terms and conditions in any of the referenced CONTRACT DOCUMENTS conflict with general terms and conditions in any referenced CONTRACT DOCUMENTS, the more specific terms and conditions shall be deemed to control. However, the general terms and conditions in any referenced CONTRACT DOCUMENTS shall remain in full force and effect, to the extent they do not conflict with the specific terms and conditions in any referenced CONTRACT DOCUMENTS.

- 6. The COUNTY will pay to the CONTRACTOR in the manner and at such times set forth in the CONTRACT DOCUMENTS such amounts as required by the CONTRACT DOCUMENTS.
- 7. In lieu of the COUNTY retaining a portion of progress payments due the CONTRACTOR, the CONTRACTOR may elect to deposit qualifying securities equivalent to the amount to be withheld. Upon such deposit under an escrow agreement substantially in the form specified in section 22300(e) of the Public Contracts Code, the funds shall be released.
- 8. Eight (8) hours of labor shall constitute a legal day's work, and the CONTRACTOR or any subcontractor under him, in the performance of the contract, shall not require more than eight (8) hours of labor in any calendar day, or more than forty (40) hours of labor in any calendar week, from any person employed by the CONTRACTOR in the performance of the work under this Contract, except as permitted under the provisions of Section 1815 of the Labor Code of the State of California. The CONTRACTOR shall forfeit, as penalty to the County, twenty-five dollars (\$25.00) for each worker employed by the CONTRACTOR or any subcontractor under the CONTRACTOR in the performance of the contract for each calendar day during which any worker is required or permitted to labor more than eight (8) hours and for each calendar week during which any worker is required or permitted to labor more than forty (40) hours, in violation of the provisions of such Labor Code.
- 9. The Contractor and subcontractors shall comply with the requirements of Labor Code sections 1777.5 and 1777.6 in the employment of apprentices. Information relative to apprenticeship standards, wage schedules, and other requirements may be obtained from the Director of Industrial Relations ex officio the Administrator of Apprenticeship, San Francisco, California, or from the Division of Apprenticeship Standards and its branch offices.
- 10. Pursuant to Section 1770 et seq. of the California Labor Code, the CONTRACTOR shall pay not less than the prevailing rate of per diem wages as determined by the Director of the California Department of Industrial Relations. The statement of prevailing wages appearing in the General Prevailing Wage Rates, as established by the California Department of Industrial Relations, is hereby specifically referred to and by this reference is made a part of this contract. Copies of the Prevailing Wage Scale are available at the following website: http://www.dir.ca.gov/DLSR/statistics_research.html#PWD. Those copies shall be made available to any interested party upon request. Failure to pay such prevailing wages shall subject the employer to the penalties set forth in Labor Code section 1775. The difference between such prevailing wage rates and the amount paid to each worker for each calendar day or portion thereof for which the worker was paid less than the prevailing wage rate shall be paid to each worker by the

CONTRACTOR or subcontractor. An error on the part of the COUNTY does not relieve the CONTRACTOR or any subcontractor from responsibility for payment of the prevailing rate of per diem wages and penalties pursuant to Labor Code sections 1770 through 1775.

11. The CONTRACTOR and each subcontractor must keep accurate payroll records of employees on public contracts and certify these records upon request, pursuant to Section 1776 of the California Labor Code and implementing regulations set forth in Title 8, Division 1, Chapter 8, Subchapter 3, sections 16000 and 16400 through 16404 of the California Code of Regulations. Payroll records must be made available for inspection by employees, the County, and the Division of Labor Standards Enforcement. The CONTRACTOR shall be responsible for compliance by the CONTRACTOR'S subcontractors.
12. The CONTRACTOR shall be subject to the examination and audit of the State auditor, at the request of the County or as part of any audit of the County, for a period of three (3) years after final payment under the contract.
13. During the performance of this Contract, Contractor agrees as follows:
 - a. During the performance of this Contract, Contractor and its subcontractors shall not unlawfully discriminate against any employee or applicant for employment because of race, religion, color, national origin, ancestry, physical disability, medical condition (cancer related), marital status, pregnancy, age (over 18), sex, sexual orientation, veteran's status or any other non-merit factor unrelated to job duties. Contractor and subcontractors shall insure that the evaluation and treatment of their employees and applicants for employment are free of such discrimination. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this non-discrimination clause.
 - b. The Contractor shall, in all solicitations or advertisements for employees by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, national origin, ancestry, physical or mental disability, medical condition (cancer related), marital status, pregnancy, sex, sexual orientation, age (over 18), veteran status, or any other non-merit factor unrelated to job duties.
 - c. The Contractor shall include the nondiscrimination and compliance provisions of this clause in all subcontracts to perform work under this Contract.
14. The CONTRACTOR offers and agrees to assign to the COUNTY all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Section 15) or under the Cartwright Act (Chapter 2 (commencing with Section 16700) of Part 2 of Division 7 of the California Business and Professions Code), arising from purchases of goods, services, or materials pursuant to this CONTRACT. This assignment shall be made and become effective at the time the COUNTY tenders final payment to the CONTRACTOR, without further acknowledgment by the parties.
15. This CONTRACT shall be binding upon all parties hereto and their respective heirs, executors, administrators, successors, and assigns.

16. The following individuals are the parties CONTRACT Administrators:

COUNTY'S Contract Administrator:

CONTRACTOR'S Contract Administrator:

Name: John Guertin
Title: RMA Director
Address: 2301 Technology Parkway
Hollister, CA 95023
Phone: 831-636-4170
Fax: 831-636-4176
E-mail: jguertin@cosb.us

Name: _____
Title: _____
Address: _____

Phone: _____
Fax: _____
E-mail: _____

This CONTRACT shall not be effective unless and until approved by a duly authorized representative of County of San Benito and San Benito County Counsel.

IN WITNESS WHEREOF, County of San Benito and Contractor have caused this Agreement to be signed as of the day and year first above written.

CONTRACTOR (FIRM)

Date _____
Address: _____

Phone: _____
Fax: _____

COUNTY OF SAN BENITO

Date _____
John Guertin, RMA Director

APPROVED AS TO LEGAL FORM:
San Benito County Counsel's Office

Date _____
G. Michael Ziman, Deputy County Counsel



PAYMENT BOND

KNOW ALL PERSONS BY THESE PRESENTS, THAT WHEREAS the County of San Benito, State of California, hereinafter designated as the "Obligee," has on _____, 20____, awarded to _____ hereinafter designated as "Principal," a contract for the construction of _____ (Contract No.) _____, and

WHEREAS, said Principal is required to furnish a bond in connection and with said contract, providing that if said Principal, or any of his or its subcontractors, shall fail to pay for any materials, provisions, or other supplies used in, upon, for, or about the performance of the work contracted to be done, or for any work or labor done thereon of any kind, the Surety on this bond will pay the same to the extent hereinafter set forth:

NOW, THEREFORE, We, the Principal, and _____ as Surety, are held and firmly bound unto the Obligee in the penal sum of _____ lawful money of the United States for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that if said Principal, or any of his or its subcontractors, shall fail to pay any of the persons named in Section 3181 of the Civil Code of the State of California, or any amounts due under the Unemployment Insurance Code with respect to such work or labor performed under the contract, or for any amounts required to be deducted, withheld, and paid over to the Employment Development Department of the State of California, from the wages of employees of the Principal and subcontractors pursuant to Section 13020 of the Unemployment Insurance Code of the State of California with respect to such work or labor, as required by the provisions of Section 3225 and following of the Civil Code of the State of California, then said Surety will pay the same in, or to an amount not exceeding the amount, hereinabove set forth, and also will pay, in case suit is brought upon this bond, reasonable attorneys' fees to such claimant and to the Obligee as shall be fixed by the Court.

This bond is issued pursuant to Civil Code Sections 3247 through 3252, inclusive, of the State of California, and shall inure to the benefit of any and all persons, companies, and corporations named in Section 3181 of said Civil Code so as to give a right of action to them or their assigns in any suit brought upon this bond.

The said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of the Contract, or to the work to be performed thereunder, or the specifications accompanying the same shall, in any way, affect its obligations on this bond, and it does hereby waive notice of any such change, extension of time, alteration, or addition to the terms of the Contract, or to the work or to the specifications. Said Surety hereby waives the provisions of Sections 2819 and 2845 of the Civil Code of the State of California.

IN WITNESS WHEREOF, the above-bounden parties have signed this instrument under their seals this _____ day of _____, 20____, the name and corporate seal of each corporate party being hereto affixed, and these presents duly signed by its undersigned representatives, pursuant to authority of its governing body.

(SEAL)

Principal

Signature for Principal

Title of Signatory

(SEAL)

Surety

Signature of Surety

Title of Signatory

(This bond must be submitted in sets of four, each bearing original signatures. The signature of the Attorney-In-Fact for the Surety must be acknowledged by a Notary Public. These bonds must be accompanied by a current Power of Attorney appointing such Attorney-In-Fact.)



Bond Number:
Premium:

FAITHFUL PERFORMANCE BOND

KNOW ALL PERSONS BY THESE PRESENTS, that WHEREAS the County of San Benito, State of California, hereinafter designated as the "Obligee," has on _____, 20____, awarded to _____ hereinafter designated as the "Principal," a contract for the construction of

_____ (Contract No. _____), and

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

NOW, THEREFORE, We, the Principal, and _____ as Surety, are held and firmly bound unto the Obligee in the penal sum of _____ Dollars (\$_____) lawful money of the United States for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that, if the above bounden Principal, his or its heirs, executors, administrators, successors, or assigns shall in all things stand to and abide by, and well and truly keep and faithfully perform the covenants, conditions, and agreement in the said Contract, and any alterations made as therein provided, on his or their part to be kept and performed at the time and in the manner therein specified, and in all respects according to their true intent and meaning, and shall indemnify and save harmless the Obligee, its officers and agents as therein stipulated, then this obligation shall become null and void; otherwise it shall be and remain in full force and virtue, and Principal and Surety, in the event suit is brought on this bond, will pay to the Obligee such reasonable attorneys' fees as may be fixed by the Court.

As a condition precedent to the satisfactory completion of the said Contract, the above obligation in said amount shall hold good for a period of one (1) year after the completion and acceptance of the said work, during which time if the above bounden Principal, his or its heirs, executors, administrators, successors, or assigns shall fail to make full, complete, and satisfactory repair and replacements or totally protect the said Obligee from loss or damage made evident during said period of one (1) year from the date of acceptance of the work, and resulting from or caused by defective materials or faulty workmanship in the prosecution of the work done, the above obligation in the said sum shall remain in full force and effect. However, anything in this paragraph to the contrary notwithstanding, the obligation of the Surety hereunder shall continue so long as any obligation of the Principal remains.

The said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of the Contract, or to the work to be performed thereunder, or the specifications accompanying the same, shall, in any way, affect its obligations on this bond, and it does hereby waive notice of any such change, extension of time, alteration, or addition to the terms of the Contract, or to the work or to the specifications. Said Surety hereby waives the provisions of Section 2819 and 2845 of the Civil Code of the State of California.

IN WITNESS WHEREOF, the above bounden parties have signed this instrument under their seals this _____ day of _____, 20____, the name and corporate seal of each corporate party being hereto affixed, and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

(SEAL)

Principal

Signature for Principal

Title of Signatory

(SEAL)

Surety

Signature of Surety

Title of Signatory

(The signature of the Attorney-In-Fact for the Surety must be acknowledged by a Notary Public, and this bond must be accompanied by a current Power of Attorney appointing such Attorney-In-Fact. This bond must be submitted in sets of four, each bearing original signatures.)

PROCUREMENT REQUIREMENTS

COUNTY OF SAN BENITO RESOURCE MANAGEMENT AGENCY



2301 Technology Parkway • Hollister, CA 95023-3840
831.636.4170 • 831.636.4176 fax • www.cosb.us

NOTICE TO CONTRACTORS

San Benito County New Behavioral Health Center – Modular Bid

PROJECT: PWB-1810

Sealed Bids shall be delivered to the San Benito County Resource Management Agency, 2301 Technology Parkway, Hollister, California, 95023-3840, no later than **2:00 P.M. on Thursday, January 10, 2019**. Bids will be opened and will be publicly read in the **RMA conference room, 2301 Technology Parkway, Hollister, California** at **2:00 P.M.** or thereafter. This project is for licensed contractors with a Type B license. The Contractor shall complete all or any designated portions of the work called for under the contract in all parts and requirements within 90 calendar days (except as modified in the technical specifications). The County of San Benito and its Board of Supervisors reserves the right to reject any or all Bids received as the public good may require.

Each contractor shall include in their Bid all labor, tools, and materials for a complete and working project for each trade component in conformance with the intent shown on the plans and specifications and specified herein.

Plans, Specifications and Bid forms to be used for bidding on this project can only be obtained by going to the San Benito County website at www.cosb.us. On the right-hand side, under Quicklinks, you will see "Bids & RFPs". Click on this link, and go down the page until you see "Listing of Advertised Projects". Click on this link and it will take you to E-Bid Board, where you will find the project name. Click on the name to see the IFB, plans and specs for this job. If you have any questions, please call the San Benito County Resource Management Agency, Public Works Division at (831) 636-4170.

Prospective Bidders must be fully qualified, licensed, certified, and insured to perform the work requested. All work performed must meet all current applicable laws and regulations.

Each Bidder must submit a Bid for the project for which they intend to bid to the Administrative Office on the standard forms enclosed. Said Bid shall be accompanied by a cashier's check, a certified check or bidder's bond of ten percent (10%) of the amount of the Bid submitted, to be made payable to the County of San Benito. Bid bonds shall be issued by a corporate surety duly admitted and authorized to issue bonds and undertakings by the State of California.

Pursuant to Section 1700, and following, of the California Labor Code, the Contractor shall pay not less than the prevailing rate of per diem wages as determined by the Director of the California Department of Industrial Relations. Copies of such prevailing rate of per diem wages are available at the following web site: http://www.dir.ca.gov/DLSR/statistics_research.html#PWD. Those copies shall be made available to any interested party upon request. The Contractor shall forfeit, as penalty, to the County of San Benito, twenty-five dollars (\$25.00) for each calendar day or portion thereof, for each workman paid less than the stipulated prevailing rates for any work done under the contract by it or by any subcontractor under it, in violation of the provisions of such Labor Code.

County will be the sole judge as to the technical acceptability of any Bids and any award will be as determined most advantageous to the County considering such factors as completeness and responsiveness to this Invitation for Bids, experience, references, and anticipated costs. The County reserves the right to reject any or all Bids or parts thereof and to waive any informality or irregularity in any Bid or the bidding process.

Insurance requirements for the project shall be the amounts set forth in the General Conditions, Section 19, unless expressly modified below:

Commercial General Liability Insurance	\$ _____
All Risk Property Coverage or Builders Risk Insurance	\$ _____
Business Automobile Liability Insurance	\$ _____

INSTRUCTIONS TO BIDDERS

1) All portions of the Bid must be completed before the Bid is submitted. Failure to do so may result in the Bid being rejected as nonresponsive. Attached to and submitted with this Bid, Bidder must provide: (1) the Bid Schedule; (2) Names and Titles Form; (3) Bidder's Bond; (4) Reference List; (5) Subcontractor List; (6) Non-Collusion Affidavit, completed and signed by Bidder; (7) Statement of Compliance, completed and signed by Bidder; (8) Bidder's Qualifications, completed and signed by Bidder; (9) Guaranty, completed and signed by Bidder; (10) Contractor's Certificate as to Worker's Compensation, completed and signed by Bidder; and, (11) Affidavit Concerning Employment of Undocumented Aliens, completed and signed by Bidder. Failure to submit all required documents may result in the Bid being rejected as nonresponsive.

2) An original of the Bid form shall be filled in and submitted as the Bid.

3) County of San Benito has obtained report(s) that may contain facts that may materially affect Bidders' Bids. County of San Benito has constructed other public works projects throughout the County of San Benito, and obtained reports and other information in the course of the design and construction of those other public works construction projects, all of which may contain facts that may materially affect Bidders' Bids. Bidders are strongly encouraged to inspect applicable County of San Benito reports, records and documents. Said reports and documents will be made available upon written request at the Administrative Office, 481 Fourth Street, Hollister, California, 95023 for inspection and copying at Bidders' sole cost and expense, during normal working hours, Monday through Friday, 9:00 a.m. through 5:00 p.m..

4) If a pre-bid conference has been scheduled at the site of the work, all Bidders, subcontractors, material suppliers, and others who may be working on the work of improvement are strongly encouraged to attend this pre-bid conference. Due to the facts and circumstances of this particular project, the on-site pre-bid conference may be the only opportunity to conduct the pre-bid investigation of the site and satisfy the pre-bid obligations set forth in these Contract Documents. If a Bidder (or others) attend the entirety of a scheduled pre-bid on-site conference and need additional time to complete their investigation of the site or other pre-bid obligations set forth in these Contract Documents, Bidder must notify the County of San Benito in writing, via certified or registered mail, within three (3) days of the on-site pre-bid conference, to request additional time to complete its investigation of the site. The written request must include an estimate of the amount of additional time required by Bidder at the site. County of San Benito retains discretion to determine additional time requirements, if any.

5) Investigations of subsurface conditions or otherwise, are made for the purpose of design, and the County of San Benito assumes no responsibility whatsoever with respect to the sufficiency or accuracy of borings, the log of test borings, or other preliminary investigations, or of the interpretation thereof, and there is no guaranty, either expressed or implied, that the conditions indicated are representative of those existing throughout the work, or any part of it, or that unanticipated conditions may not occur. When a log of test borings or other report is made available to Contractor or included in the Contract Documents, it is expressly understood and agreed that said log of test borings or other reports does not constitute a part of the Contract, and represents only an opinion of the County of San Benito as to the character of the materials to be encountered, and is made available or included in the Contract Documents only for the convenience of the Bidders. Bidders must satisfy themselves, through their own investigation, as to conditions to be encountered.

6) In addition to other minimum qualifications, the County of San Benito has determined that the successful lowest responsive, responsible Bidder must demonstrate to the satisfaction of the County of San Benito, the following minimum experience to be qualified to perform the work described in the Contract Documents:

- a. Have possessed a valid, active and in good standing, State of California Department of Consumer Affairs, Contractor's License Board license, appropriate for trade being bid, for a minimum of five (5) continuous years prior to the date of Bid opening.
- b. Not have any pending disciplinary proceedings or investigations by the Contractor's State License Board.
- c. Currently (as of the date of Bid opening) or within the past year, not have any suspensions, disbarments, or similar proceedings (including stipulated agreements), restricting, limiting or prohibiting Bidder from bidding or performing other public works projects for any other public agency.

7) Following the opening of Bids, the County of San Benito may request in writing that the apparent lowest responsive, responsible Bidder complete a Contractor Qualifications Questionnaire and furnish all required supporting documentation to enable the County of San Benito to determine whether the apparent lowest responsive, responsible Bidder is qualified to perform the work described in the Contract Documents. By submission of a Bid, Bidder agrees to complete the Contractor Qualifications Questionnaire, furnish all required attachments, sign the Contractor Qualifications Questionnaire, all in strict conformance with the requirements of the Contract Documents and Contractor Qualifications Questionnaire, and return to the County of San Benito within ten (10) days of County of San Benito's written request. If Bidder fails or refuses to complete the Contractor Qualifications Questionnaire, furnish all required attachments, sign the Contractor Qualifications Questionnaire, or return it to the County of San Benito within ten (10) days of date of dispatch of County of San Benito's written request, Bidder may not be considered for award of the contract, and further, Bidder agrees that the County of San Benito may either award the work to another Bidder or call for new Bids. In such event, the Bidder shall be liable to the County of San Benito for the difference between the amount of the disqualified Bid and the larger amount for which the County of San Benito procures the work plus all of the County of San Benito's costs, damages, expenses, and liabilities.

8) If for any reason the County of San Benito elects to not award the contract to the apparent lowest responsive, responsible Bidder, the County of San Benito may request in writing that the apparent second lowest responsive, responsible Bidder complete the Contractor Qualifications Questionnaire and furnish all required supporting documentation to enable the County of San Benito to determine whether the second lowest responsive, responsible Bidder is qualified to perform the work described in the Contract Documents. If for any reason the County of San Benito elects to not award the contract to the apparent second lowest responsive, responsible Bidder, the County of San Benito may request the third lowest responsive, responsible Bidder complete the Contractor Qualifications Questionnaire and furnish all required supporting documentation, and so on.

9) If the County of San Benito receives from a Bidder within the time set forth in these Contract Documents, a complete Contractor Qualifications Questionnaire and all required supporting documentation as required by the Contract Documents, and if the County of San Benito determines that a Bidder is not qualified to perform the work required by the Contract Documents, and if the County of San Benito elects to not award the Contract to that Bidder, the County of San Benito will promptly return that Bidder's Bid security.

10) Bid protests shall be filed in writing with the County Administrative Officer, County of San Benito, Administrative Office, 481 Fourth Street, Hollister, California, 95023, by certified or registered mail, not later than three (3) days after the Bid opening or, if the protest is based on the selection of the apparent lowest responsive responsible Bidder, not later than three (3) days after selection of the apparent lowest responsive, responsible Bidder. The protest shall specify the reasons and facts upon which the protest is based.

BID

For: **NEW BEHAVIORAL HEALTH CENTER – MODULAR BID**

Name of Bidder: _____

Business Address : _____

Place of Residence: _____

Telephone / Fax: () / () _____

Email: _____

DIR PWC#: _____

1) All portions of the Bid must be completed before the Bid is submitted. Failure to do so may result in the Bid being rejected as nonresponsive. Attached to and submitted with this Bid, Bidder must provide (1) the Bid Schedule; (2) Names and Titles Form; (3) Bidder's Bond; (4) Reference List; (5) Subcontractor List; (6) Non-Collusion Affidavit, completed and signed by Bidder; (7) Statement of Compliance, completed and signed by Bidder; (8) Bidder's Qualifications, completed and signed by Bidder; (9) the Guaranty, completed and signed by Bidder; (10) Contractor's Certificate as to Worker's Compensation, completed and signed by Bidder; and, (11) Affidavit Concerning Employment of Undocumented Aliens, completed and signed by Bidder. Failure to submit all required documents may result in the Bid being rejected as nonresponsive.

2) One copy of the Bid shall be filled in and submitted as the Bid.

3) The Bidder, having the appropriate active license required by the State of California; and having carefully read and examined the plans, specifications, and all related bidding documents as prepared by Adam Goldstone, County of San Benito for the **SBC New Behavioral Health Center – Modular Bid** having carefully and fully examined the site of the proposed work and all information available to Bidder, and being familiar with all the conditions related to the proposed work, including the availability of materials, equipment, and labor, hereby offers to furnish all labor, materials, tools, transportation, services, and equipment necessary to complete the work of the described project in accordance with the Contract Documents, and to complete all requirements of the Contract Documents for the sums quoted in this Bid. The Bidder agrees that it will not withdraw its Bid within sixty (60) days after the Bid deadline. Bidder agrees, if requested by County of San Benito, to complete and sign the Contractor Qualification Questionnaire, furnishing all required attachments, and return it to County of San Benito within ten (10) days of date of dispatch by County of San Benito. If the Bidder is selected as the apparent lowest responsive, responsible Bidder, the Bidder agrees, within ten (10) days after date of dispatch of Notice of Award, to sign and deliver the Contract, and to furnish the Performance Bond, the Payment Bond, Certificates of Insurance, and other required items. If awarded the Contract, the Bidder agrees to complete the work within the number of calendar days specified by the Project Manager after the date of the commencement specified in the Notice to Proceed.

4) The Bidder agrees that if the Bidder is selected as the apparent lowest responsive, responsible Bidder, and the Bidder fails to sign the Contract and furnish (1) the **Performance Bond**, (2) the **Payment Bond**, (3) **Certificates of Insurance**, and (4) **other required items** within the time limit specified in the Contract Documents, the County of San Benito may award the work to another Bidder or call for new Bids. In such event, the Bidder shall be liable to the County of San Benito for the difference between the amount of the disqualified Bid and the larger amount for which the County of San Benito procures the work plus all of the County of San Benito's costs, damages, expenses and liabilities arising from Bidder's failure to sign the Contract and/or furnish the required documents.

I/We the undersigned hereby certify that I/We am/are a duly authorized official of the company and have the authority to sign on behalf of the company and assure that all statements made in the Bid are true. I/We agree to furnish and deliver the specified items/services at the prices stated herein, and have read, understand, and agree to the terms and conditions contained herein and on all of the attachments.

Contractor's License #: _____ Type: _____ (as applicable)

Signature of Authorized Official:

Name/Title of Authorized Official:

BID SCHEDULE

I will perform the work of the **New Behavioral Health Center – Modular Bid** as set forth in the Contract Documents and in conformance with all plans, specifications, requirements, conditions and instructions of County of San Benito Invitation for Bid, IFB No. PWB-1810, prepared by the County of San Benito, for the following lump sum price:

BASE BID \$ _____

Total price in words: _____

I/We agree that the prices stated herein will be firm for ninety (90) calendar days from the Bid Submittal Deadline.

The work for the **New Behavioral Health Center – Modular Bid** specifically includes: Modular construction components.

The Bidder acknowledges receipt of the following Addenda:

Addendum # _____, dated _____	_____	_____
	Signature	Date
Addendum # _____, dated _____	_____	_____
	Signature	Date
Addendum # _____, dated _____	_____	_____
	Signature	Date
Addendum # _____, dated _____	_____	_____
	Signature	Date

AUTHORIZED SIGNATURE OF BIDDER: _____

PRINT NAME/TITLE: _____

BUSINESS NAME: _____

Executed in _____, California, on _____, 2018

DATE: _____

NOTE:

Where quantities are shown they are engineers estimated quantities. Variations may occur between actual quantities and engineers estimated quantities. Bidder is responsible to calculate quantities when preparing the Bid. Payment will be based on lump sum Bid amount(s) and no allowance will be made for variations between actual quantities and engineer’s estimated quantities.

NAMES AND TITLES FORM

NAMES AND TITLES OF KEY MEMBERS OF FIRM:

(Name of person signing the Bid on behalf of the Bidder and all general partners, if a partnership, must be included.)

Bidder is a: (circle one)
Corporation Partnership Individual Joint Venture Other _____
(Specify)

NAME OF PRESIDENT IF A CORPORATION: _____

NAME OF SECRETARY IF A CORPORATION: _____

CALIFORNIA CONTRACTORS LICENSE(S):

Name of License(s):

Classification(s) Number Expiration Date

Classification(s) Number Expiration Date

(For Joint Ventures, list Joint Venture's license or licenses for all Joint Venture partners.)

- 1) Is your firm authorized to do business in the State of California? Yes No
- 2) Is your firm a State of California registered small business? Yes No
- 3) Local Business Yes No
- 4) This firm has been in continuous business under the present name for _____ years.
- 5) Annual sales volume: _____
- 6) Net worth of business: \$ _____

NAMES AND TITLES FORM (continued)

NAME OF BIDDER'S FIRM: _____

Address: _____

Phone: _____

Fax: _____

Email: _____

By: _____
(Signature)

(Print or Type Name)

(Print or Type Title)

By: _____
(Signature)

(Print or Type Name)

(Print or Type Title)

(If signature is by other than the sole proprietor, general partner, or corporate officers, attach an original Power of Attorney.)

The following documents are submitted with and made a condition of this Bid:

Bid security in the form of _____ (fill in type of Bid security)

Corporation is organized under the laws of the State of _____.

Corporate Seal:

BIDDER'S BOND

Know All Persons by These Presents, That we, _____

_____, As PRINCIPAL, and _____

_____, as SURETY, are held and firmly bound unto the County of San Benito of the State of California, hereinafter called the County, in the penal sum of TEN PERCENT (10%) OF THE TOTAL AMOUNT OF THE BID of the Principal above named, submitted by said Principal to the County for the work described below for the payment of such sum in lawful money of the United States, well and truly to be made, and we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

In no case shall the liability of the surety exceed the sum of _____ (\$_____) Dollars.

THE CONDITION OF THIS OBLIGATION IS SUCH, That whereas the Principal has submitted the above mentioned bid to the County for certain construction specifically described as follows: New Behavioral Health Center – Modular Bid: for which Bids are to be opened at Hollister, California on January 10, 2019 @ 2:00 p.m.

NOW, THEREFORE, If the aforesaid Principal is awarded the contract and, within the time and manner required under the specifications, after the prescribed forms are presented to him for signature, enters into a written contract, in the prescribed form, in accordance with the bid, and files two bonds with the Purchasing Agent, one to guarantee faithful performance and the other to guarantee payment for labor and materials, as required by law, then this obligation shall be null and void; or should the aforementioned contract be awarded to other than the herein named Principal, then this obligation shall be null and void; otherwise, it shall be and remain in full force and virtue.

IN WITNESS WHEREOF, We have hereunto set our hands and seals on this _____ day of _____ A.D. 20_____.

_____(SEAL) _____(SEAL)

_____(SEAL) _____(SEAL)

_____(SEAL) _____(SEAL)

Surety

Principal

(Note: Signatures of those executing for the Surety must be properly acknowledged.)

Address

REFERENCE LIST

1) NAME: _____
ADDRESS: _____
P.O. Box/Street City State Zip
CONTACT PERSON/TITLE: _____
TELEPHONE NUMBER: _____ FAX NUMBER: _____
DOLLAR AMOUNT OF CONTRACT: _____
DATES AND WORK PERFORMED: _____

2) NAME: _____
ADDRESS: _____
P.O. Box/Street City State Zip
CONTACT PERSON/TITLE: _____
TELEPHONE NUMBER: _____ FAX NUMBER: _____
DOLLAR AMOUNT OF CONTRACT: _____
DATES AND WORK PERFORMED: _____

3) NAME: _____
ADDRESS: _____
P.O. Box/Street City State Zip
CONTACT PERSON/TITLE: _____
TELEPHONE NUMBER: _____ FAX NUMBER: _____
DOLLAR AMOUNT OF CONTRACT: _____
DATES AND WORK PERFORMED: _____

SUBCONTRACTOR LIST

In compliance with the provisions of Section 4100 through 4114, inclusive, of the Public Contract Code, and any amendments thereto, each Bidder shall set forth in his or her Bid, **the name and location of the place of business** of each subcontractor who will perform work or labor or render service to the prime contractor in or about the construction of the work or improvement, or a subcontractor licensed by the State of California who, under subcontract to the prime contractor, specially fabricates and installs a portion of the work or improvement according to detailed drawings contained in the plans and specifications, in an amount in excess of one-half of one percent (0.5%) of the prime contractor's total Bid and the portion of the work which will be done by each subcontractor under this act. The prime contractor shall list only one subcontractor for each portion as is defined by the prime contractor in his or her Bid.

Trade	1.	2.	3.
	_____	_____	_____
Name	_____	_____	_____
Location	_____	_____	_____
CSLB & DIR PWC #:	_____	_____	_____
Trade	4.	5.	6.
	_____	_____	_____
Name	_____	_____	_____
Location	_____	_____	_____
CSLB & DIR PWC #:	_____	_____	_____
Trade	7.	8.	9.
	_____	_____	_____
Name	_____	_____	_____
Location	_____	_____	_____
CSLB & DIR PWC #:	_____	_____	_____
Trade	10.	11.	12.
	_____	_____	_____
Name	_____	_____	_____
Location	_____	_____	_____
CSLB & DIR PWC #:	_____	_____	_____

NON-COLLUSION AFFIDAVIT

TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID
Pursuant to Section 7106 of the Public Contract Code,

The undersigned declares:

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

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

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

Signature

STATEMENT OF COMPLIANCE

(Company Name)

(hereinafter referred to as "prospective Contractor") hereby certifies, unless specifically exempted, compliance with Government Code Section 12990 and California Code of Regulations, Title II, Division 4, Chapter 5, in matters relating to the development, implementation, and maintenance of a nondiscrimination program. Prospective Contractor agrees not to unlawfully discriminate against any employee or applicants for employment because of race, religion, color, national origin, ancestry, physical handicap, medical condition, marital status, sex, sexual orientation, physical and mental disabilities, or age (over forty).

I, _____
(Name of Official)

hereby swear that I am duly authorized to legally bind the prospective Contractor to the above-described certification. I am fully aware that this certification, signed on

(date)

in the County of _____, is made under the penalty of perjury under the
(County)
laws of the State of California.

(Signature)

(Print or Type Title)

BIDDER QUALIFICATIONS

This form must be completed, signed by Bidder, and submitted to County of San Benito with Bidder's Bid. Failure to complete, sign, and submit with Bidder's Bid may result in Bidder's Bid being rejected as not responsive.

County of San Benito has determined that Bidders must meet the following minimum qualifications to bid the work of improvement contemplated herein:

1. Have possessed a valid, active and in good standing, State of California Department of Consumer Affairs, Contractor's License Board license, appropriate for trade being Bid, for a minimum of five (5) continuous years prior to the date of Bid opening.
2. Not have any pending disciplinary proceedings or investigations by the Contractor's State License Board.
3. Currently (as of the date of Bid opening) or within the past year, not have any suspensions, disbarments, or similar proceedings (including stipulated agreements), restricting, limiting or prohibiting Bidder from bidding or performing other public works for any other public agency.

I, being the _____ (insert title) of Bidder herein, declare that Bidder meets all of the minimum criteria set forth above.

Signature

Print Name

Date

GUARANTY

TO THE COUNTY OF SAN BENITO

The undersigned, as prime Contractor, guarantees the construction and installation of the following work included in this project:

SAN BENITO COUNTY NEW BEHAVIORAL HEALTH CENTER – MODULAR BID

Should any of the materials or equipment 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 the plans and specifications, due to any of the above causes, all within **one year** after the date on which this contract work is accepted by the County, the undersigned agrees to reimburse the County, upon demand, for County's 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 County, to replace any such material and to repair said work completely without cost to the County so that said work will function successfully as originally contemplated. (Ordinary wear and tear and unusual abuse or neglect excepted).

The County 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 County 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 County. If the undersigned shall fail or refuse to comply with his obligations under this guaranty, the County shall be entitled to all costs and expenses, including attorney's fees, reasonably incurred by reason of said failure or refusal.

Contractor, Name and Address

Date

By _____

Signature of Principal

CONTRACTOR'S CERTIFICATE AS TO WORKER'S COMPENSATION

(Labor Code section 1861)

Labor Code section 3700 provides, in relevant part:

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

(a) By being insured against liability to pay compensation in one or more insurers duly authorized to write compensation insurance in this state.

(b) By securing from the Director of Industrial Relations a certificate of consent to self-insure, either as an individual employer, or as one employer in a group of employers, which may be given upon furnishing proof satisfactory to the Director of Industrial Relations of ability to self-insure and to pay any compensation that may become due to his or her employees."

I certify that I am aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for Worker's Compensation or to undertake self-insurance in accordance with the provisions of that Code, and I will comply with such provisions before commencing the performance of the work of this contract.

Dated: _____

Bidder's business name

By: _____

Print Name: _____

And Title: _____

AFFIDAVIT CONCERNING EMPLOYMENT OF UNDOCUMENTED ALIENS
TO BE SUBMITTED WITH BID

(Public Contract Code section 6101)

Public Contract Code section 6101 provides that,

"No state agency or department, as defined in [Public Contract Code] Section 10335.7, that is subject to this code, shall award a public works or purchase contract to a bidder or contractor, nor shall a bidder or contractor be eligible to bid for or receive a public works or purchase contract, who has, in the preceding five years, been convicted of violating a state or federal law respecting the employment of undocumented aliens.

_____ (Name), being first duly sworn, deposes and says (1) that he or she is the _____ (Title) of _____ (DBA), the party making the foregoing Bid; and (2) that the party making the foregoing Bid has not, within the preceding five (5) years, been convicted of violating a state or federal law respecting the employment of undocumented aliens.

Dated: _____

Bidder's business name

By: _____

Print Name: _____

Title: _____

SECTION 00 01 10
TABLE OF CONTENTS

DIVISION 0 – PROCUREMENT AND CONTRACT REQUIREMENTS

Section 00 00 00	Cover
Section 00 01 01	Project Directory
Section 00 01 07	Seals Page
Section 00 01 10	Table of Contents
Section 00 31 00	Available Project Information – Geotechnical Investigation Report & Supplement

DIVISION 1 - GENERAL REQUIREMENTS

Section 01 11 00	Summary of Work
Section 01 11 09	Contract Considerations
Section 01 20 00	Price and Payment Procedures
Section 01 25 00	Product Options and Substitutions
Section 01 31 19	Coordination and Meetings
Section 01 32 16	Construction Schedule
Section 01 33 00	Submittal Procedures
Section 01 42 00	References
Section 01 45 00	Quality Control
Section 01 45 29	Testing Laboratory Services
Section 01 60 00	Material and Equipment
Section 01 74 00	Cleaning and Waste Management
Section 01 75 00	Starting and Adjusting
Section 01 77 00	Closeout Procedures
Section 01 78 36	Warranties
Section 01 78 39	Project Record Documents

DIVISION 4 - MASONRY

Section 04 05 00	Mortar and Grout
------------------	------------------

DIVISION 5 - METALS

Section 05 51 33	Metal Ladders
------------------	---------------

DIVISION 6 – WOODS, PLASTICS, COMPOSITES

Section 06 05 60	Countertops
Section 06 20 00	Finish Carpentry
Section 06 41 16	Laminate-Clad Wood

DIVISION 7 - THERMAL AND MOISTURE PROTECTION

Section 07 13 00	Weather-Resistive Barrier & Flashing
Section 07 21 30	Building Insulation
Section 07 26 40	Water Vapor Emission Control Barrier

Section 07 42 00	Metal Wall Panels
Section 07 54 19	Polyvinyl-Chloride (PVC) Roofing
Section 07 60 00	Flashing and Sheet Metal
Section 07 61 00	Sheet Metal Roofing
Section 07 63 00	Gutters and Downspouts
Section 07 72 33	Roof Hatches
Section 07 84 00	Firestopping
Section 07 92 00	Joint Sealers

DIVISION 8 - OPENINGS

Section 08 13 13	Hollow Metal Doors and Frames
Section 08 14 16	Wood Doors
Section 08 41 12	Aluminum Entrances and Storefronts
Section 08 51 13	Aluminum Windows
Section 08 58 00	Aluminum Interior Sliding Service Window
Section 08 63 00	Metal Framed Skylights – Pinnacle 350
Section 08 71 00	Door Hardware
Section 08 80 00	Glazing
Section 08 90 00	Louvers and Vents

DIVISION 9 – FINISHES

Section 09 22 16	Metal Stud Framing system
Section 09 24 00	Portland Cement Plaster
Section 09 28 13	Cementitious Backing Board
Section 09 29 00	Gypsum Board
Section 09 30 13	Ceramic Tile
Section 09 51 00	Suspended Acoustical Ceilings
Section 09 65 10	Resilient Flooring
Section 09 72 00	Wall Protection
Section 09 72 16	Wall Coverings
Section 09 84 00	Fabric Wrapped Acoustical Wall Panels
Section 09 91 00	Painting
Section 09 96 53	Elastomeric Coating
Section 09 97 23	Elastomeric Coating

DIVISION 10 – SPECIALTIES

Section 10 11 00	Visual Display Surfaces
Section 10 11 16	Marker Boards
Section 10 14 00	Signage
Section 10 28 00	Toilet, Bath, and Laundry Accessories
Section 10 44 00	Fire Extinguishers and Cabinets

DIVISION 12 – FURNISHINGS

Section 12 49 40	Roller Shades
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DIVISION 22 – PLUMBING

Section 22 05 00	Common Work for Plumbing Design Build
Section 23 05 00	Common Work for HVAC Design Build

DIVISION 26 – ELECTRICAL

Section 26 05 19	Low-Voltage Electrical Power Conductors and Cables
Section 26 05 26	Grounding and Bonding for Electrical Systems
Section 26 05 29	Hangers and Supports for Electrical Systems
Section 26 05 33	Raceway and Boxes for Electrical Systems
Section 26 05 53	Identification for Electrical Systems
Section 26 22 00	Low-Voltage Transformers
Section 26 24 16	Panelboards
Section 26 27 26	Wiring Devices
Section 26 28 16.16	Enclosed Switches
Section 26 51 00	Interior Lighting
Section 26 52 00	Safety Lighting

END OF SECTION

SECTION 01 11 00 SUMMARY OF WORK

PART 1 - GENERAL

- a. SECTION INCLUDES
 - i. Work Included – description of scope and shown on Drawings and Specifications.
 - ii. Work by County or by Others
 - iii. Owner (County)-furnished products.
 - iv. Work Not Included
 - v. Contractor's use of site.

- b. WORK INCLUDED
 - i. Work of this Contract is for the design and construction of the San Benito County Modular Behavioral Health Building, based on the following general scopes of work (Work specified on construction documents dated **November 9th, 2018**, including subsequent addenda, unless otherwise indicated):
 - 1. Modular Building Design
 - a) Modular company will take the lead in developing the final 100% architectural construction drawings based on the Design Development set created by HY Architects, dated November 9th, 2018.
 - b) HY Architects will overstamp final drawings for submittal to the County of San Benito Building Department, which will include all site related scopes of work. HY Architects will peer review the final development of the modular construction documents.
 - c) HY Architects will maintain Mechanical Engineering (LIST Engineers) and Electrical Engineering (EDGE Engineering) as the Engineers of Record for the complete design of the mechanical, electrical, and low voltage systems.
 - d) Architectural and structural design construction documents for the modular building will be completed by the modular company based on the Design Development drawings created by HY Architects. Coordination between A/E disciplines will be required throughout the design process. Project will require printing of 50% Construction Documents, 90% Construction Documents, and 100% Construction Documents with review meetings and approvals.
 - e) Fire Alarm drawings will be developed by HY Architects.

- f) Fire Sprinkler drawings will be design-build and under the contract of the modular building company.
 - g) The modular building will be at grade with a depressed perimeter foundation and concrete peer supports for a modular steel frame with corrugated steel deck and light weight concrete topping. Site will be grubbed and graded by site work General Contractor. Modular company responsible for setting the onsite constructed foundation/footings. All onsite construction will be required to be developed by prevailing wage labor. No exceptions.
 - h) Site utilities will be brought to the building within 5ft of the building footprint. Utility connections will be the responsibility of the modular building trade contractors.
 - i) Design coordination with HY Architects, Civil, Landscaping, and other related scopes of work not in Modular company's contract award.
 - j) Modular company responsible A/E design professionals will be required to assist in responding to all jurisdictional approvals (County of San Benito, Local Fire Marshal, Housing Community Development, etc.)

2. Modular Building Construction:

- a. Construction of 17,212 square foot modular SBC Behavioral per the Design Development Documents (drawings & specifications) created by HY Architects, dated November 9th, 2018, including all subsequent bid addenda issued during bid period.
- b. Modular company to include installation of design-build fire sprinkler system.
- c. Fire sprinkler system design is currently not in the bid set but will be provided by HY Architects and issued as a bid addendum.
- d. All onsite modular construction by required trades must be developed by prevailing wage labor. No exceptions.

c. WORK NOT INCLUDED

- 1. Fire Alarm System will be purchased and installed by Others. Modular company required to coordinate installation after modular building components set in place for cabling and devices installation. Fire alarm connection to Air Handling Units above at deck level need coordination with Modular roofing system – accommodation for low voltage fire alarm wiring/conduit required.
- 2. All furniture will be Owner Furnished Owner Installed.
- 3. White noise system furnished and installed by Others.

4. Equipment not specified in Construction Documents will be Owner Furnished Owner Installed.
5. Site work by Others
 - a. Utilities will be provided 5ft from building – Modular company required to connect utilities to building systems.
 - b. Grubbing, grading, and pad preparation based on geotechnical report by Others. Building staking, foundation related trenching/excavation, foundation, building by Modular company.
6. Security intrusion system (contacts, monitors, etc.) by Others.
7. Entrance Canopy & back staff Patio Canopy and low wall construction currently not in scope of work – by Others.
8. Signage by Others except for code related ADA signage as defined in HY Architects drawings.

a. **CONTRACTOR'S USE OF SITE AND PREMISES**

- i. Contractor shall have limited use of the site and premises throughout the construction period. Refer to Division 0 – General Conditions.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

SECTION 01 11 09 CONTRACT CONSIDERATIONS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Cash Allowances.
- B. Schedule of Values.
- C. Application for Payment.
- D. Defect assessment.
- E. Non-payment for rejected Work.
- F. Change procedures.
- G. Alternates.
- H. Unit prices.

1.2 MATERIAL AND LABOR CASH ALLOWANCES

- A. Include in the Contract Sum all Allowances stated herein.
- B. Costs Included in Allowances: Cost of product to Contractor or subcontractor, less applicable trade discounts; delivery to site and applicable taxes.
- C. Funds will be drawn from Allowance amount only by written authorization of the County.
- D. At closeout of Contract, funds remaining in Allowance amount will be credited to County by Change Order.
- E. Whenever costs are more than Allowance amount, the Contract Sum will be adjusted accordingly by Change Order.
- F. Contractor Responsibilities:
 - 1. Assist Architect in selection of products and suppliers.
 - 2. Obtain proposals from suppliers and offer recommendations.
 - 3. On notification of selection by County, execute agreement with designated supplier.
 - 4. Arrange for and process Shop Drawings, Product Data, and Samples. Arrange for delivery and product handling at site.

5. Promptly inspect products upon delivery for completeness, damage, and defects. Submit claims for damage.

1.3 SCHEDULE OF VALUES

- A. Submit Schedule of Values.
- B. Format: Submit typed schedule based upon the attached Schedule of Values augmented by the Table of Contents of this Project Manual. Identify each line item with number and title of the major Specification Section.
- C. Include in each line item, the amount of Allowances specified in this Section.
- D. Include within each line item, a directly proportional amount of Contractor's overhead and profit.
- E. Revise schedule to list approved Change Orders, on continuation sheet, with each Application for Payment.

1.4 NON-PAYMENT FOR REJECTED WORK

- A. Payment will not be made for any of the following:
 1. Products wasted or disposed of in a manner that is not acceptable.
 2. Products determined to be unacceptable before or after placement.
 3. Products not completely unloaded from the transporting vehicle.
 4. Products placed beyond the lines and levels of the required Work.
 5. Products remaining on hand after completion of the Work.
 6. Loading, hauling and disposing of rejected products.

1.5 CHANGE PROCEDURES

- A. The Architect will advise of minor changes in the Work not involving an adjustment to Contract Sum or Contract Time as authorized by the General Conditions.
- B. The Architect may issue a Price Request (PR) which includes a detailed description of a proposed change with supplementary or revised Drawings and Specifications. Contractor shall prepare and submit a detailed estimate within 14 days.
- C. Any change in the Work which involves the adjustment to Contract Sum or Contract Time shall be properly certified by the Contractor as indicated in the General Conditions of the Contract.
- D. The Contractor may propose a change by submitting a Proposed Change Order (PCO) to the Architect, describing the proposed change and its full effect on the Work. Include a statement describing the reason for the change, and the effect on the Contract Sum and

Contract Time with full documentation and a statement describing the effect on Work by separate or other contractors if applicable.

- E. Stipulated Sum Change Order: Based on Price Request and Contractor's fixed price quotation or Proposed Change Order Request as approved by Architect.
- F. Time and Material/Force Account Change Order: Submit itemized account and supporting data after completion of change, within time limits indicated in the General Conditions of the Contract.
- G. Maintain detailed records of Work done on Time and Material/Force Account basis. Provide full information required for evaluation of proposed changes, and to substantiate costs for changes in the Work as indicated in the General Conditions of the Contract.
- H. Construction Change Directive: Architect may issue a directive, signed by the County and Architect, instructing the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order. Document will describe changes in the Work, and designate method of determining any change in Contract Sum or Contract Time. Promptly execute the change.
- I. Force Account Directive: Architect may issue a directive, signed by the County and Architect, to proceed with a change in the Work on a direct cost basis as indicated in the General Conditions of the Contract.
- J. Execution of Change Orders: Architect will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.
- K. All Addenda (changes and/or revisions prior to Award of Contract) and Change Orders (changes and revisions after Award of Contract) shall be approved by the Architect and the Division of the State Architect prior to start of construction covered by those changes and/or revisions.
- L. Promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum.
- M. Promptly revise progress schedules to reflect any changes in Contract Time, revise sub-schedules to adjust times for other items of Work affected by the change and resubmit.
- N. Promptly enter changes in Project Record Documents.

1.6 ALTERNATES

- A. An Alternate is an amount proposed by the bidder and stated on the Bid Form for certain Work defined herein that may be added to or deducted from the Base Bid amount if the County decides to accept a corresponding change in either the amount of construction to be completed, or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
- B. The cost for each Alternate is the net addition to or deduction from the Contract Sum to incorporate the Alternate into the Work.

- C. Include as part of each Alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not specifically mentioned as part of the Alternate.
- D. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at the Owner's option. Accepted Alternates will be identified in Owner-Contractor Agreement.
- E. Coordinate related Work and modify surrounding Work as required to integrate the Work of each Alternate.
- F. Execute accepted Alternates under the same conditions as other Work of this Contract.

PART 2 - PRODUCTS

Not used

PART 3 - EXECUTION

Not used

END OF SECTION

**FORM A (Sample)
Schedule of Values
Modernization/New Construction**

Project:

Project Manager:

General Contractor:

Date:

Item No.	Description of Work	% of Total Contract	Total Dollar Amount Value
1	Hazardous Material Abatement	%	\$
2	Buildings Demolition and Clearing	%	\$
3	Site Work	%	\$
4	Foundation	%	\$
5	Structural Steel	%	\$
6	Rough Carpentry	%	\$
7	Custom Wood Case Work	%	\$
8	Finish Carpentry	%	\$
9	Insulation and Thermal Protection	%	\$
10	Roofing	%	\$
11	Sheet Metal Flashing and Trim	%	\$
12	Doors	%	\$
13	Windows	%	\$
14	Finish Hardware	%	\$
15	Glazing	%	\$
16	Ceramic Tile Wall Finish	%	\$
17	Acoustical Ceilings	%	\$
18	Flooring	%	\$
19	Interior Painting	%	\$
20	Exterior Painting	%	\$
21	Restrooms and Toilet Partitions	%	\$
22	Marker Boards and Tackboards	%	\$
23	Toilet and Bath Accessories	%	\$
24	Furniture and Equipment	%	\$
25	Window Shades	%	\$
26	Fire Alarm System	%	\$
27	Plumbing and Fixtures	%	\$
28	HVAC	%	\$
29	Electrical	%	\$
30	Interior Lighting	%	\$
31	Technology / Computers	%	\$
32	Security Systems	%	\$
33	Telecommunications	%	\$

34	Wall Systems			%	\$
35	Painting			%	\$
36	Stage Upgrade			%	\$
37	Kitchen Upgrade			%	\$
38	Exterior Lighting			%	\$
39	Portable Installation			%	\$
40	Fire Life Safety			%	\$
41	Elevator			%	\$
42	As-Builts			%	\$
	Totals:			%	\$

COST BREAKDOWN FORM FOR CONTRACT MODIFICATION

SHEET 1 OF 4

One separate form shall be used by Contractor, each first tier subcontractor and each lower tier subcontractor. One form for each shall be used for each Change Order. One form for each, for each day shall be used for Force-Account Work.

CHANGE ORDER NUMBER: DATE:

CHANGE ORDER DESCRIPTION:

CONTRACTOR:

LABOR				
NAME	CLASSIFICATION	HOURS	RATE	TOTAL
TOTAL LABOR COSTS (Enter here and on Line 1 of Sheet 4)				

COST BREAKDOWN FORM FOR CONTRACT MODIFICATION

SHEET 2 OF 4

MATERIALS	
DESCRIPTION	COST
TOTAL MATERIAL COSTS (Enter here and on Line 4 of Sheet 4)	

COST BREAKDOWN FOR CONTRACT MODIFICATION

SHEET 3 of 4

EQUIPMENT RENTAL				
SIZE & TYPE OF EQUIPMENT	IDENT. NO.	HOURS	RATE	TOTAL
TOTAL EQUIPMENT RENTAL COSTS (Enter here and on Line 8 of Sheet 4)				

SPECIALIST	
DESCRIPTION OF WORK	COST
TOTAL SPECIALIST COSTS (Enter here and on Line 11 of Sheet 4)	

COST BREAKDOWN FORM FOR CONTRACT MODIFICATION

SHEET 4 OF 4

TOTAL COSTS		
1.	TOTAL LABOR COSTS	\$
2.	15% of Line 1	\$
3.	ADD Lines 1 and 2	\$
4.	TOTAL MATERIAL COSTS	\$
5.	15% of Line 4	\$
6.	8.25% of Line 4	\$
7.	ADD Lines 4, 5, and 6	\$
8.	TOTAL EQUIPMENT RENTAL COSTS	\$
9.	15% of Line 8	\$
10.	ADD Lines 8 and 9	\$
11.	TOTAL SPECIALIST COSTS	\$
12.	15% of Line 11	\$
13.	ADD Lines 11 and 12	\$
14.	TOTAL COST OF EXTRA WORK (Add Lines 3, 7, 10 and 13.)	\$

CONTRACTOR OR AUTHORIZED REPRESENTATIVE

APPROVED BY INSPECTOR

RECAPITULATION COSTS FORM FOR CONTRACT MODIFICATION

Use this form to add total costs of extra Work of Contractor, first tier subcontractors and lower tier subcontractors. One form shall be used for each Change Order. One form shall be used each day for Force Account Work.

1. TOTAL COST OF CONTRACTOR'S EXTRA WORK (Line 14 from Sheet 4 of 4)		
2. First Tier Subcontractor	Cost of Extra Work	
2a.	\$	
2b.	\$	
2c.	\$	
2d.	\$	
2e.	\$	
2f.	\$	
3. Total Costs of First Tier Subcontractors' Extra Work (Add Lines 2a through 2f.)		\$
4. 5% of Line 3		\$
5. Lower Tier Subcontractor	Cost of Extra Work	
5a.	\$	
5b.	\$	
5c.	\$	
5d.	\$	
6. Total Costs of Lower Tier Subcontractors' Extra Work (Add Lines 5a through 5f.)		\$
7. 10% of Line 6		\$
8. CONTRACT CHANGE ORDER AMOUNT (Add Lines 1, 3, 4, 6, and 7.)		\$

CONTRACTOR OR AUTHORIZED REPRESENTATIVE

APPROVED BY INSPECTOR

CHANGE ORDER

CHANGE ORDER #:

PROJECT:

CONTRACT #:

CONTRACTOR:

CHANGE ORDER SCOPE:

CHANGE ORDER AMOUNT:

CONTRACT TIME ADJUSTMENT:

ADJUSTED COMPLETION DATE:

The signatures of the County and Contractor below indicate acceptance by both parties of the costs and time adjustments noted above as a part of this change to the Work. In conformance with the requirements of the Contract Documents, the Contractor agrees that said cost and time adjustments are full satisfaction for the extra Work described in this Change Order. No other costs arising out of or connected with the performance of the extra Work described in this Change Order, of any nature, may be recovered by the Contractor, except as authorized under the Contract Documents.

Approved by:

Contractor	Owner
Title	Title
Date	Date

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SECTION 01 20 00 PRICE AND PAYMENT PROCEDURES

PART 1 -GENERAL

1.1 SECTION INCLUDES

- A. Change Procedures.
- B. Schedule of Values.

1.2 CHANGE PROCEDURES

- A. Written Order: Architect may make minor changes in Work not involving adjustment to Contract Price or Contract Time as authorized by General Conditions, by issuing Architect's Supplemental Instructions or Instruction Bulletins.
- B. Request For Proposal: Architect may issue a Request For Proposal or Instruction Bulletin that includes detailed description of proposed change with supplementary or revised drawings and specifications, change in Contract Time for executing change and period of time during which requested price will be considered valid. Contractor shall prepare and submit the proposal within 7 days from issuance of the Request for Proposal or Instruction Bulletin.
- C. Change Order Request: Contractor may propose changes by submitting Change Order Request to Architect, describing proposed change and its full effect on the Work. Include statements describing reason for change, and effect on Contract Price and Contract Time with full documentation and statement describing effect on Work by separate or other contractors. Document any requested substitutions in accordance with Division 01, General Requirements.
- D. Construction Change Directive: Architect may issue Construction Change Directives or Instruction Bulletins signed by Owner and Architect directing Contractor to proceed with change in Work expeditiously without delay. Document will describe changes in Work and may designate method of determining any change in Contract Price or Contract Time, if any. Contractor shall promptly execute the change.
- E. Change Order: Issued in accordance with the General Conditions and Supplementary Conditions.
- F. Stipulated Price Change Order: Based on a Request For Proposal or Instruction Bulletin and Contractor's fixed price quotation or Contractor's for Change Order Request as approved by Architect.
- G. Time and Material Change Orders: Submit itemized account and supporting data after completion of change within time limits indicated in Conditions of Contract. Architect will determine change allowable In Contract Price and Contract Time as provided in Contract Documents.
 - 1. Maintain detailed records of work done on Time and Material basis. Provide full information required for evaluation of proposed changes, and to substantiate costs for changes in

- Work.
2. Refer to the General Conditions for additional requirements.
- H. Change Order Forms: AIA G701 Change Order or other form agreed with Anderson Family Health Center's Manager.
- I. Execution of Change Orders: Architect will issue Change Orders for signature of parties as provided in Conditions of the Contract.

1.3 SCHEDULE OF VALUES

- A. Submit printed schedule on AIA Forms G702 and G703 -Application and Certificate for Payment and Continuation Sheet. Contractor's standard form or electronic media printout will be considered, submit sample forms to Architect for approval.
1. Submit application for progress payment in accordance with the General and Supplementary Conditions.
- B. Submit Schedule of Values in duplicate within 15 calendar days after date of Owner-Contractor Agreement for Architect's approval.
- C. Format: Utilize Table of Contents of this Project Manual. Identify each line item with number and title of the major Specification Section. Identify site mobilization and bonds and insurance. List mechanical, electrical, plumbing and fire protection Work separately for each building and for site Work.
- D. Break down the plumbing and mechanical portions of the work at a minimum into a rough, finish, including air balance and electrical portion.
- E. Include separate line items, showing amount of General Contractor's overhead and profit, bonds and insurance, supervision, and then remainder of general items.
- F. Revise schedule to list approved Chang Order with each Application for Payment.

PART 2 – PRODUCTS

NOT USED.

PART 3 - EXECUTION

NOT USED.

END OF SECTION

SECTION 01 25 00 PRODUCT OPTIONS AND SUBSTITUTIONS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Product options.
- B. Substitutions.

1.2 DEFINITIONS

- A. Requests for changes in products, materials, or equipment required by Contract Documents proposed by the Contractor prior to and after award of the Contract are considered requests for substitutions. Contractor must refer to the Instructions to Bidders and the General Conditions for limitations on when requests for substitution(s) are permitted on this Project. The following are not considered substitutions:
 - 1. Revisions to Contract Documents requested by the Owner or Architect.
 - 2. Specified options of products, materials, and equipment included in Contract Documents.
- B. Whenever in the Specifications any material, process, or article is indicated or specified by grade, patent, or proprietary name, or by name of manufacturer, that Specification shall be used for the purpose of facilitating the description of that material, process, or article desired, and shall be assumed to be followed by the words "or approved equal," except when the product is designated to match others in use on a particular public improvement whether completed or in the course of completion.

1.3 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Any product meeting those standards or description may be used.
- B. Products Specified by Naming One or More Manufacturers with or without Provision for Substitution: Provide products of manufacturers named and meeting Specifications, with substitution of products or manufacturers only when submitted under provisions of this Section.

1.4 LIMITATIONS ON SUBSTITUTIONS SUBMITTED PRIOR TO THE RECEIPT OF BIDS

- A. The bid shall be based upon the standards of quality established by those items of equipment and/or materials which are specifically identified in the Contract Documents.
- B. Architect may consider requests for substitutions of specified equipment and/or materials only prior to bid and only when requests are received by Architect within the time indicated in the Instructions to Bidders.
- C. Consideration by Architect of a substitution request will be made only if request is made in strict conformance with provisions of this Section.

- D. Burden of proof of merit of requested substitution is the responsibility of the entity requesting the substitution.
- E. It is the sole responsibility of the entity requesting the substitution to establish proper content of submittal for requests for substitutions. Incomplete submittals will be rejected.
- F. Architect's decision on substitution requests are final and do not require documentation or justification.
- G. When substitution is not accepted, provide specified product.
- H. Substitute products shall not be included within the bid without written acceptance by Addendum.

1.5 LIMITATIONS ON SUBSTITUTIONS

- A. Owner will not consider any substitution requests submitted after the bids are opened. All requests for substitutions shall be submitted prior to the date the bids are opened and in compliance with the provisions stated herein in the Contract Documents.
- B. The Contract is based upon the standards of quality established by those items of equipment and/or materials which are specifically identified in the Contract Documents.
- C. Consideration by Architect will be made only if request is made in strict conformance with provisions of this Section.

1.6 REGULATORY REQUIREMENTS

- A. It shall be the responsibility of the entity requesting the substitution to obtain all regulatory approvals required for proposed substitutions.
- B. All regulatory approvals shall be obtained for proposed substitutions prior to submittal of substitution request to Architect.
- C. All costs incurred by the Owner in obtaining regulatory approvals for proposed substitutions to include the costs of the Architect and any authority having jurisdiction over the project shall be reimbursed to the Owner. Costs of these services shall be reimbursed regardless of final acceptance or rejection of substitution.

1.7 SUBSTITUTION REPRESENTATION

- A. In submitting a request for substitution, the entity requesting the substitution makes the representation that he or she:
 - 1. Has investigated the proposed substitution and has determined that it meets or exceeds the quality level of the specified product.
 - 2. Has determined that all components of the proposed substitution are identical and fully interchangeable with the product name and number specified.

3. Will provide the same warranty or guarantee for the substitution as for the specified product.
 4. Will coordinate installation and make changes to other Work which may be required for the Work to be completed with no additional cost to the Owner.
 5. Waives claims for additional cost or time extension which may subsequently become apparent.
 6. Will reimburse Owner for the cost of Architect's review or redesign services associated with substitution request, including reviews by agencies having jurisdiction. Additional time required for Architect or agency reviews shall not be construed as construction delay.
- B. Maximum of two substitutions may be proposed.
- C. If specified product is no longer available, Contractor shall provide proof from the specified manufacturer indicating the product is not available.

1.8 SUBMITTAL PROCEDURE

- A. Submit two digital copies of each request.
- B. Submit request with Architect's Substitution Request Form. Form may be obtained at the office of the Architect. Substitution requests received without request form will be returned un-reviewed.
- C. Limit each request to one proposed substitution.
- D. Request to include sufficient data so that direct comparison of proposed substitution can be made.
- E. Provide complete documentation for each request. Documentation shall include the following information, as appropriate, as a minimum:
 1. Statement of cause for substitution request.
 2. Identify product by Specification Section and Article Number.
 3. Provide manufacturer's name, address, and phone number. List fabricators, suppliers, and installers as appropriate.
 4. List similar projects where proposed substitution has been used, dates of installation and names of Architect and Owner.
 5. List availability of maintenance services and replacement materials.
 6. Documented or confirmation of regulatory approval.
 7. Product Data, including drawings and descriptions of products.
 8. Fabrication and installation procedures.
 9. Samples of proposed substitutions.

10. Itemized comparison of significant qualities of the proposed substitution with those of the product specified. Significant qualities may include size, weight, durability, performance requirements and visual effects.
 11. Coordination information, including a list of changes or modifications needed to other items of Work that will become necessary to accommodate proposed substitution.
 12. Statement on the substitutions effect on the construction schedule.
 13. Cost information including a proposal of the net reduction in cost to the Contract Sum if the proposed bid substitution is accepted.
 14. Certification that the substitution is equal to or better in every respect to that required by the Contract Documents and that substitution will perform adequately in the application intended.
 15. Waiver of right to additional payment or time that may subsequently become necessary because of failure of substitution to perform adequately.
- F. Inadequate warranty, vagueness of submittal, failure to meet specified requirements, or submittal of insufficient data will be cause for rejection of substitution request.

1.9 ARCHITECT'S REVIEW

- A. The Architect will accept or reject proposed substitution within a reasonable amount of time.
- B. If a decision on a substitution cannot be made prior to the date set for bid opening, the product specified shall be used.
- C. There shall be no claim for additional time for review of proposed substitutions.
- D. Final acceptance of a substitution submitted prior to the date established for the receipt of bids will be in the form of an addendum.

PART 2 - PRODUCTS

Not used

PART 3 - EXECUTION

Not used

END OF SECTION

SECTION 01 31 19 COORDINATION AND MEETINGS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Coordination.
- B. Field engineering.
- C. Preconstruction conference.
- D. Progress meetings.
- E. Preinstallation conferences.
- F. Post construction dedication.

1.2 COORDINATION

- A. Coordinate scheduling, submittals, and Work of the various Sections of Specifications to assure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- B. Prior to commencement of a particular type or kind of Work examine relevant information, Contract Documents, and subsequent data issued to the Project.
- C. Verify that utility requirement characteristics of operating equipment are compatible with building utilities. Coordinate Work of various Sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- D. Coordinate space requirements and installation of mechanical and electrical Work which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with line of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
- F. In locations where several elements of mechanical and electrical Work must be sequenced and positioned with precision in order to fit into available space, prepare coordination drawings showing the actual conditions required for the

installation. Prepare coordination drawings prior to purchasing, fabricating or installing any of the elements required to be coordinated.

- G. Closing up of walls, partitions or furred spaces, backfilling and other covering up operations shall not proceed until all enclosed or covered Work and inspections have been completed. Verify before proceeding.
- H. Coordinate completion and clean up of Work of separate Sections in preparation for completion and for portions of Work designated for County occupancy.
- I. After County occupancy of premises, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of County's activities.
- J. Coordinate all utility company work in accordance with the General Conditions.

1.3 FIELD ENGINEERING

- A. Contractor shall employ a Land Surveyor registered in the State of California and acceptable to the County.
- B. Control datum for survey is that established by County provided survey. Contractor shall locate and protect survey control and reference points.
- C. Replace dislocated survey control points based on original survey control.
- D. Provide field engineering services. Establish elevations, lines, and levels, utilizing recognized engineering survey practices.
- E. Upon completion of Work, submit certificate, signed by the Land Surveyor, that elevations and locations of Work are in conformance with Contract Documents. Record deviations on Record Drawings.

1.4 PRECONSTRUCTION CONFERENCE

- A. The County will schedule a conference immediately after receipt of fully executed Contract Documents prior to project mobilization.
- B. Mandatory Attendance: County, Inspector of Record, Architect, Contractor, Contractor's Project Manager, and Contractor's Job/Project Superintendent.
- C. Optional Attendance: Architect's consultants, subcontractors, and utility company representatives.
- D. Architect and Construction Manager will preside at conference, and Architect will review and approve minutes prior to distribution of copies.
- E. Agenda:

1. Execution of County-Contractor Agreement.
2. Issue Notice to Proceed.
3. Submission of executed bonds and insurance certificates.
4. Distribution of Contract Documents.
5. Submission of list of subcontractors, list of products, schedule of values, and progress schedule.
6. Designation of responsible personnel representing the parties.
7. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
8. Scheduling.

1.5 PROGRESS MEETINGS

- A. Construction Manager will schedule and administer meetings throughout progress of the Work at a minimum of once per week.
- B. Construction Manager will make arrangements for meetings, prepare agenda, preside at meetings, record minutes (Field Reports), and distribute copies. Architect will review and approve all minutes prior to distribution.
- C. Attendance Required: Job Superintendent, Construction Manager, Inspector of Record, Architect, and subcontractors and suppliers as appropriate to agenda topics for each meeting.
- D. Agenda:
 1. Review minutes of previous meetings. (Field Reports)
 2. Review of Work progress.
 3. Field observations, problems, and decisions.
 4. Identification of problems, which impede planned progress.
 5. Review of submittals schedule and status of submittals.
 6. Review of off-site fabrication and delivery schedules.
 7. Maintenance of construction schedule.
 8. Corrective measures to regain projected schedules.

9. Planned progress during succeeding Work period.
10. Coordination of projected progress.
11. Maintenance of quality and Work standards.
12. Effect of proposed changes on progress schedule and coordination.
13. Other business relating to Work.

1.6 PREINSTALLATION CONFERENCES

- A. When required in individual Specification Section, Contractor shall convene a preinstallation conference prior to commencing Work of the Section. Refer to individual Specification Section for timing requirements of conference.
- B. Require attendance of parties directly affecting, or affected by, Work of the specific Section.
- C. Notify Architect four (4) days in advance of meeting date.
- D. Preinstallation conference to coincide with regularly scheduled progress meeting wherever possible.
- E. Architect shall prepare agenda, preside at conference, record minutes, and distribute copies within two (2) days after conference to participants.
- F. Review Contract Documents, conditions of installation, preparation and installation procedures, and coordination with related Work and manufacturer's recommendations.
- G. Preinstallation Schedule: As a minimum, Work being installed under the following Sections will require preinstallation conferences. Contractor shall review the technical Specifications and add all additional requirements for preinstallation meetings contained in those Sections.

Section 02 41 16 – Building Demolition

Section 03 36 00 – Concrete Testing and Inspection

Section 07 13 00 – Weather Resistive Barrier and Flashing

Section 23 80 00 – Heating, Ventilating and Air-Conditioning.

Section 26 05 00 – Basic Electrical Materials and Methods.

1.7 POST CONSTRUCTION DEDICATION

- A. Attendance Required: Project Superintendent, Project Manager, major subcontractors, County, and Architect.

PART 2 - PRODUCTS

Not used

PART 3 - EXECUTION

Not used

END OF SECTION

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SECTION 01 32 16 CONSTRUCTION SCHEDULE

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. References.
- B. Performance requirements.
- C. Quality assurance.
- D. Qualifications.
- E. Project record documents.
- F. Submittals.
- G. Review and evaluation.
- H. Format.
- I. Cost and schedule reports.
- J. Early work schedule.
- K. Construction schedule.
- L. Short interval schedule.
- M. Requested time adjustment schedule.
- N. Recovery schedule.
- O. Updating schedules.
- P. Distribution.

1.2 REFERENCES

- A. Construction Project Planning and Scheduling Guidelines, latest edition, available from The Associated General Contractors of America (AGC). (916) 371-2422.
- B. CSI - Construction Specifications Institute MP-2-1 Master Format.

- C. United States National Weather Service - Local Climatological Data.

1.3 PERFORMANCE REQUIREMENTS

- A. Ensure adequate scheduling during construction activities so Work may be prosecuted in an orderly and expeditious manner within stipulated Contract Time.
- B. Ensure coordination of Contractor and subcontractors at all levels.
- C. Ensure coordination of submittals, fabrication, delivery, erection, installation, and testing of materials and equipment.
- D. Ensure on-time delivery of County-furnished materials and equipment.
- E. Ensure coordination of jurisdictional reviews.
- F. Assist in preparation and evaluation of applications for payment.
- G. Assist in monitoring progress of Work.
- H. Assist in evaluation of proposed changes to Contract Time.
- I. Assist in evaluation of proposed changes to Construction Schedule.
- J. Assist in detection of schedule delays and identification of corrective actions.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with Construction Planning and Scheduling Manual published by the AGC.
- B. Maintain one copy of document on site.
- C. In the event of discrepancy between the AGC publication and this Section, provisions of this Section shall govern.

1.5 QUALIFICATIONS

- A. Scheduler: Contractor shall engage trained personnel or specialist consultant with five years minimum experience in scheduling construction work of a complexity and size comparable to this Project, who can demonstrate proficiency in the system used.
- B. Administrative Personnel: Five years minimum experience in using and monitoring schedules on comparable projects.

1.6 PROJECT RECORD DOCUMENTS

- A. Submit Record Documents under provisions of Section 01 78 39.

- D. Submit one reproducible and two copies of final Record Construction Schedule which reflects actual construction of this Project.
- C. Record Construction Schedule shall be certified for compliance with actual way Project was constructed.
- D. Receipt of Record Construction Schedule shall be a condition precedent to any retainage release or final payment.

1.7 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Within ten (10) days from the Notice to Proceed submit proposed Early Work Schedule and preliminary Cost Report defining activities for first 60 days of Work.
- C. Within 45 days from Notice of Award submit proposed Construction Schedule and final Cost Report.
- D. Submit updated Construction Schedule with each Application for Payment.
- E. Submit Short Interval Schedule at each Construction Progress Meeting.
- F. Submit Time Adjustment Schedule within five days of commencement of a claimed delay.
- G. Submit Recovery Schedules as required by completion of Work.
- H. Submit one reproducible and two copies of each schedule and cost report.

1.8 REVIEW AND EVALUATION

- A. Early Work Schedule shall be reviewed during Preconstruction Conference with County and Architect.
- B. Within five days of receipt of County and Architect's comments provide satisfactory revision to Early Work Schedule or adequate justification for activities in question.
- C. Acceptance by County of corrected Early Work Schedule shall be a condition precedent to making any progress payments for first 60 days of Contract.
- D. Cost loaded values of Early Work Schedule shall be basis for determining progress payments during first 60 days of Contract.
- E. Participate in joint review of Construction Schedule and Reports with County and Architect.

- F. Within seven days of receipt of County and Architect's comments provide satisfactory revision to Construction Schedule or adequate justification for activities in question.
- G. In the event that an activity or element of work is not detected by County or Architect review, such omission or error shall be corrected by next scheduled update and shall not affect Contract Time.
- H. Acceptance by County of corrected Construction Schedule shall be a condition precedent to making any progress payments after first 60 days of Contract.
- I. Cost-loaded values of Construction Schedule shall be basis for determining progress payments.
- J. Review and acceptance by County and Architect of Early Work Schedule or Construction Schedule does not constitute responsibility whatsoever for accuracy or feasibility of schedules, nor does such acceptance expressly or impliedly warrant, acknowledge or admit reasonableness of activities, logic, duration, manpower, cost or equipment loading stated, or implied on schedules.

1.9 FORMAT

- A. Prepare diagrams and supporting mathematical analyses using Precedence Diagramming Method, under concepts and methods outlined in AGC Construction Planning and Scheduling Manual.
- B. Listings: Reading from left to right, in ascending order for each activity.
- C. Diagram Size: 42 inches maximum height x width required.
- D. Scale and Spacing: To allow for legible notations and revisions.
- E. Illustrate order and interdependence of activities and sequence of Work.
- F. Illustrate complete sequence of construction by activity.
- G. Provide legend of symbols and abbreviations used.

1.10 COST AND SCHEDULE REPORTS

- A. Activity Analysis: Tabulate each activity of network diagram and identify for each activity:
 - 1. Description.
 - 2. Interface with outside contractors or agencies.
 - 3. Number.

4. Preceding and following number.
 5. Duration.
 6. Earliest start date.
 7. Earliest finish date.
 8. Actual start date.
 9. Actual finish date.
 10. Latest start date.
 11. Latest finish date.
 12. Total and free float.
 13. Identification of critical path activity.
 14. Monetary value keyed to Schedule of Values.
 15. Manpower requirements.
 16. Responsibility.
 17. Percentage complete.
 18. Variance positive or negative.
- B. Cost Report: Tabulate each activity of network diagram and identify for each activity:
1. Description.
 2. Number.
 3. Total cost.
 4. Percentage complete.
 5. Value prior to current period.
 6. Value this period.
 7. Value to date.
- C. Required Sorts: List activities in sorts or groups:

1. By activity number.
2. By amount of float time in order of early start.
3. By responsibility in order of earliest start date.
4. In order of latest start dates.
5. In order of latest finish dates.
6. Application for payment sorted by Schedule of Values.
7. Listing of activities on critical path.
8. Listing of basic input data which generates schedule.

1.11 EARLY WORK SCHEDULE

- A. Shall establish Scope of Work to be performed during first 60 days of Contract.
- B. Shall designate critical path or paths.
- C. Shall contain the following phases and activities:
 1. Procurement activities to include mobilization, Shop Drawings and Sample submittals.
 2. Identification of key and long-lead elements and realistic delivery dates.
 3. Construction activities in units of whole days limited to 14 days for each activity except non-construction activities for procurement and delivery.
 4. Approximate cost and duration of each activity.
- D. Shall contain seasonal weather considerations. Seasonal rainfall shall be 10-year average for the month as evidenced by Local Climatological Data obtained from United States National Weather Service.
- E. Activities shall be incorporated into Construction Schedule.
- F. No application for payment will be evaluated or processed until Early Work Schedule has been submitted and reviewed.
- G. Shall be updated on a monthly basis while Construction Schedule is being developed.
- H. Failure to submit an adequate or accurate Early Work Schedule or failure to submit on established dates will be considered a breach of Contract.

1.12 CONSTRUCTION SCHEDULE

- A. Include Early Work Schedule as first 60 days of Construction Schedule.
- B. Shall be a computer generated, time-scaled network diagram of activities.
- C. Indicate a completion date for Project that is no later than required completion date subject to any time extensions processed as part of a Change Order.
- D. Conform to mandatory dates specified in the Contract Documents.
- E. Should schedule indicate a completion date earlier than any required completion date, County or Architect shall not be liable for any costs should Project be unable to be completed by such date.
- F. Seasonal weather shall be considered in planning and scheduling of all Work. Seasonal rainfall shall be 10-year average for the month as evidenced by Local Climatological Data obtained from United States National Weather Service.
- G. Level of detail shall correspond to complexity of Work involved.
- H. Indicate procurement activities, delivery, and installation of County- furnished material and equipment.
- I. Designate critical path or paths.
- J. Subcontractor Work at all levels shall be included in schedule.
- K. As developed shall show sequence and interdependence of activities required for complete performance of Work.
- L. Shall be logical and show a coordinated plan of Work.
- M. Show order of activities and major points of interface, including specific dates of completion.
- N. Duration of activities shall be coordinated with subcontractors and suppliers and shall be best estimate of time required.
- O. Shall show description, duration, and float for each activity.
- P. Failure to include any activity shall not be an excuse for completing all Work by required completion date.
- Q. Activities of long intervals shall be broken into increments no longer than 14 days, or a value over \$20,000.00 unless approved by the County or it is non-construction activity for procurement and delivery.
- R. An activity shall meet the following criteria:

1. Any portion or element of Work, action, or reaction that is precisely described, readily identifiable, and is a function of a logical sequential process.
 2. Descriptions shall be clear and concise. Beginning and end shall be readily verifiable. Starts and finishes shall be scheduled by logical restraints.
 3. Responsibility shall be identified with a single performing entity.
 4. Additional codes shall identify building, floor, bid item, and CSI classification.
 5. Assigned dollar value (cost-loading) of each activity shall cumulatively equal total Contract Amount. Mobilization, bond and insurance costs shall be separate. General Requirement costs, overhead, profit, shall be prorated throughout all activities. Activity costs shall correlate with Schedule of Values.
 6. Each activity shall have manpower-loading assigned.
 7. Major construction equipment shall be assigned to each activity.
 8. Activities labeled start, continue or completion is not allowed.
- S. For major equipment and materials show a sequence of activities including:
1. Preparation of Shop Drawings and Sample submissions.
 2. Review of Shop Drawings and Samples.
 3. Finish and color selection.
 4. Fabrication and delivery.
 5. Erection or installation.
 6. Testing.
- T. Include a minimum of 15 days prior to completion date for punch lists and clean up. No other activities shall be scheduled during this period.

1.13 SHORT INTERVAL SCHEDULE

- A. Shall be fully developed horizontal bar-chart-type schedule directly derived from Construction Schedule.
- B. Prepare schedule on sheet of sufficient width to clearly show data.
- C. Provide continuous heavy vertical line identifying first day of week.

- D. Provide continuous subordinate vertical line identifying each day of week.
- E. Identify activities by same activity number and description as Construction Schedule.
- F. Show each activity in proper sequence.
- G. Indicate graphically sequences necessary for related activities.
- H. Indicate activities completed or in progress for previous two-week period.
- I. Indicate activities scheduled for succeeding two-week period.
- J. Further detail may be added if necessary to monitor schedule.

1.14 REQUESTED TIME ADJUSTMENT SCHEDULE

- A. Updated Construction Schedule shall not show a completion date later than the Contract Time, subject to any time extensions processed as part of a Change Order.
- B. If an extension of time is requested, a separate schedule entitled "Requested Time Adjustment Schedule" shall be submitted to County and Architect.
- C. Indicate requested adjustments in Contract Time which are due to changes or delays in completion of Work.
- D. Extension request shall include forecast of Project completion date and actual achievement of any dates listed in the Agreement.
- E. To the extent that any requests are pending at time of any Construction Schedule update, Time Adjustment Schedule shall also be updated.
- F. Schedule shall be a time-scaled network analysis.
- G. Accompany schedule with formal written time extension request and detailed impact analysis justifying extension.
- H. Time impact analysis shall demonstrate time impact based upon date of delay, and status of construction at that time and event time computation of all affected activities. Event times shall be those as shown in latest Construction Schedule.
- I. Activity delays shall not automatically constitute an extension of Contract Time.
- J. Failure of subcontractors shall not be justification for an extension of time.
- K. Float is not for the exclusive use or benefit of any single party. Float time shall be apportioned according to needs of project, as determined by the County.

- L. Float suppression techniques such as preferential sequencing, special lead/lag logic restraints, extended activity durations, or imposed dates shall be apportioned according to benefit of Project.
- M. Extensions will be granted only to extent that time adjustments to activities exceed total positive float of the critical path and extends Contract completion date.
- N. County] shall not have an obligation to consider any time extension request unless requirements of Contract Documents, and specifically, but not limited to these requirements are complied with.
- O. County shall not be responsible or liable for any construction acceleration due to failure of County to grant time extensions under Contract Documents should requested adjustments in Contract Time not substantially comply with submission and justification requirements of Contract for time extension requests.
- P. In the event a Requested Time Adjustment Schedule and Time Impact Analysis are not submitted within 10 days after commencement of a delay, it is mutually agreed that delay does not require a Contract Time extension.

1.15 RECOVERY SCHEDULE

- A. When activities are behind Construction Schedule a supplementary Recovery Schedule shall be submitted.
- B. Form and detail shall be sufficient to explain and display how activities will be rescheduled to regain compliance with Construction Schedule.
- C. Maximum duration shall be one month and shall coincide with payment period.
- D. Ten days prior to expiration of Recovery Schedule verification to determine if activities have regained compliance with Construction Schedule will be made. Based upon this verification the following will occur:
 - 1. Supplemental Recovery Schedule will be submitted to address subsequent payment period.
 - 2. Construction Schedule will be resumed.

1.16 UPDATING SCHEDULES

- A. Review and update schedule at least 10 days prior to submitting an Application for Payment.
- B. Maintain schedule to record actual prosecution and progress.

- C. Approved Change Orders that affect schedule shall be identified as separate new activities.
- D. Change Orders of less than \$5,000.00 value or less than three days duration need not be shown unless critical path is affected.
- E. No other revisions shall be made to schedule unless authorized by County.
- F. Provide narrative Progress Report at time of schedule update that details the following:
 - 1. Activities or portions of activities completed during previous reporting period.
 - 2. Actual start dates for activities currently in progress.
 - 3. Deviations from critical path in days ahead or behind.
 - 4. List of major construction equipment used during reporting period and any equipment idle.
 - 5. Number of personnel by craft engaged on Work during reporting period.
 - 6. Progress analysis describing problem areas.
 - 7. Current and anticipated delay factors and their impact.
 - 8. Proposed corrective actions and logic revisions for Recovery Schedule.
 - 9. Proposed modifications, additions, deletions, and changes in logic of Construction Schedule.
- G. Schedule update will form basis upon which progress payments will be made.
- H. County will not be obligated to review or process Application for Payment until schedule and Progress Report have been submitted.

1.17 DISTRIBUTION

- A. Following joint review and acceptance of updated schedules distribute copies to County, Architect, and all other concerned parties.
- B. Instruct recipients to promptly report in writing any problem anticipated by projections shown in schedule.

PART 2 - PRODUCTS

Not used

PART 3 - EXECUTION

Not used

END OF SECTION

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SECTION 01 33 00
SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Submittal procedures.
- B. Proposed products list.
- C. Shop Drawings.
- D. Product Data.
- E. Samples.
- F. Manufacturers' instructions.
- G. Manufacturers' certificates.
- H. Deferred approval requirements.
- I. Submittal schedule.

1.2 SUBMITTAL PROCEDURES

- A. Transmit each submittal in conformance with requirements of this Section.
- B. Sequentially number the transmittal forms. Resubmittals to have original number with a numerical suffix. Architect will not review more than 1 resubmittal for a specified product.
- C. Identify Project and Architect's project number, Contractor, subcontractor or supplier; pertinent Drawing sheet and detail number(s), and Specification Section number, as appropriate.
- D. Apply Contractor's stamp, signed or initialed certifying that review, verification of products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with the requirements of the Work and Contract Documents. Submittals without Contractor's stamp and signature will be returned without review. Incomplete submittals will be returned without review.
- E. Schedule submittals to expedite the Project, and deliver to Architect. Schedule shall include all items requiring color selection to be simultaneously submitted.
- F. Make submittals in groups containing associated and related items to make sure that information is available for checking each item when it is received. Submittals for all items requiring color selection must be received before any will be approved.

- G. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until all related submittals are received.
- H. Make submittals far enough in advance of scheduled dates for installation to provide time for review and possible revisions and resubmission prior to approval and subsequent placement of orders.
- I. No extension of Contract Time will be authorized because of failure to transmit submittals to the Architect sufficiently in advance of the Work to permit processing.
- J. Identify variations from Contract Documents and product or system limitations which may be detrimental to successful performance of the completed Work.
- K. Provide space for Contractor and Architect review stamps.
- L. Revise and resubmit submittals as required, identify all changes made since previous submittal.
- M. Distribute copies of reviewed submittals to concerned parties. Instruct parties to promptly report any inability to comply with provisions.
- N. Submittals not requested will not be recognized or processed. Submittals not requested will be returned without review.

1.3 PROPOSED PRODUCTS LIST

- A. Within 10 calendar days after date of Notice to Proceed, submit complete list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
- B. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

1.4 SHOP DRAWINGS

- A. Submit (5) five sets of printed Shop Drawings in accordance with the submittal list. Review comments will be shown on the transparency and Contractor may make and distribute such copies as are required for his purposes.
- B. After review, distribute in accordance with procedures specified above and for Record Documents described in Section 01 78 39, Project Record Documents.
- C. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not a Shop Drawing.
- D. Do not use or allow others to use Shop Drawings which have been submitted and have been rejected.

1.5 PRODUCT DATA

- A. When specified in individual Specification Sections, submit as a PDF and email to Architect and copy Owner staff and IOR.

- B. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information unique to this Project.
- C. After review, distribute in accordance with procedures specified above and provide copies for Record Documents described in Section 01 78 39, Project Record Documents.

1.6 SAMPLES

- A. Submit Samples to illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate Sample submittals for interfacing Work.
- B. Where specific colors or patterns are not indicated, provide materials and products specified in the full range of color, texture and pattern for selection by Architect. Range shall include standard stocked color/texture/pattern, standard color/texture/pattern not stocked, but available from manufacturer, and special color/ texture/pattern available from manufacturer as advertised in Product Data and brochures. Unless otherwise indicated in individual Specification Sections, Architect may select from any range at no additional cost to Owner.
- C. Include identification on each Sample, with full Project information.
- D. Submit (5) full samples.
- E. Reviewed Samples which may be used in the Work are indicated in individual Specification Sections.

1.7 MANUFACTURER'S INSTRUCTIONS

- A. When specified in individual Specification Sections, submit manufacturers' printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, in quantities specified for Product Data.
- B. Identify conflicts between manufacturers' instructions and Contract Documents.

1.8 MANUFACTURER'S CERTIFICATES

- A. When specified in individual Specification Sections, submit manufacturers' certificate to Architect for review, in quantities specified for Product Data.
- B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- C. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect.

1.9 MOCK-UP

- A. Where indicated, provide mock-ups as required. Mock-ups shall be prepared per the Specifications and shall accurately and reasonably represent the quality of construction the Contractor will provide. If the mock-up or portions thereof do not adequately represent the quality of the Work specified, the Contractor shall modify the mock-up as needed.

- B. Once completed to the Architect's satisfaction, the mock-up shall serve as the standard of quality for the Work.
- C. All mock-ups, at the Owner's option, shall remain the property of the Owner. If not required by the Owner, Contractor shall remove and dispose of the mock-up.
- D. Where indicated, on-site mock-ups, if accepted, may be integrated into the Work.

PART 2 - PRODUCTS

Not used

PART 3 - EXECUTION

Not used

END OF SECTION

SECTION 01 42 00 REFERENCES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Definitions.
- B. Specification format and content.
- C. Industry standards.
- D. Codes and standards.
- E. Governing regulations/authorities.

1.2 DEFINITIONS

- A. General: Basic Contract definitions are included in the General Conditions.
- B. Regulations: Includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.

1.3 SPECIFICATION FORMAT AND CONTENT

- A. Specifications are organized into Divisions and Sections based on the Construction Specifications Institute's most current format.
- B. The Sections are placed in the Project Manual in numeric sequence; however, this sequence is not complete and the Table of Contents of the Specifications must be consulted to determine the total listing of Sections.
- C. The Section title is not intended to limit the meaning or content of the Section, nor to be fully descriptive of the requirements specified therein.
- D. The organization of the Specifications shall not control the division of the Work among subcontractors or establish the extent of Work to be performed by any trade.
- E. Specifications use certain conventions regarding style of language and the intended meaning of certain terms, words, and phrases when used in particular situations or circumstances. These conventions are:
 - 1. Language used in Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words that are implied, but not stated, shall be interpolated as the sense requires. Singular words shall be interpreted as plural, and plural words interpreted as singular, where applicable to maintain the context of the Contract Document indicated.

2. Imperative and streamlined language is generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by the Contractor. Subjective language is used for clarity to describe responsibilities that must be fulfilled indirectly by the Contractor, or by others when so noted.
3. The words "shall be" are implied wherever a colon (:) is used within a sentence or phrase.
4. The words "Contractor shall" are implied wherever a sentence or phrase begins without a clear subject (e.g., "Transmit each submittal..." means "Contractor shall transmit each submittal...") and the requirement is not clearly that of Owner Architect, Construction Manager, Project Inspector, or other agent and/or representative.

1.4 INDUSTRY STANDARDS

- A. Except where Contract Documents include more stringent requirements, applicable construction industry standards shall apply as if bound into the Contract Documents to the extent referenced. Such standards are made part of Contract Documents by reference.
- B. Conform to reference standard by date of issue current on date for receiving bids [or date of Owner Contractor Agreement when there are no Bids] except when a specific date is indicated.
- C. Where compliance with two or more standards is specified and where standards may establish different or conflicting requirements for quantities or quality levels, the more stringent, higher quality and greater quantity of Work shall apply.
- D. The quantity or quality level shown or specified shall be the minimum provided or performed. Indicated numeric values are minimum or maximum, as appropriate, for the context of the requirements.
- E. Each entity engaged in construction of the Work is required to be familiar with industry standards applicable to its construction activity.
- F. Copies of applicable standards are not bound with the Contract Documents. Where copies of standards are needed to perform a required activity, Contractor shall obtain copies directly from publication source.
- G. Trade association names and titles of general standards are frequently abbreviated. Where such abbreviations are used in the Specifications or other Contract Documents, they shall mean the recognized trade association, standards-generating organization, authority having jurisdiction, or other entity applicable to the content of the text provision. Refer to the "Encyclopedia of Associations", published by Gale Research Co., available in most libraries.
- H. Refer to individual Specification Sections and related Drawings for names and abbreviations of trade associations and standards applicable to specific portions of the Work. In particular, refer to Division 15 for names and abbreviations applicable to mechanical Work, and refer to Division 16 for names and abbreviations applicable to electrical Work.
- I. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.5 CODES AND STANDARDS

- A. Latest edition of pertaining ordinances, laws, rules, codes, regulations, standards, and others of public agencies having jurisdiction of the Work are intended wherever reference is made in either the singular or plural to Code or Building Code except as otherwise specified, including but not limited to the latest edition of those in the following listing.
- B. Refer to Construction Documents, Sheet A0.01 for Applicable Codes.

1.6 GOVERNING REGULATIONS/AUTHORITIES

- A. Authorities having jurisdiction have been contacted where necessary to obtain information for preparation of Contract Documents. Contact authorities having jurisdiction directly for information having a bearing on the Work.
- B. Comply with all federal, state and local laws, ordinances, rules and regulations indicated and which bear on the conduct of the Work.

PART- 2 PRODUCTS

Not used

PART- 3 EXECUTION

Not used

END OF SECTION

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SECTION 01 45 00 QUALITY CONTROL

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Quality assurance and control of installation.
- B. Tolerances.
- C. Field samples.
- D. Mock-up.
- E. Manufacturers' field services and reports.
- F. Observation and supervision.

1.2 QUALITY ASSURANCE/CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply fully with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Project Engineer before proceeding.
- D. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Perform Work by persons qualified to produce workmanship of specified quality.
- F. Comply with journeyman/apprentice ratios as applicable and as required by the County's findings.
- G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.

1.3 TOLERANCES

- A. Monitor tolerance control of installed products to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturer's tolerances. Should manufacturer's tolerance conflict with Contract Documents, request clarification from Project Engineer before proceeding.

- C. Adjust products to appropriate dimensions; position before securing products in place.
- D. No tolerances related to disabled access requirements allowed or accepted beyond the tolerances defined in Chapter 11B of the current California Building Code.

1.4 FIELD SAMPLES

- A. Install field samples at the site as required by individual Specifications Sections for review.
- B. Acceptable samples represent a quality level for the Work.
- C. Where field sample is specified in individual Sections to be removed, clear area after field sample has been accepted by Architect of Record.

1.5 MOCK-UP

- A. Tests will be performed under provisions identified in this Section and identified in the respective product Specification Sections.
- B. Assemble and erect specified items, with specified attachment and anchorage devices, flashings, seals and finishes.
- C. Where mock-up is specified in individual Sections to be removed, clear area after mock-up has been accepted by Architect of Record.

1.6 MANUFACTURERS' FIELD SERVICES AND REPORTS

- A. Provide if individual Specification Sections require material or product suppliers or manufacturers to provide qualified staff personnel to observe the tests and/or mock-up as applicable, and initiate corrective instructions when necessary.
- B. Individuals shall report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.
- C. Submit report in duplicate within 15 days of observation to Project Architect for review.

1.7 OBSERVATION AND SUPERVISION

- A. The County and Architect of Record or their appointed representatives will review the Work and the Contractor shall provide facilities and access to the Work at all times as required to facilitate this review. Administration by the Project Engineer and any consulting structural engineer will be in accordance with applicable regulations, including, without limitation, CCR, Title 24.

- B. One or more Project Inspector(s) appointed by the City or in contract with the County, referred to hereinafter as the "Project Inspector", will observe the Work in accordance with CCR, Title 24 regulations:
 - 1. The Project Inspector shall have access to the Work wherever it is in preparation or progress for ascertaining that the Work is in accordance with the Contract Documents and all applicable code sections. The Contractor shall provide facilities and access as required and shall provide assistance for sampling or measuring materials.
 - 2. The Project Inspector will notify the County and Architect of Record and call the attention of the Contractor to any observed failure of Work or material to conform the Contract Documents.
 - 3. The Project Inspector shall observe and monitor all testing and inspection activities required.
- C. The Contract shall conform with all applicable laws as indicated in the Contract Documents, including, without limitation, to CCR, Title 24. The Contractor shall supervise and direct the Work and maintain a competent superintendent on the job who is authorized to act in all matters pertaining to the Work. The Contractor's superintendent shall also inspect all materials, as they arrive, for compliance with the Contract Documents. Contractor shall reject defective Work or materials immediately upon delivery or failure of the Work or material to comply with the Contract Documents. The Contractor shall submit verified reports as indicated in the Contract Documents, including, without limitation, the Specifications and as required by CCR, Title 24.

1.8 TESTING AGENCIES

- A. Testing agencies and tests shall be in conformance with the General Documents and the requirements of CCR, Title 24.
- B. Testing and inspection in connection with earthwork shall be under the direction of the County's consulting civil engineer.
- C. Testing and inspection of construction materials and workmanship shall be performed by a qualified laboratory, referred to hereinafter as the "Testing Laboratory". The Testing Laboratory shall be under direction of an engineer registered in the State of California, shall conform to requirements of ASTM E329, and shall be employed by or in contract with the County.

1.9 TESTS AND INSPECTIONS

- A. The Contractor shall be responsible for notifying the County and Project Inspector of all required tests and inspections. Contractor shall notify the County and Project Inspector forty-eight (48) hours in advance of performing any Work requiring testing or inspection.

- B. The Contractor shall provide access to Work to be tested and furnish incidental labor, equipment, and facilities to facilitate all inspections and tests.
- C. The County will pay for the first inspections and tests required by the “CCR”, and other inspections or tests that the County and/or the Project Architect may direct to have made, including but not limited to the following principal items:
 - 1. Tests and observations for earthwork and paving.
 - 2. Tests for concrete mix designs, including tests of trial batches.
 - 3. Tests and inspections for structural steel Work.
 - 4. Additional tests directed by the County that establish that materials and installation comply with the Contract Documents.
 - 5. Test and observation of welding and expansion anchors.
- D. The County may, at its discretion, pay and back charge the Contractor for:
 - 1. Retests or re-inspections, if required, and tests or inspections required due to Contractor error or lack of required identifications of material.
 - 2. Uncovering of Work in accordance with Contract Documents.
 - 3. Testing done on weekends, holidays, and overtime will be chargeable to the Contractor for the overtime position.
 - 4. Testing done off site.
- E. Testing and inspection reports and certifications.
 - 1. If initially received by Contractor, Contractor shall provide to each of the following a copy of the agency or laboratory report of each test or inspection or certification.
 - a. The County.
 - b. The Construction Manager, if any.
 - c. Architect of Record
 - d. The Consulting Engineer, if any.
 - e. Other Engineers on the Project, as appropriate.
 - f. The Project Inspector.
 - g. The Contractor.

2. When the test or inspection is one required by the CCR, a copy of the report shall be provided as requested by the Project Inspector and/or Architect of Record.

PART 2 - PRODUCTS

Not used

PART 3 - EXECUTION

3.1 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 structural support 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.

3.2 PREPARATION

- A. Clean substrate surfaces prior to applying next material or substance.
- B. Seal cracks or openings of substrate prior to applying next material or substance.
- C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

END OF SECTION

SECTION 01 45 29 TESTING LABORATORY SERVICES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Selection and payment.
- B. Contractor submittals.
- C. Laboratory responsibilities.
- D. Laboratory reports.
- E. Limits on testing laboratory authority.
- F. Contractor responsibilities.
- G. Schedule of inspections and tests.

1.2 REFERENCES

- A. ASTM D3740 - Practice for Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
- B. ASTM E329 - Recommended Practice for Inspection and Testing Agencies for Concrete, Steel, and Bituminous Materials as Used in Construction.
- C. CBC - California Building Code.
- D. Title 24, Part 2, of the California Code of Regulations.

1.3 OBSERVATIONS AND SUPERVISION

- A. The Owner and Architect or their appointed representatives will review the Work and the Contractor shall provide facilities and access to the Work at all times as required to facilitate this review. Administration by the Architect and any consulting structural engineer will be in accordance with applicable regulations, including, without limitation, CCR, Part 1, Title 24, Section 7-141.
- B. One or more Project Inspector(s) employed by or in contract with the Owner, referred to hereinafter as the "Project Inspector", will observe the work in accordance with CCR, Part 1, Title 24, Section 7-144(a)(b)(c), 7-145(a):

1. The Project Inspector shall have access to the tests wherever it is in preparation or progress for ascertaining that the tests is in accordance with the Contract Documents and all applicable code sections. The Contractor shall provide facilities and access as required and shall provide assistance for sampling or measuring materials.
 2. The Project Inspector will notify the Owner and Architect and call the attention of the Contractor to any observed failure of tests or material to conform to Contract Documents.
 3. The Project Inspector shall observe and monitor all testing and inspection activities required.
- C. The Contractor shall conform with all applicable laws as indicated in the Contract Documents, including, without limitation, to CCR, Part 1, Title 24, Section 7-143. The Contractor shall supervise and direct the Work and maintain a competent superintendent on the job who is authorized to act in all matters pertaining to the Work. The Contractor's superintendent shall also inspect all materials, as they arrive, for compliance with the Contract Documents. Contractor shall reject defective Work or materials immediately upon delivery or failure of the Work or material to comply with the Contract Documents. The Contractor shall submit verified reports as indicated in the Contract Documents, including, without limitation, the Specifications and as required by Part 1, Title 24, Section 7-151.

1.4 TESTING AGENCIES

- A. Testing agencies and tests shall be in conformance with the Contract Documents and the requirements of Part 1, Title 24, Section 7-149.
- B. Testing and inspection in connection with earthwork shall be under the direction of the Owner's consulting soils engineer, if any, referred to hereinafter as the "Soils Engineer."
- C. Testing and inspection of construction materials and workmanship shall be performed by a qualified laboratory, referred to hereinafter as the "Testing Laboratory." The Testing Laboratory shall be under direction of an engineer registered in the State of California, shall conform to requirements of ASTM E329, and shall be employed by or in contract with the Owner.

1.5 TESTS AND INSPECTIONS

- A. The Contractor shall be responsible for notifying the Owner and Project Inspector of all required tests and inspections. Contractor shall notify the Owner and Project Inspector forty-eight (48) hours in advance of performing any Work requiring testing or inspection.
- B. The Contractor shall provide access to Work to be tested and furnish incidental labor, equipment, and facilities to facilitate all inspections and tests.

- C. The Owner will pay for first inspections and tests required by the "CCRs", and other inspections or tests that the Owner and/or the Architect may direct to have made, including, but not limited to, the following principal items:
 - 1. Tests and observations for earthwork and paving.
 - 2. Tests for concrete mix designs, including tests of trial batches.
 - 3. Tests and inspections for structural steel capitalize Work.
 - 4. Field tests for framing lumber moisture content.
 - 5. Additional tests directed by the Owner that establish that materials and installation comply with the Contract Documents.
 - 6. Test and observation of welding and expansion anchors.
 - 7. Factory observation of components and assembly of modular prefabrication structures and buildings.

- D. The Owner may, at its discretion, pay and back charge the Contractor for:
 - 1. Retests or reinspections, if required, and tests or inspection required due to test failures Contractor error or lack of required identifications of material.
 - 2. Uncovering of Work in accordance with Contract Documents.
 - 3. Testing done on weekends, holidays, and overtime will be chargeable to the Contractor for the overtime portion.
 - 4. Testing done off site.

- E. Testing and inspection reports and certifications:
 - 1. If initially received by Contractor, Contractor shall provide to each of the following a copy of the agency or laboratory report of each test or inspection or certification.
 - a. The Owner.
 - b. The Construction Manager, if any.
 - c. The Architect.
 - d. The Consulting Engineer, if any.
 - e. Other Engineers on the Project, as appropriate.
 - f. The Project Inspector.

g. The Contractor.

2. When the test or inspection is one required by the CCR, a copy of the report shall also be provided to the local jurisdiction.

1.6 SELECTION AND PAYMENT

- A. Owner will employ and pay for services of an independent testing laboratory to perform specified inspection and testing as specified by Owner's testing laboratory.
- B. Owner's employment of testing laboratory shall in no way relieve Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

1.7 OWNER'S TESTING LABORATORY RESPONSIBILITIES

- A. Test samples of mixes submitted by Inspector.
- B. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
- C. Perform specified inspection, sampling, and testing of products in accordance with specified standards.
- D. Ascertain compliance of materials and mixes with requirements of Contract Documents.
- E. Promptly notify Architect and Contractor of observed irregularities or non-conformance of Work or products.
- F. Perform additional inspections and tests required by Architect.
- G. Attend preconstruction conferences and progress meetings when requested by Architect.

1.8 LABORATORY REPORTS

- A. After each inspection and test, Owner shall then submit one copy of laboratory report to Contractor. Laboratory shall submit copies of the report per the requirements of Section 01300, Submittals. Reports of test results of materials and inspections found not to be in compliance with the requirements of the Contract Documents shall be forwarded immediately.
- B. Verification of Test Reports: Each testing agency shall submit in accordance with Section 01300 Submittals, a verified report covering all of the tests which were required to be made by that agency during the progress of the project. Such report shall be furnished each time that Work on the Project is suspended, covering the tests up to that time and at the completion of the Project, covering all tests.

1.9 LIMITS ON TESTING LABORATORY AUTHORITY

- A. Laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.
- B. Laboratory may not approve or accept any portion of the Work.
- C. Laboratory may not assume any duties of Contractor.
- D. Laboratory has no authority to stop the Work.

1.10 CONTRACTOR RESPONSIBILITIES

- A. Submit proposed items for testing as required herein and/or as defined in Section 011400 to Architect for review in accordance with applicable Specifications.
- B. Cooperate with laboratory personnel, and provide access to the Work and to manufacturer's facilities.
- C. Notify Architect, Owner's Representative, and testing laboratory 48 hours prior to expected time for operations requiring inspection and testing services.
 - 1. When tests or inspections cannot be performed after such notice, reimburse Owner for laboratory personnel and travel expenses incurred due to the Contractor's negligence.
 - 2. The Contractor shall notify the Owner's representative a sufficient time in advance of the manufacture of material to be supplied by him under the Contract Documents, which must by terms of the Contract be tested, in order that the Owner may arrange for the testing of same at the source of supply.
 - 3. Any material shipped by the Contractor from the source of supply prior to having satisfactorily passed such testing and inspection or prior to the receipt of notice from said representative that such testing and inspection will not be required shall not be incorporated in the job.
- D. Employ and pay for services of Owner's testing laboratory to perform additional inspections, sampling and testing required when initial tests indicate Contractor's Work and/or materials does not comply with Contract Documents.

1.11 SCHEDULE OF INSPECTIONS AND TESTS BY OWNER'S TESTING LABORATORY

- A. The testing agency shall perform tests and inspections per the local jurisdiction approved "Tests and Inspections" list as well as for the following in conformance with the (CBC) California Building Code, Title 24, Part 2, of the California Code of

Regulations.

1. General Requirements (Chapter 17A):
 - a. Special Inspections - 1701A.
 - b. Nondestructive Testing - 1704A.
 - c. Prefabricated Construction -1704A.
2. Foundations (Chapter 18A and 33):
 - a. Earth fill compaction - 3304.1.
3. Concrete (Chapter 19A):
 - a. Materials:
 - (1) Portland Cement Tests - 1903A.2.
 - (2) Concrete Aggregates - 1903A.5.
 - (3) Reinforcing Bars - 1903A.8, 1929A.2.
 - (4) Prestressing Steel & Anchorage - 19010A.5, 1910A.3.
 - (5) Waiver of Batch Plant Inspection and Tests - 1929A.5.
 - b. Concrete Quality:
 - (1) Proportions of Concrete - 1904A.1, 1904A.2, 1904A.3, 1904A.4, 1905A.1, 1905A.2, 1905A.3, 1905A.4, 1905A.5.
 - (2) Strength Tests of Concrete - 1905A.6.
 - (3) Splitting Tensile Tests - 1905A.1.4.
 - (4) Composition Construction Cores - 1929A.8.
 - c. Concrete Inspection:
 - (1) Job Site Inspection - 1905A.6, 1905A.7.
 - (2) Batch Plant or Weighmaster Inspection - 1929A.4.
 - (3) Reinforcing Bar Welding Inspection - 1929A.12.

- d. Anchors in Concrete:
 - (1) Drilled-In-Expansion Bolts or Epoxy-Type Anchors in Concrete - 1923A.3.5.
- 4. Masonry (Chapter 21A):
 - a. Materials:
 - (1) Masonry Units - 2102A.2, 4., 5., 6.
 - (2) Portland Cement - 2102A.2,2.
 - (3) Mortar & Grout Aggregates - 2102A.2, 1, 2103A.3, 2103A.4.
 - (4) Reinforcing Bars - 2102A.2, 10. 1903A.5, 1929A.2.
 - b. Masonry Quality:
 - (1) Portland Cement Tests - 1903A.2, 1929A.1.
 - (2) Mortar & Grout Tests - 2105A.3.4, 2.
 - (3) Masonry Prism Tests - 2105A.3.2, 2105A.3.3, 2105A.3.4, 2105A.3.5.
 - (4) Masonry Core Tests -2105A.3.1.
 - (5) Masonry Unit Tests - 2105A.3.4,1.
 - (6) Reinforcing Bar Tests - 1929A.2.
 - c. Masonry Inspection:
 - (1) Reinforced Masonry - 2115A, 2105A.7.
 - (2) Reinforcing Bar Welding Inspection - 1929A.12.
- 5. Structural Steel (Chapter 22A):
 - a. Materials:
 - (1) Structural Steel - 2203A.2, 2231A.1.
 - (2) Material Identification - 2203A.

- b. Inspection and Tests of Structural Steel:
 - (1) Tests of Structural & Cold Formed Steel - 2231A.1.
 - (2) Tests of H.S. Bolts, Nuts, Washers - 2231A.2.
 - (3) Tests of End Welded Studs - 2231A.3.
 - (4) Shop Fabrication Inspection - 2231A.4.
 - (5) High Strength Bolt Inspection - 2231A.6.
 - (6) Welding Inspection - 2231A.5.
 - (7) Nelson Stud Welding - 2231A.3.
 - (8) Non-destructive Weld Testing - 1703A.

- 6. Wood (Chapter 23):
 - a. Materials:
 - (1) Lumber and Plywood Grading - 2304.
 - (2) Glued-Laminated Members - 2304.

 - b. Wood Inspection:
 - (1) Timber Connectors - 2337.2.
 - (2) Truss Joists - 2337.3.
 - (3) Plate Connected Wood Trusses - 2337.3.
 - (4) Glu-Laminated Fabrication - 2337.1.

- 7. Veneer (Chapter 14):
 - a. Materials:
 - (1) Masonry Units - 1403.3, 2102A.
 - (2) Precast Concrete Units - 1403.3, 1916A.
 - (3) Mortar and Grout - 2103A.3, 2103A.4.

- (4) Bond and Shear Tests - 1403.5.6.
- 8. Roof Covering (Chapter 15):
 - a. Materials:
 - (1) Roof Tile Tests - 1507.7.1.
- 9. Aluminum (Chapter 20A):
 - a. Materials:
 - (1) Alloys - 2001A.2.
 - (2) Identification - 2001A.4.
 - b. Inspection.
 - (1) Welding - 2004A.8.
- B. Plumbing: Testing as specified in Division 15 including, but not limited to: sterilization, soil waste and vent, water piping, source of water, pressure, gas piping, downspouts and storm drains.
- C. Automatic Fire Sprinklers (where applicable): Testing as specified in Division 15 shall include, but not be limited to, hydrostatic pressure.
- D. Heating, Ventilating and Air Conditioning: Testing as specified in Division 15 shall include, but not be limited to: Ductwork tests, cooling tower tests, boiler tests, controls testing, piping tests, water and air systems, and test and balance of heating and air conditioning systems.
- E. Electrical: Testing as specified in Division 16, including, but not limited to, equipment testing, all electrical system operations, grounding system and checking insulation after cable is pulled.

1.12 PROJECT INSPECTOR'S ACCESS TO SITE

- A. A Project Inspector in accordance with the requirement of the local jurisdiction and the State of California Code of Regulations Title 24, Part 1 will be assigned to the Work. His duties are specifically defined in Section 7-145(a), and as indicated in the General Conditions.
- B. The Owner and the Construction Manager shall at all times have access for the purpose of inspection to all parts of the Work and to the shops wherein the Work is in

preparation, and the Contractor shall at all times maintain proper facilities and provide safe access for such inspection.

- C. The Work of construction in all stages of progress shall be subject to the personal continuous observation of the Project Inspector. He shall have free access to any or all parts of the Work at any time. The Contractor shall furnish the Project Inspector reasonable facilities for obtaining such information as may be necessary to keep him fully informed respecting the progress and manner of the Work and the character of the materials. Inspection of the Work shall not relieve the Contractor from any obligation to fulfill this Contract. The presence of a Project Inspector shall in no way change, mitigate or alleviate the responsibility of the Contractor.
- D. The Project Inspector is not authorized to change, revoke, alter, enlarge or decrease in any way any requirement of the Contract Documents, Drawings, Specifications or subsequent Change Orders.
- E. Whenever there is insufficient evidence of compliance with any of the provisions of Title 24, Part 2 of the California Code of Regulations or evidence that any material or construction does not conform to the requirements of Title 24, Part 2 of the California Code of Regulations, the local jurisdiction may require tests as proof of compliance. Test methods shall be as specified herein or by other recognized and accepted test methods determined by the local authorities. All tests shall be performed by a testing laboratory accepted by local jurisdiction.

PART 2 - PRODUCTS

Not used

PART 3 - EXECUTION

Not used

END OF SECTION

SECTION 01 60 00
MATERIAL AND EQUIPMENT

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Products.
- B. Transportation and handling.
- C. Storage and protection.
- D. Damage and restoration.

1.2 PRODUCTS

- A. Products: New material, machinery, components, equipment, fixtures, and systems forming the Work. Does not include machinery and equipment used for preparation, fabrication, conveying and erection of the Work. Products may also include existing materials or components if designated for reuse.
- B. Provide interchangeable components of the same manufacturer, for similar components.
- C. Provide products that comply with the Contract Documents, that are undamaged and are unused at the time of installation.
- D. Provide products complete with all accessories, trim, finish, safety guards and other devices and detail needed for a complete installation and for the intended use and effect.
- E. Where products are specified by name or by manufacturer provide the product or manufacturer specified. No substitutions will be permitted unless made under the provisions of **Section 01630**.
- F. Where Specifications only describe a product or assembly by listing exact characteristics required, provide a product or assembly that provides the characteristics.
- G. Where Specifications only require compliance with performance requirements, provide products that comply with those requirements.
- H. Where the Specifications only require compliance with an imposed code, standard or regulation, provide a product that complies with the standards, codes or regulations specified.
- I. Where Specifications require review and acceptance of a Sample, the Architect's decision will be final on whether a proposed product Sample is acceptable or not.

- J. Do not use materials and equipment removed from existing premises, unless as specifically directed.

1.3 TRANSPORTATION AND HANDLING

- A. Transport and handle products in accordance with manufacturer's instructions.
- B. Schedule delivery to minimize long-term storage at site to prevent overcrowding of construction spaces.
- C. Coordinate production and delivery of Owner-furnished items (OFI), where applicable.
- D. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft and other losses.
- E. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged. Notify Architect of Record of any items received under County (Owner) purchase, if applicable.
- F. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

1.4 STORAGE

- A. Store products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weather-tight, climate controlled enclosures.
- B. For exterior storage of fabricated products, place on sloped supports, above ground.
- C. Provide off-site storage when site does not permit on-site storage.
- D. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation.
- E. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- F. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- G. Arrange storage of products to permit access for inspection. Periodically inspect to assure products are undamaged and are maintained under specified conditions.
- H. Prevent the discharge of pollutants to storm water from storage of materials on-site using best management practice techniques defined in Chapter 4 of the Construction Activity Handbook published by the Storm Water Quality Task Force.

1.5 PROTECTION

- A. Protect installed Work and provide special protection where specified in individual Specification Sections.
- B. Provide temporary and removable protection for installed products. Control activity in immediate Work area to minimize damage.
- C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- D. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects.
- E. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- F. Prohibit traffic from landscaped areas.

1.6 DAMAGE AND RESTORATIONS

- A. Damage to existing or new Work, whether accidental or not, shall be restored or replaced as specified or directed by Architect of Record.
- B. Restoration shall be equal to structural performance of original Work.
- C. Finish shall match appearance of existing adjacent Work.
- D. Work not properly restored or where not capable of being restored shall be removed and replaced.

PART 2 - PRODUCTS

Not used

PART 3 - EXECUTION

Not used

END OF SECTION

SECTION 01 74 00 CLEANING AND WASTE MANAGEMENT

PART 1 - GENERAL

1.

B. Interior dust control.

1.

regulations, and antipollution laws.

PART 2 - PRODUCTS

2.

property nor damage surfaces.

of the surface material to be cleaned.

manufacturer.

PART 3 - EXECUTION

3.

on an as-needed basis until painting is finished.

cleaning process will fall on wet or newly coated surfaces.

3.

other foreign materials from sight-exposed interior and exterior surfaces, including fixtures, equipment, etc.

removed. Paint work and equipment shall be cleaned and touched up as required.

window washer.

units have been operated during construction.

cleaned, if required, to remove soil and visible stains.

inspection of sight-exposed interior and exterior surfaces, equipment, fixtures, etc., and all work areas to verify that the entire Work is clean.

- J. Clean, strip, and seal all flooring products per manufacturer's specifications and requirements prior to installation of furniture and equipment.

END OF SECTION

SECTION 01 77 00

CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Closeout procedures.
- B. Final cleaning.
- C. Adjusting.
- D. Demonstration and Instructions.
- E. Project Record Documents.
- F. Operation and maintenance data.
- G. Warranties.
- H. Spare parts and maintenance materials.

1.2 CLOSEOUT PROCEDURES

- A. Request Architect's observation of rough-ins when walls and ceilings are still open for observation. Give Architect at least 48 hours notice. Architect will prepare punch list of unsatisfactory Work.
- B. When Work is substantially complete, submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is substantially complete in accordance with Contract Documents and ready for Architect's inspection. Certificate shall include evidence that equipment and systems have been tested in the presence of the Architect and manufacturer's representatives, where applicable. Substantial Completion shall be defined as 95 percent completion of all Work, including 100 percent completion of the following: air balance report and submittal, final testing of fire alarm by Local Fire Inspector/Consultant/Owner's Representative, mechanical utility commissioning with Owner's Representative, final electrical testing by IOR/testing laboratory, all finishes, painting (except touch-up), cleaning of Project area (including window washing).
- C. Provide submittals to Architect that are required by governing or other authorities.
- D. Punch List:
 - 1. Contractor shall correct all punch list items within twenty days of delivery of the punch list, but no later than the final completion date.
 - 2. Prior to submission of its request for final payment, Contractor shall certify that a completed set of Project Record Documents has been submitted to the Architect for final review.

- E. Final Inspection:
 - 1. Within seven days after notice by the Contractor of completion of punch list work, the Architect will conduct the final inspection with the Owner and the Contractor.
 - 2. Items found not resolved may be cause for back charge of additional time for Architect to re-visit the site for final verification.
- F. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due.
- G. Submit affidavit of payment of debts and claims, AIA Document G706.
- H. Submit affidavit of release of liens, AIA Document G706A.
- I. Submit consent of Contractor's surety to final payment, AIA Document G707.

1.3 REINSPECTION FEES

- A. Architect (and his consultants, if required) will perform 1 observation of rough-ins, and 1 observation of Work that is substantially complete. When punch list items have been completed, Architect will observe to verify.
- B. Should the Architect and his Consultants have to perform re-inspections and punch list due to failure of the Work to comply with the status of completion claimed by the Contractor; Owner will deduct the amount of compensation for such re-inspections and punch lists from the final payment to the Contractor.

1.4 FINAL ADJUSTMENT OF ACCOUNTS

- A. Submit a final statement of accounting to the Architect.
- B. Statement shall reflect all adjustments to the Contract Sum:
 - 1. The original Contract Sum.
 - 2. Additions and Deductions Resulting From:
 - a. Previous Change Orders.
 - b. Deductions for uncorrected Work.
 - c. Penalties and bonuses.
 - d. Deductions for liquidated damages.
 - e. Deductions for re-inspection payment.
 - f. Other adjustments.
 - 3. Total Contract Sum, as adjusted.

4. Previous payments.
5. Sum Remaining Due: Architect will prepare a final Change Order, reflecting approved adjustments to the Contract Sum, which were not previously made by Change Order.

1.5 FINAL APPLICATION FOR PAYMENT

- A. Contractor shall submit the final Application for Payment in accordance with procedures and requirements stated in the General Conditions.

1.6 RELATED REQUIREMENTS

- A. As a condition precedent to final acceptance of the Project, the Contractor shall provide spare/loose parts, maintenance materials and operation manuals as required by various Sections of the Specifications.
 1. Parts and materials shall be packaged so as to preclude damage in normal handling and storage.
 2. Packages shall be labeled with full description of contents and Project name.
 3. Place packaged parts and materials at location directed by Owner's representative.
 4. Maintenance and Operation Manuals: Provide permanent quality manual of maintenance and operation for all materials requiring operation or for which manufacturer, supplier, or installer recommend maintenance (i.e., floor coverings, roofing, operating mechanisms, electrical devices, paint, etc.). Manuals shall contain manufacturer's instructions and recommendations for proper operation and maintenance. Where applicable, include parts list, sources of parts, service and program for frequency of maintenance. Five sets required, bound in 3-ring binders, shall be provided by Contractor.
 5. Prior to turning over any operations manuals or spare/loose parts, accompanied by a CD-ROM or flash drive, Contractor shall submit for approval and, upon approval, shall maintain a master log of required manuals and parts, including description, Specification reference, responsibility designation, anticipated and actual delivery dates, delivery acknowledgement, etc.
- B. The General Conditions cover the Contractor's responsibility to remedy defects due to faulty workmanship and materials which appear within one year from the date of recording of the Notice of Acceptance.
- C. Special warranties are required by various Sections of the Specifications. Assemble written warranties, label and submit to the Architect for review and transmittal to the Owner.
 1. Equipment warranties shall be written in the manufacturer's standard form and shall be countersigned by the subcontractor or supplier and the Contractor.
 2. All other warranties shall be written on the subcontractor's or supplier's letterhead and shall be countersigned by the Contractor.
 3. Bind warranties and bonds in heavy-duty five sets of commercial quality, durable 3-ring vinyl covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2 inch by 11 inch paper. Identify each binder on the front and the

spine with the typed or printed title "WARRANTIES AND BONDS", the Project title or name and the name of the Contractor. The CD-ROM or flash drive shall be included in the binder side pocket.

4. When operating and maintenance manuals are required for warranted construction, provide additional copies of each warranty, as necessary, for inclusion in each required manual.

1.7 FINAL CLEANING

- A. Execute final cleaning prior to final inspection. Work includes sweeping, brushing, and other general cleaning of completed Work and removal of debris, surplus material, and tools not in active use, scaffolding and other equipment no longer needed.
- B. Clean interior and exterior glass and surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.
- C. Clean equipment and fixtures to a sanitary condition.
- D. Replace filters of operating equipment.
- E. Clean debris from roofs, gutters, downspouts, and drainage systems.
- F. Clean site; sweep paved areas, rake clean landscaped surfaces.
- G. Remove waste and surplus materials, rubbish, and construction facilities from the site.
- H. Refer to Section 01 74 00 for additional requirements.

1.8 FIRE PROTECTION

- A. Store volatile/hazardous waste in covered metal containers and remove from premises daily in a manner which complies with all ordinances, regulations, and laws regarding hazardous materials.

1.9 POLLUTION CONTROL

- A. Conduct clean-up and disposal operations to comply with codes, ordinances regulations, and anti-pollution laws.

1.10 ADJUSTING

- A. Adjust operating products and equipment to ensure smooth and unhindered operation.

1.11 DEMONSTRATION AND INSTRUCTIONS

- A. Demonstrate operation and maintenance of products to Owner's personnel two weeks prior to date of final inspection.
- B. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.

- C. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.
- D. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at agreed-upon times, at equipment location.
- E. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

1.12 PROJECT RECORD DOCUMENTS

- A. Maintain on site, one set of the following Record Documents; record actual revisions to the Work in contrasting color.
 - 1. Contract Drawings.
 - 2. Specifications.
 - 3. Addenda.
 - 4. Change Orders and other Modifications to the Contract.
 - 5. Reviewed Shop Drawings, Product Data, and Samples.
- B. Store Record Documents separate from documents used for construction, in a clean, dry environment and maintain sets in good order.
- C. Record information concurrent with construction progress.
- D. Specifications: Legibly mark and record at each Section in contrasting color ink, description of actual products installed, including the following:
 - 1. Manufacturer's name and product model and number.
 - 2. Changes made by Addenda and Modifications.
- E. Contract Drawings and Shop Drawings: Legibly mark each item in contrasting color ink to record actual construction including:
 - 1. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - 2. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 - 3. Field changes of dimension and detail, identified by RFI or Change Order.
 - 4. Details not on original Contract Drawings.
- F. After final inspection is requested, Contractor shall submit Record Documents with digital scan copy in PDF to the Architect for review. Contractor shall make such revisions or corrections as may be necessary for the Drawings and Specifications to be a true, complete, and accurate record of the Work.

1. Accompany submittal with transmittal in duplicate, containing:
 - a. Date.
 - b. Project title and number.
 - c. Contractor's name and address.
 - d. Title and number of each Record Document.
 - e. Signature of Contractor or his authorized representative.
- G. Submit documents to Architect for final Application for Payment. Inadequate or incomplete Record Documents may be used as cause for withholding payment.

1.13 RECORD DRAWINGS

- A. Architect will provide Contractor with one set of reproducible sepia plans of the original Contract Drawings.
- B. Contractor shall maintain one set of marked-up prints kept at each job-site and updated each month, or as otherwise agreed, shall transfer changes and information indicated on the marked-up blue line prints to the reproducible drawings. Contractor shall submit to the Architect one set of blue line prints showing all changes incorporated into the Work since the preceding monthly submittal. The Record Drawings shall be available at the Project Site.
- C. Label and date each Record Drawing "RECORD DOCUMENT" in legibly printed letters.
- D. Deviations in construction, especially pipe and conduit locations and deviations caused by Change Orders, Field Clarifications, Requests for Clarification and Addenda shall be accurately and legibly recorded.
- E. Locations and changes shall be done in a neat, legible manner and, where applicable, indicated by drawing a "cloud" around the changed or addition information.

1.14 RECORD DRAWING INFORMATION

- A. Record the following information:
 1. Locations of Work buried under or outside each building, such as plumbing and electrical lines and conduits.
 2. Actual numbering of each electrical circuit.
 3. Locations of significant Work concealed inside each building whose general locations are changed from those shown on the Contract.
 4. Locations of all items, not necessarily concealed, which vary from the Contract Documents.
 5. Installed location of all cathodic protection anodes.
 6. Deviations from the sizes, locations, and other features of installations shown in the

Contract Documents.

7. Locations of underground Work, points of connection with existing utilities, changes in direction, valves, manholes, catch basins, capped stub-outs, invert elevations, etc.
8. Sufficient information to locate Work concealed in each building with reasonable ease and accuracy. In some instances, this may be by dimension, in others; it may be in relation to the spaces in the building near which it was installed.

1.15 OPERATION AND MAINTENANCE DATA

- A. Provide Data For:
 1. Fire alarm system.
 2. Mechanical equipment and controls.
 3. Energy management system.
 4. Electrical system.
 5. Security and communication systems.
- B. Submit prior to final inspection, bound in 8-1/2 inch x 11 inch text pages, three-ring, D-size binders with durable vinyl covers plus one CD-ROM for all equipment in the above categories.
- C. Prepare binder covers with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS", title of Project, and subject matter of binder when multiple binders are required.
- D. Internally subdivide the binder contents using permanent page dividers with laminated plastic tabs, logically organized in Parts as described below.
- E. Part 1: Directory, listing names, addresses, and telephone numbers of Architect, engineers, Contractor, subcontractors, and major equipment suppliers.
- F. Part 2: Operation and maintenance instructions, arranged by Specification Section. For each category, identify names, addresses, and telephone numbers of subcontractors and suppliers. Identify the following:
 1. Significant design criteria.
 2. List of equipment.
 3. Parts list for each component.
 4. Operating instructions.
 5. Maintenance instructions for equipment and systems.
 6. Maintenance instructions for finishes, including recommended cleaning methods and materials.
- G. Part 3: Project documents and certificates, including the following:

1. Shop Drawings and Product Data.
2. Air and water balance reports.
3. Certificates.
4. Photocopies of warranties.

1.16 WARRANTIES

- A. Provide duplicate notarized copies.
- B. Execute and assemble documents from subcontractors, suppliers, and manufacturers, including items furnished by Owner.
- C. Provide Table of Contents and assemble in binder with durable plastic cover.
- D. Submit prior to final Application for Payment.
- E. For items of Work delayed beyond date of Completion, provide updated submittal within ten days after acceptance, listing date of acceptance as start of warranty period.
- F. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of warranty on the Work that incorporates the products.
- G. Manufacturer's letter of intent to furnish products and services beyond the warranty period where indicated.
- H. Manufacturer's disclaimer and limitations on product warranties do not relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with Contractor.
- I. When correcting failed or damaged warranted construction, remove and replace construction that has been damaged as a result of such failure or must be removed and replaced to provide access for correction of warranted construction.
- J. When Work covered by warranty has failed and has been corrected, reinstate warranty by written endorsement. Reinstated warranty shall be equal to original warranty with equitable adjustment for depreciation.
- K. Upon determination that Work covered by warranty has failed, replace or repair Work to an acceptable condition complying with requirements of the Contract Documents.

1.17 SPARE PARTS AND MAINTENANCE MATERIALS

- A. Provide products, spare parts, maintenance and extra materials in quantities specified in individual Specification Sections.
- B. Deliver to Project Site and place in location as directed.
- C. Obtain signed receipt for delivery of materials and submit prior to application for final payment.

PART 2 - PRODUCTS

2.1 CLEANING MATERIALS

- A. Use only those cleaning materials which will not create disruptive fumes or hazards to health or property and which will not damage surfaces.
- B. Use only cleaning materials and methods recommended by manufacturer of surface to be cleaned and by cleaning agent material manufacturer. Repair or replace surfaces damaged due to use of improper cleaners and techniques.

PART 3 - EXECUTION

3.1 CLEAN-UP DURING CONSTRUCTION

- A. Execute daily cleaning to keep Work, site and adjacent properties free from accumulations of waste materials, rubbish and windblown debris resulting from construction operations.
- B. Provide on-site containers for the collection of waste materials, debris, and rubbish.
- C. Remove waste materials, debris and rubbish from the site daily or dispose of in approved container on-site.

3.2 DUST CONTROL

- A. Clean interior spaces prior to the start of finish painting and continue cleaning on an as-needed basis until painting is finished.
- B. Schedule operations so that dust and other contaminants resulting from cleaning process will not fall on wet or newly-coated surfaces
- C. Vacuum clean interior building areas when ready to receive finish painting and continue vacuum cleaning on an as-needed basis until building is ready for acceptance and occupancy.
- D. Lower waste materials in a controlled manner with as few handlings as possible; do not drop or throw materials from heights.
- E. Conform to City, County, and State dust control regulations.

3.3 GENERAL CLEANING REQUIRMENTS

- A. Remove grease, mastic, adhesives, dust, dirt, stains, fingerprints, labels, and other foreign materials from sight-exposed interior and exterior surfaces.
- B. Wash and shine glazing mirrors.
- C. Polish glossy surfaces to a clear shine.
- D. Clean glass; remove labels, fingerprints, grease, dirt stains, spots, marks, and other foreign materials from exposed exterior and interior surfaces.
- E. Clean hardware, plumbing fixtures, and chrome and storefront systems; remove paint spots,

asphalt and smears from surfaces; clean fixtures and wash concrete and tile floors.

- F. Comply with all special cleaning, waxing and finishing instructions contained in Contract Documents.
- G. Restore existing improvements, inside or outside property, which were disturbed, damaged or destroyed as a result of Work under this Contract.
- H. Restore and replace damaged material conforming to original colors, textures, lines, grades, shapes and kind, except as otherwise required. Labor, material and methods used in restoring improvements shall conform to directions obtained from Architect before commencing Work.

3.4 FINAL CLEANING

- A. Use experienced workmen and professional cleaners for final cleaning.
- B. Legally dispose of waste materials, debris and rubbish off the site.
- C. Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials, from exposed and semi-exposed surfaces.
- D. Repair, patch and touch-up marred surfaces to specified finish, to match adjacent surfaces.
- E. Vacuum clean all interior spaces including inside cabinets. Broom clean paved surfaces. Rake clean other surfaces of grounds.
- F. Broom and water clean paved surfaces and walks. Rake clean other surfaces and grounds.
- G. Maintain cleaning until building or portion thereof, is accepted and occupied by Owner.
- H. At completion of construction and just prior to final acceptance or occupancy, conduct final inspection exposed interior and exterior surfaces.

3.5 VENTILATING SYSTEM CLEANING

- A. Clean permanent filters and replace disposable filters if units were operated during construction.
- B. Clean ducts, blowers and coils if units were operated during construction.

END OF SECTION

SECTION 01 78 36

WARRANTIES

PART 1 - GENERAL

1.

1.

manufacturers for particular products and are specifically endorsed by the manufacturer to the Owner.

Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Owner.

1.

suppliers shall not affect warranties between Contractor and Owner.

damage, improper maintenance, or accident caused by others nor shall he be responsible for defective parts whose replacement is necessitated by failure of Owner's maintenance forces properly to clean and service them, provided that Contractor has furnished complete operating and maintenance instructions to Owner.

warranty period shall run from the date of acceptance of such items.

the separate Sections of the Specifications or other Contract Documents shall be subject to the terms of this Section during the first year of the life of such warranty.

warranty period, the Contractor shall, promptly upon receipt of notice from the Owner or Architect and without expense to the Owner, comply with the following:

and correct all defects therein.

said repairs and changes.

site, disturbed in fulfilling any such warranty.

written notice, repair or cause to be repaired special equipment which has been furnished and installed and which may be damaged and the repair of which is included in the provision of any warranty.

nature, may suffer further damage or cause loss to the Owner owing to the 7-day delay, the Owner may, after notice, cause such equipment to be repaired.

of the cost to the Owner for the completion of such repairs and the reconditioning of the equipment to its exact state prior to damage.

period and notice thereof is given within such period, the warranty shall continue as to Work requiring repair or change until the things herein required to be done are completed, and the termination of the warranty period shall not apply thereto.

warranties addressed to and in favor of the Owner shall be secured from said subcontractors.

held to limit, as to time or scope of liability, the Contractor's liability for defects or the liability of his sureties to less than the legal limit of liability under laws having jurisdiction.

assumed under any other provision of the Contract Documents.

Contract.

1.

one year, typed on subcontractor's letterhead, when required by a Specification Section:

(The Remainder of this Page is Blank)

WRITTEN WARRANTY FOR

We hereby warrant that _____
which we have provided in _____ has been completed in accordance with
Specification Section _____ and Contract Documents requirements.

We agree to repair or replace any or all of our Work, together with any other adjacent Work which
may be displaced or damaged by so doing, which may prove to be either patently defective in its
workmanship or materials within the period of time prescribed by law or latently defective in its
workmanship or materials within a period of _____ year(s) from date established in the
Certificate of Substantial Completion of above-named structure, ordinary wear and tear and
unusual abuse or neglect excepted.

We also agree to repair any and all damages resulting from such defects.

In the event of our failure to comply with above-mentioned conditions within a reasonable time but
in no case longer than 7 calendar days after being notified in writing by the Owner we collectively
and separately do hereby authorize the Owner to have said defective Work and damages repaired
or replaced and made good at our expense and will honor and pay the costs and charges
therefore upon demand.

SIGNED _____
signing) (Subcontractor's name, address, license number, and date of

COUNTERSIGNED _____
signing) (Contractor's name, address, license number, and date of

1.

the respective manufacturers, suppliers, and subcontractors.

contract.

number.

1.

sheets to fit into binders.

the title of Project and name of Contractor.

covers.

1.

Completion, provide updated submittal within 30 days after acceptance listing the date of acceptance as the start of the warranty period.

1.

individual Sections.

PART 2 – PRODUCTS

Not used

PART 3 – EXECUTION

Not used

END OF SECTION

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SECTION 01 78 39 PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.

and other modifications marked currently to record changes made during construction.

condition, and shall not be used for construction purposes.

construction.

individual Specification Sections.

1.

of blue-line or black-line prints as the work proceeds.

clear, permanent markings. Use contrasting colors for different disciplines of Work and where required for clarity.

or other approved datum.

appurtenances referenced to permanent surface improvements.

construction, referenced to visible and accessible features of structure.

steps, retaining walls, and similar features.

accurately transferred by the Contractor to a complete set of reproducible vellum transparencies of the Drawings as originally issued for construction obtained from the Architect at Owner's cost.

Contractor shall furnish his own drawings for incorporation of details and dimensions.

certified by the Contractor as to their correctness and turned over to the Architect.

Work).

Specification Section to record:

ble), and supplier of each product and item of equipment actually installed.

Directive.

manufacturer's product was installed.

markup.

times for review by the Architect and Owner.

1.

payment to Contractor.

1.

PART 2 – PRODUCTS

Not used

PART 3 – EXECUTION

Not used

END OF SECTION

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SECTION 04 05 00 MORTAR AND GROUT

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. The requirements of Division 1 apply to all Work of this Section.

1.2 SCOPE

- A. Provide all materials, labor and accessories as required and specified for complete mortar and grout installation in masonry walls.

1.3 RELATED WORK (See also Table of Contents):

- A. Cast-In-Place Concrete: Section 03 30 00.
- B. Reinforcing Steel: Section 03 21 00.
- C. Concrete Unit Masonry: Section 04 22 00.

1.4 QUALITY ASSURANCE

- A. Standards and References: (Latest Edition unless otherwise noted)
 1. ASTM C144, Aggregate for Masonry Mortar.
 2. ASTM C150, Portland Cement.
 3. ASTM C207, Hydrated Lime for Masonry Purposes
 4. ASTM C270, Standard Specification for Mortar for Unit Masonry
 5. ASTM C404, Aggregates for Grout
 6. ASTM C476, Standard Specification for Grout for Masonry
 7. ASTM C1019, Method of Sampling and Testing Grout
 8. CBC Section 2103
 9. 2016 California Building (CBC)
 10. Masonry Standards Joint Committee (MSJC)
- B. Tests and Inspections:
 1. A testing program is required prior to start of construction. Testing program to be done in Compliance with the 2016 CBC requirements and in collaboration with Testing Laboratory, Design team, contractor, owner and submitted for review by the agency in charge of building enforcement. Requirements below are minimum requirements; additional requirements may be required in final testing program.
 2. All tests and inspections herein are to be performed by an independent testing laboratory approved by the building official.
 3. Mortar and Grout Tests: If mortar and grout tests are indicated as required on the Structural drawings, at the beginning of Masonry Work, at least 1 test sample

each of mortar and grout shall be taken on 3 successive working days, then once per week with at least one sample taken for each 5000 square feet of wall area, or fraction thereof.

- a. Test specimens shall be made in accordance with ASTM C1019 for grout and ASTM C780 for mortar.
 - b. Test specimens shall be continuously stored in moist air until tested.
 - c. Mortar shall show a compressive strength of not less than 1800 psi at 28 days. Grout shall show a compressive strength of not less than 2000 psi at 28 days.
4. If masonry placement and grouting inspection is indicated as required on the Structural Drawings, a special inspector shall be employed per CBC Section 1704 during the placement of all units, placement of all reinforcing steel, during all grouting operations and during taking of all test specimens.
- C. Submittals:
1. Mix design for mortar and grout shall be submitted for review.
 2. Supplier's certificates indicating materials comply with the specifications below. They shall include but are not necessarily limited to:
 - a. Aggregates
 - b. Cement
 - c. Admixtures

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cement: ASTM C 150, Type I or II, low alkali; natural gray.
- B. Hydrated Lime: ASTM C 207, Type S.
- C. Quicklime: ASTM C 5.
- D. Lime Putty: Made from hydrated lime or quicklime.
1. If made from quicklime, other than processed pulverized quicklime, slake lime and then screen through a No. 16 mesh sieve. Before using, store and protect slaked and screened lime putty for not less than 10 days.
 2. Processed pulverized quicklime shall be slaked for not less than 48 hours, and shall be cool when used.
 3. Lime putty prepared from hydrated lime may be used immediately after mixing.
 4. Lime putty prepared from quicklime or pulverized quicklime shall have a plasticity figure, after slaking and screening, of not less than 200, and shall weigh not less than 83 lbs. per cubic foot. Lime putty prepared from hydrated lime shall conform to ASTM C 207, Type S.
- E. Aggregate:
1. For Mortar: ASTM C144.
 2. For Grout: ASTM C404.

- F. Admixture: "Sika Grout Aid"
- G. Water: Suitable for domestic consumption.

2.2 MORTAR

- A. Mortar shall be Type S having a 28 day compressive strength of not less than 1800 psi, and shall conform to CBC Section 2103.
- B. Mortar shall be made with admixtures that are proportioned, added and mixed in strict accordance with manufacturer's directions.
- C. Mortar mix shall be proportioned by volume; one part portland cement, not less than 1/4 part nor more than 1/2 part lime putty, and sand totaling not less than 2-1/4 nor more than 3 times sum of volumes of cement and lime used.
 - 1. Total clay content shall not exceed 2% of sand content or 6% of cement content.

2.3 GROUT

- A. Grout shall have a 28-day compressive strength of not less than 2000 psi. Proportion by volume, and with sufficient water to produce consistency for pouring without segregation so that grout will flow into masonry joints. Grout shall conform to CBC Section 2103.
- B. Fine Grout: 1 part portland cement, to which may be added not more than 1/10 part lime putty, and 3 parts sand.
 - 1. Fine grout shall be used for all grout spaces less than 3" wide.
- C. Coarse Grout: 1 part portland cement, to which may be added not more than 1/10 part lime putty, 3 parts sand and not less than 1 part nor more than 2 parts pea gravel (3/8" maximum aggregate size).
 - 1. Coarse grout shall be used in grout spaces 3" wide or more.
- D. Add "Sika Grout Aid" admixture to grout at the rate of 1 pound per 100 pounds cementitious material.

PART 3 - EXECUTION

3.1 MIXING MORTAR AND GROUT

- A. Accurately measure materials in suitably calibrated devices; shovel measurements are not acceptable. Each 94lb. sack of portland cement will be considered as 1 cubic foot.
- B. Place sand, cement and water in mixer in that order and mix for at least 2 minutes; then add lime putty and continue mixing as long as necessary to secure a uniform mass, but in no case less than 10 minutes.

- C. Use mixers of at least 1 sack capacity; batches requiring fractional sacks will not be permitted unless cement is weighed for each batch.

3.2 GROUTING PROCEDURES

- A. Specified under Sections 04 22 00 and 04 21 00.

3.3 RETEMPERING

- A. When necessary to retemper mortar, add water and remix; retempering by dashing water over mortar will not be permitted.
- B. Any mortar which is unused within 30 minutes after initial mixing and any mortar that has begun to set shall not be used.

3.4 DEFECTIVE MORTAR OR GROUT

- A. Should the strength of mortar or grout fall below that specified, remainder of Work shall be adjusted to reach required strength. Work in place representing inferior grout and mortar and indicating a strength less than the minimum specified shall be tested by taking and testing core samples. Number and location of cores shall be determined by Structural Engineer.
- B. Should compression tests of cores fail to meet required strength, masonry shall be deemed to be defective and shall be removed and replaced at no cost to Owner.
- C. Costs relative to taking and testing of core samples shall be paid by Owner and will be deducted from Contract Amount. Cost of patching core holes shall be borne by Contractor.

END OF SECTION 04 05 00

SECTION 05 51 33 METAL LADDERS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Metal roof access ladder.

1.2 RELATED SECTIONS

- A. Section 05 50 00 – Metal Fabrications:
- B. Section 06 10 00: Rough Carpentry.

1.3 REFERENCES

- A. Codes and Regulations:
 - 1. California Building Code, 2016 edition.
 - 2. Welding Certification requirements of permit jurisdiction.
- B. Organization and Trade Standards:
 - 1. Applicable or referenced sections of AISC Manual of Steel Construction, current edition.
 - 2. Applicable or referenced sections of AWS D1.1 Standards, current edition.
 - 3. ANSI A14.3 - American National Standard for Ladders -- Fixed -- Safety Requirements; 1992.
 - 4. ASTM B 209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2001.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Shop Drawings: Ladder shall be detailed and submitted for approval prior to fabrication showing full dimensions, wall and floor attachments, materials, construction and finish, and shall comply with all safety orders pertinent to the installation. Indicate size and type of fasteners, welds, accessory items, shop finish and method of anchorage.
- C. Product Data: Submit for primer paint.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver all materials and finished assemblies in an undamaged condition under provisions of Section 01 25 00.
- B. Maintain manufacturer's packaging until ready for installation.

1.6 WARRANTY

- A. Provide a 5 year manufacturer's warranty against defects in materials and workmanship.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: ALACO Ladder Co., which is located at: 5167 G St. ; Chino, CA 91710-5143; Toll Free Tel: 888-310-7040; Tel: 909-591-7561; Email: request info (sales@alacoladder.com); Web: www.alacoladder.com
- B. Requests for substitutions will be considered in accordance with provisions of Section 01600.General: Comply with OSHA and ANSI A14.3. Provide complete with anchors and accessories.

2.3 MATERIALS

- A. Extruded Aluminum Profiles: ASTM B 221/B 221M, ASTM B 210, ASTM B 308/B 308M, Alloy 6061-T6; standard mill finish.
- B. Aluminum Sheet and Plate: ASTM B 209/B 209M, Alloy 6061-T6; standard mill finish.
- C. Fasteners: Aluminum solid aircraft rivets rated at 300 lbs (1335 N) shear strength.
- D. Cast fittings, connectors and rung ends: Cast Aluminum alloy 356
- E. Ladder shall be shop fabricated.
- F. Fabricate finish surfaces smooth, unless otherwise specified.
- G. Make joints as strong and rigid as adjoining sections. Make exposed joints close fitting and where jointing is least conspicuous. Unless otherwise indicated, full weld joints and seams and dress smooth where exposed.

2.3 LADDERS

- A. Ladders - General: Comply with ANSI A14.3 and OSHA regulations.
- B. Fixed Wall Ladders: Extruded aluminum; serrated rungs 1-1/8 inches (29 mm) in diameter, connected to 2-7/8 inch (73 mm) side rail channels with cast aluminum

rung connectors, each secured to rails by means of four solid aircraft rivets.

1. Attic and Roof Hatch Access: Provide ladder Model # 560. Provide ladder side rail with rubber end caps and end with sufficient clearance for hatch to properly close. According to manufacturer's instructions, Contractor shall determine the exact required height of ladder in field prior to ordering and ensure coordination with roof access hatch installation and operation.
2. Mounting Brackets: Provide Model #560, 3/8" thick mounting brackets with bolts into solid wall framing as needed for a complete and proper installation.

2.4 FINISHES

- A. Provide all aluminum in standard mill finish.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Prior to Work of this Section, carefully inspect the installed Work of all other trades and verify that all such Work is complete to the point where this installation may properly commence.
- B. Verify measurements in field for Work fabricated to fit job conditions.

3.2 INSTALLATION

- A. Install straight and true and in accordance with fabricator's instructions and with approved Shop Drawings.
- B. Upon completion of installation, re-examine Work and provide additional shims, washers, anchors and corrective Work to insure that installation is firm, tight anchored, in alignment with neat fits, without distortion, unsightly fastenings raw edges or protrusions.

3.3 ADJUSTING AND CLEANING

- A. Cleaning Galvanized Surfaces: Clean bolted connections, abraded areas and field welds and apply ASTM A780 galvanizing repair paint.

3.4 PROTECTION

- A. Protect finished installation under provisions of Section 01 50 00.

END OF SECTION

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SECTION 06 05 60 COUNTERTOPS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Solid surface countertops.
- B. Laminated plastic countertops.
- C. Splash panels.
- D. Preparation for utilities.

1.1 RELATED SECTIONS

- A. Section 06 41 16: Laminate-Clad Wood Casework.

1.3 REFERENCES

- A. WI - Woodwork Institute: Manual of Millwork.

1.4 QUALITY ASSURANCE

- A. Manufacture countertops in accordance with quality standards of the Manual of Millwork of the Woodwork Institute.

1.5 MOCK-UP

- A. Prepare mock-up under provisions of Section 01 44 00.
- B. Provide full size countertops of each type indicated.
- C. Units will be examined to ascertain quality and conformity to WI standards.
- D. Units will establish a minimum standard of quality for this Work.
- E. Approved units may be used as part of the Work.

1.6 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Shop Drawings: Include materials, component profiles, fastening methods, assembly methods, joint details, accessory listings, and schedule of finishes. Provide WI Certified Compliance label on first page of each set.
- C. Submit Samples of each type of countertop material.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Substitutions: Under provisions of Section 01 62 00.

2.4 SOLID SURFACE COUNTERTOPS

- A. Manufacturer: Corion, Wilsonart, Formica or equal
- B. Material: Solid Surface: Non-porous, homogeneous material maintaining the same composition throughout the part with a composition of acrylic polymer, aluminum trihydrate filler and pigment
- C. Lavatory Tops with Seamed Bowls: 1/2" thick countertop of solid polymer surfacing material, cast to desired profiles and sizes having edge details as indicated on Drawings conforming to CSA B45.5/IAPMO Z124, complete with seamed "S" undermount bowl. Provide countertops complete with backsplashes of size shown on Drawings. Ensure countertop and backsplash finish/color per drawings.

2.5 LAMINATED PLASTIC COUNTERTOPS

- D. Fabricate in accordance with Section 16 of the Manual of Millwork:
 - 1. WI Grade: Premium [Custom].
 - 2. Core Thickness: 0.75 inch minimum.
 - 3. Laminate Thickness: 0.050 inch.
 - 4. Edge Covering: Rolled
 - 5. Backsplash: Square butt
 - 6. Top of Back Splash: Waterfall
 - 7. Plastic Colors and Pattern: Refer to drawings.
 - 8. Exam & Soiled Utility Rooms: Acid-resistant laminated plastic

2.6 HARDWARE

- A. Grommets: Doug Mockett and Company, Inc. SG Series; plastic 3-1/2 inch diameter. Colors and locations as selected by Architect.
- B. Countertop Support Brackets: 1/8 inch thick x 18 inch x 24 inch steel legs, 1-1/2 inch forms with six 1/4 inch mounting holes per side, 1,000 lbs minimum load support, 45 degree cut out as manufactured by A & M Hardware, Inc., or approved equal.
- C. Remainder of hardware required shall be as listed in Supplement No. 1 to Sections 14 and 15 of the Manual of Millwork.

2.7 FABRICATION

- A. Shop assemble countertops for delivery to site in units easily handled and sized to permit passage through building openings.
- B. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.
- C. Provide cutouts for plumbing fixtures, inserts, appliances, outlet boxes, and other fixtures and fittings. Verify locations of cutouts from on-site dimensions. Seal contact surfaces of cut edges.
- D. Install plastic grommets in the field in countertops as directed by the Owner's Representative and/or Architect.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Verify adequacy of backing and support framing.
- B. Examine countertops for defects. Correct all defects prior to installation.

3.2 INSTALLATION

- A. Install countertops in accordance with Installation of Architectural Millwork, Section 26 of the Manual of Millwork.
- B. Make joints neatly, with uniform appearance.
- C. Install Work plumb, level, true, and straight, with no distortions. Install with no variation in flushness of adjoining surfaces.
- D. Shim as required, using concealed shims.

- E. Scribe and cut to fit adjoining Work.
- F. Repair damaged and defective Work to eliminate visual and functional defects; where repair is not possible, replace Work.
- G. Sealant: Install sealant as specified in Section 07 92 00, as required to close any small unavoidable gaps between counter and abutting surfaces.

3.3 ADJUSTING AND CLEANING

- A. Protect countertops from damage until acceptance.
- B. Clean countertops with materials and equipment that will not cause damage to surfaces.

3.4 SCHEDULE

- A. Each base cabinets shall receive a countertop.
- B. All countertops shall be plastic laminate covered unless specifically noted otherwise.
- C. Stainless steel countertops shall be as detailed on Drawings.
- D. Galvanized steel countertops shall be installed where indicated.

END OF SECTION

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SECTION 06 20 00 FINISH CARPENTRY

PART 1- GENERAL

1.1 SECTION INCLUDES

- A. Finish carpentry items, other than shop prefabricated casework.
- B. Hardware and attachment accessories.

1.2 REFERENCES

- A. ASTM E84 - Test Method for Surface Burning Characteristics of Building Materials.
- B. ASTM E152 - Methods for Fire Tests of Door Assemblies.
- C. AWWA - American Wood Preservers Association.
- D. NFPA 80 - Fire Door and Windows.
- E. UL - Underwriters' Laboratories, Inc.
- F. WI - Woodwork Institute: Manual of Millwork.

1.3 QUALITY ASSURANCE

- A. Manufacture millwork and finish carpentry items in accordance with quality standards of the Manual of Millwork of the Woodwork Institute.

1.4 REGULATORY REQUIREMENTS

- A. Conform to CBC and UL requirements for fire ratings.
- B. Conform to Flame Spread Classifications of Interior Millwork contained within the Appendix of the WI Manual of Millwork for flame spread ratings.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, finishes, and accessories to a minimum scale of 1-1/2 inch to one foot. Provide WI Certified Compliance label on first page of each set.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store and protect products under provisions of Section 01 60 00.
- B. Conform to Section 1 of Millwork Manual.
- C. Store materials in ventilated, interior locations under constant minimum temperatures of 70 degrees F and maximum relative humidity of 50 to 55 percent.

PART 2 - PRODUCTS

2.1 FABRICATORS

- A. Substitutions: Under provisions of Section 01 62 00.

2.2 MATERIALS

- A. Materials specified under Millwork Manual Section Numbers refer to lumber grades in Millwork Manual as follows: Section 3, Lumber - Hardwood/Softwoods; Section 4, Plywood - Hardwood/Softwood; Section 6, Exterior Trim; Section 9, Interior Trim.

2.3 INTERIOR TRIM - PAINT GRADE

- A. Finger jointed kiln-dried pine is acceptable for all areas except high moisture areas.
- B. Trim profiles shall be mill standard shape numbers as indicated.
- C. All paint-grade trim shall be pre-painted at mill.

2.4 INTERIOR TRIM - STAIN GRADE

- A. Fabricate in accordance with Section 9 of Millwork Manual:

<u>Item</u>	<u>Species</u>	<u>Grade</u>	<u>Intended Finish</u>
Base, Casing & Trim	Birch	Custom	Transparent
Tackboard Frames, Chalk Rail & Frame	Birch	Custom	Transparent

2.5 ADHESIVE

- A. Adhesives: Type 1 adhesive recommended by WI to accommodate application in accordance with the Appendix to the Millwork Manual.
- B. Formulation: Exterior type per AWPA C20, consisting of organic-resin solution, insoluble in water, thermally set in wood by kiln drying.
- C. Wall Adhesive: Solvent release, cartridge type, compatible with wall substrate, capable of achieving durable bond.

2.6 WOOD TREATMENT PROCESS

- A. Fire Retardant Type: Listed by Underwriters' Laboratories, Inc. (UL); capable of providing a maximum flame spread/smoke development rating of 20/25 in accordance with ASTM E84.

2.7 ACCESSORIES

- A. Nails: Size and type to suit application, galvanized finish for interior use, stainless steel for exterior use.
- B. Bolts, Nuts, Washers, Blind Fasteners, Lags, and Screws: Size and type to suit application; galvanized finish for interior use, stainless steel for exterior use.
- C. Lumber for Shimming and Blocking: Softwood lumber of Douglas Fir species.
- D. Primer: Alkyd primer sealer.
- E. Wood Filler: Solvent base, tinted to match surface finish color.

2.8 FABRICATION

- A. Fabricate work in accordance with WI Custom grade standards.
- B. Shop assemble work for delivery to site, permitting passage through building openings.
- C. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.
- D. Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces and openings are ready to receive work and field measurements are as instructed by the fabricator.
- B. Verify mechanical, electrical, and building items affecting work of this Section are placed and ready to receive this work.
- C. Verify adequacy of backing and support framing.
- D. Beginning of installation means acceptance of existing conditions.

3.2 PREPARATION

- A. Before installation, prime paint surfaces of items or assemblies to be in contact with cementitious materials or that will be permanently concealed from view.

3.3 INSTALLATION

- A. Install work in accordance with WI Manual of Millwork standard.

3.4 TOLERANCES

- A. Maximum Variation from True Position: 1/16 inch.
- B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch.

3.5 PREPARATION FOR FINISHING

- A. Set exposed fasteners. Apply wood filler in exposed fastener indentations. Sand Work smooth.

3.6 FINISHING

- A. Site finish under provisions of Section 09 91 00.

3.7 PROTECTION

- A. Protect finished installation under provisions of Section 01 60 00.

END OF SECTION

SECTION 06 41 16 LAMINATE-CLAD WOOD CASEWORK

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Special fabricated cabinet units.
- B. Preparation for utilities.
- C. Cabinet hardware.

1.2 RELATED SECTIONS

- A. Section 06 05 60: Countertops.

1.3 REFERENCES

- A. WI - Woodwork Institute: Manual of Millwork.
- B. NEMA LD3.1: High-Pressure Decorative Laminates.

1.4 QUALITY ASSURANCE

- A. Manufacture casework items in accordance with quality standards of the Manual of Millwork of the Woodwork Institute.

1.5 MOCK-UP

- A. Prepare mock-up under provisions of Section 01 33 00.
- B. Provide full size base cabinet and upper cabinet of each type indicated, in specified finish with hardware installed.
- C. Units will be examined to ascertain quality and conformity to WI standards.
- D. Units will establish a minimum standard of quality for this Work.
- E. Approved units may be used as part of the Work.

1.6 SUBMITTALS

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

- B. Shop Drawings: Include materials, component profiles, fastening methods, assembly methods, joint details, accessory listings, and schedule of finishes. Provide WI Certified Compliance label on first page of each set.
- C. Submit Samples of each color/pattern of plastic laminate cabinet facing.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Substitutions: Under provisions of Section 01 25 00.

2.2 CABINET DESIGN

- A. Individual cabinets are indicated on the Drawings by the WI Design Numbering System, Section 15, Supplement No. 3.
- B. A WI number followed by an "L" indicated on the Drawings requires that each door or pair of doors and drawers within that WI cabinet be individually lockable.

2.3 CASEWORK - LAMINATED PLASTIC COVERED

- A. Fabricate in accordance with Section 15 of the Manual of Millwork:

- | | | |
|----|--|--|
| 1. | WI Grade: | Custom. |
| 2. | Type: | Type I. |
| 3. | Construction: | Style A-Frameless. |
| 4. | Joinery: | Dado and screw. |
| 5. | Cabinet Backs: | Dadoed (Detail 2C and 7C Millwork Manual). |
| 6. | Cabinet Door Type: | Type A. Stile and rail (for glass). |
| 7. | Shelves: | 1-M-2 particle board, 1 inch thick, MOE of 950, capable of supporting 50 lb/sq ft load with deflection of L/144. |
| 8. | Shelf Edge Bands | 0.020 inch PVC in color to match shelf.
All 4 edges of adjustable shelves to receive banding. |
| 9. | Door, Drawer, and Cabinet Drawer Box Edge Bands: | Door and Drawer: 3 mm PVC edge banding.
Boxes: 0.020 inch PVC white. |

10.	Exposed Surfaces (Including Shelves and Interior of Open Front Cabinets):	0.028 inch high pressure plastic laminate, color and pattern as selected by Architect. A maximum of 5 colors and patterns to be selected by Architect from Nevamar's standard ARP textured, satin and woodgrain pattern finish.
11.	Semi-Exposed Surfaces (Behind Doors and Inside Drawers):	Low pressure decorative polyester or melamine laminate ALA-85.
12.	Security and Dust Panels:	Particleboard, 3/4 inch thick at all lockable drawers.

2.4 HARDWARE

- A. Hinge option: Unless noted otherwise, BLUM No. B71T concealed self-closing hinge with B174H7100I Inserta Plate, silver shall be used.
- B. Pulls for doors and drawers: 4" wire pulls – US26D
- C. Sliding door hardware:
 - 1. For 3/4" sliding door: EPCO No. EP11
 - 2. For 1/4" glass sliding doors: Knappe and Vogt No. 992.
- D. Drawer Slides:
 - 1. For shallow / upper drawers: BLUM Metabox System B330M.
 - 2. For medium, tall and file drawers: BLUM Metabox System B330H.
 - 3. For all file drawers: Full extension slides.
- E. Wall standards and brackets: Knappe and Vogt No. 83 Standard with No.183 brackets for heavier duty.
- F. Door and drawer locks:
 - 1. For cabinet doors: COMPX NATIONAL No. C-8173 Lock.
 - 2. For cabinet drawers: COMPX NATIONAL No. C-8178 Lock.
 - 3. For sliding wood doors, COMPX NATIONAL No. C-8142 lock.
 - 4. For sliding glass doors: Olympus No. 329R-26D
- G. Shelf Supports at exposed opening shelving shall be Knappe and Vogt No. 346 with cushion #129. Provide (2) #8 wood screws per shelf support at opposite corners for seismic restraint.
 - H. Shelf Supports at adjustable shelves at cabinet doors shall be 'Engstrom' earthquake proof shelf clips.
 - I. Magnetic catches shall be EPCO No. EP592.

- J. Grommets: Doug Mockett and Company, Inc. SG Series; plastic 3-1/2 inch diameter. Colors and locations as selected by Architect.
- K. Hanger Rods: 1-1/16 inch diameter tubing, stainless steel.
- L. Shelf Lip: 1/4 inch thick x 3 inch high acrylic plastic edging of color selected by Architect. Ease all edges of plastic.
- M. Remainder of hardware required shall be as listed in Supplement No. 1 to Sections 14 and 15 of the Manual of Millwork.

2.5 FABRICATION

- A. Shop assemble casework for delivery to site in units easily handled and sized to permit passage through building openings.
- B. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.
- C. Provide cutouts for plumbing fixtures, inserts, appliances, outlet boxes, and other fixtures and fittings. Verify locations of cutouts from on-site dimensions. Seal contact surfaces of cut edges.
- D. In freestanding base casework with utilities, provide enclosed chase from penetration into casework (includes through floor penetrations) to termination at fixture. Utilities to be entirely concealed by chase. Provide plastic laminate clad face and edged banded removable access panels as necessary for full accessibility to utilities. Access panels to be located at unexposed portion of casework. Chase and access panels shall in no way reduce or infringe on ADA and Title 24 accessibility requirements.
- E. Install plastic grommets in the field in plastic laminate casework and Owner-furnished furniture as directed by the Owner's Representative and/or Architect.
- F. Install seismic shelf lips on all exposed edges of open laboratory shelving with flathead countersunk wood screws spaced 6 inches on center. Finish exposed screw heads to match color of shelf lip.
- G. Install one adjustable shelf for each 12 inches of height for all wall mounted cabinets.
- H. Provide stretcher at top face of all door and drawer fronts.
- I. Fabricate base and full height cabinets 22-1/2 inches deep clear I.D. unless shown otherwise.
- J. Fabricate wall mounted upper cabinets 12 inches deep clear I.D. unless shown otherwise.
- K. Provide locks as indicated at location shown on Drawings for both doors and drawers.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Verify adequacy of backing and support framing.

3.2 INSTALLATION

- A. Set and secure casework in place rigid, plumb, and level.
- B. Install casework in accordance with Installation of Architectural Millwork, Section 26 of the Manual of Millwork.

3.3 ADJUSTING AND CLEANING

- A. Adjust doors, drawers, hardware, fixtures and other moving or operating parts to function smoothly and correctly.
- B. Clean casework, shelves, hardware, fittings and fixtures.

3.4 SCHEDULE

- A. All casework shall be plastic laminate covered unless specifically noted otherwise.

END OF SECTION

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SECTION 07 13 00
WEATHER-RESISTIVE BARRIER AND FLASHING

PART

exterior finish systems.

- B. Section 09 24 00: Portland Cement Plaster.
- C. Section 09 29 00: Gypsum Sheathing.
- D. Section 07 54 19: Metal Roofing
- E. Section 07 54 20: Polyvinyl-Chloride Roofing

- 1. American Society for Testing Materials (ASTM).
- 2. California Building Code, 2016 Edition, with all applicable amendments.
- 3. Per Specification 01 42 00

- 1. Membrane system shall provide a watertight barrier to prevent passage of water into the building.
- 2. Membrane shall seal around penetrating fasteners and meet the strictest requirements of ASTM D1970.

resistive barrier and flashing from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying progress of the Work.

- D. Submit example of wall waterproofing manufacturer's warranty, as specified herein, prior to beginning Work. Provide executed warranty upon Project closeout.

manufacturer's name, components materials, application details, recommendations for application and use, and test data substantiating that products comply with Contract requirements. Maintain seals unbroken and labels intact until time of use.

- D. MSDS sheets for all materials, cleaners, and solvents used.
- A. Comply with requirements of Section 01 45 00.
- B. Do not install products until construction has progressed to a point that inclement weather will not damage existing or repaired conditions.

1.7 QUALITY REQUIREMENTS

- A. Engage experienced personnel to perform Work of this Section. The Contractor shall have completed installations similar in material, design, and extent to that indicated for this Project with a record of successful in-service performance, for a period of at least five years.
- B. Obtain each type of material comprising the wall waterproofing system, from a single manufacturer for the duration of the Project.
- C. Provide effective, full-time quality control over all fabrication and installation activities. Full responsibility for quality control shall remain with the Contractor.
- D. Perform inspections to ensure strict conformance to the Contract at all phases of construction. Inspect components for proper alignment and placement, attachment, workmanship, and damage. Inspect the Work prior to covering any part of the Work of this Section, or releasing for subsequent Work by other trades.

1.8 WARRANTY

- A. Warranty all Work under this Section in a document stating that:

1. If, within two years after the date of Substantial Completion of this Work, any of the Work of this Section is found to be defective or not in accordance with the Contract Documents, the Contractor shall, at its sole cost and expense, correct it promptly after receipt of a written notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition.
 2. The Contractor shall bear all costs incurred by the Owner, including reasonable attorney's fees, court costs, and expert witness and consultant fees, to enforce Contractor's compliance with the obligations of this warranty.
 3. The obligations of this warranty shall run directly to the Owner and its successors and assigns and may be enforced by the Owner and its successors and assigns against the Contractor, shall survive the termination of the Contract, and shall not be limited by the conditions other than this Contract.
- B. Provide five-year manufacturers' material warranties for the self-adhered membrane liquid membrane for the building underlayment.

PART

- A. Flashing: "Vycor V40" manufactured by Grace Construction Products; 0.040 inch thick, self-adhering rubberized-asphalt membrane with integrally bonded polyethylene laminate, minimum 6 inches in width.
- B. Flexible Flashing: Grace Construction Products, Self-Adhesive Bituthene 5000.
- C. Primer for Wood, Gypsum and Other Surfaces: "Perm-A-Barrier WB" Primer.
- D. Underlayment: Asphalt-saturated, Kraft, Grade D, 60-minute building paper, "Super Jumbo Tex" manufactured by Fortifiber Corporation.
- E. Weather-Resistive Barrier: "Tyvek StuccoWrap" manufactured by DuPont Building Innovations.
- F. Accessories: Seam Tape, fasteners, sealants, primers and adhesives as recommended by weather barrier and/or flashing manufacturer.
- G. Substitutions: Under provisions of Section 01 25 00.

PART

special conditions associated with repairs to existing construction prior to development of submittals and to material fabrication, purchase or delivery. Notify the Architect immediately of any inconsistency between the conditions found and those shown in the Drawings.

membrane for roughness, ridges, contaminants, unsound substrates or other conditions that may impair the installation. Promptly report any such conditions to the Architect. Correct all defective conditions before commencing Work.

- A. Follow all manufacturers' recommendations, except as modified herein. Ensure that surfaces to receive primer and membrane are clean and dry.
- B. Fully and completely adhere membrane to the primed substrate using a neoprene roller. Wrinkles, open laps, blisters, perforations or "fish mouths" in the membrane are not acceptable. Promptly repair defects in the membrane. Do not allow membrane installation defects to be concealed by Work of other Sections.
- C. Ensure all membrane material is continuously supported.
- D. Provide continuous membrane flashing at all openings. Flash rough openings, penetrations, and other appurtenances whether shown or not on the Drawings and to provide airtight and watertight assembly.
- E. Provide minimum lap onto existing weather resistive barrier of 6 inches. Ensure existing material is clean and sound, as required by manufacturer.
- F. Configure membrane flashings to maintain laps to shed water; shingle flashings over onto metal flashings. Provide a minimum 6 inches lap onto face of adjacent sheathing or waterproofing unless detailed otherwise.

up the surface. Precut into 8 feet maximum lengths and apply sheets horizontally in a shingled manner, providing 6 inches side laps and 6 inches end laps. Stagger end laps 24 inches minimum. Roll out sheets onto wall and align. Secure to building sheathing using staples. Use only as many staples as necessary to prevent sagging. Favor stapling through laps over stapling through the field of the sheet.

transitions. Wrap from one side of the wall around the corner, then wrap from the other side over the corner to lap over the first sheet. Do not cut short at corners and

transitions.

underlayment that extends 12 inches beyond the tear. Tuck the top edge of this piece underneath the sheet above the tear to create a lap that will shed water.

- D. Tie building underlayment into all openings, penetrations, and flashings whether shown on the Drawings or not.
- E. Minimize exposure of the building underlayment to rain. Promptly install rainscreen and/or siding upon completion of the building underlayment installation.
- A. Install materials in accordance with the manufacturers' recommendations, using fasteners, seam tape, and other accessories intended for the purpose.
- B. Lap joints to direct water to the exterior.
- C. Provide complete coverage to produce a continuous weathertight barrier.

3.5 PATCHING

membrane that extend 6 inches beyond the damaged area in all directions.

above to avoid creating backwater laps in the membrane.

END OF SECTION

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SECTION 07 21 30 BUILDING INSULATION

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Batt insulation and vapor barrier in exterior wall construction.
- B. Batt insulation for filling perimeter window and door shim spaces and crevices in exterior wall.
- C. Batt insulation in interior walls and partitions and attic floor system.

1.2 REFERENCES

- A. ASTM C665 - Mineral Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
- B. ASTM C1320 - Installation of Mineral Fiber Batt and Thermal Insulation for Light Frame Construction.
- C. CCR - California Code of Regulations.
- D. CBC - Uniform Building Code.
- E. Business and Professions Code.

1.3 PERFORMANCE REQUIREMENTS

- A. Materials of this Section shall provide continuity of thermal and moisture barrier at building enclosure elements.
- B. Materials of this Section shall provide continuity of sound control where indicated or scheduled.

1.4 REGULATORY REQUIREMENTS

- A. Installation of insulation may only commence if insulation meets mandatory manufacturer certification to the California Energy Commission required by Title 24, Part 6, Section 118 of the California Code of Regulations (CCR) that insulation complies with Title 20, Chapter 4, Article 3 of the California Quality Standards for Insulating Materials.

- B. Insulation materials shall be certified in compliance with Business and Professions Code Section 19165.
- C. Insulation manufacturer shall be licensed by the California Department of Consumer Affairs, Bureau of Home Furnishing and Thermal Insulation according to Business and Professions Code, Section 19059.7.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Submit Product Data for each type of insulation specified.
- C. Submit manufacturer's certification that materials meet or exceed specified regulatory requirements.

PART 2 - PRODUCTS

2.1 MANUFACTURERS - INSULATION MATERIALS

- A. Certain Teed Corp.
- B. Manville Corp.
- C. Owens-Corning Fiberglass Corporation.
- D. Substitutions: Under provisions of Section 01 25 00

2.2 MATERIALS

- A. Batt Insulation: ASTM C665 preformed glass fiber batt, Type III, Class A, with reflective membrane faced surface with a flame spread of 25 or less, and a smoke density of less than 50 when tested in accordance with CBC Standard No. 8-1. Category 1 with stapling flanges for attachment of blanket to applicable construction. Equivalent continuous roll membrane facing may be utilized in lieu of individual faced glass fiber batts. Provide R19 at walls.
- B. Batt Sound Insulation: ASTM C665 preformed glass fiber batt, Type I unfaced, with flame spread of 25 or less, and a smoke density of less than 450 when tested in accordance with CBC Standard No. 8-1. Provide R-19, 3-1/2 inch minimum thickness. Fill available wall and floor system cavity.
- C. Rigid insulation: ASTM e136, ASTM C653 and C518 Insulation. Minimum depth 6 inches.

- D. Spray-in-place insulation for Roofs : R-27; 3 inches thick; see section 07 21 19 Spray-in-Place Insulation.
- E. Nails or Staples: Steel wire; electroplated; type and size to suit application.
- F. Tape: Bright aluminum self-adhering type, mesh reinforced, 2 inches wide.
- G. Support Wire: 16 gauge steel wire.
- H. Support Rods: 13 gauge, pointed spring steel length as required for stud spacing.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that substrate, adjacent materials, and insulation are dry and ready to receive insulation.
- B. Do not install until building is fully enclosed to weather.

3.2 INSTALLATION

- A. Install insulation in accordance with insulation manufacturer's instructions and ASTM C739, C1149 and C1320.
- B. Install batt insulation in exterior walls, ceiling furring, and roof spaces without gaps or voids. Where wood framed furred ceiling occur, install insulation over the furring strips rather than between the rafters.
- C. Install batt sound insulation in interior walls and where indicated or scheduled.
- D. Trim insulation neatly to fit spaces.
- E. Fit insulation tight in spaces and tight to exterior side of mechanical and electrical services within the plane of insulation. Leave no gaps or voids.
- F. Install with factory-applied membrane facing on warm side of building spaces.
- G. Lap ends and side flanges of vapor barrier membrane over face of framing members.
- H. Extend vapor barrier on to any adjacent construction and tape seal edge of vapor barrier.
- I. Seal butt ends, lapped flanges, and tears or cuts in membrane with tape or another layer of membrane.

- J. Seal joints in vapor barrier caused by pipes, conduits, electrical boxes, and similar items penetrating vapor barrier.
- K. Face staple flange over flange of adjacent blanket to wood studs at maximum 6 inches on center.
- L. Tape stapling flange over flange of adjacent blanket to flange of metal stud.
- M. Friction fit sound insulation between studs as required to completely fill space between the wall finishes.
- N. Where wall finish does not occur use 16 gauge support wire through studs at not more than 16 inches on center vertically at metal studs.
- O. Remove all unused insulation and related products and dispose of correctly.

END OF SECTION

SECTION 07 26 40

WATER VAPOR EMISSION CONTROL BARRIER

PART I - GENERAL

1.01 DESCRIPTION

- A. Work under this Section includes, but is not necessarily limited to vapor control barrier.
- B. Related Sections include the following:
 - 1. Division 3, Section 03414 – Self Leveling Underlayment.

1.02 SYSTEM DESCRIPTION

- A. Provide a moisture vapor control system consisting of a combination of epoxy resins and other chemical compounds that is specifically formulated to prevent floor failures on concrete slabs. The moisture mitigation system must comply with the full intent of the newly adopted ASTM F3010-13 standard. A signed “Certificate of Conformance” must be presented to the Owner stating that the product submitted complies with this ASTM standard.

1.03 QUALITY ASSURANCE

- A. Manufacturer: Membrane-forming moisture mitigation systems to be qualified under this practice shall have a vapor permeance no greater than 0.1 grains h⁻¹ ft⁻² in. Hg⁻¹ when tested in accordance with Test Method E96 Wet Method when applied at the recommended thickness designated by its manufacturer.
- B. Applicator: Must be “Certified” with the product manufacturer as being trained and qualified to apply the specified product.

1.04 SUBMITTALS

- A. GENERAL: Refer to Section 01330 – Shop Drawings, Product Data and Samples.
- B. PRODUCT DATA: Manufacturer’s specification, data, and installation instructions.
- C. Submit installer “certificate” from the product manufacturer.
- D. Submit Tests from an Independent Testing Agency for the following: Testing Agency must be certified by the International Concrete Repair Institute (ICRI).
 - 1. ASTM E 96 Test Methods for water Vapor Transmission of materials, Wet Method - vapor permeance no greater than 0.1 grains h⁻¹ ft⁻² in. Hg⁻¹
 - 2. ASTM D 7234 Test Method for Pull-Off Adhesion Strength of Coatings on concrete using portable Pull-Off Adhesion Testers
 - 3. ASTM F 2170 Test Method for Determining Relative Humidity in concrete floor slabs using Insitu Probes manufactured by Wagner Electronics.

4. ASTM F-3010-13 – Submit signed “Certificate of Conformance” document confirming product submitted meets or exceeds the full intent of this standard.
5. ASTM F 710 – Test Method to Measure PH levels of the concrete using an Electronic PH Meter manufactured by Wagner Electronics.

E. Warranty certificate as specified.

1.05 PRODUCT HANDLING

- A. Refer to Section 01610 – Product Requirements.
- B. Material data safety sheet to be delivered to site prior to application.

1.06 JOB CONDITIONS

- A. Concrete surface temperature shall be 50 to 90°F.

1.07 WARRANTY

- A. 15 year warranty if product is applied by a trained and manufacturer approved installer.
 1. Warranty; Beginning on the date the project was finished the specified product manufacturer will warrant the system against material defects and the vapor transmission reduction as shown in the manufacturer printed literature is subject to the condition and restrictions set forth in the warranty.

PART II - PRODUCTS

2.01 MANUFACTURERS

- A. Specified Product: KOSTER VAP 1 2000 or Equal
 1. 100% solid 2 component epoxy barrier system used for the control of moisture vapor emission and alkalinity control. Product must have an overall perm rating of 0.1 or less.
 2. No water based or silicates formulation allowed.
 3. Be assured self leveling products and adhesives comply with the specified product.

2.02 PHYSICAL PROPERTIES

- A. Formulation: Moisture vapor control system consisting of a combination of epoxy resins and other chemical compounds. No Water based or silicate formulation allowed.
- B. The methods below are to be conducted by an Independent Laboratory testing certified by ICRI: See 1.04 Submittals
 1. ASTM E 96 Water Vapor Transmission, wet method. Vapor permeance no greater than 0.1 grains h⁻¹ ft⁻² in. Hg⁻¹

2. ASTM D 7234 Concrete Adhesion Min 500 psi (100% concrete cohesive failure)
3. ASTM D 1308 Chemical Resistance, 14pH solution No damage, 100% resistant at 28 day exposure
4. ASTM F 710 – Test Method to Measure PH levels of the concrete.

PART III - EXECUTION

3.01 INSTALLATION

- A. Mechanically prepare surfaces to an ICRI #3 by shotblasting. Grinding is permitted in inaccessible areas or for edging purposes.
 1. Mix and apply the control barrier system in accordance with the manufacturers written instructions.
 2. Treat all moving, non-moving voids and cracks in accordance with the manufacturers written instructions.

3.02 FIELD QUALITY CONTROL

- A. Floor Covering Applications
 1. Post installation moisture test not required after the installation or product.
 2. Disposal of product should be done in accordance with current local, state and federal regulations.

END OF SECTION 07 26 40

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SECTION 07 42 00

METAL WALL PANELS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. The work includes, but is not necessarily limited to, furnishing and installation of all preformed metal wall panels and accessories as indicated on drawings.

The extent of panel system work is indicated on the drawings and in these specifications.

1. Panel system requirements include the following components:
 - a. Aluminum faced composite panels with mounting system. Panel mounting system including anchorages, shims, furring, fasteners, gaskets and sealants, related flashing adapters, and masking (as required) for a complete installation.
 - b. Parapet coping, corners, soffits, sills, border, and filler items indicated as integral components of the panel system or as designed.

1.2 RELATED SECTIONS

- A. Structural Steel Supports: Section 05 10 00
- B. Structural Metal Roof and Floor Decking: Section 05 30 00
- C. Miscellaneous Fabricated Steel: Section 05 50 00
- D. Thermal Insulation: Section 07 20 00
- E. Fireproofing: Section 07 25 00
- F. Sheetmetal Gutters and Downspouts: Section 07 60 00
- G. Joint Sealants not specified herein: Section 07 90 00
- H. Finish Painting not specified herein: Section 09 90 00

1.3 REFERENCES

- A. American Society for Testing and Materials (ASTM).
- B. National Fire Protection Association (NFPA)
- C. California Building Codes (CBC).
- D. Underwriters Laboratories, Inc. (UL).
- E. American National Standards Institute (ANSI).

1.4 SYSTEM DESCRIPTION

- A. Performance Requirements: Provide metal wall panel with performance criteria stated by the manufacturer.
- B. Provide furnishing and installation of all preformed metal wall panels, and accessories as

indicated on the drawings and specified herein.

1.5 SUBMITTALS

- A. Submit under provisions of section 01 33 00.
 - 1. Shop Drawings: Submit Shop Drawings showing layout, profiles and product components.
 - 2. Samples: Submit Samples for finishes, colors and textures.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Comply with requirements of Section 01 60 00.
- B. Delivery: Deliver materials to specified destinations in manufacturer's or distributor's packaging undamaged, and complete with installation instructions.
- C. Protect against damage and discoloration.
- D. Do not bend panels.
- E. Store panels against standing water and condensation between adjacent surfaces.
- F. If panels become wet, immediately separate sheets, wipe dry with clean cloth, and allow to air dry.
- G. Remove any strippable film coating prior to installation and do not allow it to remain on the panels in extreme cold, heat or in direct sunlight.

1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify actual measurements for openings by field measurements before fabrication. Show recorded measurements on Shop Drawings. Coordinate field measurements and fabrication schedule with construction progress to avoid construction delays.

1.7 SAMPLES

- A. Prior to ordering products, submit Manufacturer's standard color Samples for Architect's/Engineer's selection.
- B. Prior to starting work, submit (quantity) 12" long Panel Samples showing shape and a representative color chip for Architect's/Engineer's acceptance.

1.8 SHOP DRAWINGS

- A. Show panel layout, trim installation, and panel attachment.

1.9 INSTALLER'S QUALIFICATIONS

- A. Installation of panels and accessories by installers with a minimum of 5 years.

1.10 MANUFACTURER'S QUALIFICATIONS

- A. Manufacturer shall have a minimum of 10 years experience supplying metal roofing/siding to the region where the work is to be done.
- B. Manufacturer shall provide proof of \$2,000,000 liability insurance for their metal roof system and comply with current independent testing and Certification as specified. See specific product literature for testing information.
- C. Panel manufacturers without full supporting literature, Flashings & Details Guides, Guide Specifications and Technical Support shall not be considered equal to the specified product.

1.11 WARRANTY

Page 2 of 5

- A. Project Warranty: Refer to Conditions of the Contract for Project warranty provisions.
- B. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document. Manufacturer's warranty shall be in addition to, and not a limitation of, other rights Owner may have under the Contract Documents.
1. Warranty Period: 5 years commencing on date of Substantial Completion.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURER

A. COMPOSITE PANELS

1. ALUCOBOND Plus material manufactured by 3A Composites USA, Inc. 208 West 5th Street Benton, KY 42025 (800-626-3365 or 270-527-4200), CEI Materials, or equal
2. Items of the same function and performance, which have received prior approval from the architect, shall be allowed for this project. Approval shall be based on documentation submitted showing the adequacy of the material.

B. THICKNESS: 4MM (0.157")

C. PRODUCT PERFORMANCE

1. Bond Integrity
When tested for bond integrity, in accordance with ASTM D 1781 (simulating resistance to panel delamination), there shall be no adhesive failure of the bond a) between the core and the skin nor b) cohesive failure of the core itself below the following values:

D. FINISHES

1. Coil coated KYNAR® 500 or HYLAR® 5000 based Polyvinylidene Fluoride (PVDF) or Fluoro Ethylene – Alkyl Vinyl Ether (FEVE) resin in conformance with the following general requirements of AAMA 2605.
2. Color: Standard color as selected by the owner / architect / engineer from manufacturer's standard colors.

E. ACCESSORIES

1. Extrusions, formed members, sheet, and plate shall conform with ASTM B 209 and the recommendations of the manufacturer.

2. Panel stiffeners, if required, shall be structurally fastened or restrained at the ends and shall be secured to the rear face of the composite panel with silicone of sufficient size and strength to maintain panel flatness. Stiffener material and/or finish shall be compatible with the silicone.
3. Sealants and gaskets within the panel system shall be as per manufacturer's standards to meet performance requirements.
4. Fabricate flashing materials from 0.030" (0.76mm) minimum thickness aluminum sheet painted to match the adjacent curtain wall / panel system where exposed. Provide a lap strap under the flashing at abutted conditions and seal lapped surfaces with a full bed of non-hardening sealant.
5. Fasteners (concealed/exposed/non-corrosive): Fasteners as recommended by panel manufacturer. Do not expose fasteners except where unavoidable and then match finish of adjoining metal.

B. Substitutions: Under provisions of Section 01 25 00.

PART 3 - EXECUTION

3.1 EXAMINATION

A. EXISTING CONDITIONS

1. Inspect installed work of other trades and verify that such work is complete to a point where this work may continue.
2. Verify that installation may be made in accordance with approved shop drawings and manufacturer's instructions.

3.02 PREPARATION

A. FIELD MEASUREMENTS

1. Verify prior to fabrication.
2. If field measurements differ from drawing dimensions, notify Architect/Engineer prior to fabrication.

B. PROTECTION

1. Treat, or isolate with protective material, and contacting surfaces of dissimilar materials to prevent electrolytic corrosion.
2. Require workmen who will be walking on Roofing Panels to wear clean, soft-soled work shoes that will not pick up stones or other abrasive material, which could cause damage or discoloration.
3. Protect work of other trades against damage and discoloration.

C. SURFACE PREPARATION

1. Clean and dry surfaces prior to applying sealant.

3.03 INSTALLATION

A. PANELS

1. Follow roof panel manufacturer's directions.
2. Install panel seams (choose one) vertically or horizontally.
3. Lap panels away from prevailing wind direction.
4. Do not stretch or compress panel side-laps.
5. Secure panels without warp or deflection.

B. ALLOWABLE ERECTION TOLERANCE

1. Maximum Alignment Variation: 1/4 inch in 40 feet.

C. FLASHING

2. Follow manufacturer's directions and architect approved Shop Drawings.
3. Overlap roof panels at least 6 inches.
4. Install flashings to allow for thermal movement.
5. Remove strippable protective film, if used, immediately preceding flashing installation.

D. CUTTING AND FITTING

1. Neat, square and true. Torch cutting is prohibited where cut is exposed to final view.
2. Openings 6 inches and larger in any direction: Shop fabricate and reinforce to maintain original load capacity.
3. Where necessary to saw-cut panels, debur cut edges.

3.04 CLEAN UP AND CLOSE OUT

A. PANEL DAMAGE AND FINISH SCRATCHES

1. replaced as directed by the Architect's or Owner's representative.

B. CLEANING AND REPAIRING

1. At completion of each day's work and at work completion, sweep panels, flashings and gutters clean. Do not allow fasteners, cuttings, filings or scraps to accumulate.
2. Remove debris from project site upon work completion or sooner, if directed.

END OF SECTION

SECTION 07 54 19
POLYVINYL-CHLORIDE (PVC) ROOFING

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Mechanically attached PVC membrane roofing system.

1.2 RELATED SECTIONS

- A. Section 06 10 00 - Rough Carpentry: Roof blocking installation and requirements.
- B. Section 07 60 00 - Flashing and Sheet Metal: Metal flashing and counter flashing installation and requirements.
- C. Section 07 72 33 - Roof Hatches: Manufactured curbs and roof hatches.
- D. Section 22 04 00 - Plumbing: Roof drain installation and requirements.

1.3 EXTENT OF WORK

- A. Provide all labor, material, tools, equipment, and supervision necessary to complete the installation of 60 mil. thick white reinforced PVC (polyvinyl chloride) membrane Mechanically-Fastened Roofing System including flashings and insulation as specified herein and as indicated on the drawings in accordance with the manufacturer's most current specifications and details.
- B. The roofing contractor shall be fully knowledgeable of all requirements of the contract documents and shall make themselves aware of all job site conditions that will affect their work.
- C. Any contractor who intends to submit a bid using a roofing system other than the approved manufacturer must submit for pre-qualification in writing 10 days prior to the bid date. Any contractor who fails to submit all information as requested will be subject to rejection. Bids stating "as per plans and specs" will be unacceptable.

1.4 SUBMITTALS

- A. Prior to starting work, the roofing contractor must submit the following:
 - 1. Shop drawings showing layout, details of construction and identification of materials.
 - 2. Sample of the manufacturer's Membrane System Warranty.

3. Submit a letter of certification from the manufacturer which certifies the roofing contractor is authorized to install the manufacturer's roofing system and lists foremen who have received training from the manufacturer along with the dates training was received.
 4. Certification from the membrane manufacturer indicating the fasteners are capable of providing a static backout resistance of 10 in. pounds minimum is required.
- B. Upon completion of the installed work, submit copies of the manufacturer's final inspection to the specifier prior to the issuance of the manufacturer's warranty.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the job site in the manufacturer's original, unopened containers or wrappings with the manufacturer's name, brand name and installation instructions intact and legible. Deliver in sufficient quantity to permit work to continue without interruption.
- B. Comply with the manufacturer's written instructions for proper material storage.
1. Store PVC membrane on provided pallets in the original undisturbed plastic wrap in a cool, shaded area and cover with light-colored, breathable, waterproof tarpaulins.
 2. Store curable materials (adhesives and sealants) between 60°F and 80°F in dry areas protected from water and direct sunlight. If exposed to lower temperature, restore to 60°F minimum temperature before using.
 3. Store materials containing solvents in dry, well ventilated spaces with proper fire and safety precautions. Keep lids on tight. Use before expiration of their shelf life.
- C. Insulation must be on pallets, off the ground and tightly covered with waterproof materials.
- D. Any materials which are found to be damaged shall be removed and replaced at the applicator's expense.

1.6 WORK SEQUENCE

- A. Schedule and execute work to prevent leaks and excessive traffic on completed roof sections. Care should be exercised to provide protection for the interior of the building and to ensure water does not flow beneath any completed sections of the membrane system.
- B. Do not disrupt activities in occupied spaces.

1.7 USE OF THE PREMISES

- A. Before beginning work, the roofing contractor must secure approval from the building owner's representative for the following:
 - 1. Areas permitted for personnel parking.
 - 2. Access to the site.
 - 3. Areas permitted for storage of materials and debris.
 - 4. Areas permitted for the location of cranes, hoists and chutes for loading and unloading materials to and from the roof.
- B. Interior stairs or elevators may not be used for removing debris or delivering materials, except as authorized by the building superintendent.

1.8 INSPECTIONS

- A. Applicator shall be responsible for acceptance or provision of proper substrate to receive new roofing materials.
- B. Applicator shall verify that the work done under related sections meets the following conditions:
 - 1. Roof drains and/or scuppers have been reconditioned and/or replaced and installed properly.
 - 2. Roof curbs, nailers, equipment supports, vents and other roof penetrations are properly secured and prepared to receive new roofing materials.
 - 3. All surfaces are smooth and free of dirt, debris and incompatible materials.
 - 4. All roof surfaces shall be free of water, ice and snow.

1.9 WORKMANSHIP

- A. Applicators installing new roof, flashing and related work shall be factory trained and approved by the manufacturer they are representing.
- B. All work shall be of highest quality and in strict accordance with the manufacturer's published specifications and to the building owner's satisfaction.
- C. There shall be a supervisor on the job site at all times while work is in progress.

1.10 QUALITY ASSURANCE

- A. The PVC single-ply membrane roofing system must achieve a UL Class A rating.
- B. Unless otherwise noted in this specification, the roofing contractor must strictly comply with the manufacturer's current specifications and details.
- C. The roofing system must be installed by an applicator authorized and trained by the manufacturer in compliance with shop drawings as approved by the manufacturer.
- D. Provide adequate number of experienced workmen regularly engaged in this type of work who are skilled in the application techniques of the materials specified. Provide at least one thoroughly trained and experienced superintendent on the job at all times roofing work is in progress.
- E. There shall be no deviations made from this specification or the approved shop drawings without the prior written approval of the specifier. Any deviation from the manufacturer's installation procedures must be supported by a written certification on the manufacturer's letterhead and presented for the specifier's consideration.
- F. Upon completion of the installation, the applicator shall arrange for an inspection to be made by a non-sales technical representative of the membrane manufacturer in order to determine whether or not corrective work will be required before the warranty will be issued. Notify the building owner 72 hours prior to the manufacturer's final inspection.

1.11 JOB CONDITIONS, CAUTIONS AND WARNINGS

- A. Refer to the manufacturer's specification for General Job Site Considerations.
- B. Material Safety Data Sheets (MSDS) must be on location at all times during the transportation, storage and application of materials.
- C. When positioning membrane sheets, exercise care to locate all field splices away from low spots and out of drain sumps. All field splices should be shingled to prevent bucking of water.
- D. When loading materials onto the roof, the authorized roofing applicator must comply with the requirements of the building owner to prevent overloading and possible disturbance to the building structure.
- E. Proceed with roofing work only when weather conditions are in compliance with the manufacturer's recommended limitations, and when conditions will permit the work to proceed in accordance with the manufacturer's requirements and recommendations.

- F. Proceed with work so new roofing materials are not subject to construction traffic. When necessary, new roof sections shall be protected and inspected upon completion for possible damage.
- G. Provide protection, such as 0.75 in. thick plywood, for all roof areas exposed to traffic during construction. Plywood must be smooth and free of fasteners and splinters.
- H. The surface on which the insulation or roofing membrane is to be applied shall be clean, smooth, dry, and free of projections or contaminants that would prevent proper application of or be incompatible with the new installation, such as fins, sharp edges, foreign materials, oil and grease.
- I. New roofing shall be complete and weathertight at the end of the work day.
- J. Contaminants such as grease, fats and oils shall not be allowed to come in direct contact with the roofing membrane.

1.12 WARRANTY

- A. Provide manufacturer's 20 year Total System Warranty covering both labor and material. The maximum wind speed coverage shall be peak gusts of 72 mph measured at 10 meters above ground level. Certification is required with bid submittal indicating the manufacturer has reviewed and agreed to such wind coverage.
- B. Pro-rated System Warranties shall not be accepted.
- C. Evidence of the manufacturer's warranty reserve shall be included as part of the project submittals for the specifier's approval.

PART 2 – PRODUCTS

2.1 GENERAL

- A. All components of the specified roofing system shall be products of Sika Sarnafil Inc., or approved equal.
- B. All products (including insulation, fasteners, fastening plates and edgings) must be manufactured and supplied by the roofing system manufacturer and covered by the warranty.

2.2 ACCEPTABLE MANUFACTURERS

- A. Sika Sarnafil Inc.

- B. Carlisle SynTec
- C. Johns Manville.
- D. Substitutions: Under provision of Section 01 25 00.

2.3 MEMBRANE

- A. Furnish Sarnafil S327 60 mil (1.5mm) thick, white, reinforced PVC (polyvinyl chloride) membrane and all required items as needed for a complete and proper roofing system.
- B. Or approved equal.

2.4 INSULATION/UNDERLAYMENT

- A. When applicable, insulation shall be installed in multiple layers. The first and second layer of insulation shall be mechanically fastened to the substrate in accordance with the manufacturer's published specifications.
- B. Cover board shall be Dens Deck.

2.5 ADHESIVES AND CLEANERS

- A. All products shall be specifically formulated for the intended purpose.
- B. Bonding Adhesive: Sika Sarnafil PVC Adhesive, Weldtite or Aqua Base 120 Bonding Adhesive
- C. Edge Sealant: Cut Edge Sealant
- D. Sealer: Water Cut-Off Mastic and PT 304 Sealant
- E. Pocket Sealant: One Part Pourable Sealer
- F. Cleaner: PVC Membrane Cleaner

2.6 FASTENERS AND PLATES

- A. To be used for mechanical attachment of insulation and to provide additional membrane securement: delete the fastener and fastening plate types which will not be used.
- B. HP-X Fasteners: A heavy duty #15 threaded fastener with a Phillips head used for membrane securement into steel, wood plank, minimum 15/32 in. thick plywood or minimum 7/16 in. OSB (oriented strand board) decks.

- C. InsulFast Fasteners: A threaded #12 fastener with #3 Phillips head used for insulation attachment only into steel or wood decks.
- D. Piranha Plates: A 2.375 in. diameter metal barbed fastening plate used with CI Fasteners for membrane securement. This plate can be used for insulation securement.
- E. Insulation Fastening Plates: a nominal 3 in. diameter metal plate used for insulation attachment with the appropriate CI Fastener.

2.7 METAL EDGING AND MEMBRANE TERMINATIONS

- A. Sika Sarnafil Coated Metal: 4 ft. x 10 ft. coated metal sheets made from 24 gauge galvanized steel with a minimum 0.035 in. thick non-reinforced white WeldTite laminate. WeldTite membrane can be welded directly to the WeldTite Coated Metal in accordance with the manufacturer's detail.
- B. Termination Bar: a 1 in. wide and 0.098 in. thick extruded aluminum bar pre-punched 6 in. on center; incorporates a sealant ledge to support Lap Sealant and provide increased stability for membrane terminations.

2.8 WALKWAY PROTECTION

- A. Walk Tread
 - 1. A polyester reinforced, 0.096 inch (96 mil/2.4 mm), weldable membrane with surface embossment. Used as a protection layer from rooftop traffic. Tread is supplied in rolls of 39.3 inches (1.0 m) wide and 32.8 feet (10 m) long. Provide twenty (330) linear feet x 39.3 inches of walk pads – locations to be identified in field.

2.9 FLASHING MATERIALS

- A. Wall/Curb Flashing
 - 1. PVC Flashing Membrane: A fiberglass reinforced membrane adhered to approved substrate using approved adhesive.

2.10 RELATED MATERIALS

- A. Wood Nailer
 - 1. Treated wood nailers shall be installed at the perimeter of the entire roof and around such other roof projections and penetrations as specified on Project

Drawings. Thickness of nailers must match the insulation thickness to achieve a smooth transition. Wood nailers shall be treated for fire and rot resistance (wolmanized or osmose treated) and be #2 quality or better lumber. Creosote or asphalt-treated wood is not acceptable. Wood nailers shall conform to Factory Mutual Loss Prevention Data Sheet 1-49. All wood shall have a maximum moisture content of 19% by weight on a dry-weight basis, unless otherwise specified by membrane manufacturer.

B. Plywood

1. When bonding directly to plywood, a minimum ½ inch (12 mm) CDX (C side out), smooth-surfaced exterior grade plywood with exterior grade glue shall be used. Rough-surfaced plywood or high fastener heads will require the use of Felt behind the flashing membrane. Plywood shall have a maximum moisture content of 19% by weight on a dry weight basis, unless otherwise specified by membrane manufacturer.

- C. Protection Board: 5/8" DensDeck Roof Board where occurs, only over tapered insulation."

PART 3 – EXECUTION

3.1 GENERAL

- A. For all manufactured products, follow manufacturer's installation instructions and details as specifically modified by the Drawings and Specifications using materials and methods described in the installation instructions. contractor shall provide any and all fasteners, hardware, mounting devices, brackets, special fittings, or other specialty items called for in the installation instructions in order to assure proper installation. all such items required by the installation instructions shall be provided by the Contractor at no additional cost to the Owner.
- B. Comply with the manufacturer's published instructions for the installation of the membrane roofing system including proper substrate preparation, jobsite considerations and weather restrictions.
- C. Position sheets to accommodate contours of the roof deck and shingle splices to avoid bucking water.

3.2 INSULATION PLACEMENT AND ATTACHMENT

- A. Install insulation or membrane underlayment over the substrate with boards butted tightly together with no joints or gaps greater than 0.25 in. Stagger joints both horizontally and vertically if multiple layers are provided.
- B. Secure insulation to the substrate with the required CI fasteners and plates in accordance with manufacturers specifications.

3.3 MEMBRANE PLACEMENT AND ATTACHMENT

- A. Unroll and position membrane without stretching. Provide and secure both perimeter and field membrane sheets in accordance with the manufacturer's most current specifications and details.
- B. Secure the membrane with the required CI Fasteners and Plates spaced a maximum of 12 in. on center depending on project conditions (centered over the pre-printed marks approximately 1.5 in. from the edge of the membrane sheet).
- C. Install adjoining membrane sheets in the same manner in accordance with the manufacturer's specifications.

3.4 MEMBRANE SPLICING/HEAT WELDING PROCEDURES

- A. Heat weld the Sika Sarnafil membrane using an Automatic Heat Welding Machine or Hot Air Hand Welder in accordance with the manufacturer's specifications. At all splice intersections, roll the seam with a silicone roller prior to membrane seam cooling. (Note: When using 0.060 in. or 0.080 in. thick membrane, all splice intersections shall be overlaid with Sika Sarnafil Joint Covers.)
- B. Probe all seams once the hot air welds have thoroughly cooled (approximately 30 minutes).
- C. Repair all seam deficiencies the same day they are discovered.
- D. Apply Cut Edge Sealant on all cut edges of reinforced membrane (where the scrim reinforcement is exposed) after seam probing is complete.

3.5 FLASHING

- A. Flashing of parapets, curbs, expansion joints and other parts of the roof must be performed using Sika Sarnafil reinforced membrane. Non-reinforced membrane can be used for flashing pipe penetrations, scuppers, as well as inside and outside corners when the use of pre-fabricated accessories is not feasible.
- B. Follow manufacturer's typical flashing procedures for all wall, curb, and penetration flashing including metal edging/coping and roof drain applications.

3.6 WALKWAYS

- A. Install walkways at all traffic concentration points (such as roof hatches, access doors, rooftop ladders, etc.) and all locations as identified on the specifier's drawing.
- B. Heat weld walkway pads to the membrane in accordance with the manufacturer's specifications.

3.7 DAILY SEAL

- A. On phased roofing, when the completion of flashings and terminations is not achieved by the end of the work day, a daily seal must be performed to temporarily close the membrane to prevent water infiltration.
- B. Complete an acceptable membrane seal in accordance with the manufacturer's requirements.

3.8 CLEAN UP

- A. Perform daily clean-up to collect all wrappings, empty containers, paper, and other debris from the project site. Upon completion, all debris must be disposed of in a legally acceptable manner.
- B. Prior to the manufacturer's inspection for warranty, the applicator must perform a pre-inspection to review all work and to verify all flashing has been completed as well as the application of all caulking.

END OF SECTION

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SECTION 07 60 00 FLASHING AND SHEET METAL

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Pre-coated, coping, parapet and cap flashings.
- B. Fascias, gutters, valleys, and scuppers.
- C. Counterflashings at piping penetrations, vent pipes, and conduits.
- D. Counterflashings over bituminous base flashings.
- E. Counterflashings at roof mounted equipment, curbs and supports.
- F. Counterflashings for roof hatches, skylights.
- G. Flexible sheet flashing.
- H. Manufactured reglets.

1.2 REFERENCES

- A. ASTM A653 - Steel Sheet, Zinc-Coated, (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- B. ASTM A755 - Steel Sheet, Metallic Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products.
- C. ASTM A924 - General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.
- D. ASTM B32 - Solder Metal.
- E. ASTM B101 - Standard Specifications for Lead-Coated Copper Sheet and Strip for Building Construction.
- F. ASTM D226 - Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
- G. ASTM D549 - Rosin in Paper and Paperboard.
- H. ASTM D4586 - Asphalt Roof Cement, Asbestos Free.
- I. SMACNA - Architectural Sheet Metal Manual.

1.3 SYSTEM DESCRIPTION

- A. Work of this Section is to physically protect membrane roofing, pre-formed metal roofing and base flashings from damage that would permit water leakage to building interior.

1.4 QUALITY ASSURANCE

- A. Applicator: Company specializing in sheet metal flashing Work with five years minimum experience.
- B. Perform Work in accordance with SMACNA standard details and requirements.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Submit Shop Drawings of sheet metal items indicating profiles, jointing, terminations and installation details. Indicate type and spacing of fasteners.
- C. Submittal of specific plates from the SMACNA Architectural Sheet Metal Manual constitutes acceptable documentation of installation details.
- D. Submit Product Data for pre-coated galvanized steel and flashing accessories.
- E. Submit two 4-inch square Samples illustrating metal finish color for pre-coated steel.

1.6 STORAGE AND HANDLING

- A. Store products under provisions of Section 01 60 00.
- B. Stack preformed material to prevent twisting, bending, or abrasion, and to provide ventilation.
- C. Prevent contact with materials during storage which may cause discoloration, staining, or damage.

1.7 WARRANTY

- A. Provide manufacturer's 20-year warranty against defective materials and finish.
- B. Provide installer's 2-year warranty coverage for water tightness and integrity of seals.

PART 2 - PRODUCTS

2.1 SHEET MATERIALS

A. Parapets, Cap, Coping, Fascias, and Gutters

- 1 Pre-Coated Galvanized Steel: ASTM A755 on zinc-coated galvanized substrate, ASTM A653, Grade 33, G90 zinc coating in accordance with ASTM A924; 0.0299 inch thick core steel, factory pre-coated with 'Kynar 500" or "Hylar 5000" coating of color to match sheet metal roofing specified in Section 07 61 00. Color to be selected by Architect.

B. Counterflashing

- 1 Galvanized Steel: ASTM A653, Grade 33, G90 zinc coating in accordance with ASTM A924, 0.0299 inch thick core steel.

C. Window Flashing.

- 1 Vycor Pro – self-adhesive flashing @ windows. Pre-cut Sill, jamb, head flashing for windows and doors.

2.2 ACCESSORIES

- A. Lead-Coated Copper: ASTM B101, Temper H00 and H01, cold-rolled copper sheet, coated both sides with lead weighing not less than 12 pounds per 100 square feet nor more than 15 pounds per 100 square feet total weight of copper sheet with lead applied to both sides.
- B. Fastener: Galvanized steel or stainless steel with soft neoprene washers at exposed fasteners. Finish exposed fasteners shall match pre-coated metal.
- C. Underlayment: ASTM D266; No. 30 asphalt-saturated roofing felt.
- D. Metal Primer: As specified in Section 09 91 00.
- E. Protective Backing Paint: Zinc chromate alkyd.
- F. Slip Sheet: ASTM D549, 0.05 psf, rosin-sized building paper.
- G. Sealant: As specified in Section 07 92 00.
- H. Bedding Compound: Rubber-asphalt type.
- I. Plastic Cement: ASTM D4586, Type I.

- J. Metal Flashing System: Two piece pre-coated galvanized steel similar to Springlok Flashing System, manufactured by Fry Reglet, type as indicated. Include fabricated end closures and mitered corners.
- K. Solder for Lead-Coated Copper: ASTM B32, Grade SN 60 percent tin, 40 percent lead.
- L. Solder for Zinc: ASTM B32; 50/50 tin/lead type, with rosin flux.
- M. Self-Adhesive Flexible Sheet Flashing: 40-mil-thick composite of polyethylene film and self-adhesive rubberized asphalt with embossed slip-resistant surface; "Ice and Water Shield" by W.R. Grace or approved equal.
- N. Manufactured Reglets: Two piece pre-coated galvanized steel, spring-action type similar to "Springlock Flashing System" or approved equal, manufactured by Fry Reglet, type as indicated. Include fabricated end closures and mitered corners. Finish: Manufacturer's gray epoxy primer; exposed portions shall be field finish painted as specified in Section 09 91 00.

2.3 FABRICATION

- A. Form sections true to shape, accurate in size, square, and free from distortion or defects.
- B. Fabricate concealed cleats of galvanized steel, ASTM A653, Grade 33, G90 zinc coating, 0.0478 inch thickness, interlockable with sheet.
- C. Fabricate exposed cleats and coverplates of same material as sheet, interlockable with sheet.
- D. Form pieces in longest practical lengths.
- E. Hem exposed edges on underside 1/2 inch. Miter and seam corners.
- F. Form material with flat lock seam.
- G. Solder and seal metal joints. After soldering, remove flux. Wipe and wash solder joints clean.
- H. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.
- I. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.
- J. Fabricate flashings to allow toe to extend 2 inches over bituminous base flashings or roofing surface. Return and brake edges.

- K. Fabricate vent pipe and roof penetration flashings of lead-coated copper with clamping ring.

2.4 FINISH

- A. Shop prepare and prime exposed ferrous metal surfaces.
- B. Back-paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil.
- C. Site paint exposed to view metal surfaces under provisions of Section 09 91 00.
- D. "Kynar 500" or "Hylar 5000" factory pre-coated finish with 0.2 mil baked on primer and 0.8 mil baked on topcoat for a 1.0 mil dry film thickness. Finish shall be warranted for a minimum of 20 years against all defects.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Verify roof openings, curbs, pipes, sleeves, ducts, or vents through roof are solidly set, cant strips and reglets are in place, and nailing strips located.
- B. Verify membrane termination and base flashings are in place, sealed, and secure.
- C. Beginning of installation means acceptance of existing conditions.

3.2 PREPARATION

- A. Field measure site conditions prior to fabricating Work.
- B. Install starter and edge strips, and cleats before starting installation.
- C. Install surface-mounted reglets true to line and level. Seal top with sealant.
- D. Install underlayment with protective slip sheet over parapets, caps, copings, gravel stops and curbs.

3.3 INSTALLATION

- A. Conform to indicated details on the Drawings and the recommendations included in the SMACNA Architectural Sheet Metal Manual.
- B. Provide for thermal expansion of exposed sheet metal Work. Space movement joints at 10 feet on center maximum with no joints within 2 feet of corners. Attach members with clips to permit movement without damage, or provide slotted or oversize holes with washers.

- C. Form expansion joints of intermeshing hooked flanges filled with sealant.
- D. Insert flashings into reglets to form tight fit. Secure in place with lead wedges at maximum 12 inches on center. Pack remaining spaces with lead wool. Seal flashings into reglets with sealant.
- E. Secure flashings in place using concealed fasteners. Use exposed fasteners only where indicated.
- F. Lap, lock, seam and seal all joints. Make lock seam Work flat and true to line, and sweat full of solder, except where installed to permit expansion and contraction. Lap flat lock seams, and lap seams where soldered according to pitch, but in no case less than 3 inches. Make seams in direction of flow.
- G. Apply plastic cement compound between metal flashings and felt flashings. Apply bituminous coating between dissimilar metals where occurs.
- H. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.
- I. Roof-Penetration, Vent Pipe Flashing: Turn lead flashing down inside vent piping. Clamp flashing to other pipes penetrating roof except for vent piping. Seal with elastomeric sealant.
- J. Seal metal joints watertight and weathertight throughout.

3.4 FIELD QUALITY CONTROL

- A. Conform to SMACNA Architectural Sheet Metal Manual.
- B. Field observation will involve surveillance of Work during installation to ascertain compliance with specified requirements.

3.5 CLEANING AND ADJUSTMENT

- A. Leave Work clean and free of stains, scrap and debris.
- B. Repair and replace damaged Work.

END OF SECTION

SECTION 07 63 00 GUTTERS AND DOWNSPOUTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Kynar pre-finished aluminum gutters
- B. Steel pipe downspouts.
- C. Precast concrete splash blocks and sheet metal splash pans.

1.2 REFERENCES

Contractor's work shall comply with the following standards as applicable. Manufactured items are to be fabricated to these same standards.

The following standards (and publications) are applicable to the extent referenced in the text. The most recent of these standards is implied, unless otherwise stated.

- A. ASTM A53 - Pipe, Steel, Black and Hot-Dipped Zinc-Coated Welded and Seamless.
- B. ASTM A653 - Steel Sheet, Zinc Coated, (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- C. ASTM A755 - Steel Sheet, Metallic Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products.
- D. ASTM A924 - General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.
- E. SMACNA - Architectural Sheet Metal Manual.

1.3 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Submit Shop Drawings of metal items indicating profiles, jointing, terminations, and installation details. Indicate type and spacing of fasteners.
- C. Submittal of specific plates from the SMACNA Architectural Sheet Metal Manual constitutes acceptable documentation of installation details.
- D. Submit Product Data for pre-coated galvanized steel.

1.4 QUALITY ASSURANCE

- A. Applicator: Company specializing in sheet metal Work with five years minimum experience.
- B. Perform Work in accordance with SMACNA standard details and requirements.

1.5 STORAGE AND HANDLING

- A. Store products under provisions of Section 01 60 00.
- B. Stack preformed material to prevent twisting, bending, or abrasion and to provide ventilation.
- C. Prevent contact with materials during storage which may cause discoloration, staining or damage.

1.6 WARRANTY

- A. Provide manufacturer's 20-year warranty against defective materials and finish.
- B. Provide installer's 2-year warranty coverage for water tightness and integrity of seals.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Kynar 500 pre-finished, .032 aluminum preformed gutters.
- B. Steel Pipe: ASTM A53, Grade B, Schedule 40 steel pipe, standard weight, Type S, one piece without joints, galvanized according to ASTM A53; 1.8 ounces per square foot.

2.2 COMPONENTS

- A. Fascia Gutters shall Kynar 500 pre-finished, Box Gutter – color selected by architect. Include downspout outlet and integral straps as part of assembly.
- B. Steel Pipe Downspouts: Fabricate from Schedule 40 steel pipe, and other steel stock as indicated, all full penetration welded into one assembly, then hot-dip galvanized.
(Use these within 8 feet of finished grade only.)
- C. Splash Blocks: Pre-cast concrete type, of sizes and profiles indicated; minimum 3000 psi at 28 days, with minimum 5 percent air entrainment.
- D. Splash Pans: Fabricated from same metal as gutters. Tack down to roofing surface with asphalt cement.

2.3 ACCESSORIES

- A. Anchorage Devices: Meet SMACNA requirements.
- B. End Caps, Downspout Outlets, Rain Diverters, Straps, Support Brackets, Joint Fasteners. Profiled to suit gutters and downspouts.
- C. Protective Backing Paint: Zinc chromate alkyd at all concealed surfaces.
- D. Gutter Expansion Joints: Provide at every 50' of length or as recommended by SMACNA. Submit sketches of detail.

2.4 FABRICATION

- A. Form gutters and downspouts of profiles and sizes indicated.
- B. Field measure site conditions prior to fabricating Work.
- C. Fabricate with required connection pieces.
- D. Form sections square, true, and accurate in size, in maximum possible lengths and free of distortion or defects detrimental to appearance or performance.
- E. Hem exposed edges of metal.
- F. Seal metal joints.
- G. Fabricate gutter and downspout accessories; seal watertight.
- H. Form splash pans to size as detailed with rolled edges.

2.5 SHOP FINISHING

- A. Shop prepare and prime exposed ferrous metal surfaces.
- B. Back-paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mils.
- C. Site paint exposed to view metal surfaces as specified in Section 09 91 00.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces are ready to receive Work. Contractor to correct deficiencies in the surfaces at own expense.
- B. Beginning of installation means acceptance of existing conditions.

3.2 INSTALLATION

- A. Provide concealed solid blocking at all steel pipe downspout brackets.
- B. Coordinate layout of downspouts with site conditions and features on the building not shown in the building elevations.
- C. Install gutters, downspouts, and accessories in accordance with SMACNA requirements.
- D. Coordinate installation of sheet metal gutters with steel pipe downspouts.
- E. Join lengths with seams sealed watertight. Flash and seal gutters to downspouts and accessories.
- F. Seal metal joints watertight.
- G. Set splash blocks under downspouts. Tack down all metal rooftop splash pans to roof surface with asphalt cement.
- H. Coordinate downspouts connecting to the storm drain system with other Work.

END OF SECTION

SECTION 07 72 33 ROOF HATCHES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Prefabricated roof hatches with integral support curbs, operable hardware, and counterflashings as indicated.
- B. Roof hatch railing system.

1.2 REFERENCES

- A. UL - Underwriters' Laboratories: Fire Hazard Classification.
- B. FM - Factory Mutual Engineering Corporation: Roof Assembly Classifications.
- C. OSHA - Standards of Occupational Safety and Health Administration.

1.3 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Provide Product Data on unit construction, sizes, configuration, jointing methods, attachment methods, and accessories.
- C. Manufacturer and/or fabricator shall submit a certificate of product compliance with OSHA Standards.

1.4 REGULATORY REQUIREMENTS

- A. Underwriters' Laboratories Inc. (UL) and Factory Mutual (FM) requirements as applicable to fire rated [heat] [smoke] vents.
- B. OSHA regulations as applicable to roof access hatches, 29 CFR 1910.23.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Babcock-Davis Hatchways, Inc., (781) 643-5344.
- B. Dur-Red Products, (323) 771-9000.
- C. Milcor, Inc., (800) 528-1411.
- D. Substitutions: Under provisions of Section 01 25 00.

2.2 ROOF HATCHES

- A. Unit: 30 inch x 36 inch size or as noted, single leaf type unless otherwise indicated.
- B. Curb: 14 gage galvanized prime painted steel with one inch rigid insulation; integral cap flashing to receive roof flashing system; extended flange for mounting.
- C. Cover: 14 gage galvanized prime painted steel with 1 inch glass fiber insulation retained by 22 gage steel inner liner. Continuous gasket to provide weatherproof seal.
- D. Hardware: Manufacturer's standard manually operated type with compression spring operators, positive snap latch with turn handles inside and out and padlock hasp inside; automatic hold-open arm with vinyl covered grip handle for easy release; cadmium plated finish.
- E. Hinges: Manufacturer's recommended type.

2.3 HEAT/SMOKE VENTS

- A. Unit: Sizes shown single leaf type unless otherwise indicated, labeled as being FM Approved. UL Listed.
- B. Curb: 14 gage galvanized prime painted steel with 1 inch rigid insulation; integral cap flashing to receive roof flashing system; extended flange for mounting.
- C. Cover: 14 gage galvanized prime painted steel with 1 inch glass fiber insulation retained by 22 gage steel interior liner. Continuous gasket to provide weatherproof seal.
- D. Hardware: Compression spring operators, heavy duty shock absorbers, and manual pull rings for interior and exterior operation; hold-open arm with vinyl covered grip handle for easy release; cadmium plated finish.
- E. Hinges: Manufacturer's recommended type.
- F. Operation: Automatic opening upon break of 160 degrees Fahrenheit fusible link.

2.4 RAILING SYSTEM

- A. Nesea Corporation, Model No. RHSR-SS as distributed by David/Randall Associates, (215) 256-7950.
- B. Shop Fabrication or Substitutions: Under provisions of Section 01 25 00.

2.5 HATCH AND VENT FABRICATION

- A. Fabricate free of visual distortions and defects. Weld corners and joints.
- B. Provide for removal of condensation.
- C. Provide weathertight assembly.

2.6 FINISH

- A. Shop prime paint all exposed metal.
- B. Site paint metal surfaces under provisions of Section 09 91 00.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions. Coordinate with installation of roofing system and related flashings. Provide weather tight installation.
- B. Permanently bolt railing system to roof hatch curb in accordance with manufacturer's instructions.
- C. Apply bituminous paint on metal surfaces of units in contact with cementitious materials and dissimilar metals.

END OF SECTION

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SECTION 07 84 00

FIRESTOPPING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Penetrations through fire-resistance-rated floor and roof construction including both empty openings and openings containing cables, pipes, ducts, conduits, and other penetrating items.
- B. Penetrations through fire-resistance-rated walls and partitions including both empty openings and openings containing cables, pipes, ducts, conduits, and other penetrating items.
- C. Penetrations through smoke barriers and construction enclosing compartmentalized areas involving both empty openings and openings containing penetrating items.
- D. Sealant joints in fire-resistance-rated construction.
- E. Fireproof firestopping and firesafing materials and accessories.
- F. Opening between top tracks of walls and connecting floor or roof assemblies.
- G. Related Sections include the following:
 - 1. Section 08 11 13 – Metal Doors and Frames: Vision panels in interior doors.
 - 2. Section 08 14 16 – Flush Wood Doors

1.2 REFERENCES

- A. ASTM E 774 – Standard Specification for Sealed Insulating Glass Units.
- B. ASTM C920 - Elastomeric Joint Sealants.
- C. ASTM C1193 - Use of Joint Sealants.
- D. ASTM E84 - Test Method for Surface Burning Characteristics of Building Materials.
- E. ASTM E119 - Method for Fire Tests of Building Construction and Materials.
- F. UL - Fire Hazard Classifications.
- G. UL 1479 (ASTM E814) - Fire Tests of Through-Penetration Firestops.

1.3 DEFINITION

- A. Firestopping (Firesafing): A sealing or stuffing material or assembly placed in spaces between building materials to arrest the movement of smoke, heat, gases, or fire through wall or floor openings.

1.4 SYSTEM DESCRIPTION

- A. F-Rated Through-Penetration Firestop Systems: F-ratings as required according to UL 1479, but not less than that equaling or exceeding fire resistance rating of assembly penetrated where the following conditions exist:
 - 1. Penetrations larger than 4 inch nominal pipe size or 16 square inches in overall cross-sectional area.
- B. T-Rated Through-Penetration Firestop Systems: T-ratings, in addition to F-ratings, as required according to UL 1479, where the following conditions exist:
 - 1. Through-penetrations of fire-rated walls above corridor ceilings which are not part of a fire-resistive assembly.
 - 2. Through-penetrations of fire-rated walls below any ceiling.
 - 3. Penetrations larger than 4 inch nominal pipe size or 16 square inches in overall cross-sectional area.
- C. Penetrations not larger than 4 inch nominal pipe size or 16 square inches in overall cross-sectional area shall have the annular space between the penetrating item and the wall/floor assembly filled with a material which will prevent passage of flame and hot gases sufficient to ignite cotton waste when subjected to ASTM E119 under a minimum positive pressure differential of 0.01-inch water column for the time period at least equal to the fire resistance rating of the wall/floor assembly.
- D. Surface Burning: ASTM E84 with a flame spread/smoke developed rating of 25/450.
- E. Firestop all interruptions and terminations of fire-rated assemblies.
- F. For piping penetrations for plumbing and wet-pipe sprinkler systems, provide moisture-resistant through-penetration firestop systems.
- G. For floor penetrations with annular spaces exceeding 4 inches or more in width and exposed to possible loading and traffic, provide firestop systems capable of supporting the floor loads involved either by installing floor plates or by other means.
- H. For penetrations involving insulated piping, provide through-penetration firestop systems not requiring removal of insulation.

1.5 SUBMITTALS

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

- B. Submit manufacturer's Shop Drawings for each type of firestop or smoke seal required by the Project. Shop Drawings shall indicate the detailing of all necessary anchorages, reinforcements and fastenings required.
- C. Product Data: Provide product characteristics, performance and limitation criteria.
- D. Manufacturer's Installation Instructions: Indicate preparation and installation instructions.
- E. Certification: Submit firestopping manufacturer's certification that products supplied comply with local regulations controlling use of volatile organic compounds (VOCs) and are nontoxic to building occupants.

1.6 QUALITY ASSURANCE

- A. Through-penetration firestop systems shall correspond to through-penetration firestop system designations listed in the UL Fire Resistance Directory.
- B. Firestopping and smoke seal Work shall be performed by an installer trained or approved by the firestop or smoke seal manufacturer. Equipment used shall be in accordance with firestop or smoke seal manufacturer's written installation instructions.

1.7 REGULATORY REQUIREMENTS

- A. Conform to Title 24, Part 2 and UL requirements for fire-resistance ratings and surface-burning characteristics.
- B. Firestopping products shall contain no detectable asbestos as determined by 40 CFR, Part 763, Subpart F, Appendix A, Section 1, Polarized Light Microscopy.

1.8 SEQUENCING AND SCHEDULING

- A. Coordinate Work with related trades.
- B. Coordinate construction of openings and penetrating items to ensure that through-penetration firestop systems are installed in accordance with manufacturer's instructions and regulatory requirements.
- C. Do not cover up installations that will become concealed behind other construction until Owner's Representative and authorities having jurisdiction, if required, have examined each installation.

1.9 ENVIRONMENTAL REQUIREMENTS

- A. Do not apply materials when temperature of substrate material and ambient air is below 60 degrees F.
- B. Maintain this minimum temperature before, during, and for 3 days after installation of materials.

1.10 DELIVERY, STORAGE AND HANDLING

- A. Deliver all materials in original unopened packages fully identified with manufacturer's name, trade name and UL label.
 - 1. Leave seals unbroken and labels intact until time of use.
 - 2. Remove from job site any rejected or damaged packages found unsuitable for use.
- B. Store materials in a dry place, off of the ground or floor, and away from other material subject to sweating or attraction of moisture or dampness.
- C. Provide ventilation in areas to receive solvent cured materials.

PART 2 - PRODUCTS

2.1 FIRESTOPPING, GENERAL

- A. Provide firestopping components that are compatible with each other, substrates of openings, and items penetrating firestopping.
- B. Provide accessories for each firestopping system that are needed to comply with designated fire-resistance-rated systems specified by firestopping manufacturer.

2.2 ACCEPTABLE MANUFACTURERS

- A. Hilti Construction Chemicals Inc.
- B. Minnesota Mining and Mfg. Co.
- C. Tremco.
- D. United States Gypsum Co.
- E. Bio Fireshield, Inc.
- F. Dow-Corning Corp.
- G. International Protective Coatings (IPC.)
- H. Substitutions: Under provisions of Section 01 25 00.

2.3 FILL MATERIALS

- A. General: Firestopping and smoke seal materials shall be asbestos free.
 - 1. The F rating must be a minimum of 1 hour, but not less than the fire resistance rating of the assembly being penetrated, when tested per ASTM E84.
 - 2. Materials being applied in openings between elements of differing fire ratings shall conform to the most restrictive rating.

3. Fire tests shall be conducted with a minimum positive pressure differential of 0.03 inches of water column.
 4. Material shall be noncombustible, with flame spread of 25 or less, and smoke development of 50 or less, when tested in accordance with ASTM E84.
- B. Firestop or Smoke Seal Mortar: Single-component Portland cement fly ash mortar, requiring no special supports or anchoring devices to pass water hose stream tests.
- C. Intumescent:
1. Wrap: Single-component, elastomeric sheet with aluminum foil on one side.
 2. Calk: Water-based latex calk per UL1479.
- D. Vinyl Compound: Vinyl-based powder product mixed on site with water to produce a paintable compound with flame-spread and smoke-developed rating of 0 per ASTM E84.
- E. Silicone Foam: Two-component, silicone based liquid elastomer that, when mixed, expands and cures in place to produce a flexible nonshrinking foam.
- F. Firestop or Smoke Seal Sleeve: Prefabricated device used around plastic pipes in fire-rated floors and walls. The sleeve shall be made of a steel collar lined with an intumescent material.
- G. Fiber Stuffing: Mineral fiber stuffing with a minimum density of 3.5 lbs/cu ft.
- H. Mineral fiber board, mineral fiber matting, and mineral fiber putty-forming and damming materials shall be used to contain the fluid material mixture prior to and during filling of penetrations and voids.
1. Fire tested and functionally approved forming materials may be left in place to become an integral part of the formed penetration seal.
 2. Combustible forming and damming materials may be used for containment during installation of materials only, and must be removed from the final completed penetration seal system.
- I. Provide primers as required which conform to manufacturer's recommendations for various substrates and conditions.

2.4 JOINT SEALANTS

- A. Manufacturer's standard chemically-curing elastomeric sealant that complies with ASTM C920.
- B. Provide selections from manufacturer's full range of colors.
- C. Single-Component, Neutral Curing Silicone Sealant: Type S; Grade NS; Class 25; exposure-related use NT; and joint substrate related uses M, G, A, and O, as applicable to substrate assembly condition.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that site conditions are suitable for installation of products.
- B. Verify openings are ready to receive the Work of this Section.
- C. Notify the Contractor in writing, with copy to Architect, of conditions detrimental to the timely completion of the Work.
- D. Do not proceed with Work until all unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter which may affect bond of firestopping material.
- B. Remove laitance and form release agents from concrete.
- C. Remove incompatible materials which may affect bond.
- D. Install backing materials to arrest liquid material leakage.

3.3 APPLICATION OF THROUGH-PENETRATION FIRESTOPS

- A. Install material at walls or partition openings which contain penetrating sleeves, piping, ductwork, conduit and other items requiring firestopping.
- B. Comply with through-penetration firestop manufacturer's installation instructions and Drawings pertaining to products and applications required.
- C. Install forming materials and other accessories of types required to support fill materials during their application and in the position needed to produce shapes and depths required to achieve fire ratings.
- D. After installing fill materials, remove combustible forming materials and other accessories not indicated as permanent components of firestop system.
- E. Apply primer and materials in accordance with manufacturer's instructions.
- F. Apply firestopping material in sufficient thickness to achieve rating.
- G. Install firestops or smoke seals with sufficient pressure to properly fill and seal openings to ensure an effective smoke seal.
- H. Install fire-resistant filler in openings where indicated.

1. Dam bottom of vertical openings and one side of horizontal openings with temporary containment forms or, where required to achieve fire-resistance ratings, provide permanent mineral composition board forms.
2. On horizontal penetrations, provide partial face containment forms where required for material displacement.
3. Allow installed fillers to cure, and remove temporary forms; trim ragged edges with sharp knife; inspect and fill voids with additional filler to form uniform thickness of filler.

3.4 APPLICATION OF FIRE-RESISTIVE JOINT SEALANT

- A. Comply with ASTM C1193 and manufacturer's installation instructions and Drawings pertaining to products and applications required.
- B. Install joint fillers to provide support and at a position required to produce depth to joint widths that allow development of fire-resistance rating required.
- C. Install sealant to completely fill recesses provided. Install sealant at same time as joint filler.
- D. Tool non-sag sealants after application to form smooth uniform bead to configuration required to produce fire-resistance rating.
- E. Spillage: Do not allow sealants to overflow or spill onto adjoining surfaces, or to migrate into voids of adjoining surfaces. Clean adjoining surfaces by whatever means may be necessary to eliminate evidence of spillage.
- F. Recess exposed edges of gaskets and exposed joint fillers slightly behind adjoining surfaces, unless otherwise shown, so that compressed units will not protrude from joints.
- G. Tool or trowel exposed surfaces. Remove excess firestop or smoke seal material promptly as Work progresses and upon completion.
- H. Apply firestop or smoke seal material at penetrations of insulated piping after the insulation is installed.
 1. The material used shall have been tested for compatibility and rating in conjunction with the use of the insulation material being used.
 2. Calcium silicate, or other pipe insulation, may be substituted for fiberglass pipe insulation through the sleeve, if the insulation is part of an assembly which meets the requirements specified for firestopping or smoke sealing.
- I. Firestopping or smoke sealing materials for filling voids in floors having openings of 4 inches or greater, shall be installed to support the same load as the floor system, unless the area is protected by a permanent barrier preventing loading or traffic on the firestopped or smoke sealed area.

3.5 FIELD QUALITY CONTROL

- A. Do not cover up installations that will become concealed behind other construction until Owner's Representative and authorities having jurisdiction, if required, have examined each installation.
- B. Where deficiencies are found, repair or replace firestopping to required condition.

3.6 CLEANING

- A. Clean Work under provisions of Section 01 74 00.
- B. Clean adjacent surfaces of firestopping materials.

3.7 CURING AND PROTECTION OF FINISHED WORK

- A. Cure firestopping and smoke seal materials in compliance with manufacturer's instructions and recommendations.
- B. Installer shall advise Contractor of procedures required for protection of firestopping and smoke seals during remaining construction period.
- C. Protect finished Work under provisions of Section 01 87 00.
- D. Protect adjacent surfaces from damage by material installation.

END OF SECTION

SECTION 07 92 00 JOINT SEALERS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Preparing sealant substrate surfaces.
- B. Sealant and backing.

1.2 SUMMARY OF SEALANT LOCATIONS

A. Joints in Horizontal Surfaces:

1. Expansion and isolation joints in cast-in-place concrete slabs.
2. Control and expansion joints in ceramic and quarry tile.
3. Control and expansion joints in soffits, ceilings and overhead surfaces.
4. Perimeter joints in exterior openings.
5. Joints between ceiling surfaces and frames for doors and windows.
6. Joints in flashing and sheet metal.
7. Perimeter joints of toilet fixtures.
8. Acoustical isolation joints between head and sill of walls and floor and ceiling surfaces.
9. Joints between countertops and wall surfaces.
10. Joints in skylights and framing.
11. Joints between thresholds and floors.
12. Isolation joints in plaster soffits and ceilings.
13. Penetrations in construction assemblies including but not limited to piping, electrical devices, recessed cabinets, soffits, heating, ventilation or exhaust ducts shall be sealed to reduce sound transmission.

14. Joints between dissimilar materials and those listed above.

15. Other joints as indicated.

B. Joints in Vertical Surfaces:

1. Expansion and isolation joints in cast-in-place concrete.

2. Expansion and isolation joints in masonry.

3. Control and expansion joints in ceramic and quarry tile.

4. Perimeter joints in exterior openings.

5. Joints in flashing and sheet metal.

6. Perimeter joints of toilet fixtures.

7. Acoustical isolation joints of walls.

8. Joints between cabinets and walls.

9. Joints between wall surfaces and door and window frames.

10. Joints in skylights and framing.

11. Isolation joints in plaster walls.

12. Penetrations in construction assemblies including but not limited to piping, electrical devices, recessed cabinets, soffits, heating, ventilation or exhaust ducts shall be sealed to reduce sound transmission.

13. Joints between dissimilar materials and those listed above.

14. Other joints as indicated.

1.3 REFERENCES

A. ASTM C834 - Latex Sealing Compounds.

B. ASTM C919 - Practices for Use of Sealants in Acoustical Applications.

C. ASTM C920 - Elastomeric Joint Sealants.

D. ASTM C1193 - Standard Guide for Use of Joint Sealants.

- E. ASTM D217 - Cone Penetration of Lubricating Grease.
- F. ASTM D1056 - Flexible Cellular Materials - Sponge or Expanded Rubber.
- G. FS TT-S-001657 - Sealing Compound, Single Component, Butyl Rubber Based, solvent Release Type.
- H. SWRI - (Sealant, Waterproofing and Restoration Institute) - Sealant and Caulking Guide Specification.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Submit Product Data indicating sealant chemical characteristics, performance criteria, limitations, and color availability.
- C. Submit two 4-inch long Samples illustrating colors selected.

1.5 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in manufacturing the products specified in this Section with minimum five years documented experience.
- B. Applicator: Company specializing in applying the Work of this Section with minimum three years documented experience, approved by sealant manufacturer.
- C. Conform to Sealant, Waterproofing, and Restoration Institute (SWRI) requirements for materials and installation.
- D. Perform Work in accordance with ASTM C1193.
- E. Perform acoustical sealant application work to provide maximum STC values in accordance with ASTM C919.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Do not install solvent curing sealants in enclosed building spaces.
- B. Do not install sealant when temperature is less than 40 degrees F.
- C. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

1.7 WARRANTY

- A. Provide sealant manufacturer's 5-year warranty against defects in materials.
- B. Include coverage for installed sealants and accessories which fail to achieve air and water seal and exhibit loss of adhesion or cohesion or do not cure.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers and products are listed for each sealant type.
- B. Substitutions: Under provisions of Section 01 25 00.

2.2 SEALANTS

- A. Type A - Acrylic Latex: One-part, non-sag, mildew resistant acrylic emulsion compound complying with ASTM C834, Type S, Grade NS, formulated to be paintable.
 - 1. Tremco Inc., Acrylic Latex Caulk.
 - 2. Bostik Construction Products Division, "Chem-Calk 600."
 - 3. Pecora Corporation, "AC-20."
- B. Type B - Butyl Sealant: One-part, non-sag solvent-release-curing sealant complying with FS TT-S-001657 for Type 1 and formulated with a minimum of 75 percent solids.
 - 1. Tremco Inc., Tremco "Bitul Sealant."
 - 2. Bostik Construction Products Division, "Chem-Calk 300."
 - 3. Pecora Corporation, "BC-158."
- C. Type C - Silicone Sealant: One-part nonacid-curing silicone sealant complying with ASTM C920, Type S, Grade NS, Class 25.
 - 1. Dow Corning Corp., "Dow Corning 790."
 - 2. General Electric Co., "Silpruf."
 - 3. Tremco, Inc., "Spectrum 1."
 - 4. Pecora Corp., "864" or "890."
- D. Type D - Neutral-Curing Silicone Sealant: One part medium modulus neutral-curing silicone sealant complying with ASTM C920, Type S, Grade NS, Class 25.

1. Dow Corning Corp., "Dow Corning 795."
 2. General Electric Co., "Ultraglaze 4000."
 3. Tremco, Inc., "Spectrum 3."
 4. Pecora Corp., "895."
- E. Type E - One-Part Mildew-Resistant Silicone Sealant: Complying with ASTM C920, Type S, Grade NS, Class 25.
1. Dow Corning Corp., "Dow Corning 786."
 2. General Electric Co., "Sanitary 1700."
 3. Rhone-Poulenc Inc., "Rhodorsil 6 B White."
 4. Tremco, Inc., "Proglaze White."
 5. Pecora Corp., "863" or "898" White.
- F. Type F - Multi-Part Pourable Sealant: Complying with ASTM C920, Type M, Grade P, Class 25. Shore A hardness +40.
1. Tremco, Inc., "HPL."
 2. Mameco International, Inc., "Vulkem 255."
 3. Pecora Corp., "Dynatred" or "Urexpam NR-200."
 4. Sika Corporation, "Sikaflex 2C NS/SL."
 5. W.R. Meadows, "Pourthane."
- G. Type G - Acoustical Sealant: Nondrying, nonhardening permanently flexible conforming to ASTM D217.
1. Pecora Corp., "BA-98 Acoustical Sealant."
 2. Tremco, Inc., "Tremco Acoustical Sealant."
 3. United States Gypsum Co., "Sheetrock Acoustical Sealant."
- H. Type H - - Sound and Fire Protective Rated Moldable Putty Pads as wall opening protective materials when code required in fire-rated walls.

1. Tremco, Inc., TREMstop "MP Putty Pads".
2. 3M Inc., "3M Fire Barrier Moldable Putty Pads MPP+."
3. Hilti Co., "CFS-P PA Fire Putty Pad".

2.3 ACCESSORIES

- A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.
- B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.
- C. Joint Backing: ASTM D1056; round, closed cell polyethylene foam rod; oversized 30 to 50 percent larger than joint width.
- D. Bond Breaker: Pressure-sensitive tape recommended by sealant manufacturer to suit application.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that joint openings are ready to receive Work and field measurements are as shown on Drawings and recommended by the manufacturer.
- B. Beginning of installation means installer accepts existing substrate.

3.2 PREPARATION

- A. Clean and prime joints in accordance with manufacturer's instructions. Prime if recommended by manufacturer.
- B. Remove loose materials and foreign matter which might impair adhesion of sealant.
- C. Verify that joint backing and release tapes are compatible with sealant.
- D. Perform preparation in accordance with ASTM C1193.
- E. Protect elements surrounding the Work of this Section from damage or disfiguration.

3.3 INSTALLATION

- A. Install sealant in accordance with manufacturer's instructions.

- B. Measure joint dimensions and size materials to achieve required width/depth ratios.
- C. Install joint backing to achieve a neck dimension no greater than 1/3 the joint width.
- D. Install bond breaker where joint backing is not used.
- E. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- F. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.
- G. Tool joints concave. unless otherwise detailed.

3.4 CLEANING AND REPAIRING

- A. Clean work under provisions of Section 01 70 00.
- B. Clean adjacent soiled surfaces.
- C. Repair or replace defaced or disfigured finishes caused by Work of this Section.

3.5 PROTECTION OF FINISHED WORK

- A. Protect sealants until cured.

3.6 SCHEDULE

<u>Type</u>	<u>Location</u>	<u>Color</u>
Type A - Acrylic Latex Cure	All interior joints not otherwise scheduled	To match adjacent surfaces
Type B - Butyl	Under thresholds	Black
Type C - One-Part Nonacid Curing Silicone	Exterior door, entrance & window frames. Metal flashing	To match adjacent material
Type D - Neutral-Curing Silicone	Joints within glazed curtain wall system, skylight framing system, aluminum entrance system glass and glazing	Translucent
Type E - Mildew-Resistant Silicone	Interior joints in ceramic tile and at plumbing fixtures	Translucent
Type F - Multi-	Exterior & interior joints in	To match adjacent

<u>Type</u>	<u>Location</u>	<u>Color</u>
part Pourable Urethane	horizontal surfaces of concrete; between metal & concrete masonry and mortar	material
Type G - Acoustical Sealant	In walls and assemblies of or adjacent to exterior walls and procedure room and exam rooms. In sound rated walls between stud track/runner and adjacent construction. Between outlet boxes and gypsum board. Penetrations in construction including but not limited to piping, electrical devices, recessed cabinets, soffits, heating, ventilation or exhaust ducts shall be sealed.	White
Type H - Sound and Fire Protective Rated Moldable Putty Pads	At fire-rated wall openings when code required, such as electric boxes. In sound rated walls at electric boxes.	Red

END OF SECTION

SECTION 08 13 13 HOLLOW METAL DOOR AND FRAMES

1. RELATED DOCUMENTS

- a Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

2. SUMMARY

a Section Includes:

- 1 Standard and custom hollow metal doors and frames.
- 2 Steel sidelight, borrowed lite and transom frames.
- 3 Light frames and glazing installed in hollow metal doors.

b Related Sections:

- 1 Division 08 Section "Flush Wood Doors".
- 2 Division 08 Section "Glazing" for glass view panels in hollow metal doors.
- 3 Division 08 Section "Door Hardware".
- 4 Division 08 Section "Access Control Hardware".
- 5 Division 09 Sections "Exterior Painting" and "Interior Painting" for field painting hollow metal doors and frames.

c Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

- 1 ANSI/SDI A250.8 - Recommended Specifications for Standard Steel Doors and Frames.
- 2 ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames, Frames Anchors and Hardware Reinforcing.
- 3 ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames.
- 4 ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
- 5 ANSI/SDI A250.11 - Recommended Erection Instructions for Steel Frames.
- 6 ASTM A1008 - Standard Specification for Steel Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
- 7 ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- 8 ASTM A924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.

- 9 ASTM C 1363 - Standard Test Method for Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus.
- 10 ANSI/BHMA A156.115 - Hardware Preparation in Steel Doors and Frames.
- 11 ANSI/SDI 122 - Installation and Troubleshooting Guide for Standard Steel Doors and Frames.
- 12 ANSI/NFPA 80 - Standard for Fire Doors and Fire Windows; National Fire Protection Association.
- 13 ANSI/NFPA 105: Standard for the Installation of Smoke Door Assemblies.
- 14 NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; National Fire Protection Association.
- 15 UL 10C - Positive Pressure Fire Tests of Door Assemblies.
- 16 UL 1784 - Standard for Air Leakage Tests of Door Assemblies.

3. SUBMITTALS

- a Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, hardware reinforcements, profiles, anchors, fire-resistance rating, and finishes.
- b Door hardware supplier is to furnish templates, template reference number and/or physical hardware to the steel door and frame supplier in order to prepare the doors and frames to receive the finish hardware items.
- c Shop Drawings: Include the following:
 - 1 Elevations of each door design.
 - 2 Details of doors, including vertical and horizontal edge details and metal thicknesses.
 - 3 Frame details for each frame type, including dimensioned profiles and metal thicknesses.
 - 4 Locations of reinforcement and preparations for hardware.
 - 5 Details of anchorages, joints, field splices, and connections.
 - 6 Details of accessories.
 - 7 Details of moldings, removable stops, and glazing.
 - 8 Details of conduit and preparations for power, signal, and control systems.
- d Samples for Verification:
 - 1 Samples are only required by request of the architect and for manufacturers that are not current members of the Steel Door Institute.

4. QUALITY ASSURANCE

- a Source Limitations: Obtain hollow metal doors and frames through one source from a single manufacturer wherever possible.

5. DELIVERY, STORAGE, AND HANDLING

- a Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project site storage. Do not use non-vented plastic.
- b Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
- c Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch high wood blocking. Do not store in a manner that traps excess humidity.
 - 1 Provide minimum 1/4-inch space between each stacked door to permit air circulation. Door and frames to be stacked in a vertical upright position.

6. PROJECT CONDITIONS

- a Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

7. COORDINATION

- a Coordinate installation of anchorages for hollow metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

8. WARRANTY

- a Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.
- b Warranty includes installation and finishing that may be required due to repair or replacement of defective doors.

PRODUCTS

9. MANUFACTURERS

- a Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1 CECO Door Products.
 - 2 Curries Company.

3 Security Metal Products.

10. MATERIALS

- a Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- b Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.
- c Frame Anchors: ASTM A 653/A 653M, Commercial Steel (CS), Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.

11. ENERGY-EFFICIENT HOLLOW METAL DOORS

- a General: Provide 1-3/4 inch doors of design specified, not less than thickness indicated; fabricated with smooth surfaces, without visible joints or seams on exposed faces unless otherwise indicated. Comply with ANSI/SDI A250.8 and ANSI/NAAMM HMMA 867.
- b Energy Efficient Exterior Doors: Face sheets fabricated of commercial quality hot-dipped zinc coated steel that complies with ASTM A924 A60. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model, ANSI/SDI A250.4 for physical performance level, and HMMA 867 for door construction.

1 Design: Flush panel.

2 Core Construction: Foamed in place polyurethane and steel stiffened laminated core with no stiffener face welds, in compliance with HMMA 867 "Laminated Core".

a Provide 22 gauge steel stiffeners at 6 inches on-center internally welded at 5" on-center to integral core assembly, foamed in place polyurethane core chemically bonded to all interior surfaces. No stiffener face welding is permitted.

b Thermal properties to rate at a fully operable minimum U-Factor 0.29 and R-Value 3.4, including insulated door, thermal-break frame and threshold.

Kerf Type Frames: Thermal properties to rate at a fully operable minimum U-Factor 0.36 and R-Value 2.7, including insulated door, kerf type frame, and threshold.

3 Level/Model: Level 2 and Physical Performance Level A (Heavy Duty), Minimum 18 gauge (0.042 inch - 1.1-mm) thick steel, Model 4.

4 Vertical Edges: Vertical edges to be mechanically interlocked with hairline seam. Beveled Lock Edge, 1/8 inch in 2 inches (3 mm in 50 mm).

- 5 Top and Bottom Edges: Reinforce tops and bottoms of doors with a continuous steel channel not less than 16 gauge, extending the full width of the door and welded to the face sheet. Doors with an inverted top channel to include a steel closure channel, screw attached, with the web of the channel flush with the face sheets of the door. Plastic or composite channel fillers are not acceptable.
- 6 Hinge Reinforcement: Minimum 7 gauge (3/16") plate 1-1/4" x 9".
- 7 Hardware Reinforcements: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.

c Manufacturers Basis of Design:

- 1 CECO Door Products Trio-E/Trio Series.
- 2 Curries Company 777 Trio-E/Trio Series.

12. STANDARD HOLLOW METAL FRAMES

a General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.

b Interior Frames: Fabricated from cold-rolled steel sheet that complies with ASTM A 1008/A 1008M.

- 1 Fabricate frames with mitered or coped corners.
- 2 Fabricate frames, with the exception of slip-on drywall types, with "closed and tight" miter seams continuously welded on face, finished smooth with no visible seam unless otherwise indicated.
- 3 Frames for Steel Doors: Minimum 16 gauge (0.053-inch -1.3-mm) thick steel sheet.
- 4 Frames for openings up to 48 inches in width: Minimum 16 gauge (0.053-inch - 1.3-mm) thick steel sheet.]
- 5 Frames for openings 48 inches and wider in width: Minimum 14 gauge (0.067-inch -1.7-mm) thick steel sheet.]
- 6 Frames for Wood Doors: Minimum 16 gauge (0.053-inch-1.3-mm-) thick steel sheet.
- 7 Frames for Borrowed Lights: Minimum 16 gauge (0.053-inch-1.3-mm-) thick steel sheet.
- 8 Manufacturers Basis of Design:

- a CECO Door Products SQ/SU/SR Series (Masonry Profile).
- b Curries Company M/G Series (Masonry Profile).

c Fire rated frames: Fabricate frames in accordance with NFPA 80, listed and labeled by a qualified testing agency, for fire-protection ratings indicated.

d Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 Table 4 with reinforcement plates from same material as frames.

13. ENERGY-EFFICIENT HOLLOW METAL FRAMES

- a Weatherstripped Frames: Subject to the same compliance standards and requirements as standard hollow metal frames, provide where indicated weatherstripped profiles with 1/8" integral kerf formed into the frame soffit able to receive manufacturer's listed gasket material. Available for use in both masonry and drywall construction, with fire rating up to 3 hours complying with NFPA 105, UL 1784, and ASTM E-283 Test criteria.
 - 1 Manufacturers Basis of Design:
 - a CECO Door Products - Weatherstripped SQW/SRW Series.
 - b Curries Company - Weatherstripped WC/WM Series.

14. FRAME ANCHORS

- a Jamb Anchors:
 - 1 Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, formed from A60 metallic coated material, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.
 - 2 Stud Wall Type: Designed to engage stud and not less than 0.042 inch thick.
 - 3 Compression Type for Drywall Slip-on (Knock-Down) Frames: Adjustable compression anchors.
 - 4 Windstorm Opening Anchors: Types as tested and required for indicated wall types to meet specified wind load design criteria.
 - 5 FEMA 361 Storm Shelter Anchors: Masonry T-shaped, wire masonry type, or existing opening type anchors.
- b Floor Anchors: Floor anchors to be provided at each jamb, formed from A60 metallic coated material, not less than 0.042 inches thick.
- c Mortar Guards: Formed from same material as frames, not less than 0.016 inches thick.

15. LIGHT OPENINGS AND GLAZING

- a Stops and Moldings: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints at fabricator's shop. Fixed and removable stops to allow multiple glazed lites each to be removed independently. Coordinate frame rabbet widths between fixed and removable stops with the type of glazing and installation indicated.
- b Moldings for Glazed Lites in Doors and Loose Stops for Glazed Lites in Frames: Minimum 20 gauge thick, fabricated from same material as door face sheet in which they are installed.

- c Fixed Frame Moldings: Formed integral with hollow metal frames, a minimum of 5/8 inch (16 mm) high unless otherwise indicated. Provide fixed frame moldings and stops on outside of exterior and on secure side of interior doors and frames
- d Preformed Metal Frames for Light Openings: Manufacturer's standard frame formed of 0.048-inch-thick, cold rolled steel sheet; with baked enamel or powder coated finish; and approved for use in doors of fire protection rating indicated. Match pre-finished door paint color where applicable.
- e Glazing: Comply with requirements in Division 08 Section "Glazing" and with the hollow metal door manufacturer's written instructions.
 - 1 Factory Glazing: Factory install glazing in doors as indicated. Doors with factory installed glass to include all of the required glazing material.

16. ACCESSORIES

- a Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.
- b Grout Guards: Formed from same material as frames, not less than 0.016 inches thick.

17. FABRICATION

- a Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. When shipping limitations so dictate, frames for large openings are to be fabricated in sections for splicing or splining in the field by others.
- b Tolerances: Fabricate hollow metal work to tolerances indicated in ANSI/SDI A250.8.
- c Hollow Metal Doors:
 - 1 Exterior Doors: Provide optional weep-hole openings in bottom of exterior doors to permit moisture to escape where specified.
 - 2 Glazed Lites: Factory cut openings in doors with applied trim or kits to fit. Factory install glazing where indicated.
 - 3 Astragals: Provide overlapping astragals as noted in door hardware sets in Division 08 Section "Door Hardware" on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum 3/4 inch beyond edge of door on which astragal is mounted.
 - 4 Continuous Hinge Reinforcement: Provide welded continuous 12 gauge strap for continuous hinges specified in hardware sets in Division 08 Section "Door Hardware".
- d Hollow Metal Frames:

- 1 Shipping Limitations: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
- 2 Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.
 - a Welded frames are to be provided with two steel spreaders temporarily attached to the bottom of both jambs to serve as a brace during shipping and handling. Spreader bars are for bracing only and are not to be used to size the frame opening.
- 3 Sidelight and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
- 4 High Frequency Hinge Reinforcement: Provide high frequency hinge reinforcements at door openings 48-inches and wider with mortise butt type hinges at top hinge locations.
- 5 Continuous Hinge Reinforcement: Provide welded continuous 12 gauge straps for continuous hinges specified in hardware sets in Division 08 Section "Door Hardware".
- 6 Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated for removable stops, provide security screws at exterior locations.
- 7 Mortar Guards: Provide guard boxes at back of hardware mortises in frames at all hinges and strike preps regardless of grouting requirements.
- 8 Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.
- 9 Jamb Anchors: Provide number and spacing of anchors as follows:
 - a Stud Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
 - Three anchors per jamb up to 60 inches high.
 - Four anchors per jamb from 60 to 90 inches high.
 - Five anchors per jamb from 90 to 96 inches high.
 - Five anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.
 - Two anchors per head for frames above 42 inches wide and mounted in metal stud partitions.
- 10 Door Silencers: Except on weatherstripped or gasketed doors, drill stops to receive door silencers. Silencers to be supplied by frame manufacturer regardless if specified in Division 08 Section "Door Hardware".
 - e Hardware Preparation: Factory prepare hollow metal work to receive template mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section "Door Hardware."

- 1 Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
- 2 Reinforce doors and frames to receive non-template, mortised and surface mounted door hardware.
- 3 Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.
- 4 Coordinate locations of conduit and wiring boxes for electrical connections with Division 26 Sections.

18. STEEL FINISHES

- a Prime Finishes: Doors and frames to be cleaned, and chemically treated to insure maximum finish paint adhesion. Surfaces of the door and frame exposed to view to receive a factory applied coat of rust inhibiting shop primer.
 - 1 Shop Primer: Manufacturer's standard, fast-curing, lead and chromate free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; and compatible with substrate and field-applied coatings.

EXECUTION

19. EXAMINATION

- a Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- b General Contractor to verify the accuracy of dimensions given to the steel door and frame manufacturer for existing openings or existing frames (strike height, hinge spacing, hinge back set, etc.).
- c Proceed with installation only after unsatisfactory conditions have been corrected.

20. PREPARATION

- a Remove welded in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.
- b Prior to installation, adjust and securely brace welded hollow metal frames for squareness, alignment, twist, and plumbness.
- c Tolerances shall comply with SDI-117 "Manufacturing Tolerances Standard Steel Doors and Frames."

- d Drill and tap doors and frames to receive non-template, mortised, and surface-mounted door hardware.

21. INSTALLATION

- a General: Install hollow metal work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.
- b Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11 and NFPA 80 at fire rated openings.

- 1 Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete and frames properly set and secured, remove temporary braces, leaving surfaces smooth and undamaged. Shim as necessary to comply with installation tolerances.
- 2 Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post-installed expansion anchors.
- 3 Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with mortar.
- 4 Grout Requirements: Do not grout head of frames unless reinforcing has been installed in head of frame. Do not grout vertical or horizontal closed mullion members.

- c Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.

1 Non-Fire-Rated Standard Steel Doors:

- a Jamb and Head: 1/8 inch plus or minus 1/16 inch.
- b Between Edges of Pairs of Doors: 1/8 inch plus or minus 1/16 inch.
- c Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.
- d Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch.

2 Fire-Rated Doors: Install doors with clearances according to NFPA 80.

- d Field Glazing: Comply with installation requirements in Division 08 Section "Glazing" and with hollow metal manufacturer's written instructions.

22. ADJUSTING AND CLEANING

- a Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.

- b Remove grout and other bonding material from hollow metal work immediately after installation.
- c Prime-Coat and Painted Finish Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat, or painted finishes, and apply touchup of compatible air drying, rust-inhibitive primer, zinc rich primer (exterior and galvanized openings) or finish paint.

END OF SECTION

SECTION 08 14 16

WOOD DOORS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Wood doors, non-rated.
- B. Glass lite frames.

1.2 REFERENCES

- A. WDMA I.S.1 - Industry Standard For Wood Flush Doors (Includes Standards I.S.1.1 through I.S.1.7).
- B. NFPA 80 - Fire Doors and Windows.
- C. CBC - Uniform Building Code.
- D. UL 10C - Fire Tests of Door Assemblies.
- E. WI - Woodwork Institute: Manual of Millwork.

1.3 QUALITY ASSURANCE

- A. Conform to requirements of WI Manual of Millwork, Section 12 and 13, Premium Grade except where otherwise indicated.
- B. Issue a WI Certified Compliance Certificate prior to delivery of doors certifying that doors meet all requirements of WI Grade specified.
- C. After completion issue a WI Certified Compliance Certificate for Installation.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Shop Drawings shall bear the WI Certified Compliance Label on the first page of each set. Indicate door elevations, stile and rail reinforcement, internal blocking for hardware attachment, and cutouts for glazing and louvers.
- C. Submit two Samples 12 inches x 12 inches in size illustrating each species and finish specified.

1.5 DELIVERY, STORAGE, AND PROTECTION

- A. Protect products under provisions of Section 01 87 00.
- B. Package, deliver, and store doors in accordance with WI requirements as set forth in Technical Bulletin 419-R.

1.6 WARRANTY

- A. Provide manufacturer's standard lifetime warranty under provisions of Section 01 70 00 for solid core doors.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS, FLUSH FACED DOORS and FRAMES

- A. Eggers Industries, Inc.
- B. Marshfield Door Systems, Inc.
- C. Algoma Hardwoods, Inc.
- D. Frames: Anemostat or equal.
- E. Substitutions: Under provisions of Section 01 25 00.

2.2 DOOR and FRAME CONSTRUCTION

- A. Solid Non-rated Core: Solid wood block, framed block glued, or solid particleboard.
- B. Solid, Special Function Core: Labeled fire performance type.
- C. Construction: 5-ply, with face veneer applied vertically over wood veneer cross banding.
- D. Flush Interior Door Veneer: Birch stain grade; plain sliced with book matched grain, for transparent clear finish. Satin sheen.

2.3 GLASS LITE FRAMES

- A. 20 Ga. Cold rolled steel

2.4 ADHESIVES

- A. Exterior and Interior Doors: WI Type I.

2.5 FABRICATION

- A. Fabricate non-rated wood doors to requirements of WI Manual of Millwork, Section 12 and 13, in the WI Grade specified.
- B. Premachine doors for finish hardware.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install doors in accordance with WI Manual of Millwork Sections 12 and 13 and WI Technical Bulletin 420-R.
- B. Conform to WI requirements for fit tolerances.
- C. Coordinate installation of glass and glazing.
- D. Adjust doors for smooth and balanced movements.

3.2 INSTALLATION TOLERANCES

- A. Edge clearance for swinging doors shall not exceed the following:
 - 1. Between door and frame at head and jamb 1/8 inch
 - 2. Between edge of pair of doors 1/8 inch
 - 3. At door sill with threshold 3/8 inch
 - 4. At door bottom and surface of nominal floor covering per NFPA 80 and at doors requiring an undercut as indicated on Drawings. 5/8 inch
- B. Frame installation tolerance shall not exceed the following:
 - 1. Squareness ±1/16 inch
 - 2. Alignment ±1/16 inch
 - 3. Plumbness ±1/16 inch
 - 4. Diagonal Distortion ±1/32 inch

END OF SECTION

SECTION 08 41 12

ALUMINUM ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Aluminum doors, frames and glazed lights.
- B. Anchors, brackets, and attachments.
- C. Perimeter sealant.

1.2 REFERENCES

- A. ASTM A36 - Structural Steel.
- B. ASTM B221 - Aluminum-Alloy Extruded Bar, Rod, Wire, Shape, and Tube.
- C. ASTM E283 - Rate of Air Leakage through Exterior Windows, Curtain Walls and Doors.
- D. ASTM D2000 - Classification System for Rubber Products.
- E. ASTM D2287 - Nonrigid Vinyl Chloride Polymer and Copolymer molding and Extrusion Compounds.
- F. AAMA 701.2 - Voluntary Specification for Pile Weatherstripping.
- G. AAMA SFM-1 - Aluminum Storefront and Entrance Manual.
- H. NAAMM - Metal Finishes Manual.
- I. CBC - California Building Code.

1.3 PERFORMANCE

- A. System to provide for expansion and contraction within system components caused by a cycling temperature range of 120 F degrees without causing detrimental effects to system or components.
- B. Design and size members to withstand dead loads and live loads caused by pressure and suction of wind as calculated in accordance with CBC.
- C. Limit mullion deflection to 1/200, or flexure limit of glass with full recovery of glazing materials, whichever is less.

- D. Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to exterior.
- E. Limit air infiltration through assembly to 0.06 cu ft/min/sq ft as measured in accordance with ASTM E283.
- F. System to accommodate, without damage to system or components, or deterioration of perimeter seal: Movement within system; movement between system and perimeter framing components; dynamic loading and release of loads; and deflection of structural support framing.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Shop Drawings: Include system and component dimensions; components within assembly; framed opening requirements and tolerances; anchorage and fasteners; glass and infills; door hardware requirements; and affected related Work.
- C. Product Data: Manufacturer's brochures and manufacturer's installation instructions.
- D. Submit two Samples, 12 inches x 12 inches in size, illustrating prefinished aluminum surface.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with AMA SFM-1.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle system components under provisions of Section 01 87 00.
- B. Provide strippable coating to protect prefinished aluminum surfaces.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Kawneer Company, Inc.
 - 1. Kawneer TRIFAB II 400: Storefronts.
 - 2. Kawneer 350 Tuffline: entrances with 6 inch cross bar.

3. Kawneer 1600 Wall System: 1/4-inch infill-curtain wall.
 - B. Oldcastle Glass.
 - C. Arcadia.
 - D. EFCO Corp.
 - E. Substitutions: Under provisions of Section 01 62 00.

2.2 MATERIALS

- A. Extruded Aluminum: 6063 – T6 Aluminum Alloy ASTM B221, Alloy G.S. 10A-T6.
- B. Brackets and Reinforcements: High strength aluminum.
- C. Dark Bronze anodized finish.
- D. Fasteners: Stainless steel, aluminum.
- E. Compression Weatherstripping: Replaceable gaskets of molded neoprene complying with ASTM D2000, or molded PVC complying with ASTM D 2287.
- F. Sliding Weatherstripping: Replaceable wool, polypropylene or nylon woven pile; nylon fabric or aluminum strip backing; complying with AAMA 701.2.

2.3 FABRICATED COMPONENTS

- A. Frames: 2 inch x 4 inch profile, flush glazing stops.
- B. Wide Thermal Heavy Duty Stile Doors: 2 inches thick, 5 inch wide top and mid-rail, 5 inch wide vertical stiles, 10 inch wide bottom rail (nominal dimensions); beveled glazing strips. All stiles and rails welded.
- C. Reinforced Mullion: Extruded aluminum cladding with internal reinforcement of steel shaped structural section as required by manufacturer.

2.4 GLASS AND GLAZING MATERIALS

- A. Glass and Glazing Materials: As specified in Section 08 80 00 and as indicated on Drawings.

2.5 HARDWARE

- A. Door Hardware: As specified in Section 08 71 00.

2.6 FABRICATION

- A. Fabricate doors and frames allowing for minimum clearances and shim spacing around perimeter of assembly, yet enabling installation.
- B. Rigidly fit and secure joints and corners with internal reinforcement. Weld top and bottom rails of doors to reinforcement clips. Make joints and connections flush, hairline, and weatherproof.
- C. Develop drainage holes with moisture pattern to exterior.
- D. Prepare components to receive anchor devices. Fabricate anchorage items.
- E. Arrange fasteners, attachments, and jointing to ensure concealment from view.
- F. Prepare components with internal reinforcement for door hardware and door operator hinge hardware.
- G. Reinforce framing members for imposed loads.

2.7 FINISHES

- A. Dark Bronze Anodized Finish:
- B. Apply bituminous paint to separate dissimilar metals and metal surfaces in contact with cementitious or dissimilar materials.

2.8 SEALANT MATERIALS

- A. Sealant and Backing Materials: As specified in Section 07 92 00.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Verify wall openings and adjoining materials are ready to receive Work of this Section.
- B. Beginning of installation means acceptance of existing conditions.

3.2 INSTALLATION

- A. Install doors, frames, glazing and hardware in accordance with manufacturer's instructions and AAMA SFM-1.
- B. Use anchorage devices to securely attach frame assembly to structure.
- C. Attach to structure to permit adjustment to accommodate construction tolerances and other irregularities.

- D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent Work.
- E. Install sill flashings.
- G. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- H. Install sealant and backing materials as specified in Section 07 92 00.
- I. Install hardware using templates provided. Refer to Section 08 71 00 for installation requirements.
- J. Install glass in accordance with Section 08 80 00, using exterior dry method of glazing.
- K. Adjust operating hardware.

3.3 TOLERANCES

- A. Variation from Plane: 0.03 inches per foot maximum or 0.25 inches per 30 feet, whichever is less.
- B. Misalignment of Two Adjoining Members Abutting in Plane: 0.015 inches maximum.

3.4 CLEANING

- A. Remove protective material from prefinished aluminum surfaces.
- B. Wash down exposed surfaces using a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.
- C. Remove excess sealant by moderate use of mineral spirits or other solvent acceptable to sealant manufacturer.

END OF SECTION

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SECTION 08 51 13 ALUMINUM WINDOWS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Extruded aluminum windows with fixed sash.
- B. Glass and glazing.
- C. Perimeter sealant.

1.2 REFERENCES

- A. AAMA 101 - Voluntary Specifications for Aluminum Prime Windows and Sliding Glass Door.
- B. ASTM B221 - Aluminum-Alloy Extruded Bar, Rod, Wire, Shape, and Tube.
- C. ASTM E283 - Rate of Air Leakage through Exterior Windows, Curtain Walls, and Doors.
- D. ASTM E330 - Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
- E. ASTM E331 - Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
- F. ASTM E547 - Water Penetration of Exterior Windows, Curtain Walls, and Doors by Cyclic Static Air Pressure Differential.
- G. CCR - California Code of Regulations, Title 24, Part 6, Section 116.
- H. CEC - California Energy Commission.
- I. FS L-S-125 - Screening, Insect, Nonmetallic.
- J. NFRC - National Fenestration Rating Council.
- K. NAAMM - National Association of Architectural Metal Manufacturers.
- L. SIGMA - Sealed Insulating Glass Manufacturers Association.

1.3 PERFORMANCE REQUIREMENTS

- A. Comply with air infiltration, water penetration and structural performance requirements indicated in AAMA 101 for the type, grade and performance class of window units required.
- B. Test each type and size of required window unit through a recognized testing laboratory or agency, in accordance with ASTM E330 for structural performance, with ASTM E283 for air infiltration and with both ASTM E331 and ASTM E547 for water penetration.
- C. Thermal Performance: Overall U-value of 1.10 as rated in accordance with the National Fenestration Rating councils' (NFRC) Interim U-value Rating Procedure or in accordance with default table method approved by the California Energy Commission (CEC).

1.4 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Shop Drawings: Include wall opening and component dimensions; wall opening tolerances required; anchorage and fasteners; affected related Work; installation requirements, and details of existing openings (if applicable).
- C. Submit manufacturer's installation instructions.
- D. Submit Product Data for each window type specified.
- E. Submit two 12 inch square Samples illustrating window frame sections, corner section, mullion section, screen and frame.
- F. Color samples: Minimum 1x4 inch (25x100 mm) samples of Aluminum with painted or anodized color.
- G. Glass sample, showing specified tint color.
- H. Submit manufacturer's certification and certified test results showing that window units meet or exceed specified requirements.

1.5 QUALITY ASSURANCE

- A. Qualifications: Proof of manufacturer's qualifications.
- B. Label to be permanently affixed to frame listing certified U-value, certifying organization and rating procedure.
- C. Label to be temporarily affixed to frame certifying that air infiltration requirements of CCR, Title 24, Part 6, Section 116 have been met.

- D. Installation Instruction – AAMA 2400 “Mounting Flange Installation” or AAMA 2410 (Flush Fin Installation).

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store and protect window units under provisions of Section 01 87 00.
- B. Provide wrapping or strippable coating to protect prefinished aluminum surfaces.

1.7 WARRANTY

- 1. Manufacturer shall give written warranty to Owner, stating that manufacturer will replace all aluminum windows that are found to be defective within 10 years of date of Substantial Completion.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Fixed Windows:
 - 1. Kawneer Company, Inc., NX-7400 Series.
- B. Substitutions: Under provisions of Section 01 25 00.

2.2 MATERIALS

- A. Extruded Aluminum: ASTM B221, 6063 alloy, T5 temper for strength.

2.3 FABRICATED COMPONENTS

- A. 3-1/4" equal leg frame
 - 1-1/2" nail flange
 - 7/8" insulating glass
 - 1/8" clear x 5/8" Argon x 1/8" Low-E
 - Solar Grey Tint / Mirrored
- B. Fasteners: Stainless steel.

2.4 GLASS AND GLAZING MATERIALS

- A. Glass and Glazing Materials: Dual glazed, solar gray tint, mirror finish, low E.

2.5 SEALANT MATERIALS

- A. Sealant and Backing Material: As specified in Section 07 92 00.

2.6 FABRICATION

- A. Fabricate windows allowing for minimum installation clearances and shim spacing around perimeter of assembly, yet enabling installation.
- B. Rigidly fit joints and corners. Accurately fit and secure corners tight. Make corner joints flush, hairline, and weatherproof. Seal corner joints with sealant.
- C. Develop drainage holes with moisture pattern to exterior.
- D. Prepare components to receive anchor devices. Fabricate anchorage items.
- E. Provide internal reinforcement in mullions to maintain rigidity.
- F. Factory glaze window units in accordance with manufacturer's instructions.

2.7 FINISHES

- A. Dark Bronze Anodized.
- B. Apply one coat of bituminous paint to concealed aluminum and steel surfaces in contact with cementitious or dissimilar materials.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Verify that wall openings are ready to receive Work of this Section.
- B. Beginning installation means acceptance of existing conditions.

3.2 INSTALLATION

- A. Install window frames, glass and glazing and hardware in accordance with manufacturer's instructions.
- B. Use anchorage devices to securely attach frame to structure.
- C. Align window frame plumb and level, free of warp or twist. Maintain dimensional tolerances, aligning with adjacent Work.
- D. Pack fibrous insulation in shim spaces at perimeter to maintain continuity of thermal barrier.

- E. Install sealant and backing materials as specified in Section 07 92 00.
- F. Adjust operable hardware for smooth operation and tight fit of sash.

3.3 CLEANING

- A. Remove protective material from prefinished aluminum surfaces.
- B. Wash down exposed surfaces using a solution of mild detergent in warm water. Rinse with clean water, and wipe dry with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.
- C. Remove excess sealant by moderate use of mineral spirits or other solvent acceptable to sealant manufacturer.

END OF SECTION

SECTION 08 58 00
ALUMINUM INTERIOR SLIDING SERVICE WINDOW

PART 1 – GENERAL

1.1 SUMMARY

- A. This section includes aluminum, medium-duty interior sliding service windows as indicated in drawings and in sections.

1.2 SUBMITTALS

- A. Product Data: Submit Manufacturer's technical product data substantiating that products comply.
- B. Shop drawings: Submit for fabrication and installation of windows. Include details, elevations and installation requirement of finish hardware and cleaning.
- C. Certification: Provide printed data in sufficient detail to indicate compliance with the contract documents.

1.3 DELIVERY, STORAGE, AND HANDLING

- A. Deliver windows crated to provide protection during transit and job storage.
- B. Inspect windows upon delivery for damage. Unless minor defects can be made to meet the Architect's specifications and satisfaction, damaged parts should be removed and replaced.
- C. Store windows at building site under cover in dry location.

1.4 PROJECT CONDITIONS

- A. Field measurements: Check opening by accurate field measurement before fabrication. Show recorded measurements on shop drawings. Coordinate fabrication schedule with construction progress to avoid delay of work.

1.5 WARRANTY

- A. All material and workmanship shall be warranted against defects for a period of one (1) year from the original date of purchase.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURER'S

- A. Basis of design: Design is based on aluminum, interior sliding service window manufactured by C.R. Laurence Co., Inc. (800) 421-6144
- B. Substitutions: Under the provisions of Section 01 25 00.

2.2 MATERIALS

- A. Frames: Aluminum frame modules shall be constructed of 6063-T5 extruded aluminum. Window rolls on top-hung ball bearing rollers. Catch locks included with all interior windows. Overall frame sizes are to be in accordance with the contract drawings.
- B. Finish: All aluminum to be duranodic bronze.
- C. Glazing Vinyl : Supplied with frame, 1/4" in thickness.
- D. Glazing: 1/4" thick laminated safety glass by others. See Specifications Section 08 80 00 – Glazing.
- E. Options: Keyed lock and D7 Overhead track.
- F. Model: Florence #D1038DU (OX). X = sliding panel, O = fixed panel, as viewed from clerks side.

PART 3 – EXECUTION

3.1 INSPECTION

- A. Verify that wall openings are ready to receive Work of this Section.
- B. Beginning installation means acceptance of existing conditions.

3.2 INSTALLATION

- A. Install window frames, glazing and hardware in accordance with manufacturer's instructions.
- B. Use anchorage devices to securely attach frame to structure.
- C. Align window frame plumb and level, free of warp or twist. Maintain dimensional tolerances, aligning with adjacent Work.

- D. Pack fibrous insulation in shim spaces at perimeter to maintain continuity of thermal barrier.
- E. Install sealant and backing materials as specified in Section 07 92 00.
- F. Adjust operable hardware for smooth operation and tight fit of sash.

3.3 CLEANING

- A. Remove protective material from prefinished aluminum surfaces.
- B. Wash down exposed surfaces using a solution of mild detergent in warm water. Rinse with clean water, and wipe dry with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.
- C. Remove excess sealant by moderate use of mineral spirits or other solvent acceptable to sealant manufacturer.

3.4 PROTECTION

- A. Institute protective measures required throughout the remainder of the construction period to ensure that all the windows do not incur any damage or deterioration, other than normal weathering, at the time of acceptance.

END OF SECTION

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SECTION 08 63 00 METAL FRAMED SKYLIGHTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Metal Framed Structural Skylights.
- B. Related Sections may include, but are not limited to the following:
 - 1. Division 5 Section "Structural Steel" for steel framing.
 - 2. Division 7 Section "Joint Sealants" for sealants installed at metal-framed skylight perimeters.
 - 3. Division 8 Section "Glass and Glazing"

1.3 PERFORMANCE REQUIREMENTS

- A. General: Provide metal-framed skylights capable of withstanding loads and thermal and structural movements indicated without failure. Failure includes the following:
 - 1. Deflection exceeding specified limits.
 - 2. Thermal stresses transferred to the building structure.
 - 3. Skylight framing members transferring stresses, including those caused by thermal and structural movement, to glazing.
 - 4. Weakening of fasteners, attachments, and other components.
- B. Deflection Limits: As follows:
 - 1. Deflection of the entire length of framing members in direction normal to glazing plane is limited to 1/175 of clear span.
- C. Lateral Support: Compression flanges 75% of flexural members requiring lateral be laterally braced by cross members with minimum depths equal to flexural member

depth and by anchors to the building structure. Glazing material does not provide lateral support.

D. Structural Loads: Provide metal-framed skylights, including anchorage, capable of withstanding the effects of the following service level design loads when supporting full dead loads:

1. Roof Loads

- a. Concentrated Load: 250 lbs applied to framing members at location that produces the most severe stress or deflection.
- b. Roof Live Loads: 20 lb/ sq. ft
- c. Wind Loads: 46 lb/ sq. ft (uplift)

2. Seismic Loads: 45% of assembly weight (in-plane of skylight), 15% of assembly weight (out-of-plane of skylight).

E. Structural Performance: Provide metal-framed skylights, including anchorage, capable of withstanding pressures indicated without material and deflection failures and permanent deformation of structural members exceeding 0.2 percent of span when tested according to ASTM E 330.

F. Air Infiltration: Provide metal-framed skylights with maximum air leakage of 0.06 cfm/sq. ft. (0.03 L/s per sq. m) of surface when tested according to ASTM E 283 at a minimum static-air-pressure differential of 6.24lb/sq. ft. (300 Pa).

G. Water Penetration: Provide metal-framed skylights that do not evidence water penetration when tested according to ASTM E 331 at a minimum differential static pressure of 20 percent of positive design wind pressure, but not less than 15 lb/sq. ft. (718 Pa).

H. Condensation Resistance: Provide aluminum-framed systems that when tested with fixed glazing, have a frame condensation-resistance factor (CRF) of not less than 54 when tested according to AAMA 1503 when clear over clear insulated glass is used.

I. Thermal Movement: Provide metal-framed skylights that allow for thermal movements resulting from the following maximum change (range) in ambient temperatures by preventing buckling, sealant failure, and other detrimental effects.

- 1. Temperature Change (Range): 100 degrees F.

1.4 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions and profiles of components, and finishes for metal-framed skylights.
- B. Shop Drawings: For metal-framed skylights. Include plans, elevations, sections, details, and attachments to other work as required.
- C. Samples for Initial Selection: Manufacturer's color charts consisting of sections of units showing the full range of colors available for factory-finished aluminum.
- D. Samples for Verification: Provide color sample of selected finish on 2"x3" aluminum sheet.
- E. Installer Certificates: If required, signed by manufacturer certifying that installers comply with requirements.
- F. Product Test Reports: From a qualified testing agency indicating skylights comply with requirements, based on comprehensive testing of current products.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has specialized in installing metal-framed skylights similar to those indicated for this Project and who is acceptable to manufacturer.
- B. Professional Engineer Qualifications: A professional engineer who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of skylights that are similar to those indicated for this Project in material, design, and extent.
- C. Testing Agency Qualifications: An independent testing agency with the experience and capability to conduct the testing indicated, as documented according to ASTM E 548.

1.7 PROJECT CONDITIONS

- A. Field Measurements: Where metal-framed skylights are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
 - 1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating skylights without field measurements. Coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.8 WARRANTY

- A. Warranty: Written warranty, executed by manufacturer agreeing to repair or replace components of metal-framed skylights that fail in materials or workmanship within specified warranty period. Failures include, but are not limited to, the following:
 - 1. Structural failures.
 - 2. Failure of systems to meet performance requirements.
 - 3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - 4. Water leakage; defined as uncontrolled water appearing on normally exposed interior surfaces of skylights from sources other than condensation, resulting from defects in skylight materials or workmanship. (Water controlled by flashing and gutters and drained back to the exterior and that cannot damage adjacent materials or finishes is not water leakage). Water leakage resulting from improper installations not part of this warranty.
- B. System Warranty Period: 5 years from date of shipment from the manufacturer.
- C. Finish Warranty: Provide written warranty signed by manufacturer agreeing to repair or replace work with finish defects. "Defects" is defined as peeling, chipping, chalking, fading, abnormal aging or deterioration, and failure to perform as required.
 - 1. Warranty Period for Anodized Finish: 1 year from date of shipment from the manufacturer.
 - 2. Warranty Period for Powder Coat Finish: 5 years from date of shipment from the manufacturer.
 - 3. Warranty Period for Kynar 500 Finish: 5 years from date of shipment from the manufacturer. (10 and 20 years available if specified).

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide Pinnacle 350 system by Wasco Products, Inc., Commercial Division, Wells, ME (800-388-0293)

- B. Contact Info: Matthew Vizcarra, Apollo Architectural
Phone: 707-238-5005
Fax: 707-238-5158
Email: matthew@apolloarchitectural.net
Web: <http://apolloarchitectural.net/>
- C. Substitutions: Manufacturers shall not be considered without prior approval in writing no later than ten (10) calendar days prior to bid. Substitute manufacturers must have been in the custom skylight business for not less than a period of 15 years and must submit to the Architect the following:
1. List of similar projects successfully completed within the last five years.
 2. Proof of financial capability.
 3. Complete details of proposed skylight.
 4. Complete specifications for Architect's review.

2.2 FRAMING MATERIALS

- A. Framing Members: Extruded aluminum alloy 6063-T5 or T6, ASTM B 221 with minimum effective thickness of 0.109 inches.
- B. Exterior Pressure Caps: Extruded aluminum alloy 6063-T5 or T6, ASTM B 221 with minimum effective thickness of 0.090 inches.
- C. Concealed Flashing: Manufacturer's standard corrosion-resistant, non-staining, non-bleeding flashing; compatible with adjacent materials.
- D. Exposed Flashing and Closures: Aluminum sheet alloy and temper of 1100-H14, thickness as require for proper performance.
1. Minimum Thickness: 0.032 inch Apron Flashing.
 2. Minimum Thickness: 0.062 inch Closures.
- E. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, non-staining, non-bleeding fasteners and accessories; compatible with adjacent materials.
1. Aluminum Retaining Cap Fasteners and Framing Members Fasteners: ASTM A 193/A 193M, Series 300 stainless-steel screws; type as recommended by manufacturer.
 2. Connections to Supporting Structure: Series 300 Stainless Steel or ASTM A 307, hot dipped galvanized steel fasteners by installer.
- F. Framing-System Sealants: Single-component, non-sag, high performance, non-priming, gun-grade elastomeric polyurethane sealant furnished by skylight manufacturer.

1. Sealant complies with ASTM C920, Type S, Grade NS, Class 25, Use T, NT, M, A, G, and O. Canadian Specification CAN/CGSB-19.13-M87, Classification MCG-2-25-A-N.
 2. Sealant conforms to USDA approval standards.
- G. Bituminous Paint: Cold-applied asphalt mastic paint complying with SSPC-Paint 12, except containing no asbestos, and formulated for 30-mil thickness per coat.

2.3 GLAZING MATERIALS

- A. Glazing shall comply with 2016 CBC Section 2405 – Sloped Glazing and Skylights.
- B. Refer to Specification Section 08 80 00 Glazing for additional info.
1. Glass must meet the requirements of the AAMA Glass Design for Sloped Glazing for the project.
- C. Glazing Gaskets: Manufacturer’s proprietary pressure-glazing gaskets of elastomer type and hardness selected by the skylight manufacturer to comply with requirements. Glazing gaskets to be extruded thermoplastic elastomer by the skylight manufacturer.
- D. Spacers, Edge Blocks, and Setting Blocks: Manufacturer’s standard permanent non-migrating type of elastomer type and hardness selected to comply with requirements. Spacers, Edge Blocks, and Setting Blocks to be extruded thermoplastic elastomer by the skylight manufacturer.
- E. Glazing Weatherseal Sealant: Neutral-curing silicone sealant recommended by skylight and sealant manufacturers for this use and furnished by skylight manufacturer.
1. Sealant is capable of withstanding 50 percent movement in both extension and compression (total of 100 percent movement) when tested for adhesion and cohesion under maximum cyclic movement according to ASTM C 719.
 2. Sealant complies with ASTM C 920 for Type S, Grade NS, Class 25, Uses NT, G, A, and, as applicable to substrates including other sealants with which it comes in contact, O.
 3. Color: Black.
- F. Flashing Sealant: Single-component, non-sag, high performance, non-priming, gun-grade elastomeric polyurethane sealant furnished by skylight manufacturer.
1. Sealant complies with ASTM C920, Type S, Grade NS, Class 25, Use T, NT, M, A, G, and O. Canadian Specification CAN/CGSB-19.13-M87, Classification MCG-2-25-A-N.
 2. Sealant conforms to USDA approval standards.

2.4 FABRICATION

A. Framing Components: As follows:

1. Factory fit and assemble components, where practical.
2. Fabricate components that, when assembled, will have accurately fitted joints with ends coped or mitered to produce hairline joints free of burrs and distortion.
3. Fabricate components to drain water passing joints and to drain condensation and moisture occurring or migrating within skylight system to the exterior.
4. Fabricate components to accommodate expansion, contraction, and field adjustment, and to provide for minimum clearance and shimming at skylight perimeter.
5. Fabricate components to ensure that glazing is thermally and physically isolated from framing members.
6. Form shapes with sharp profiles, straight and free of defects or deformations, before finishing.
7. Fit and assemble components to greatest extent practicable before finishing.
8. Reinforce members as required to retain fastener threads.
9. Attach retainer bars with gasketed stainless steel fasteners spaced at a maximum of 12 inches on center.
10. Weld components before finishing and in concealed locations to greatest extent practicable to minimize distortion.
11. Before shipping, shop assemble, mark, and disassemble components that cannot be permanently shop assembled.

B. Provide continuous aluminum frame with weatherproof splice joints and locked and sealed or fully welded corners. Locate weep holes in the frame at each rafter connection to drain condensation.

C. Prepare framing to receive anchor and connection devices and fasteners.

D. Field Glazing: Locate and size extruded elastomeric setting blocks and spacers in accordance with the glazing manufacturer's recommendations. At no point shall the glazing come in contact with the skylight frame or fasteners.

2.5 LUMINUM FINISHES

A. General: Comply with NAAMM "Metal Finishes Manual" recommendations for application and designations of finishes.

- B. Finish designations prefixed by AA conform to the system for designations of aluminum finishes established by the Aluminum Association.
 - 1. Mill Finish: Manufacturer's standard mill finish.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting skylight performance.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Metal Protection: As follows:
 - 1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose.
 - 2. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.
 - 3. Where aluminum will contact pressure-treated wood, separate dissimilar materials by methods recommended by manufacturer.

3.3 INSTALLATION

- A. General: Comply with manufacturer's written instructions for protecting, handling, and installing skylight components.
 - 1. Fit frame joints to produce hairline joints free of burrs and distortion.
 - 2. Rigidly secure non-movement joints.
 - 3. Accommodate thermal and mechanical movements.
 - 4. Install framing components to drain water passing joints and to drain condensation and moisture occurring or migrating within skylight system to the exterior.
 - 5. Coordinate installation of flashings at skylight perimeters to maintain continuity of water barriers.

6. Set continuous curbs and flashings in a full sealant bed, unless otherwise indicated. Comply with requirements in Division 7 Section "Joint Sealants."
- B. Erection Tolerances: Install skylight components true in plane, accurately aligned, and without warp or rack. Adjust framing to comply with the following tolerances:
 1. Variation from Plane: Limit variation from plane or location shown to 1/8 inch in 10 feet; 1/4 inch over total length.
 2. Alignment: Where surfaces abut in line and at corners and where surfaces are separated by less than 3 inches, limit offset from true alignment to less than 1/32 inch; otherwise, limit offset from true alignment to 1/8 inch.
- C. Field Glazing: Locate and size extruded elastomeric setting blocks and spacers in accordance with the glazing manufacturer's recommendations. At no point shall the glazing come in contact with the skylight frame or fasteners
- D. Install secondary-sealant weatherseal according to sealant manufacturer's written instructions to provide weatherproof joints. Install joint fillers behind sealant as recommended by sealant manufacturer.

3.4 CLEANING

- A. Clean skylights inside and outside, immediately after installation and after sealants have cured, according to manufacturer's written recommendations.
 1. Remove temporary protective coverings and strippable coatings from pre-finished metal surfaces. Remove labels and markings from all components.
- B. Remove excess sealant according to sealant manufacturer's written recommendations.

END OF SECTION

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SECTION 08 71 00 DOOR HARDWARE

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Hardware for doors.
- B. Thresholds.
- C. Gasketing.
- D. Keying and key cabinet.

1.2 REFERENCES

- A. ADAAG - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities.
- B. BHMA - Builders' Hardware Manufacturers Association.
- C. CCR - California Code of Regulations, Title 24, Part 2, California State Accessibility Standards.
- D. DHI - Door and Hardware Institute.
- E. NFPA 80 - Fire Doors and Windows.
- F. CBC - California Building Code.
- G. UL - Underwriters Laboratories.

1.3 COORDINATION

- A. Coordinate work of this Section with other directly affected Sections involving manufacturer of any internal reinforcement for door hardware.

1.4 QUALITY ASSURANCE

- A. Manufacturers: Companies specializing in manufacturing door hardware with minimum five years experience. Obtain each kind of hardware from only one manufacturer.
- B. Hardware Supplier: Company specializing in supplying commercial door hardware with five years documented experience.
- C. Hardware Installer: Company specializing in the installation of commercial door hardware with five years documented specialized experience in educational facilities.

- D. Hardware Supplier Personnel: Employ an Architectural Hardware Consultant (AHC) to assist in the Work of this Section.

1.5 REGULATORY REQUIREMENTS

- A. Conform to CBC for requirements applicable to fire-rated doors and frames.
- B. Fire-Rated Openings: Comply with NFPA Standard No. 80. Provide only hardware tested and listed by UL for the type and size of each door required, which complies with the requirements of the door and frame labels.
 - 1. Where panic exit devices are required on fire-rated doors, provide supplementary marking on door UL label indicating "Fire Door to be Equipped with Fire Exit Hardware", and provide UL Label on exit device indicating "Fire Exit Hardware".
- C. Conform to CCR, Title 24, Part 2, and ADAAG for accessibility requirements.
- D. Exit Doors: Openable at all times from the inside without the use of a key or any special knowledge or effort.

1.6 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Submit hardware schedule at earliest possible date along with essential Product Data where acceptance of hardware schedule must precede fabrication of other Work.
- C. Organize hardware schedule into "hardware sets" indicating complete designations of every item required for each door or opening. Include the following:
 - 1. Type, style, function, size and finish of each hardware item.
 - 2. Name and manufacturer of each item.
 - 3. Fastenings and other pertinent information.
 - 4. Location of hardware set cross-referenced to indications on Drawings both on floor plans and in door and frame schedule.
 - 5. Explanation of all abbreviations, symbols, codes, etc., contained in schedule.
 - 6. Mounting locations for hardware.
 - 7. Door and frame sizes and materials.

- D. Provide Product Data on specified hardware.
- E. Keying Schedule: Submit separate detailed keying schedule indicating clearly how the Owner's final instructions on keying of locks has been fulfilled.
- F. Furnish hardware templates to each fabricator of doors, frames, and other Work to be factory-prepared for the installation of hardware.

1.7 OPERATION AND MAINTENANCE DATA

- A. Submit operation and maintenance data under provisions of Section 01 70 00.
- B. Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site and to other Sections under provisions of Section 01 87 00.
- B. Store and protect products under provisions of Section 01 87 00.
- C. Package hardware items individually; label and identify package with door opening code to match hardware schedule.
- D. Ship permanent keys and cores directly from lock manufacturer to Owner.

1.9 WARRANTY

- A. Provide ten year warranty for closers, five year warranty for all other hardware under provisions of Section 01 70 00.

1.10 MAINTENANCE MATERIALS

- A. Provide special wrenches and tools applicable to each different or special hardware component.
- B. Provide maintenance tools and accessories supplied by hardware component manufacturer.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

	Item	Manufacturer	Acceptable Substitute
A.	Hinges	Ives (IVE)	Hager, Stanley
B.	Continuous Hinges	Zero (ZER)	Select
C.	Locks	Schlage (SCH)	District Standard – NO Substitutions

D.	Deadbolts	Schlage (SCH)	District Standard – NO Substitutions
E.	Push/Pulls	Ives (IVE)	Trimco, BBW, Quality
F.	Exit Devices	Von Duprin (VON)	District Standard – NO Substitutions
G.	Surface Closers	LCN (LCN)	District Standard – NO Substitution
H.	Flush Bolts	Ives (IVE)	Trimco, BBW, Quality
I.	Coordinators	Ives (IVE)	Trimco, BBW, Quality
J.	Silencers	Ives (IVE)	Trimco, BBW, Quality
K.	Protection Plates	Ives (IVE)	Trimco, BBW, Quality
L.	Stops & Holders	Ives (IVE)	Trimco, BBW, Quality
M.	Thresholds	Zero (ZER)	Reese
N.	Seals & Bottoms	Zero (ZER)	Reese
O.	Key Cabinets	Telkee	Lund, Key Systems

2.2 MATERIALS

- A. Locksets and Latchsets: Schlage "L" Series with 03 levers and interchangeable core. Fastened with through-bolts and threaded chassis hubs.
1. Chassis: Cylindrical design, corrosion-resistant plated cold-rolled steel.
 2. Locking Spindle: One piece stainless steel interlocking design.
 3. Latch Retractors: Forged steel. Balance of inner parts; corrosion-resistant plated steel, or stainless steel.
 4. Lever Trim: Accessible design, independent operation, spring-cage supported, minimum 2 inches clearance from lever mid-point to door face.
 5. Locks shall be of such construction that when locked, the door may be opened from within by using lever and without the use of a key or special knowledge.
 6. Rosettes: Minimum 3-7/16 inches diameter for coverage of ANSI/DHI A115.18, 1994 door preparation, through-bolt lugs on both spring cages to fully engage this pattern.
 7. Springs: Full compression type.

8. Strikes: 16 gage curved steel, bronze or brass with 1 inch deep box construction, lips of sufficient length to clear trim and protect clothing.
- B. Hinges: Out swinging exterior doors shall have non-removable pin (NRP). All hinge open widths shall be minimum, but of sufficient size to permit door to swing 180 degrees. Furnish exterior door hinges with stainless steel pins and ball bearings.
1. Furnish 3 hinges per leaf to 7 feet 5 inches high, Add one for each additional 2 feet of height.
 2. Exterior hinges with prime finish shall have Stanley K base.
 3. Provide extra heavy weight hinges on doors over 3 feet 4 inches wide.
- C. Panic Hardware: Furnish sex bolts for all devices. Lever handle trim shall match locksets. All touch bar type devices shall have deadlocking latch bolt, and be non-handed. Device push bar must release with 5 pounds maximum pressure at fire rated doors. When the latched door is subjected to a horizontal force of 250 pounds applied against the latching edge adjacent to the latch in the direction in which the door opens a force of 50 pounds or less shall actuate the release bar. Device shall bear UL label for fire and/or panic as may be required.
- D. Surface Door Closers: All door closers shall be of one manufacturer to provide for proper installation and servicing after installation. All closers shall be inspected after installation by a representative to ensure proper adjustment and operation. Closers shall carry a manufacturers ten year warranty against manufacturing defects and workmanship.
1. Door closer cylinders shall be of high strength cast iron construction to provide low wear operating capabilities of internal parts throughout the life of the installation.
 2. Provide 1 size adjustable 1 through 6 unless otherwise specified at exterior and interior doors.
 3. Flush transom offset brackets shall be used where parallel arm closers are listed for doors with fixed panels above doors.
 4. All closers shall utilize a temperature stable fluid capable of withstanding temperature ranges of 120 degrees F. to -30 degrees F. without requiring seasonal adjustment of closer speed to properly close the door. Closers for fire-rated doors shall be provided with a temperature stabilizing fluid that complies with standards NFPA 80-13.
 5. Drop bracket are required at narrow head rails.
 6. Maximum effort to operated doors shall not exceed 5 pounds, such pull or push effort being applied at right angles to hinged doors. Compensating devices or automatic door operators may be utilized to meet the above

standards. When fire doors are required, the maximum effort to operate the door may be increased but shall not to exceed 15 pounds when specifically approved by fire marshal. All closers shall be adjusted to operate with the minimum amount of opening force and still close and latch the door. Door shall take at least 3 seconds to move from an open position of 70 degrees to a point of 3 inches from the latch jamb. Reference CBC Sections 1133B.2.1, 1133B.2.5, 1133B2.5.1 & 1003.3.1.8.

7. No through-bolted mounting for door closers. HM and Wood Doors to receive internal blocking/ welded in reinforcement for closers
- E. Protection Plates: Fabricate either kick, armor, or mop plates with four beveled edges, height called for in Hardware Schedule by width of door less 2 inches on single doors and 1" on pairs. Furnish with countersunk machine or wood screws of bronze or stainless steel to match other hardware.
- F. Seals: Solid neoprene to be MIL Spec. R6855-CL III, Grade 40. Sponge neoprene to be MIL Spec. R6130, Type II, Group C. UL label shall be applied on all fire-rated doors.
- G. Silencers: Furnish silencers for interior hollow metal frames, 3 for single doors, 4 for pairs of doors. Omit where sound or light seals occurs, and omit at fire-rated door and frame assemblies.

2.3 DOOR STOPS

- A. Provide either floor-mounted or wall-mounted stops, whichever will best suit the condition.
- B. Provide overhead door stops where conditions do not permit installation of wall or floor stops. Overhead door stops shall be made of stainless steel and non-plastic mechanisms and finished metal end caps. Overhead door stops used in applications with door closers shall be provided with proper templating and brackets so no conflict will occur.

2.4 KEYING

- A. Master key and grand master key all locks and cylinders as directed by the District representative. Provide temporary cores during the construction phase and remove at the time District takes occupancy.
- B. All permanent I.C. Cores and keys are to be furnished by the Contractor and shipped directly from the factory to the School District Maintenance Office. All keying and keyways must be approved in writing by the District representative. The Contractor shall be responsible for installing the permanent I.C. Cores after the District receives and inventories them.
- C. Although the Hardware Schedule, at the end of this Section, may not indicate "Primus" I.C. cores, the "Primus" cores shall be furnished throughout the Project.

- D. All standard cores shall be furnished with "Primus" keys.
- E. Supply 2 "Primus" change keys per lock or cylinder.
- F. Supply "Primus" keys in the following quantities:
 - 1. 6 master keys.
 - 2. 1 grand master key.
 - 3. 10 construction keys.
 - 4. 4 control keys and 6 extra cylinder cores.

2.5 KEY CABINETS

- A. Key Cabinet: Sheet steel construction, .047 inch thick, piano hinged door with lock keyed to building system; manufactured by Lund Equipment Company, Bath, Ohio; or approved equal from Key Control System, Bechtelsvill, Pennsylvania; and Telkee, Inc., Glen Riddle, Pennsylvania. Model number as shown in Hardware Schedule.
- B. Cabinet Size: Size for project keys plus 10 percent growth.
- C. Horizontal metal strips for keyhook labeling with plastic strip cover over paper labels.
- D. Provide book index.
- E. Finish: Baked enamel finish, color as selected by Architect.

2.6 FINISHES

- A. Generally to be satin or dull chrome US26D (626 on brass or bronze base metal and 652 on steel base metal) unless otherwise noted.
- B. Push, pull and kick plates shall be dull stainless steel US32D (630).
- C. Door closers shall be powder-coated (689) to match other hardware, unless otherwise noted.
- D. Aluminum items to be finished clear anodized (628), except thresholds which can be furnished as standard mill finish.

2.7 FASTENERS

- A. Screws for strikes, face plates and similar items shall be flathead, countersunk type; provide machine screws for metal and standard wood screws for wood.
- B. Screws for butt hinges shall be flathead, countersunk, full-thread type.

- C. Fastening of closer bases or closer shoes to doors shall be by means of sex bolts and spray painted to match closer finish.
- D. Provide expansion anchors for attaching hardware items to concrete or masonry.
- E. All exposed fasteners shall have a Phillips head.\
- F. Finish of exposed screws to match surface finish of hardware or other adjacent Work.

2.8 OTHER MATERIAL

- A. All other materials not specifically described, but required for a complete and proper finish hardware installation shall be selected by Architect as required at no additional cost.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Verify that doors and frames are ready to receive Work and dimensions are as instructed by the manufacturer.
- B. Verify that power supply is available to power operated devices.
- C. Beginning of installation means acceptance of existing conditions.

3.2 INSTALLATION

- A. Install hardware in accordance with manufacturer's instructions and requirements of DHI.
- B. Use the templates provided by hardware item manufacturer.
- C. Wherever cutting and fitting is required to install hardware onto or into surfaces which are later to be painted or finished in another way, coordinate removal, storage and reinstallation or application of surface protection with finishing Work specified in Division 9. Do not install surface-mounted items until finishes have been completed on the substrate.
- D. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
- E. Drill and countersink units which are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.
- F. Set thresholds for exterior doors in full bed of butyl-rubber sealant.
- G. If swing of door is changed during construction, make necessary changes in hardware at no additional cost.

3.3 ADJUST AND CLEAN

- A. Adjust and check each operating item of hardware and each door, to ensure proper operation or function of every unit. Replace units which cannot be adjusted to operate freely and smoothly as intended for the application made.
- B. Clean adjacent surfaces soiled by hardware installation.
- C. Final Adjustment: Wherever hardware installation is made more than one month prior to acceptance or occupancy of a space or area, return to the Work during the week prior to acceptance or occupancy, and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.
- D. Instruct Owner's personnel in proper adjustment and maintenance of hardware finishes, during the final adjustment of hardware.
- E. Continued Maintenance Service: Approximately six months after the completion of the Project, the Contractor, accompanied by the Architectural Hardware Consultant, shall return to the Project and re-adjust every item of hardware to restore proper function of doors and hardware. Consult with and instruct Owner's personnel in recommended additions to the maintenance procedures. Replace hardware items which have deteriorated or failed due to faulty design, materials or installation of hardware units. Prepare a written report of current and predictable problems (of substantial nature) in the performance of the hardware.

3.4 HARDWARE LOCATIONS

- A. Hinges:
 - 1. Bottom Hinges: 10 inches from door bottom to bottom of hinge.
 - 2. Top Hinge: 5 inches from door top to top of hinges.
 - 3. Center Hinge: Center between top and bottom hinge.
 - 4. Extra Hinge: 6 inches from bottom of top hinge to top of extra hinge.
- B. Lock: 38 inches from bottom of door to center of lever or knob.
- C. Push Bar: 44 inches from bottom of door to center of bar.
- D. Push Plate: 44 inches from bottom of door to center of plate.
- E. Pull Plate: 42 inches from bottom of door to center of pull.
- F. Panic Device: 39-13/16 inches from bottom of door to center of pad.
- G. Deadlock Strike: 44 inches from floor, centered.

- H. Floor Stops: Not more than 4 inches from any adjacent wall surface. Not permitted in path of travel.
- I. Conform to CCR, Title 24, Part 2, and ADAAG for positioning requirements for accessibility.

3.5 FIELD QUALITY CONTROL

- A. Architectural Hardware Consultant (AHC) to inspect installation and certify that hardware and its installation have been furnished and installed in accordance with manufacturer's instructions and as specified herein.

3.6 HARDWARE SCHEDULE

- A. The last column in the Hardware Sets is the 3-letter abbreviation for the manufacturer as shown in Paragraph 2.1 of this Section.
- B. The items listed in the following Hardware Schedule shall conform to the requirements of the foregoing Specification.
- C. The Door Schedule on the Drawings indicates which Hardware Set is used with each door.
- D. Hardware Schedule Notes:
 - 1. Refer to Part 2 of this Section for quantity of hinges required per leaf.
 - 2. This Hardware Schedule lists bolts for metal doors; provide type as required for application.
 - 3. Closers shall not be installed in hallways, corridors, lobbies or on the exterior of the building if at all possible.
 - 4. Provide door stops or door stops and holders as follows to best suit the condition.
 - a. Interior Door Stops: Ives FS13/R14 (Floor Type) or WS407CCV (Wall Type).
 - b. Exterior Door Stops: Ives FS442 (Floor Type) or WS33 (Wall Type).
 - c. Interior Door Stop and Holders: Ives FS40 (Floor Type) or WS40 (Wall Type).
 - d. Exterior Door Stop and Holders: Ives FS43 (Floor Type) or WS45 (Wall Type).
 - e. At conditions where doors swing back to back or there is not a place to install a floor or wall type stop or stop holder, provide Glynn-

Johnson overhead types. Provide 100 Series at new doors and 90 Series with closer modification at existing doors. Hold-opens not permitted at fire-rated doors.

5. Provide gasketing at all fire rated doors complying with UL10C.
6. Provide Ives Silencers SR64 at all metal frames without weather-stripping or gasketing.

Hardware Group No. 01 - (Card Reader Electric Lock Interior Hallway)

For use on door #(s):

102-A 102-C 110A 136 161

Qty		Description	Catalog Number	Finish	Mfr
2	EA	HW HINGE	3CB1HW 5 X 4.5	652	IVE
1	EA	ELECTRIC HW HINGE	3CB1HW 5 X 4.5 TW8	652	IVE
1	EA	EL MORTISE LOCK	L9095PEL 03A RXDPS	630AM	SCH
1	EA	SURFACE CLOSER	4040XP EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E TEK CS	630	IVE
1	EA	WALL STOP	WS407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE
2	EA	PUSHBUTTON	701RD AA L2	630	SCE
1	EA	POWER SUPPLY	PS902	LGR	SCE

Doors are electrified and unlocked. The locks are fail secure.

There is always egress.

Paxton Net 2 Plus Panel, Card reader Start Up Kit, and card reader by Paxton. Timer and Programming by Access Control Integrator

Hardware Group No. 01.1 - (Card Reader Electric Lock Interior Hallway)

For use on door #(s):

141-A 141-B

Qty		Description	Catalog Number	Finish	Mfr
2	EA	HW HINGE	3CB1HW 5 X 4.5	652	IVE

1	EA	ELECTRIC HW HINGE	3CB1HW 5 X 4.5 TW8	652	IVE
1	EA	EL MORTISE LOCK	L9095PEL 03A RXDPS	630AM	SCH
1	EA	SURFACE CLOSER	4040XP EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E TEK CS	630	IVE
1	EA	WALL STOP	WS407CCV	630	IVE
	SET	SEALS	188S	BLK	ZER
1	EA	DOOR SWEEP	8192AA	AA	ZER
2	EA	PUSHBUTTON	701RD AA L2	630	SCE
1	EA	POWER SUPPLY	PS902	LGR	SCE

Doors are electrified and unlocked by card reader or push button at reception

The locks are fail secure.

There is always egress.

Paxton Net 2 Plus Panel, Card reader Start Up Kit, and card reader by Paxton. Timer and Programming by Access Control Integrator

Remote push button at reception desk

Hardware Group No. 01.2 - (Card Reader w / Panic Hardware Interior Hallway)

For use on door #(s):

101	101-G	130-A	130-B	160-A	181
190A	190B				

Qty		Description	Catalog Number	Finish	Mfr
2	EA	HW HINGE	3CB1HW 5 X 4.5	652	IVE
1	EA	ELECTRIC HW HINGE	3CB1HW 5 X 4.5 TW8	652	IVE
1	EA	ELEC PANIC HARDWARE	AX-99-L-E996-03 SS-FSE-630	630/626 AM	VON
1	EA	SURFACE CLOSER	4040XP EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	WALL STOP	WS407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE
2	EA	PUSHBUTTON	701RD AA L2	630	SCE
1	EA	POWER SUPPLY	PS902	LGR	SCE

Doors are electrified and unlocked by card reader or push button at reception. There is always egress.

Paxton Net 2 Plus Panel, Card reader Start Up Kit, and card reader by Paxton. Timer and Programming by Access Control Integrator

Hardware Group No. 01.3 - (CARD READR-PANIC LEVER - NIGHT LATCH; PUSH SIDE SURFACE MOUNT CLOSER)

For use on door #(s):

101C	145	194	205
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Qty		Description	Catalog Number	Finish	Mfr
3	EA	HW HINGE	3CB1HW SH 5 X 4.5 NRP	652	IVE
1	EA	ELECTRIC HW HINGE	3CB1HW 5 X 4.5 TW8	652	IVE
1	EA	ELEC PANIC HARDWARE	AX-98-L-E996-03 SS-FSE-630	630/630 AM	VON
1	EA	RIM CYLINDER	20-057-ICX Trim Cylinder	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	4111 SHCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E TEK CS	630	IVE
1	EA	RAIN DRIP	142A	AL	ZER
	SET	SEALS	188S	BLK	ZER
1	EA	DOOR SWEEP	8192AA	AA	ZER
1	EA	THRESHOLD WITH SIDE RETURN	655A-MSLA-10 X 4	A	ZER
1	EA	DOOR CONTACT	7764	628	SCE

Hardware Group No. 02 - OFFICE-INSWING

For use on door #(s):

103	104	106	107	109	110
120	127	128	142	148	170
182A	183	188	191		

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HINGE	3CB1 4.5 X 4.5	652	IVE
1	EA	OFFICE/ENTRY LOCK	L9050P 03A L583-363	630AM	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	FLOOR STOP/HOLDER	FS41	626	IVE
1	EA	COAT AND HAT HOOK	582	626	IVE
3	EA	SILENCER	SR64	GRY	IVE

Hardware Group No. 03 - PRIVACY W/ INDICATOR-PULL SIDE SURFACE MOUNT CLOSER

For use on door #(s):

132	133	136.1	146	184	185
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Qty		Description	Catalog Number	Finish	Mfr
3	EA	HINGE	3CB1 4.5 X 4.5	652	IVE
1	EA	PRIVACY LOCK W/IND	L9040 03A L583-363 L283-722	630AM	SCH
1	EA	SURFACE CLOSER	4040XP	689	LCN

1	EA	KICK PLATE	8400 10" X 2" LDW B4E TEK CS	630	IVE
1	EA	MOP PLATE	8400 4" X 1" LDW B-CS TKTX	630	IVE
1	EA	WALL STOP	WS407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

Hardware Group No. 03.1 - PUSH / PULL-PULL SIDE SURFACE MOUNT CLOSER-RESTROOM

For use on door #(s):

192 193

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HINGE	3CB1 4.5 X 4.5	652	IVE
1	EA	PUSH PLATE	8200 8" X 16"	US32D-AM	IVE
1	EA	PULL PLATE	8303 10" 6" X 16"	630AM	IVE
1	EA	SURFACE CLOSER	4011	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E TEK CS	630	IVE
1	EA	MOP PLATE	8400 4" X 1" LDW B-CS TKTX	630	IVE
1	EA	FLOOR STOP	FS436	626	IVE
3	EA	SILENCER	SR64	GRY	IVE

Hardware Group No. 03.3 - PRIVACY W/ INDICATOR-PUSH SIDE SURFACE MOUNT CLOSER-OH STOP

For use on door #(s):

138 144 165

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HINGE	3CB1 4.5 X 4.5	652	IVE
1	EA	PRIVACY LOCK W/IND	L9040 03A L583-363 L283-722	630AM	SCH
1	EA	OH STOP	100S	630	GLY
1	EA	SURFACE CLOSER	4040XP	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E TEK CS	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

Hardware Group No. 04.1 - (Lockable - Storage / Utility - OH stop - Interior)

For use on door #(s):

139

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HINGE	3CB1 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	L9080P 03A	630AM	SCH
1	EA	OH STOP	100S ADJ	630	GLY
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

Hardware Group No. 04.2 - (Lockable - Storage / Utility - OH stop - Interior)

For use on door #(s):

134

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HINGE	3CB1 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	L9080P 03A	630AM	SCH
1	EA	OH STOP	100S ADJ	630	GLY
1	EA	SURFACE CLOSER	4040XP	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

Hardware Group No. 04.3 - (Lockable - Storage / Utility-Armor Plate-Interior)

For use on door #(s):

105 129-A

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HINGE	3CB1 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	L9080P 03A	630AM	SCH
1	EA	SURFACE CLOSER	4040XP EDA	689	LCN
1	EA	ARMOR PLATE	8400 30" X 2" LDW B-CS TKTX	630	IVE
1	EA	FLOOR STOP/HOLDER	FS40	626	IVE
	SET	SEALS	188S	BLK	ZER
1	EA	DOOR SWEEP	8192AA	AA	ZER

Hardware Group No. 04.4 - (Lockable - Storage / Utility-Armor Plate-Interior)

For use on door #(s):

140

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HINGE	3CB1 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	L9080P 03A	630AM	SCH

1	EA	KICK PLATE	8400 16" X 2" LDW B-CS TKTX	630	IVE
1	EA	FLOOR STOP	FS436	626	IVE
3	EA	SILENCER	SR64	GRY	IVE

Hardware Group No. 04.5 - (Lockable - Storage / Utility - OH stop - Interior)

For use on door #(s):

143

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HINGE	3CB1 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	L9080P 03A	630AM	SCH
1	EA	OH STOP	100S ADJ	630	GLY
3	EA	SILENCER	SR64	GRY	IVE

Hardware Group No. 04.6 - (Lockable - Storage / Utility-Closer-Stop/Holder-Interior)

For use on door #(s):

147 189

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HINGE	3CB1 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	L9080P 03A	630AM	SCH
1	EA	SURFACE CLOSER	4040XP	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	FLOOR STOP/HOLDER	FS40	626	IVE
3	EA	SILENCER	SR64	GRY	IVE

Hardware Group No. 05 - (Sliding door system complete. See Spec. Section 08 36 13.)

For use on door #(s):

102-B	111	112	113	114	115
116	117	118	119	121	122
123	124	125	126	180	204
207					

PROVIDE COMPLETE SYSTEM: TRACK, STOPS, GUIDES DOOR AND FRAME SYSTEM AS SPECIFIED. DOOR PULLS MOUNTED BACK TO BACK. INSIDE PULL MOUNTED WITH 3" TO JAMB MIN WHEN IN FULL CLOSED POSITION. EDGE SEALS FULL PERIMETER.

Hardware Group No. 06 - (Passage-Interior-closer-floor stop)

For use on door #(s):

108 172

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HINGE	3CB1 4.5 X 4.5	652	IVE
1	EA	PASSAGE SET	L9010 03A	630AM	SCH
1	EA	SURFACE CLOSER	4040XP	689	LCN
1	EA	FLOOR STOP	FS436	626	IVE
	SET	SEALS	188S	BLK	ZER

Hardware Group No. 07 - (Passage-Interior-closer-floor stop/holder)

For use on door #(s):

131-A

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HINGE	3CB1 4.5 X 4.5	652	IVE
1	EA	PASSAGE SET	L9010 03A	630AM	SCH
1	EA	SURFACE CLOSER	4040XP	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	FLOOR STOP/HOLDER	FS40	626	IVE
	SET	SEALS	188S	BLK	ZER

Hardware Group No. 08 - (EXT-AL-panic-pair-OS-synchronized vestibule auto operators)

For use on door #(s):

100A 100B 100C 100D

Qty		Description	Catalog Number	Finish	Mfr
2	EA	CONT. HINGE	700 EPT	630	IVE
2	EA	POWER TRANSFER	EPT10	689	VON
1	EA	ELEC PANIC HARDWARE	RX-LC-QEL-3549A-NL-OP-388	626AM	VON

1	EA	ELEC PANIC HARDWARE	RX-QEL-3549A-EO	626AM	VON
1	EA	RIM CYLINDER	20-057-ICX Trim Cylinder	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
2	EA	LONG OFFSET PULL	9264 36" 20" STD	630	IVE
1	EA	SURF. AUTO OPERATOR	9563 STD2 HL/D MS	ANCLR	LCN
1	EA	ACTUATOR	10LPR 36	AL	BEA
1	EA	ACTUATOR, WALL MOUNT	8310-836T	630	LCN
2	EA	DOOR CONTACT	7764	628	SCE
1	EA	POWER SUPPLY	PS914 900-2RS-FA	LGR	VON

Wide stile alum door
 Door contact wired to intrusion alarm
 balance of seals and threshold by alum door mfg
 wire auto operator to sync delay with interior/exterior operator

Hardware Group No. 09 - (EXTERIOR STOREROOM; PUSH SIDE SURFACE MOUNT CLOSER, FLOOR STOP/HOLDER)

For use on door #(s):
 129-B 135 167

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HINGE	3CB1 SH 4.5 X 4.5 NRP	632	IVE
1	EA	STOREROOM LOCK	L9080P 03A	630AM	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E TEK CS	630	IVE
1	EA	FLOOR STOP/HOLDER	FS40	626	IVE
1	EA	GASKETING	188S-BK	S-Bk	ZER
1	EA	DOOR SWEEP	8192AA	AA	ZER
1	EA	THRESHOLD WITH SIDE RETURN	655A-MSLA-10 X 4	A	ZER
1	EA	DOOR CONTACT	7764	628	SCE

Hardware Group No. 09.1 - (EXTERIOR STOREROOM; SURFACE MOUNT CLOSER, FLOOR STOP/HOLDER)

For use on door #(s):
 195 196 206

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HINGE	3CB1 SH 4.5 X 4.5 NRP	632	IVE
1	EA	STOREROOM LOCK	L9080P 03A	630AM	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	4011T	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E TEK CS	630	IVE
1	EA	FLOOR STOP/HOLDER	FS40	626	IVE
1	EA	GASKETING	188S-BK	S-Bk	ZER
1	EA	DOOR SWEEP	8192AA	AA	ZER
1	EA	THRESHOLD WITH SIDE RETURN	655A-MSLA-10 X 4	A	ZER
1	EA	DOOR CONTACT	7764	628	SCE

**Hardware Group No. 10 - (EXTERIOR ALUM STOREFRONT-PANIC NIGHT LATCH; HD
CONC OH STOP; PUSH SIDE SURFACE MOUNT CLOSER-PULL ON EXTERIOR)**

For use on door #(s):

140-A

Qty		Description	Catalog Number	Finish	Mfr
2	EA	CONT. HINGE	700CS	628	IVE
1	EA	PANIC HARDWARE	3549A-EO	626AM	VON
1	EA	PANIC HARDWARE	3549A-NL	626AM	VON
1	EA	RIM CYLINDER	20-057-ICX	626	SCH
			Trim Cylinder		
1	EA	FSIC CORE	23-030	626	SCH
2	EA	LONG OFFSET PULL	9264 36" 20" STD	630	IVE
2	EA	OH STOP	100S	630	GLY
2	EA	SURFACE CLOSER	4111 EDA ST-1631	689	LCN
1	EA	RAIN DRIP	142A	AL	ZER
1	EA	THRESHOLD WITH SIDE RETURN	655A-MSLA-10 X 4	A	ZER
2	EA	DOOR CONTACT	7764	628	SCE

SEALS AND THRESHOLD BY DOOR MFG

END OF SECTION

Page 19 of 20

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SECTION 08 80 00 GLAZING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Glass and glazing for hollow metal work, glazed walls, doors and vertical panels.
- B. Mirror glass.

1.2 SECTION EXCLUDES

- A. Factory glazing of aluminum windows.
- B. Glazing for vertical panel systems.

1.3 REFERENCES

- A. ANSI Z97.1 - Safety Performance Specifications and Methods of Test for Safety Glazing Used in Buildings.
- B. ASTM C920 - Elastomeric Joint Sealants.
- C. ASTM C1036 - Flat Glass.
- D. ASTM C1048 - Heat-Treated Flat Glass.
- E. ASTM C1172 - Specification for Laminated Architectural Flat Glass.
- F. GANA - Glazing Manual and Sealant Manual.
- G. UL - Underwriters' Laboratories, Inc., Building Materials Directory.

1.4 QUALITY ASSURANCE

- A. Conform to Glass Association of North America (GANA) Glazing Manual and Sealant Manual for glazing installation methods.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Product Data: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements for glass. Provide data on glazing sealant. Identify colors available.

- C. Submit two 12-inch-square Samples, illustrating each glass coloration.
- D. Submit 12-inch long bead of glazing sealant in color selected.
- E. Submit sealed glass unit manufacturer's certificate indicating units meet or exceed specified requirements.

1.6 DELIVERY, STORAGE, AND PROTECTION

- A. Deliver, store and protect products under provisions of Section 01 87 00.

1.7 WARRANTY

- A. Provide manufacturer's warranty against defects in material, including loss of hermetic seal insulating units, for a period of 5 years after date of Substantial Completion.
- B. Include coverage for reflective coating on mirrors and replacement of same.
- C. Include coverage for delamination of laminated glass and replacement of same.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Laminated Glass:
 - 1. Oldcastle Building Envelope
 - 2. Ford Glass Division.
 - 3. Guardian Industries Corp.
 - 4. PPG Industries, Inc.
 - 5. HGP and Affiliates Inc.
 - 6. AFG Industries, Inc.
 - 7. Spectrum Glass Products, Inc.
 - 8. Viracon, Inc.
- B. Tempered Glass:
 - 1. Guardian Industries Corp.
 - 2. Ford Glass Division.

3. LOF Glass, Inc.
 4. PPG Industries, Inc.
 5. HGP and Affiliates Inc.
 6. AFG Industries, Inc.
 7. Spectrum Glass Products, Inc.
 8. Oldcastle Glass.
 9. Viracon, Inc.
- C. Mirror Glass:
1. Laurence Co., Inc.
 2. Ford Glass Division.
 3. PPG Industries, Inc.
 4. LOF Glass, Inc.
 5. Avalon Mirror.
- D. Substitutions: Under provisions of Section 01 62 00.

2.2 GLASS MATERIALS, GENERAL

- A. Primary Glass Standard: Comply with ASTM C1036 requirements, including reference to type, class, quality, and, if applicable, form, finish, mesh and pattern.
- B. Laminated Glass Standard: Comply with ASTM C1172 requirements including reference to type, class, quality and if applicable, form, finish and pattern.
- C. Tempered Glass Standard: Comply with ASTM C1048 requirements, including those indicated by reference to kind, condition, type, quality, class, and, if applicable, form, finish, and pattern.
- D. Visual Light Transmission and Heat Gain: Conform to requirements indicated.
- E. Sizes: Fabricate glass to sizes required for glazing openings, with edge clearances and tolerances complying with recommendations of glass manufacturer and GANA.

- F. Provide thicknesses indicated or, if not indicated, as recommended by glass manufacturer for application indicated.

2.3 PRIMARY GLASS PRODUCTS

- A. Exterior: Tinted Float Glass: ASTM C1036, Type I (transparent glass, flat), Class 1 (Gray Tinted), Quality q3 (glazing select). Low E coating on No. 2 surface of exterior glass, 35% Light Transmittance.
- B. Interior: Clear Float Glass: ASTM C1036, Type I (transparent glass, flat), Class 1 (Clear), Quality q3 (glazing select).
- C. Mirror Glass: ASTM C1036, Type I Transparent Glass, Flat; Class 1, Clear; q1 mirror select; 1/4 inch thick with pressure-sensitive adhesive coated scrim-impregnated film tape safety backing.

2.4 TEMPERED GLASS PRODUCTS at interior borrowed lights and sidelights.

- A. Manufacturing Process: Horizontal (roller hearth) process with roll wave distortion parallel with bottom edge of glass as installed.
- B. Clear Tempered Float Glass: ASTM C1048, Kind FT (fully tempered), Condition A (uncoated surfaces), Type 1 (transparent glass, flat) Class 1 (clear), Quality q3 (glazing select); conforming to ANSI Z97.1.

2.5 GLAZING SEALANTS AND PREFORMED GLAZING TABS

- A. General: Comply with ASTM C920, and sealant and glass manufacturers recommendations for suitability and compatibility.
- B. One-Part Butyl Glazing Sealant:
 - 1. "Chem-Calk 300"; Bostik Construction Products Div.
 - 2. "Norseal Butyl"; Norton Performance Products.
 - 3. "BC 158"; Pecora Corp.
 - 4. "757 Butyl Sealant"; Protective Treatments, Inc.
- C. One-Part Acid-Curing Silicone Glazing Sealant: Type S; Grade NS; Class 25:
 - 1. "Chem-Calk 1200"; Bostik Construction Products Div.
 - 2. "Dow Corning 999"; Dow Corning Corp.
 - 3. "SCS 1200"; General Electric Corp.

4. "863"; Pecora Corp.
 5. "Rhodorsil 3B"; Rhone-Poulenc Inc.
 6. "Omniglaze"; Sonneborn Building Products Div.; Rexnord Chemical Products Inc.
 7. "Proglaze"; Tremco.
- D. Preformed Butyl-Polyisobutylene Glazing Tape With Spacer Rod:
1. "Chem-Tape 60"; Bostik Construction Products Div.
 2. "Shim-Seal"; Pecora Corp.
 3. "PTTI 303 Shim Tape"; Protective Treatments, Inc.
 4. "Pre-shimmed Tremco 440 Tape"; Tremco Inc.

2.6 GLAZING ACCESSORIES

- A. Setting Blocks: Neoprene; EPDM or silicone blocks, 80-90 Shore A durometer hardness.
- B. Spacer Shims: Neoprene; EPDM or silicone blocks, Shore A durometer hardness; self-adhesive one face.
- C. Glazing Gasket: Resilient polyvinylchloride extruded shape to suit glazing channel retaining slot with prefabricated molded corners. Color to be selected by Architect from manufacturer's full range of colors.
- D. Glazing Clips: Manufacturer's standard type.
- E. Mirror Attachment Accessories: Mirror adhesive, chemically compatible with mirror coating and wall substrate.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Verify surfaces of glazing channels or recesses are clean, free of obstructions, and ready for Work of this Section.
- B. Beginning of installation means acceptance of substrate.

3.2 PREPARATION

- A. Clean contact surfaces with solvent and wipe dry.
- B. Seal porous glazing channels or recesses.
- C. Prime surfaces scheduled to receive sealant.

3.3 EXTERIOR DRY METHOD (PREFORMED GLAZING AT ALUMINUM STOREFRONT SYSTEM)

- A. Cut glazing tape to length; install on glass pane. Seal corners by butting tape and dabbing with butyl sealant.
- B. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.
- C. Rest glass on setting blocks and push against fixed stop with sufficient pressure to attain full contact at perimeter of pane.
- D. Install removable stops without displacement of glazing gasket. Exert pressure for full continuous contact.
- E. Trim protruding tape edge.

3.4 EXTERIOR COMBINATION METHOD (TAPE AND SEALANT AT STEEL FRAMES)

- A. Cut glazing tape to length and set against permanent stops, 3/16 inch below sightline. Seal corners by butting tape and dabbing with butyl sealant.
- B. Apply heel bed of butyl sealant along intersection of removable stop with frame ensuring full seal between glass and frame.
- C. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.
- D. Rest glass on setting blocks and push against tape and heel bead of sealant with sufficient pressure to attain full contact at perimeter of pane.
- E. Install removable stops with spacer strips inserted between glass, and applied stops at 24 inch intervals, 1/4 inch below sightline.
- F. Fill gap between pane and removable stop with silicone sealant to depth equal to bite of frame on pane, but not more than 3/8 inch below sightline.
- G. Apply cap bead of silicone sealant along exterior void, to uniform line, flush with sightline. Tool or wipe sealant surface with solvent for smooth appearance.

3.5 INTERIOR - DRY METHOD (TAPE AND TAPE)

- A. Cut glazing tape to length and set against permanent stops, projecting 1/16 inch above sight line.

- B. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.
- C. Rest glazing on setting blocks and push against tape for full contact at perimeter of pane or unit.
- D. Place glazing tape on free perimeter of glazing in same manner described above.
- E. Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.
- F. Knife trim protruding tape.

3.6 INSTALLATION - MIRRORS

- A. Set mirrors with adhesive, applied in accordance with adhesive manufacturer's instructions.

3.7 CLEANING

- A. After installation, mark pane with an "X" by using plastic tape or removable paste.
- B. Remove glazing materials from finish surfaces.
- C. Remove labels after Work is completed.

END OF SECTION

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SECTION 08 90 00 LOUVERS AND VENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Louvers and frames.
- B. Bird screening.

1.2 REFERENCES

- A. AMCA 500 - (Air Movement Council Association) Test Method for Louvers, Dampers, and Shutters.
- B. ASTM B221 - Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes.
- C. ASTM A653 - Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot- Dip Process.
- D. ASTM A924 - General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot- Dip Process.

1.3 SYSTEM PERFORMANCE

- A. Fabricate louver to permit 50 percent free area.

1.4 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in manufacture of AMCA certified louvers with five years experience.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Shop Drawings: Indicate layout, elevations, dimensions, and tolerances; head, jamb, and sill details; blade configuration; screening; and frames.
- C. Provide Product Data on preassembled louvers describing design characteristics, maximum recommended air velocity, free area, materials, and finishes.
- D. Submit two 6-inch square Samples illustrating finish and color of exterior prefinish.

- E. Submit manufacturer's installation instructions.

1.6 COORDINATION

- A. Coordinate Work of this Section with installation of flashings under Section 07 60 00.
- B. Coordinate Work of this Section with mechanical ductwork.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Ruskin
- B. Airline Products Co.
- C. The C/S Group.
- D. The Airlite Co. (as a standard of quality).

2.2 MATERIALS

- A. Aluminum: ASTM B221, 6063 alloy, T5 or T52 temper; extruded shape.
- B. Steel Sheet: ASTM A653, Commercial Steel, Type A, galvanized to G90 zinc coating in accordance with ASTM A924.
- C. Fasteners and Anchors: Stainless steel type.

2.3 ACCESSORIES

- A. Bird Screen: Interwoven wire mesh of aluminum 0.063 inch diameter wire, 1/2 inch open weave, square design.
- B. Insect Screen: 18 x 16 size aluminum mesh, set in aluminum frame.
- C. Primer: Zinc chromate, alkyd type.
- D. Flashings: Of same material as louver frame.

2.4 FINISHES

- A. Steel Surfaces: Shop coat of primer for site painting under provisions of Section 09 91 00.

- B. All louvers where not used in conjunction with other aluminum products shall be finish painted to match color of adjacent surfaces.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Verify that prepared openings and flashings are ready to receive Work and opening dimensions are as indicated on Drawings.
- B. Beginning of installation means acceptance of existing conditions.

3.2 INSTALLATION

- A. Install louver assembly in accordance with manufacturer's instructions.
- B. Install louvers level and plumb.
- C. Secure louvers in opening framing with concealed fasteners.
- D. Install flashings and align louver assembly to ensure moisture shed from flashings and diversion of moisture to exterior.
- E. Install insect screens to exhaust louvers. Install bird screens to all exterior louvers.

3.3 CLEANING

- A. Clean surfaces and components.

END OF SECTION

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SECTION 09 22 16 METAL STUD FRAMING SYSTEM

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Formed metal stud framing.
- B. Framing accessories.

1.2 REFERENCES

- A. ASTM A653 - Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- B. ASTM A924 - General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
- C. ASTM C645 - Non-Load (Axial) Bearing Steel Studs, Runners (Track) and Rigid Furring Channels for Screw Application of Gypsum Board.
- D. ASTM C754 - Installation of Steel Framing Members to Receive Screw-Attached Gypsum Wallboard, Backing Board, or Water-Resistant Backing Board.
- E. ASTM C1002 - Steel Drill Screws for the Application of Gypsum Board or Metal Plaster Bases.
- F. NFPA 80 - Fire Doors and Windows.
- G. GA600 - Fire Resistance Design Manual.
- H. MSMA - Metal Stud Manufacturers Association.
- I. SSPC - Steel Structures Painting Council.

1.3 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Submit Shop Drawings of any prefabricated Work indicating component details, stud layout, framed openings, anchorage to structure, type and location of fasteners, and accessories or items required of other related work.
- C. Product Data: Manufacturer's descriptive literature for all products specified.

1.4 QUALITY ASSURANCE

- A. Perform work in accordance with ASTM C754.
- B. Maintain one copy of each document on site.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Gold Bond Building Products.
- B. Domtar Gypsum.
- C. National Gypsum Company.
- D. Substitutions: Under provisions of Section 01 62 00.

2.2 STUD FRAMING MATERIALS

- A. Studs: ASTM A653, Grade 33, galvanized to G60 coating class in compliance with ASTM A924, non-load bearing rolled steel, channel shaped, punched for utility access, as follows:
 - 1. Depth: as noted in drawings.
 - 2. Thickness: 0.033 inch unless otherwise indicated.
- B. Runners: Of same material, finish and thickness as studs, unpunched.
- C. Ceiling Runners: Of same material, finish and thickness as studs.
- D. Deflection and Firestop Track: Top runner designed to allow for deflection of structure applied to interior partition fabricated of same material, finish and thickness as studs and of the following configuration:
 - 1. Top runner with slotted flanges, 2-1/2 inch deep with slots 1 inch on center.
 - 2. Products: Subject to compliance with requirements provide one of the following:
 - a. "SLP-TRK", Sliptrack Systems, Inc.
 - b. "The System", Metal-Lite, Inc.
 - c. Substitutions: Under provisions of Section 01 62 00.
- E. Furring and Bracing Members: Of same material and finish as studs, thickness to suit purpose.

- F. Fasteners: ASTM C1002, self-drilling, self-tapping screws.
- G. Metal Backing: 0.0538 inch thick galvanized steel.
- H. Anchorage Devices: Powder actuated.
- I. Primer: SSPC 20.

2.3 FABRICATION

- A. Fabricate assemblies of framed sections to sizes and profiles required; with framing members fitted, reinforced, and braced to suit design requirements.
- B. Fit and assemble in largest practical sections for delivery to site, ready for installation.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that conditions are ready to receive work.
- B. Verify field measurements are as shown on Drawings.
- C. Verify that rough-in utilities are in proper location.
- D. Beginning of installation means installer accepts existing conditions.

3.2 ERECTION

- A. Install components in accordance with ASTM C754 requirements and manufacturer's instructions.
- B. Align and secure top and bottom runners at 24 inches on center.
- C. Fit runners under and above openings; secure intermediate studs at spacing of wall studs.
- D. Install studs vertically at 16 inches on center, U.O.N. in drawings.
- E. Connect studs to tracks using fastener method.
- F. Stud splicing not permissible.
- G. Construct corners using minimum three studs.

- H. Double studs of 0.0329 inch thickness to form box jambs and headers at wall openings, door and window jambs, and each side of other openings.
- I. Frame door and window openings with details indicated and with GA-600 and NFPA 80.
- J. Install framing below sills of openings to match framing above head of opening.
- K. Coordinate erection of studs with requirements of door and window frame supports and attachments.
- L. Brace stud framing system and make rigid.
- M. Construct toilet and plumbing chase walls of 0.0329 inch thick studs braced horizontally at 24 inches on center vertically with 2-1/2 inch wide cross studs.
- N. Erect minimum 0.0329 inch thick studs behind all cementitious backing board and ceramic tile installations.
- O. Align stud web openings and point stud flanges in the same directions.
- P. Secure stud ends to bottom tracks on both faces.
- Q. Coordinate installation of bucks, anchors, and backing with electrical and mechanical work to be placed in or behind stud framing.
- R. Backing: Secure steel backing to studs. Install backing for support of toilet partitions, wall cabinets, toilet accessories, hardware, and all other wall mounted items.
- S. Extend partition framing full height to structural support or substrates above suspended ceilings, except where partitions are indicated to terminate at ceiling.
- T. For sound and fire resistance rated partitions extend framing to underside of floor/roof or other continuous solid surface to obtain rating.
- U. Continue partition framing over door and window openings and frame around ducts penetrating partitions above ceiling.
- V. Maintain clearance under structural building members to avoid deflection transfer to studs. Provide deflection track top runner to attain lateral support and avoid axial loading.
- W. Coordinate placement of insulation in multiple stud spaces made inaccessible after stud framing erection.
- X. Maintain clearance under structural building members at fire-resistance rated assemblies. Provide firestop track top runner.

3.3 RADIUSED PARTITION ERECTION

- A. Cut top and bottom runners through leg and web at 2-inch intervals for arc length.
- B. Allow for uncut straight lengths of not less than 12 inches at ends of arcs.
- C. Bend runners to uniform curve of radius indicated and locate straight lengths so they are tangent to arcs.
- D. Support outside (cut) leg of runners by clinching a 1-inch high-by-0.0329 inch thick steel sheet strip to inside of cut legs using metal lock fasteners.
- E. Attach runners to structural elements at floor and ceiling with fasteners located 2 inches from ends and spaced 24 inches on center.

3.4 ERECTION TOLERANCES

- A. Maximum variation from true position: 1/2 inch.
- B. Maximum variation of any member from plane: 1/8 inch in 10 feet.
- C. Maximum variation from plumb: 1/8 inch in 10 feet.

END OF SECTION

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SECTION 09 24 00 PORTLAND CEMENT PLASTER

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Metal furring and lathing and suspended ceiling framing.
- B. Portland cement plaster system.
- C. Machine applied surface finish.
- D. Application over existing plaster finish.
- E. Cutting and patching.

1.2 REFERENCES

- A. ASTM C91 - Masonry Cement.
- B. ASTM C150 - Portland Cement.
- C. ASTM C206 - Finishing Hydrated Lime.
- D. ASTM C207 - Hydrated Lime for Masonry Purposes.
- E. ASTM C847 - Standard Specifications for Metal Lath.
- F. ASTM C897 - Aggregate for Job-Mixed Portland Cement-Based Plasters.
- G. ASTM C926 - Application of Portland Cement-Based Plaster.
- H. ASTM C932 - Surface-Applied Bonding Agents for Exterior Plaster.
- I. ASTM C954 - Steel Drill Screws for the Application of Gypsum Board or Metal Plaster Bases to Steel Studs from 0.033 inches to 0.112 inches in thickness.
- J. ASTM C1002 - Steel Drill Screws for the Application of Gypsum Board or Metal Plaster Bases.
- K. ASTM C1063 - Installation of Lathing and Furring for Portland Cement Based Plaster.
- L. ASTM C 1032 – Standard Specification for Woven Wire Lath
- M. ITS (DIR) – Directory of Listed Products; Intertek Testing Services NA, Inc.

- N. NAAMM Standard ML/SFA 920 - Guide Specifications for Metal Lathing and Furring.
- O. PCA (Portland Cement Association) – Portland Cement Plaster (Stucco) Manual.
- P. UL (FRD) – Fire Resistance Directory; Underwriters Laboratories Inc.
- Q. CCR - California Code of Regulations, Title 24, Part 2, Chapter 25.
- R. ICBO - International Conference of Building Officials.
- S. CBC – California Building Code, Chapter 25.

1.3 QUALITY ASSURANCE

- A. Applicator: Company specializing in cement plaster work with five years documented experience.
- B. At the completion of lathing and prior to the application of scratch coat of plaster, contact the Northern California Plastering Institute, Inc., and arrange for inspection of lathing and accessories installation. Provide to Architect a written report of the results of the inspection.
- C. Lath and related accessories shall provide proper, secure base and reinforcement for plaster systems. Plaster base coats shall provide suitable base for finish coat.

1.4 REGULATORY REQUIREMENTS

- A. Conform to CBC, Chapter 7, for fire rated assemblies as indicated on Drawings.
- B. Conform to CCR, Title 24, Part 2, Chapter 25A for materials and their installation.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Provide Product Data on plaster materials, characteristics and limitations of products specified.
- C. Submit Samples of texture for plaster finish, building paper, flashing membrane, lath, accessories, trim, and fasteners.
- D. Samples: Submit two samples, 12 x 12 inch (minimum) in size illustrating finish color and texture. Provide color samples of sealants. Provide physical samples of each type of fastener and anchorage.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Comply with requirements of Section 01 60 00.
- B. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use.
- C. Keep plaster and other cementitious materials dry until ready for use. Keep materials off ground, under watertight covers, and away from damp surfaces.
- D. Protect metal products from rusting.
- E. Remove from site any damaged or deteriorated materials.
- F. Stack preformed material to prevent twisting, bending, abrasion, staining, or corrosion and to provide ventilation.
- G. Prevent contact with materials during storage which may cause damage, discoloration, staining, or drainage.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Do not apply plaster when substrate or ambient air temperature is less than 40 degrees Fahrenheit nor more than 90 degrees Fahrenheit.
- B. Maintain minimum ambient temperature of 40 degrees Fahrenheit during and after installation of plaster.
- C. Protect plaster from uneven and excessive evaporation during dry weather and from strong blasts of dry air.
- D. Do not subject newly applied plaster to hot, dry winds.
- E. Do not install exterior plaster when prevailing temperature is less than 40 degrees Fahrenheit.
- F. When ambient air temperature exceeds 80 degrees Fahrenheit, follow procedures for maintaining moisture content in new plaster.
- G. Do not apply plaster when substrate temperature exceeds 85 degrees Fahrenheit or ambient air temperature exceeds 95 degrees Fahrenheit.
- H. Provide protection against accelerated dehydration caused by wind. Protect cement plaster from uneven and excessive evaporation during hot and/or windy weather.
- I. Fine spray plaster twice daily after 24 hours.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Lathing Materials:

1. Western Metal Lath Division.
2. Amico-West.
3. CEMCO.
4. BMI Products – A Sika Company

B. Accessories:

1. Fry Reglet Corp.
2. Keene Metal Products Division.
3. M.M. Systems Corporation.
4. CEMCO.
5. Amico-West.
6. Superior Metal Trim.
7. Stockton Wire Products.
8. Western.

C. Substitutions: Under provisions of Section 01 62 00.

2.2 PLASTER BASE COAT MATERIALS

- A. Cement: ASTM C150, Normal - Type I, Portland or ASTM C91, masonry.\
- B. Lime: ASTM C206, Type S for use with Portland cement or ASTM C207, Type S, for use with masonry cement.
- C. Aggregate: In accordance with ASTM C897 and PCA Plaster (Stucco) Manual.
- D. Water: Clean, fresh, potable and free of mineral or organic matter which can affect plaster.
- E. Plaster Mix Reinforcement: Glass fibers, 1/2 inch nominal length, alkali resistant.

- F. Bonding Agent: ASTM C932; type recommended for bonding plaster to concrete, concrete masonry surfaces and existing plaster surfaces. Larsen Products Corp. "Weld-Crete". Substitutions under provisions of Section 01 62 00.
- G. Sand: ASTM C144.

2.3 PLASTER FINISH COAT MATERIALS

- A. Cement: As specified for plaster base coat, grey color.
- B. Lime: ASTM C 206, Type S. As specified for plaster base coat.
- C. Aggregate: In accordance with ASTM C 897.
- D. Water: Clean, fresh, potable and free of mineral or organic matter which can affect plaster.
- E. Finish: Site paint under provisions of Section 09 91 00.

2.4 FURRING AND LATHING

- A. Metal Lath for Vertical Surfaces: ASTM C847, 3.4 lb/sq. yd. expanded metal, galvanized, self furring type with continuous groove.
- B. Metal Lath for Horizontal Surfaces: ASTM C847, 3.4 lb./sq. yd expanded metal, galvanized, 3/8 inch rib lath with factory applied Kraft paper backing.
- C. Wire Lath for Vertical/Horizontal Patchwork: 1-1/2 x 17 gage woven galvanized wire.
- D. Underlayment: Two layers of WRB Type D building paper conforming to CBC Standard No. 14-1.

2.5 ACCESSORIES

- A. Corner Mesh: Formed steel, minimum .0179 inch thick; expanded flanges shaped to permit complete embedding in plaster; minimum 2 inches wide; galvanized finish.
- B. Corner Reinforcement: Equivalent to Western Metal, .0179 inch "Stucco-Lok" or 18 gage Stockton "Corneraid" for straight corners. Stockton "Bullnose Regular" for rounded corners, galvanized finish.
- C. Strip Mesh: Metal lath, 3.4 lb/sq. yd. expanded metal, galvanized, 6 inch wide x 18 inch long.

- D. Vent Screed: Equivalent to Superior SRS, minimum .0179 inch thick; depth governed by plaster thickness, minimum 4 inch width, double "V" profile with perforated expanse between "V's" of longest possible lengths; galvanized finish.
- E. Casing Bead: Formed steel; minimum .0239 inch thick; thickness governed by plaster thickness; maximum possible lengths; expanded metal flanges, with square edges; galvanized finish.
- F. Curved Casing Bead: Square-edged style fabricated from aluminum, preformed into curve or radius indicated.
- G. Weep Screed: Equivalent to Superior SWS, minimum .0179 inch thick; depth governed by plaster thickness, minimum 3-1/2 inch high flange, "V" shaped, of longest possible lengths; galvanized finish.
- H. Drip Screed: Equivalent to Superior No. 5 or No. 10 drip mould as indicated on drawings, minimum .0179 inch thick; depth governed by plaster thickness, minimum 3-1/2 inch high flange, of longest possible lengths; galvanized finish.
- I. Window/Door Drip Screed: Equivalent to Superior SWD, minimum .0179 inch thick; depth governed by plaster thickness, minimum 3-1/2 inch high flange, of longest possible lengths; galvanized finish.
- J. Control and Expansion Joints: Equivalent to Western XJ 15-3, depth to conform to plaster thickness, maximum practical lengths, galvanized finish.
- K. Interior Corner Joints: Equivalent to Western No. 30, depth to conform to plaster thickness, maximum practical lengths, galvanized finish.
- L. Anchorages: Nails, staples, or other approved metal supports, of type and size to suit application, galvanized to rigidly secure lath and associated metal accessories in place.
- M. Screws: ASTM C954 or ASTM C1002, self drilling.
- N. Penetration Flashing: Type 1, Grade A conforming to CBC Standard 14-1, 9 inch wide x length required.
- O. Polyethylene Sheet: Clear, 6 mil thick, with self-adhesive tape.
- P. Wire: ASTM A641, Class 1 coating (galvanized), soft temper.
- Q. Powder Activated Fastener: 0.145 inch diameter SDM flat head nail with washer as manufactured by Hilti, Inc., ICBO Report No. 2388.

2.6 SUSPENDED METAL CEILING FRAMING

- A. Runner Channels: 1-1/2 inch high cold rolled steel, .475 lb./ft., galvanized or coated with rust inhibitive paint; length as required.

- B. Furring Channels: 3/4 inch high cold rolled steel, .30 lb./ft., galvanized or coated with rust inhibitive paint.
- C. Hanger Wires: ASTM A641, No. 8 gauge galvanized soft temper wire.
- D. Tie Wire: ASTM A641, No. 18 gauge galvanized soft temper wire.
- E. Compression struts as indicated on Drawings.

2.7 CEMENT PLASTER MIXES

- A. Mix and proportion cement plaster in accordance with ASTM C926 and PCA Plaster (Stucco) Manual.
- B. Base Coat and Brown Coat: One part cement, minimum 3-1/2 and maximum 4 parts aggregate, and 0-3/4 parts hydrated lime, and alkali resistant glass fibers at a rate of 1 lb. per sack of cement.
- C. Job Mixed Finish Coat: One part cement, three parts aggregate, and one part lime.
- D. Mix only as much plaster as can be used in 1 hour.
- E. Mix materials dry, to uniform color and consistency, before adding water.
- F. Protect mixtures from frost, contamination, and evaporation.
- G. Do not retemper mixes after initial set has occurred.

2.8 CEMENT PLASTER FINISHES

- A. Unless noted otherwise, all interior plaster surfaces shall be smooth finish.
- B. All exterior plaster surfaces below 9 feet shall be smooth finish. Finishes above 9 feet may be lightly textured in accordance with those patterns indicated in the Portland Cement Plaster (Stucco) Manual and as approved by the Architect.
- C. Plaster surface finishes must be capable of receiving roller-applied paint (medium texture) without leaving pinholes or voids.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Verify that surfaces and site conditions are ready to receive Work.
- B. Grounds and Blocking: Verify items within walls for other Sections of Work have been installed.

- C. Mechanical and Electrical: Verify services within walls have been tested and approved.
- D. Beginning of installation means acceptance of existing conditions.

3.2 PREPARATION FOR PATCHING

- A. Remove existing plaster as necessary to install metal lathing and accessories as specified herein and as per manufacturer's instructions. Expose at least 6 inches of both lath and building paper. Leave an irregular plaster edge (no sawn edges permitted). Remove all loose plaster.
- B. Protect surfaces near the Work of this Section from damage, disfiguration, and overspray. Mask off all windows, louvers, and ventilation screeds occurring in plastered areas.
- C. Sandblast existing plaster surface to expose entire base coat.
- D. Clean concrete, masonry, and sandblasted plaster surfaces of foreign matter. Clean surfaces using acid solutions, solvents, or detergents. Wash surfaces with clean water.
- E. Roughen smooth concrete surfaces.
- F. Moisten exposed plaster edges. Apply bonding agent in accordance with manufacturer's instructions.
- G. Insert 8 inch x 12 inch felt paper "tiles" shingle-style starting at the bottom, running continuously all around the edge of the patched area. Place margin of tiles under the irregular plaster and lapping that edge by 2 inches; fasten securely.
- H. Place a continuous 3/16 inch bead of asphalt sealant into the joint between the original felt paper and the irregular plaster edge (for exterior applications).
- I. Overlap new felt paper over the original paper, scribing to the irregular plaster edge.
- J. Overlap the new lathing over the original lathing and secure the edge with the approved fastener.

3.3 INSTALLATION - LATHING MATERIALS

- A. Install metal lathing in accordance with ML/SFA 920, ASTM C1063 and as specified herein.
- B. On vertical surfaces apply two plies of WRB underlayment over substrate; weatherlap horizontal edges 4 inches, vertical edges 6 inches. Fasten in place.

- C. Install penetration flashing around all openings and penetrations in exterior walls, soffits and ceilings in compliance with CCR, Title 24, Part 2, Section 1402A, including sealant and in conformance with recommendations contained in Plaster and Lathing Systems Manual and ML/SFA 920.
- D. Apply self-furring reinforcement with self-furring ribs perpendicular to supports for horizontal surfaces.
- E. Apply metal lath taut, with long dimension perpendicular to supports for vertical surfaces.
- F. Lap ends minimum 1 inch. Secure end laps with tie wire where they occur between supports.
- G. Lap sides of expanded metal lath minimum 1-1/2 inches. Nest outside ribs of rib lath together.
- H. Furr out metal lath from vertical supports or backing not less than 1/4 inch. Furring of metal lath on vertical supports having a bearing surface width of 1-5/8 inches or less is not required.
- I. Attach metal lath to vertical metal supports with tie wires or No. 8 self drilling screws with 3/8 inch diameter wafer head capable of penetrating metal supports by not less than 1/4 inch. Maximum spacing 6 inches on center.
- J. Attach metal lath to horizontal metal supports with tie wires or No. 8 self drilling screws with 3/8 inch diameter wafer head fitted with 1 inch O.D. x 1/4 inch I.D. x 16 gage galvanized cut washers capable of penetrating metal supports by not less than 1/4 inch.
- K. Attach metal lath to wood supports using 1-1/2 inch No. 11 galvanized nails with 7/16 inch diameter heads at maximum 6 inches on center. In addition, at horizontal wood supports, secure lath to each support with 1/2 inch wide, 1-1/2 inch long No. 9 W & M gage ring shank, hook staple placed around a 10d common nail laid flat under the surface of the lath at 27 inches on center and not more than 3 inches from the edge of each sheet. Such staples may be placed over the ribs of 3/8 rib lath or over the back wire of other approved lath at 27 inches on center omitting the 10d nails.
- L. Continuously reinforce internal angles with corner mesh, except where corner joint No. 30 is shown. Fasten at perimeter edges only.
- M. Place beaded external angle with mesh at corners. Fasten at outer edges only.
- N. Place strip mesh diagonally at corners of lathed openings. Secure rigidly in place.

- O. Place 4 inch wide strips of metal lath centered over junctions of dissimilar backing materials. Secure rigidly in place.
- P. Place window/door drip screed at head of all windows and door openings in exterior walls.
- Q. Place weep screed at base of all vertical plaster applications at foundation line not less than 4 inches above earth or 2 inches above paved surfaces. WRB underlayment and lath shall cover and terminate on the attachment flange of the screed.
- R. Place drip screed at base of all vertical plaster applications which do not terminate at framed wall openings or at foundation line.
- S. Place vent screed in soffit areas as indicated.
- T. Place casing beads at all terminations of plaster finish not otherwise indicated to have screeds installed and at all intersections with dissimilar materials. Butt and align ends. Secure rigidly in place.
- U. Install accessories to lines and levels.

3.4 INSTALLATION - SUSPENDED METAL CEILING FRAMING

- A. Install in accordance with ASTM C1063.
- B. Coordinate location of hangers with other Work.
- C. Install ceiling framing independent of walls and columns.
- D. Reinforce openings in ceiling suspension system which interrupt main carrying channels or furring channels with lateral channel bracing. Extend bracing minimum of 24 inches past end of openings.

3.5 CONTROL AND EXPANSION JOINTS

- A. Locate interior control and expansion joints as indicated on the Drawings, but not to exceed 20 feet on center, horizontally or vertically.
- B. Locate exterior control and expansion joints as indicated on Drawings.
- C. Establish control and expansion joints with specified joint device.
- D. Install expansion joint in such a way as to assist with air seal continuity.
- E. Coordinate joint placement with other related Work.

3.6 PLASTERING

- A. Apply plaster in accordance with ASTM C926 and PCA Portland Cement Plaster (Stucco) Manual.
- B. Three Coat Application: At metal lathed surfaces, apply scratch coat to a nominal thickness of 3/8 inch, brown coat to a nominal thickness of 3/8 inch, and finish coat to a nominal thickness of 1/8 inch. [Apply elastomeric finish coat.]
- C. Two Coat Application: Apply bonding agent to substrate. Wet surface if required. At concrete, masonry, and existing plaster surfaces, apply 3/8 inch thick leveling coat and then 1/8 inch finish coat. [Apply elastomeric finish coat.]
- D. No flat horizontal surfaces in restrooms. Restrooms are designed to be hosed down daily. Plaster at base of windows, tops of stub walls and other flat surfaces shall be gently sloped so as not to allow any standing water.
- E. Coved corners and beveled edges in restrooms: All inside corners and intersections of walls and ceilings shall receive a 1/2 inch cove. All beveled edges around windows, doors, and other projections shall receive a 1/2 inch beveled edge.
- F. Moist cure scratch and brown coats. Do not apply brown coat sooner than 48 hours following scratch coat.
- G. After curing, dampen base coat prior to applying finish coat. Do not apply finish coat sooner than 7 days following brown coat.
- H. Apply finish plaster in two coats evenly and uniformly. Machine or trowel or finish spray as indicated. Apply as recommended based on finish texture selected. Apply first coat to provide texture pattern; second coat to obtain uniformity in color and texture.
- I. Moist cure finish coat for minimum period of 48 hours only when strong dry wind conditions exist.

3.7 FINISH COAT TEXTURE

- A. Medium Sand Float as defined by photographs and application procedures in Plaster and Lathing Systems Manual, Third Edition, and as indicated.

3.8 TOLERANCES

- A. Maximum Variation from True Flatness: 1/8 inch in 10 feet.

3.9 CLEANING

- A. Remove protective maskings.
- B. Remove any overspray from surrounding materials.
- C. Clean adjacent affected surfaces.

3.10 PLASTER APPLICATION SCHEDULE

- A. Exterior Vertical Surface of Existing Plaster Building Walls: Two coat plaster over bonding agent.
- B. Exterior Vertical Surface of Existing Plaster Building Walls Where Necessary: Three coat plaster over metal lath and underlayment.
- C. Exterior Vertical Surface of Framed Walls: Three coat plaster over metal lath and underlayment.
- D. Exterior Horizontal Framed Surfaces: Three coat plaster over metal lath.
- E. As indicated on Drawings.

END OF SECTION

SECTION 09 28 13 CEMENTITIOUS BACKING BOARD

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Membrane under backing board.
- B. Cementitious backing board.
- C. Preparation of surface to receive tile finish.

1.2 REFERENCES

- A. ANSI/TCA A108.11 - Interior Installation of Cementitious Backer Units.
- B. ANSI/TCA A118.4 - Latex-Portland Cement Mortar.
- C. ANSI/TCA A118.9 - Test Methods and Specifications for Cementitious Backer Units.

1.3 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Product Data for materials specified.
- C. Samples of backing board and membrane.

1.4 QUALITY ASSURANCE

- A. Conform to ANSI/TCA A108.11 and A118.9 for backing board.

1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in the manufacture of products specified in this Section with minimum five years documented experience.
- B. Installer: Company specializing in applying the Work of this Section with minimum five years documented experience.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Maintain 50 degrees Fahrenheit during installation.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS:

- A. Georgia Pacific Corp.
- B. National Gypsum Company.
- C. United States Gypsum Co..
- D. Substitutions: Under provisions of Section 01 25 00.

2.2 BACKING BOARD MATERIALS

- A. Backing Board: ANSI/TCA A118.9; high density, cementitious, glass fiber reinforced, 1/2 inch thick; 2 inch wide coated glass fiber tape for joints and corners; manufacturer shall be licensed by TCA. Material containing "Styrofoam" additive or a rippled or pinholed surface will be rejected.

2.3 MORTAR MATERIALS

- A. Portland Cement Mortar Materials: ANSI/TCA A118.1.
- B. Latex-Portland Cement Mortar: ANSI/TCA A118.4 and the following:
 - 1. Acrylic resin latex additive.
 - 2. Dry mortar mix supplied by latex manufacturer.

2.4 ACCESSORIES

- A. Vapor Barrier: ASTM D226; "Tyvek" or approved equal.

2.5 JOINT FILLER MIX

- A. Mix and proportion pre-mix setting bed and grout materials in accordance with manufacturer's instructions and referenced standards.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces are ready to receive Work.

- B. Beginning of installation means installer accepts condition of existing surfaces.

3.2 PREPARATION

- A. Protect surrounding work from damage or disfiguration.
- B. Vacuum clean existing surfaces and damp clean.

3.3 INSTALLATION

- A. Install vapor barrier over substrate; weatherlap horizontal edges 4 inches, lap vertical edges 6 inches, and tape all joints as recommended by manufacturer.
- B. Coordinate installation of backing board with application of finish surfaces. Install with the rough side exposed.
- C. Install backing board in accordance with manufacturer's instructions and ANSI/TCA A108.11. Tape joints and corners. Chamfer all exposed corners to create a 1/2 inch radius.
- D. Smooth finish with skim coat of dry-set mortar to conceal all joints, fasteners, and imperfections in the board surface, to a feather edge, to make the entire surface "paint ready".
- E. Obtain acceptance of special coatings applicator prior to final completion.

3.4 CLEANING

- A. Clean Work under provisions of 01 70 00.

END OF SECTION

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SECTION 09 29 00 GYPSUM BOARD

PART 1- GENERAL

1.1 SECTION INCLUDES

- A. Gypsum board.
- B. Taped and sanded joint treatment.
- C. Surface primer.
- D. Level 5 finish
- E. Resilient furring channels.
- F. Metal channel ceiling framing.

1.2 REFERENCES

- A. ASTM C11 - Standard Terminology Relating to Gypsum and Related Building Materials and Systems.
- B. ASTM C36 - Gypsum Wallboard.
- C. ASTM C475 - Joint Treatment Materials for Gypsum Wallboard Construction.
- D. ASTM C514 - Nails for the Application of Gypsum Wallboard.
- E. ASTM C557 - Adhesives for Fastening Gypsum Wallboard to Wood Framing.
- F. ASTM C630 - Water Resistant Gypsum Backing Board.
- G. ASTM C641 - Zinc-Coated (Galvanized) Carbon Steel Wire.
- H. ASTM C645 - Non-Load (Axial) Bearing Steel Studs, Runners (Track), and Rigid Furring Channels for Screw Application of Gypsum Board.
- I. ASTM C754 - Installation of Steel Framing Members to Receive Screw Attached Gypsum Wallboard, Backing Board, or Water Resistant Backing Board.
- J. ASTM C840 - Application and Finishing of Gypsum Board.
- K. ASTM C919 - Use of Sealants in Acoustical Applications.
- L. ASTM C1002 - Steel Drill Screws for the Application of Gypsum Board.

- M. ASTM D226 - Asphalt-Saturated Felt Used in Roofing and Waterproofing.
- N. ASTM E90 - Method for Laboratory Measurement of Airborne Sound transmission Loss of Building Partitions.
- O. GA 201 - Using Gypsum Board for Walls and Ceilings.
- P. GA 214 - Levels of Gypsum Board Finish.
- Q. GA 216 - Application and Finishing of Gypsum Board.
- R. GA 600 - Fire Resistance Design Manual.
- S. CBC - California Building Code.
- T. UL - Underwriters Laboratories.
- U. CISCA – Ceilings & Interior Systems Construction Association.

1.3 QUALITY ASSURANCE

- A. Applicator: Company specializing in gypsum board systems, with five years documented experience.

1.4 REGULATORY REQUIREMENTS

- A. Conform to CBC, Chapter 7, and UL and GA requirements for fire-rated assemblies.

1.5 ACOUSTICAL PERFORMANCE

- A. Acoustical attenuation for interior partitions, where indicated, shall be STC rating in accordance with ASTM E90.

1.6 DEFINITIONS

- A. Refer to ASTM C11 for definitions of terms related to gypsum board assemblies.

1.7 FIELD SAMPLES

- A. Provide field samples under provisions of Section 01 33 00.
- B. On wall and ceiling surface duplicate specified texture finish on at least 100 square feet of surface area.
- C. Provide complete finish including surface primer.
- D. Simulate finished lighting conditions for review of field sample.

- E. After surface texture is accepted, the accepted surface will remain as part of the Work and will be used to evaluate subsequent applications of finish texture.

1.8 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Provide Product Data for all items specified.
- C. Submit 12 inch square Samples of each texture finish specified.
- D. Provide product data, MSDS, and other official literature from manufacturer clearly identifying that the product and its adhesives and sealants, meet the testing requirements and threshold limits of the State of California Department of Health Services (DHS) *Standard Practice for the Testing of Volatile Organic Compounds*. Such products shall be identified by a 3rd party certification program listing low-emitting material products that meet the State testing requirements. Contractor to clearly highlight, circle and call out on the product literature, identifying how the product complies.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Georgia Pacific Corp.
- B. National Gypsum Company.
- C. United States Gypsum Co..
- D. Substitutions: Under provisions of Section 01 62 00.

2.2 FRAMING MATERIALS

- A. Metal Furring: ASTM C645, hat-shaped, 7/8 inch deep, .0329 inch thick.
- B. Resilient Furring Channel: Manufacturer's standard product designed to reduce sound transmission, complying with ASTM C645 for material, finish and widths of face and fastening flange; 1/2 inch deep x .0179 inch thick asymmetric - shaped channel with face connected to single flange by slotted leg (web).
- C. Furring Channel: ASTM C754, 1-1/2 inch x .475 pounds per foot.
- D. Fasteners: ASTM C514 and C1002.
- E. Hanger Wire: ASTM A641, Class 1 coating (galvanized) soft temper, 9 gauge.
- F. Tie Wire: ASTM A641, Class 1 coating (galvanized) soft temper, 16 and 18 gauge.

- G. Adhesive: ASTM C557.

2.3 GYPSUM BOARD MATERIALS

- A. Note: All Gypsum Board to be 5/8" thick Type X which will satisfy our acoustical treatments requirements.
- B. Fire Rated Gypsum Board: ASTM C36; fire resistive type, UL rated; 5/8 inch thick Type X unless otherwise indicated, maximum permissible length; ends square cut, tapered and beveled edges.
- C. Moisture-Resistant Gypsum Board: ASTM C630; 5/8 inch thick unless otherwise indicated, maximum permissible length; ends square cut, tapered and beveled edges.
- D. Acoustical Ceiling Assemblies – SA200
- E. Acoustical Panels – National Gypsum/ The SoundBook USG Eclipse/Climaplus

2.4 ACCESSORIES

- A. Acoustical Sealant: Non-hardening, non-skinning, for use in conjunction with gypsum board.
 - 1. "Sheetrock Acoustical Sealant", manufactured by United States Gypsum Company.
 - 2. "BA-98 Acoustical Sealant", manufactured by Pecora Corporation.
 - 3. "Tremco Acoustical Sealant", manufactured by Tremco, Inc.
- B. Fire-Rated Sealant: As specified in Section 07 84 00.
- C. Corner Beads: Metal, hot dip galvanized.
- D. Edge Trim: GA 201 and GA 216; Type LC bead, unless otherwise indicated.
- E. Control Joints: Roll-formed zinc, USG No. 093, or approved equal.
- F. Spot Grout: ASTM C475, setting-type joint compound.
- G. Joint Materials: ASTM C475; reinforcing tape, joint compound, adhesive, water, and fasteners. Use tapes and compound recommended by gypsum board manufacturer for the use intended. Use ready mixed, drying type compounds. Use taping compound for embedding tape and first coat over fasteners and flanges of corner beads and trim. Use topping compound for fill and finish coats.
- H. Primer: Flat latex basecoat paint equivalent to "First Coat" manufactured by United States Gypsum Company.

- I. Membrane: ASTM D226; No. 15 asphalt saturated roofing felt.
- J. Adhesive for Application Over Hard Surfaces: Mastic glue as recommended by the gypsum board manufacturer for the specific substrate.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Verify that site conditions are ready to receive Work.
- B. Beginning of installation means acceptance of substrate.

3.2 WALL FURRING INSTALLATION

- A. Erect wall furring for direct attachment to masonry and concrete walls.
- B. Erect metal furring vertically at 16 inches on center. Secure in place on alternate channel flanges at maximum 24 inches on center.

3.3 ACOUSTICAL ACCESSORIES INSTALLATION

- A. Space resilient furring channels horizontally at maximum 16 inches on center, not more than 2 inches from floor and ceiling lines.
- B. Locate nested joints over framing members.
- C. Install acoustical sealant within partitions in accordance with manufacturer's instructions and ASTM C919. Seal perimeter, joints, openings and penetrations on each face of partition.

3.4 CEILING FRAMING INSTALLATION

- A. Install in accordance with ASTM C754 and CBC, Chapter 25.
- B. Coordinate locations of hangers with other Work.
- C. Install ceiling framing independent of walls and columns.
- D. Space 9 gauge hanger wires at 3 feet on center along 1-1/2 inch furring channels and within 6 inches of end of furring channel.
- E. Install 1-1/2 inch furring channels at 4 feet on center and within 6 inches of parallel walls. Provide 1 inch clearance between end of channels and abutting walls.
- F. Position furring channels for proper ceiling height, level, and secure with hanger wire saddle-tied along channel.

- G. At channel splices, interlock flanges, overlap ends 12 inches and secure each end with double-strand of 16 gauge tie wire.
- H. Erect metal furring at right angles to 1-1/2 inch furring channels. Space metal furring 16 inches on center.
- I. Install metal furring within 6 inches of parallel walls. Provide 1 inch clearance between end of furring and abutting wall.
- J. Secure metal furring to furring channel with clips or saddle tie with double strand of 18 gauge tie wire.
- K. At splices of metal furring nest furring at least 8 inches and securely wire-tie each end with double strand of 16 gauge tie-wire.
- L. Reinforce openings in ceiling suspension system which interrupt main furring channels or metal furring with lateral channel bracing. Extend bracing minimum 24 inches past each end of openings.

3.5 MEMBRANE INSTALLATION

- A. Install membrane over wall studding where moisture resistant gypsum board is to be installed.
- B. Install membrane over substrate; weatherlap horizontal edges 4 inches, vertical edges 6 inches.

3.6 GYPSUM BOARD INSTALLATION

- A. Install gypsum board in accordance with ASTM C840 and manufacturer's instructions.
- B. Erect single layer standard gypsum board in most economical direction, with ends and edges occurring over firm bearing except those ends and edges which are perpendicular to framing.
- C. Erect single layer fire rated gypsum board vertically, with edges and ends occurring over firm bearing except those ends and edges which are perpendicular to framing members. Comply with required UL, CBC, or GA fire rated assembly.
- D. Erect double layer gypsum board with standard gypsum board for first layer placed in most economical direction with second layer placed parallel to face layer with adhesive and supplementary fasteners. Off-set joints of second layer from joints of first layer by at least 12 inches.
- E. Erect double layer fire-rated gypsum board in accordance with required UL, CBC, or GA fire rated assembly.

- F. Use screws when fastening gypsum board to metal furring.
- G. Use screws when fastening gypsum board to wood furring or framing except where nails are required for UL or CBC fire-rated assembly.
- H. Install firestop sealant at wall penetrations and terminations in accordance with required UL, CBC, or GA fire-rated assembly in accordance with Section 07 84 00.
- I. Treat cut edges and holes in moisture-resistant gypsum board with sealant.
- J. Place control joints as indicated on the Drawings.
- K. Place corner beads at external corners. Use longest practical length. Place edge trim where gypsum board abuts dissimilar materials.
- L. Spot grout metal door frames. Apply spot grout at each jamb anchor clip just before inserting board into frame.

3.7 CURVED PARTITIONS

- A. Install panels horizontally and unbroken across curved surface.
- B. Wet gypsum panels on surface that will become compressed.
- C. On convex side of partition, begin installation at one end of curved surface and fasten panels to studs as they are wrapped around curve.
- D. On concave side of partition, start fastening panels at center of curve and work outward to panel ends.
- E. Allow wetted panels to dry before applying joint treatment.

3.8 EXTERIOR SOFFIT AND CEILING INSTALLATION

- A. Apply gypsum soffit board panels perpendicular to supports with end joints staggered and located over supports.
- B. Install panels with 1/4 inch space where panels abut other construction penetrations.
- C. Fasten with corrosion-resistant screws.

3.9 JOINT TREATMENT

- A. Tape, fill, and sand joints, edges, and corners in accordance with GA-214.
- B. Feather successive coats a minimum of 2 inches onto adjoining surfaces for each coat.

- C. Where fire-resistance rating is required, detail of joint treatment shall meet fire-rating requirement.
- D. Level 1 Treatment:
1. All joints and angles shall have tape embedded in joint compound.
 2. Surface shall be free of excess joint compound.
 3. Tool marks and ridges are acceptable.
 4. Use for plenum areas above ceiling, in areas that are generally concealed and other areas not normally open to view.
- E. Level 2 Treatment:
1. All joints and angles shall have tape embedded in joint compound and one separate coat of joint compound shall be applied over all fastener heads and accessories.
 2. Surface shall be free of excess joint compound.
 3. Tool marks and ridges are acceptable.
 4. Use where surface is substrate to ceramic tile, acoustic tile, or tackable wallboard system.
- F. Level 3 Treatment:
1. Not used.
- G. Level 4 Treatment:
1. All joints and angles shall have tape embedded in joint compound with three separate coats of topping compound applied over all joints, angles, fasteners, and accessories.
 2. All compound shall be smooth and free of tool marks and ridges.
 3. Sand lightly between coats, taking care not to roughen face paper.
 4. Use for all surfaces that are scheduled to receive a textured and painted finish, except areas of food service and preparation, or a surface applied wallcovering.
 5. Acceptable in Storage Room / Closets, Janitor Closet, Mechanical and Electrical Utility Rooms only.
- H. Level 5 Treatment: (All exposed gypsum board surfaces unless otherwise noted)

1. All joints and angles shall have tape embedded in joint compound with three separate coats of topping compound applied over all joints, fasteners, and accessories.
2. Apply a thin skim coat of topping compound over entire surface.
3. All compounds shall be smooth and free of tool marks and ridges.
4. Sand lightly between coats.
5. Use at all walls areas where severe lighting conditions exist and areas that are to receive gloss, semi-gloss, enamel or non-textured flat paints

3.10 FINISHING

- A. Roller apply surface primer to all gypsum board surfaces scheduled to receive a painted and textured finish prior to application of paint or texture finish.
- B. Spray apply textured finish to all surfaces scheduled to receive a paint finish except surfaces of food service and preparation areas.
- C. Trowel-apply patch-to-match textures to match existing.
- D. Remove any overspray of texture finish from door frames, windows, and other adjoining construction.

3.11 TOLERANCES

- A. Maximum Variation from True Flatness: 1/8 inch in 10 feet in any direction.

3.12 SCHEDULE

- A. New Construction: Note: New construction may be over wood or metal frame construction.

Room Type	Wallboard System	Finish Type	Notes
Typical Surfaces (All areas, unless noted otherwise.)	5/8", Type X	Level 5	All surfaces Accent surfaces only, such as Soffits.
Wet Areas	5/8", Type MR	Level 5 or coordinate with final surface	Coordinate finish with final surface treatment

END OF SECTION

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SECTION 09 30 13 CERAMIC TILE

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Ceramic tile.
- B. Cementitious backing board.

1.2 REFERENCES

- A. ANSI/TCA A108.5 - Ceramic Tile Installed with Dry-Set Portland Cement Mortar or Latex Portland Cement Mortar.
- B. ANSI/TCA A108.11 - Interior Installation of Cementitious Backer Units.
- C. ANSI/TCA A118.1 - Dry-Set Portland Cement Mortar.
- D. ANSI/TCA A118.4 - Latex-Portland Cement Mortar.
- E. ANSI/TCA A118.6 - Ceramic Tile Grouts.
- F. ANSI/TCA A118.9 - Test Methods and Specifications for Cementitious Backer Units.
- G. ANSI/TCA A137.1 - Specifications for Ceramic Tile.
- H. ASTM C1028 – Static Coefficient of Friction of Ceramic Tile.
- I. ASTM D226 - Asphalt-Saturated Felt Used in Roofing and Waterproofing.
- J. ASTM D2047 – Static Coefficient of Friction Test.
- K. TCA (Tile Council of America) - Handbook for Ceramic Tile Installation.

1.3 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Submit Product Data for all materials specified.
- C. Samples: Mount tile and apply grout on two 24 inch x 24 inch plywood panels, representative of pattern, color variations, and grout joint size variations.
- D. Submit manufacturer's installation instructions, maintenance data, and recommended cleaning and stain removal methods and cleaning materials.

1.4 QUALITY ASSURANCE

- A. Conform to ANSI/TCA A137.1 for tile material.
- B. Conform to ANSI/TCA Standards and TCA Handbook for tile installation.

1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in the manufacture of products specified in this Section with minimum five years documented experience.
- B. Installer: Company specializing in applying the Work of this Section with minimum five years documented experience.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Maintain 50 degrees Fahrenheit during installation of mortar materials.

1.7 EXTRA STOCK

- A. Provide extra quantity of full size tile and trim shape units to Owner under provisions of Section 01 70 00.
- B. Provide quantity equal to 2 percent of units installed of each shape and color.

PART 2 - PRODUCTS

2.1 MANUFACTURERS - TILE

- A. Dal-Tile Corp.
- B. American Olean Tile Co., Inc.
- C. Crossville Ceramics.
- D. Summitville Tiles, Inc.
- E. United States Ceramic Tile Co.
- F. Substitutions: Under provisions of Section 01 25 00.

2.2 TILE MATERIAL

- A. Ceramic Wall Tile: Clay.

1. Moisture Absorption: Over 3.0 percent.
2. Pattern: Refer to drawings.
3. Size: Refer to drawings
4. Edge: Cushioned.
5. Surface Finish: TBD
6. Color(s): Refer to drawings.

2.3 MANUFACTURERS - MORTAR AND GROUT

- A. As recommended by the manufacturer for the application indicated.

2.4 MORTAR & GROUT MATERIALS

- A. Water-Cleanable, Kerapoxy; Tile-Setting Epoxy and chemical-resistant nonsagging Grout; with a VOC content of 65 g/L or less. That complies with testing and product requirements of the California Department of Public Health's standards.

1. Basis-of-Design Product: Subject to compliance with requirements, provide MAPEI Corporation; or a comparable product by one of the following:

- a. Custom Building Products.
- b. Laticrete International, Inc.
- c. TEC; H.B. Fuller Construction Products Inc.

2.5 GROUT MATERIALS

- A. Portland Cement Grout Materials: ANSI/TCA A118.6, commercial type.
- B. Latex-Portland Cement Grout: ANSI/TCA A118.6 of color selected and the following:
 1. Acrylic resin latex additive.
 2. Dry mortar mix supplied by latex manufacturer.

2.6 ACCESSORIES

- A. Membrane: ASTM D226; No. 15 asphalt saturated roofing felt.

- B. Backing Board: ANSI/TCA A118.9; high density, cementitious, glass fiber reinforced, 1/2 inch thick; 2 inch wide coated glass fiber tape for joints and corners; manufacturer shall be licensed by TCA.
- C. Sealant: Type specified in Section 07 92 00.
- D. Metal Trims / Edges Bands: Refer to drawings.

2.7 MORTAR MIX AND GROUT MIX

- A. Water-Cleanable, Kerapoxy; Tile-Setting Epoxy and chemical-resistant nonsagging Grout; with a VOC content of 65 g/L or less. That complies with testing and product requirements of the California Department of Public Health's standards.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide MAPEI Corporation; or a comparable product by one of the following:
 - a. Custom Building Products.
 - b. Laticrete International, Inc.
 - c. TEC; H.B. Fuller Construction Products Inc.
- B. Provide product capable of withstanding continuous and intermittent exposure to temperatures of up to 140 and 212 deg F, respectively, and certified by manufacturer for intended use.

2.8 SEALER

- A. Tile and Grout Sealer: "Aqua Mix Penetrating Sealer" manufactured by Aqua Mix, Inc., (562) 946-6877, or approved equal.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces are ready to receive Work.
- B. Beginning of installation means installer accepts condition of existing surfaces.

3.2 PREPARATION

- A. Protect surrounding Work from damage or disfiguration.
- B. Vacuum clean existing surfaces and damp clean.
- C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.

3.3 INSTALLATION - THINSET METHOD

- A. Install mortar, tile, and grout in accordance with ANSI/TCA 108.5 and applicable tile installation standards of the TCA Handbook.
- B. Install membrane over substrate; weatherlap horizontal edges 4 inches, lap vertical edges 6 inches.
- C. Install backing board in accordance with manufacturer's instructions and ANSI/TCA A108.11. Tape joints and corners; cover with skim coat of dry-set mortar to a feather edge.
- D. Lay tile to pattern indicated. If not indicated, request from Architect. Do not interrupt tile pattern around openings.
- E. Cut and fit tile tight to penetrations through tile. Form corners and bases neatly. Align wall, base, and floor joints.
- F. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make joints watertight, without voids, cracks, excess mortar or excess grout.
- G. Form internal angles square and external angles bullnosed.
- H. Sound tile after setting. Replace hollow sounding units.
- I. Keep control joints free of mortar or grout. Apply sealant to joints.
- J. Allow tile to set for a minimum of 48 hours prior to grouting.
- K. Grout tile joints.
- L. Apply sealant to junction of tile and dissimilar materials and junction of dissimilar planes.

3.4 CLEANING

- A. Clean Work under provisions of 01700.
- B. Clean tile surfaces.

3.5 SEALING

- A. Install sealer on all surfaces in accordance with manufacturer's instructions.

END OF SECTION

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SECTION 09 51 00 SUSPENDED ACOUSTICAL CEILINGS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Suspended metal grid ceiling system.
- B. Acoustical panels.
- C. Perimeter trim.

1.2 REFERENCES

- A. ASTM A513 - Electric-Resistance-Welded Carbon and Alloy Steel Mechanical Tubing.
- B. ASTM C635 - Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
- C. ASTM C636 - Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.
- D. ASTM C641 - Zinc-Coated (Galvanized) Carbon Steel Wire.
- E. ASTM E580 - Application of Ceiling Suspension Systems from Acoustic Tile and Lay-in Panels in Areas Requiring Seismic Restraint.
- F. ASTM E1264 - Classification of Acoustical Ceiling Products.
- G. CCR - California Code of Regulations, Title 24, Part 2, Chapter 25A.
- H. DSA - Division of the State Architect.
- I. CBC - California Building Code.
- J. UL - Underwriters' Laboratories Building Material Directory.

1.3 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in manufacture of ceiling suspension system and ceiling panels with five years minimum experience.
- B. Installer: Company with five years minimum documented experience, approved by manufacturer.

1.4 REGULATORY REQUIREMENTS

- A. Conform to CCR Title 24, Part 2, for suspension system requirements.
- B. Suspension system shall be acceptable to DSA and have current product acceptance number issued by DSA.
- C. Conform to applicable UL and CBC combustibility requirements for materials.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Provide Product Data on metal grid system components and acoustic units.
- C. Provide product acceptance approval verification issued by DSA for metal grid system.
- D. Submit two 6-inch squares Samples illustrating material and finish of acoustic units.
- E. Submit two 12-inch long Samples of suspension system main runner, cross runner, and edge trim.

Provide product data, MSDS, and other official literature from manufacturer clearly identifying that the product meets the testing requirements and threshold limits of the State of California Department of Health Services (DHS) *Standard Practice for the Testing of Volatile Organic Compounds*.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Maintain uniform temperature of minimum 60 degrees Fahrenheit, and humidity of 20 to 40 percent prior to, during, and after installation.

1.7 SEQUENCING/SCHEDULING

- A. Do not install acoustical ceilings until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead Work is completed, tested, and approved.
- B. Schedule installation of acoustic units after interior wet Work is dry.

1.8 EXTRA STOCK

- A. Provide extra quantity of acoustic units to Owner under provisions of Section 01 70 00.
- B. Provide quantity equal to 2 percent of units installed.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS - SUSPENSION SYSTEM

- A. Armstrong Ceiling Systems.
- B. Chicago Metallic Corporation.
- C. USG Interior Systems, (DONN).
- D. Substitutions: Under provisions of Section 01 25 00.

2.2 SUSPENSION SYSTEM MATERIALS

- A. Grid: See Section 2.5 and Section 2.6.
- B. Accessories: Stabilizer bars, clips, splices, and edge moldings required for suspended grid system.
- C. Grid Materials: Commercial quality cold-rolled steel with galvanized coating.
- D. Grid Finish: Off-White color, baked enamel.
- E. Support Channels and Hangers: Galvanized steel; size and type to suit application, to rigidly secure acoustic ceiling system including integral mechanical and electrical components, as detailed on Drawings.
- F. Compression Strut: ASTM A513, telescoping design as detailed on Drawings, galvanized 3/4 inch diameter 14 gage rigid steel tubing with crimped end attached to roof framing and secured to 1/2 inch diameter 14 gage rigid steel tubing with crimped end to main runners or equivalent pre-manufactured compression post supplied by ceiling grid manufacturer.
- G. Hanger Wire: ASTM C641, Class 1 coating (galvanized), soft temper, No. 12 gage.

2.3 ACCEPTABLE MANUFACTURERS - ACOUSTIC UNITS

- A. Armstrong Ceiling Systems.
Contact: Armstrong World Industries, Inc.
Michelle Moretti / mcmoretti@armstrongceilings.com / 916.202.5052
- B. BPB Celotex.
- C. Chicago Metallic Corporation
- D. USG Interiors, Inc.

- E. Substitutions: Under provisions of Section 01 25 00.

2.4 ACOUSTIC UNIT MATERIALS

- A. See Finish Schedule, Sheet ID2.00.

- B. Acoustical Ceiling Panel Types:

ACT-1 (Waiting Area – See Reflected Ceiling Plans and Finish Schedule)

1. Surface Texture: Fine Fissured except at Procedure Rooms #108 and #123, surface texture to be smooth.)
2. Composition: Mineral Fiber
3. Color: White
4. Size: 24IN x 48IN
5. Edge Profile: Beveled Tegular 9/16" for interface with SUPRAFINE XL 9/16" Exposed Tee grid.
6. Noise Reduction Coefficient(NRC): 0.65 ASTM C 423; Classified with UL label on product carton.
7. Ceiling Attenuation Class (CAC): 35 ASTM C 1414; Classified with UL label on product carton.
8. Flame Spread: ASTM E 1264; Class A (UL)
9. Light Reflectance (LR) White Panel: ASTM E 1477; 0.85
10. Dimensional Stability: Standard
11. Recycle Content: Post-Consumer - 0% Pre-Consumer - 67%
12. Acceptable Product: CIRRUS Second Look III, #511 as manufactured by Armstrong World Industries

ACT-2 (Back of House - See Reflected Ceiling Plans and Finish Schedule)

1. Surface Texture: Medium
2. Composition: Mineral Fiber
3. Color: White
4. Size: 24IN x 48IN
5. Edge Profile: Lay-In 15/16IN for interface with PRELUDE XL 15/16" Exposed Tee grid.
6. Noise Reduction Coefficient(NRC): 0.70 ASTM C 423; Classified with UL label on product carton.
7. Ceiling Attenuation Class (CAC): 35 ASTM C 1414; Classified with UL label on product carton.
8. Flame Spread: ASTM E 1264; Class A (UL)
9. Light Reflectance (LR) White Panel: ASTM E 1477; 0.85
10. Dimensional Stability: Standard
11. Recycle Content: Post-Consumer - 0% Pre-Consumer - 67%
12. Acceptable Product: Armstrong Fine Fine Fissured High-NRC #1754 (24"x24"x7/8") and 1755 (24"x48"x7/8") Square Lay-in, except at Procedure Rooms #108 and #123, ceiling panels shall be Armstrong Clean Rooms VL Unperforated #870 (24"x48"x5/8") Square Lay-in.

- C. Acoustical Wood Veneer Ceiling Types:

WD-1: (Waiting Area - See Reflected Ceiling Plans and Finish Schedule)

1. Surface Texture: Smooth
2. Composition: Fire-retardant Particle Board
3. Species/Finish: Light Cherry
4. Size: 96IN x 5-1/4IN
5. Reveal: Square
6. Module: 6"
7. Edge Banding and Trim: To match face veneer
8. Noise Reduction Coefficient (NRC): 0.40 ASTM C 423
9. Flame Spread: ASTM E84 HPVA Fire Classification Class A (HPVA)
10. Dimensional Stability: Standard
11. Acceptable Product: WoodWorks Linear, Item # 6460W1___ as manufactured by Armstrong World Industries.

REQUIRED WoodWorks Panel Accessories:

1. 5370 – 12' HD Linear Carriers (BLACK) (concealed) with integral clips (factory applied) for nominal 4-1/2" module
2. 7805BK – Black Wall Angle
3. 5843 – Linear Wood Panel Splice

WD-2: (Reception Areas - See Reflected Ceiling Plans and Finish Schedule)

1. Surface Texture: Smooth
2. Composition: Wood
3. Finish: Light Cherry
4. Species: Solid Poplar
5. Size: 1x8' Panels
6. Reveal: 1.375" between blades
7. Blade Size: 5/8"
8. Blade Count: 6 blades per 1' section
9. Blade Attachment: BACKER
10. NRC: 0.75 w/BLACK Bio-Acoustic Infill Panel (11"x48")
11. Flame Spread: ASTM E84 HPVA Fire Classification Class C;
12. Dimensional Stability: Standard
13. Acceptable Product: WoodWorks Grille #7263BO___ + Bio-Acoustic Infill Panel #6657 as manufactured by Armstrong World Industries.

2.5 METAL SUSPENSION SYSTEMS FOR ACOUSTICAL CEILING PANELS

A. Components:

Main beams and cross tees, base metal and end detail, fabricated from commercial quality hot dipped galvanized steel complying with ASTM A 653. Main beams and cross tees are double-web steel construction with type exposed flange design. Exposed surfaces chemically cleansed, capping prefinished galvanized steel in baked polyester paint. Main beams and cross tees shall have

rotary stitching.

- a. Structural Classification: ASTM C 635 Heavy Duty duty
 - b. Color: White and match the actual color of the selected ceiling tile, unless noted otherwise.
 - c. Acceptable Product: SUPRAFINE XL 9/16" Exposed Tee as manufactured by Armstrong World Industries.
- B. Attachment Devices: Size for five times design load indicated in ASTM C 635, Table 1, Direct Hung unless otherwise indicated.
- C. Wire for Hangers and Ties: ASTM A 641, Class 1 zinc coating, soft annealed, with a yield stress load of at least three times design load, but not less than 12 gauge.
- D. Required Molding & Trim: 7800 - 12ft Wall Molding
- E. Accessories:
1. BERC2 - 2 inch Beam End Retaining Clip, 0.034 inch thick, hot-dipped galvanized cold-rolled steel per ASTM A568 - used to join main beam or cross tee to wall molding.
 2. SJCG - Seismic Joint Clip, 5 inches x 1-1/2 inch, hot-dipped galvanized cold-rolled steel per ASTM A568. The two piece unit is designed to accommodate a seismic separation joint. The clip is compatible with 15/16 inch and 9/16 inch grid systems including Prelude, Suprafine, and Silhouette. The SJCG is not suitable for use with Vector panel installations.
 3. SJMR15 - Seismic Joint Clip - Main Beam, 1 inch x 4 inches, commercial quality cold rolled hot dipped galvanized steel per ASTM A568, chemically cleansed.

2.6 METAL SUSPENSION SYSTEMS FOR WOOD VENEER CEILINGS

A. Components

Main beams and cross tees, base metal and end detail, fabricated from commercial quality hot dipped galvanized steel complying with ASTM A 653. Main beams and cross tees are double-web steel construction with type exposed flange design. Exposed surfaces chemically cleansed, capping prefinished galvanized steel in BLACK 360 Degree Painted Baked Polyester paint. Main beams and cross tees shall have rotary stitching.

- a. Structural Classification: ASTM C 635 normal duty
 - b. Color: TECH BLACK
 - c. Acceptable Product: TECH BLACK, Prelude XL 15/16" Exposed Tee as manufactured by Armstrong World Industries. Series in BLACK #7301
- B. Attachment Devices:
Size for five times design load indicated in ASTM C 635, Table 1, Direct Hung unless otherwise indicated.
- C. Wire for Hangers and Ties:

ASTM A 641, Class 1 zinc coating, soft annealed, with a yield stress load of at least time three design load, but not less than 12 gauge.

D. Wood Works Edge Moldings and Trim: 780036 BLACK - 12ft Wall Molding in BLACK

E. WoodWorks Suspension Accessories: BERC2 - steel - 2" Beam End Retaining Clip

PART 3 - EXECUTION

3.1 INSPECTION

- A. Verify that existing conditions are ready to receive Work.
- B. Verify that layout of hangers will not interfere with other Work.\
- C. Beginning of installation means acceptance of existing conditions.

3.2 INSTALLATION - GRID SYSTEM

- A. Install system in accordance with ASTM C636 and ASTM E580 as supplemented in this Section and with notes on the Drawings entitled Metal Suspension Systems for Lay In Panel Ceilings.
- B. Install after major above ceiling Work is complete. Coordinate the location of hangers with other Work.
- C. Hang system independent of columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members. Provide cross-struts at four-foot centers for acoustic panels and at two-foot centers for metal panels.
- D. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest effected hangers and related carrying channels to span the extra distance.
- E. Compression struts shall be installed at each main runner not exceeding 12 feet on center in both directions and not more than 8 inches from end of main runner. Insert main 3/4 inch tube over 1/2 inch tube with a minimum 6 inch lap. Secure crimped end of main 3/4 inch tube to structural framing with metal screws and 1/2 inch tube to main runner with metal screws. Secure tube sections together with 2 set screws. Install prefabricated compression post according to manufacturer's recommendations.
- F. Locate grid system on room axis according to reflected ceiling plan. Trim edge panels precisely to fit using table saw. Reject cut pieces which are deformed or damaged during cutting.

- G. Do not eccentrically load system, or produce rotation of runners.
- H. Install edge molding at intersection of ceiling and vertical surfaces, using longest practical lengths. Miter corners. Provide edge moldings at junctions with other interruptions.

3.3 INSTALLATION - ACOUSTIC UNITS

- A. Field reveal cut edge of perimeter tiles to match factory reveal edge. Paint cut surface if necessary to match surface of tile.
- B. Fit acoustic units in place, free from damaged edges or other defects detrimental to appearance and function.
- C. Lay directional patterned units one way in room. Fit border neatly against abutting surfaces.
- D. Install acoustic units level, in uniform plane, and free from twist, warp and dents.

3.4 TOLERANCES

- A. Maintain tolerances in accordance with Section 01 44 00.
- B. Variation from Flat and Level Surface: 1/8 inch in 10 feet.
- C. Variation from Plumb of Grid Members Caused by Eccentric Loads: Two degrees maximum.

END OF SECTION

SECTION 09 65 10 RESILIENT FLOORING

PART I - GENERAL

1.01 RELATED DOCUMENTS

- A. Scope: Work under this Section shall include all materials and installation necessary to provide Resilient Flooring. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 – Specification sections, apply to work of this section.

1.02 SUMMARY

- A. The work of this Section includes:
1. All resilient flooring as indicated on drawings
 2. Resilient wall base as indicated on drawings
 3. Responsibilities, preparation/installation
- B. Related Sections: Other specification sections which directly relate to the work of this section include, but are not limited to, the following:
1. Section 035414 – Self Leveling Underlayment in Resilient Flooring Spec.
 2. Section 072640 – Water Vapor Emission Control Barrier
 3. Section 096530 – Resilient Flooring Accessories
- C. References (Industry Standards):
1. American Association of Textile Chemists and Colorists
 - a. AATCC 134 Electrostatic Propensity of Carpets
 2. American National Standards Institute
 - a. ANSI ESD S97.2 Floor Materials and Footwear – Voltage Measurement on a Person
 3. American Society for Testing and Materials
 - a. ASTM C423 Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method
 - b. ASTM C518 Standard Test Method for Steady State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
 - c. ASTM D412 Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers – Tension
 - d. ASTM D2047 Standard Test Method for Static Coefficient of Friction of Polish-Coated Floor Surfaces as Measured by the James Machine
 - e. ASTM D2240 Standard Test Method for Rubber Property – Durometer Hardness
 - f. ASTM D3389 Standard Test Method for Coated Fabrics Abrasion Resistance (Rotary Platform, Double Head Abrader)
 - g. ASTM D6499 Standard Test Method for The Immunological Measurement of Antigenic Protein in Natural Rubber and its Products
 - h. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials

- i. ASTM E90 Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
- j. ASTM E648 Standard Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source
- k. ASTM E662 Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials
- l. ASTM E1745 Standard Specification for Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs
- m. ASTM E2179 Standard Test Method for Laboratory Measurement of the Effectiveness of Floor Coverings in Reducing Impact Sound Transmission Through Concrete Floors
- n. ASTM E2180 Standard Test Method for Determining the Activity of Incorporated Antimicrobial Agent(s) in Polymeric or Hydrophobic Materials
- o. ASTM F150 Standard Test Method for Electrical Resistance of Conductive and Static Dissipative Resilient Flooring
- p. ASTM F155 Method of Test for Temper of Strip and Sheet Metals for Electronic Devices
- q. ASTM F386 Standard Test Method for Thickness of Resilient Flooring Materials Having Flat Surfaces
- r. ASTM F710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring
- s. ASTM F925 Standard Test Method for Resistance to Chemicals of Resilient Flooring
- t. ASTM F970 Standard Test Method for Static Load Limit
- u. ASTM F1344 Standard Specification for Rubber Floor Tile
- v. ASTM F1482 Standard Practice for Installation and Preparation of Panel Type Underlayments to Receive Resilient Flooring
- w. ASTM F1514 Standard Test Method for Measuring Heat Stability of Resilient Flooring by Color
- x. ASTM F1859 Standard Specification for Rubber Sheet Floor Covering Without Backing
- y. ASTM F1860 Standard Specification for Rubber Sheet Floor Covering With Backing
- z. ASTM F1861 Standard Specification for Resilient Wall Base
- aa. ASTM F2055 Standard Test Method for Size and Squareness of Resilient Floor Tile by Dial Gage Method
- bb. ASTM F2169 Standard Specification for Resilient Stair Treads
- cc. ASTM F2170 Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using *in situ* Probes
- dd. ASTM F2199 Standard Test Method for Determining Dimensional Stability of Resilient Floor Tile after Exposure to Heat
- ee. ASTM F3010 Standard Practice for Two-Component Resin Based Membrane-Forming Moisture Mitigation Systems for Use Under Resilient Floor Coverings

- ff. ASTM G21 Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi
- 4. European Norm
 - a. FTM 101 C 4046 Static Decay
- 5. International Organization for Standardization
 - a. ISO 140 Measurement of sound insulation in buildings and of building elements
- 6. National Fire Protection Association
 - a. NFPA 253 Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Energy Source
 - b. NFPA 258 Test Method for Specific Density of Smoke Generated by Solid Materials

1.03 SUBMITTALS

- A. Product Data: Submit manufacturer's Installation Guide, Maintenance Guide and Safety Data Sheet (SDS) for each material proposed for use (available at www.nora.com/us).
- B. Samples: Submit two 6 inch by 6 inch samples of each product in color specified, for verification.

1.04 QUALITY ASSURANCE

- A. Manufacturer: Provide resilient flooring manufactured by a firm with a minimum of 10 years' experience with resilient flooring of type's equivalent to those specified. Manufacturers proposed for use, which are not named in this section, should submit evidence of ability to meet performance requirements specified not less than 10 days prior to bid date.
 - 1. The manufacturer should have the Quality Management System approved by Lloyd's Register Quality Assurance to the Quality Management System Standard ISO 9001:2000.
 - 2. Color Matching: Provide resilient flooring products, including wall base, accessories and subfloor preparation products from one manufacturer to ensure color matching and compatibility.
 - 3. Manufacturer must be capable of providing technical training and technical field service representation.
- B. Installer Qualifications: Installer should be approved by manufacturer for the requirements of the project or INSTALL (International Standards & Training Alliance) resilient certified for the requirements of the project.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in labeled packages. Store and handle in strict compliance with manufacturer's recommendations. Protect from damage due to weather, excessive temperatures, and construction operations.
- B. Deliver materials sufficiently in advance of installation to condition materials to the required temperature for 48 hours prior to installation.

1.06 PROJECT CONDITIONS

- A. Maintain temperature and humidity at service levels or 68° F (20° C), ± 5° F (3° C), and 50% RH ± 10% in areas to receive resilient flooring. Specified temperature should be maintained at least 48 hours before, during, and 72 hours after installation.

1.07 WARRANTY

- A. Provide current, detailed manufacturer's warranty for each flooring product as applicable, including limited wear, defect and conductivity.

PART II - PRODUCTS

2.01 ACCEPTABLE MANUFACTURER

- A. Mannington Commercial, 1844 US Hwy 41 SE, Calhoun, GA 30701; Phone: 800-241-2262
- B. Tandus Centiva Corp., 1701 Mars Hill Rd., Florence, AL 35630; Phone: 800-248-2878
- C. Or equal

- D. The Manufacturer should meet 1.04 A. and have or provide the following:
 - 1. ISO 14001 Environmental Management Systems certification.
 - 2. Validation according to the Eco-Management and Audit System (EMAS).
 - 3. Construction waste take back program for the purpose of reducing jobsite waste by taking back their uninstalled waste flooring. Details of the nora program are available at www.nora.com/us.
 - 4. Flooring surfaces that are easily cleaned and do not require coatings and stripping, or use chemicals that may be hazardous to human health.
 - 5. Supply all required products that are CA 01350 compliant.
 - 6. Flooring that is free of anything known to be teratogenic, mutagenic or carcinogenic.
 - 7. Flooring that contains no polyvinyl chloride or plasticizers.
 - 8. Flooring that contains no halogens.
 - 9. Flooring that contains no asbestos.

2.02 RESILIENT FLOORING FOR COMMERCIAL TRAFFIC

- A. Refer to drawings.

PART III – RESPONSIBILITIES

3.01 GENERAL CONTRACTOR RESPONSIBILITIES

- A. Supply a safe, climate controlled building and subfloor as detailed in manufacture Installation Instructions.

- B.
 - 1. A concrete subfloor that meets the requirements of ASTM F710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring is required, or as detailed in the nora Installation Guide.

- C. A concrete subfloor that is structurally sound, and has finished shrinking, cracking, curling or moving in any way is required.

- D. For all concrete substrates on or below grade, a permanent effective vapor retarder with a low permeance (less than 0.1) and that meets the requirements of the latest edition of ASTM E1745 Standard Specification for Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs, should be placed directly underneath the concrete above the granular fill, and installed as per the manufacturer's written instructions. Alternatively a surface applied moisture mitigation system should be used as described in 3.01 H.

- E. A clean non-burnished concrete surface free from any paint, wax, oil, grease, and film forming curing compounds, silicate penetrating curing compounds, sealing, hardening or parting compounds is required. The surface should not have any alkaline salts, laitance, mold, mildew, residual adhesive, chemical adhesive removers or anything that may prevent appropriate products bonding to it. If not then the general contractor should provide the mechanical means to remove them. This could be dustless diamond grinding (DiamaBrush), bead-blast or similar with a suitable Hepa vacuum attachment. Review and comply with all relevant local, state and federal regulations.
- F. Valid tests and acceptable test results should be provided to the end user and flooring contractor, including documenting with photographs, the location of all tests, recorded % relative humidity levels and temperature of both the concrete subfloor and ambient conditions prior to flooring installation. Testing should be performed at the correct, controlled ambient service temperature and humidity following the protocol of ASTM F2170 Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes, using a Wagner Rapid RH probes only. It is recommended that moisture testing be performed by a certified International Concrete Repair Institute (ICRI) Tier 2 Testing Technician – Grade 1. When tested at the correct ambient temperature and humidity the maximum allowable %RH per Manufacture Installation Instructions.
- G. If it is not possible to drill into the concrete for any reason as detailed in ASTM F2170 Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes, please contact the nora® Technical Department for other recommendations.
- H. Only if it is not possible to provide a concrete substrate with acceptable moisture levels, or that (when appropriate) have a confirmed effective vapor retarder, then a surface applied moisture mitigation system should be used that meets the requirements of ASTM F3010 Standard Practice for Two-Component Resin Based Membrane-Forming Moisture Mitigation Systems for Use Under Resilient Floor Coverings. Please note that all additional costs associated with this concrete condition are the responsibility of the general contractor / end user, including any additional requirements for concrete preparation, priming, leveler, patching or labor.
- I. A secure storage area that is maintained permanently or temporarily at ambient service temperature and humidity (except walk in freezers or similar), or 68°F ± 5° F and 50% ± 10% relative humidity, for at least 48 hours prior to and during the application of the flooring, so the flooring contractor can acclimate the flooring materials is required.
- J. An installation area that is weather tight and maintained either permanently or temporarily at ambient service temperature and humidity (except walk in freezers or similar), or 68°F ± 5° F and 50% ± 10% relative humidity, for at least 48 hours prior to, during and 72 hours after the application of the flooring is required.
- K. Areas with direct prolonged exposure to sunlight should be protected with the use of Low E glass doors and windows or facades.
- L. Areas of the flooring that are subject to direct sunlight through doors or windows should have them covered using blinds, curtains, cardboard or similar for the time of the installation and 72 hours after the installation to allow the adhesive to cure. Note: These areas should be installed using wet adhesives only, not dryfix systems.
- M. Prevent all traffic for a minimum of 12 hours and rolling loads for 72 hours to allow the adhesive to cure. If required, after 12 hours protect the flooring from damage during construction operations using Masonite, plywood or a similar product, ensuring first that the flooring surface is free of all debris. Lay panels so that the edges form a butt joint and tape the joint to prevent both

movement and debris entrapment underneath them. Inspect immediately before covering and after removal for final acceptance.

- N. Have the flooring cleaned no sooner than 72 hours (unless given written permission from the Manufacturer's Technical Department) after the installation using Manufacturer's Maintenance Guide.

3.02 FLOORING CONTRACTOR RESPONSIBILITIES

- A. Provide trained installers that have at least one of the following:
 1. Approved by Manufacturer for all of the requirements of the project or INSTALL (International Standards & Training Alliance) certified for the requirements of the project.
 2. An effective installation manager, to manage the project, installers, and ensure that all of the required procedures are followed as detailed in the Manufacturer's Installation Guide.
- B. Acclimate the flooring in the secure storage area provided by the general contractor that is maintained permanently or temporarily at ambient service temperature and humidity (except walk in freezers or similar), or 68°F ± 5° F and 50% relative humidity, for at least 48 hours prior to application.
- C. For wooden subfloors American Plywood Association (APA) underlayment grade plywood should be double sheeted at a suitable thickness (minimum total wood thickness of 1 1/4 inch) to overlay the wooden substrate and installed as detailed in ASTM F1482 Standard Practice for Installation and Preparation of Panel Type Underlayments to Receive Resilient Flooring.
- D. Perform mat bond tests in each major area (1 per ~1,000 sq. ft.) This should consist of the proposed subfloor preparation, mitigation and leveling or smoothing products. A detailed method statement is available from Manufacturer. Do not proceed with installation until all the results of the bond test are acceptable.
- E. Review and comply with all relevant Safety Data Sheets (SDS), local, state and federal regulations.
- F. Clean out and fill or repair any dormant saw cuts and cracks with an appropriate product following the manufacturers written usage instructions. For any expansion (moving) joints, use an industry standard expansion joint assembly.
- G. When required, use a surface applied moisture mitigation system that meets the requirements of ASTM F3010, and following the directions and requirements detailed in the manufacturers written instructions. Provide written confirmation and photographs to the general contractor or end user that the subfloor was prepared correctly prior to the application of the membrane, and that the membrane was applied correctly (without pin-holes) including confirmation of the gallons used and total square feet installed.
- H. When required, use a leveler following the manufacturers written instructions. The surface should be free of dust, solvents, paint, wax, varnish, oil, grease, asphalt, old adhesives, and other extraneous materials that may interfere with the bond. These should be completely removed by mechanical means only. Dustless diamond grinding or bead blasting are the preferred method to remove contaminates and bond breakers, as it also helps to level the concrete.
- I. Prime the subfloor prior to using a suitable leveler. Note: a 1/8 inch minimum thickness is required for the leveler to be considered porous or as required by Manufacturer's adhesive systems.

J. Vacuum floors immediately prior to installing the flooring to remove all loose particles. If required, only use water based sweeping compounds. Do not use any wax or oil based compounds that leave behind a residue that may interfere with the adhesive bond.

K. Install resilient flooring, including but not limited to the following, in accordance with the Manufacture Installation Guide.

Adhesives: Trowelable water-resistant type recommended by Manufacturer to suit resilient products and substrate conditions indicated.

1. Do not mix manufacturing batches of a color within the same area.
2. Do not install resilient flooring over building expansion joints.
3. Do not install defective or damaged resilient flooring.
4. Layout resilient flooring to provide ~equal size at perimeter. Adjust layout as necessary to reduce the amount of resilient flooring which is cut to less than half full width.
5. Lay resilient flooring with arrows in the same direction (excluding borders).
6. Install resilient flooring without voids at seams. Lay seams together without stress.
7. Cut/scribe resilient flooring neatly at perimeter and obstructions.
8. Extend resilient flooring into reveals, closets, and similar openings.
9. Remove excess adhesive immediately.
10. Install reducer strips at exposed edges.

L. When required, install wall base with cold weld in accordance with Manufacturer's Installation Guide. Install in longest practical lengths.

M. When required, heat weld seams using a color coordinated heat welding rod in accordance with the Mfgr. Installation Guide.

N. When required, cold weld noraplan using a color coordinated cold weld in accordance with the Mfgr. Installation Guide.

O. When required, flash cove. Extend flooring up the wall using the boot flash coving method, to the required height. Provide cove stick and suitable capping strip. All internal and external vertical seams, or as specified, should be welded with a color coordinated weld system.

P. When required, use Mfgr. sanitary base installed using Mfgr. adhesive system and following the Mfgr. Installation Guide. All vertical external corners should be cold welded. If specified, all other seams between the sanitary base, and between the sanitary base and flooring should be cold welded together with coordinated colored cold weld in accordance with the Mfgr. Installation Guide. ms.

Q. Touch-up and repair any minor damage to eliminate all evidence of repair. Remove and replace work which cannot be satisfactorily repaired.

END OF SECTION 09 65 10

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SECTION 09 72 00 WALL PROTECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Wall Coverings
- B. Resilient edge and corner guards and resilient bumper guards and associated accessory items.
- C. Prefinished polyester glass reinforced plastic sheets.

1.2 RELATED SECTIONS

- A. 09 29 00 Gypsum Board
- B. 09 90 00 Painting

1.3 REFERENCES

- A. National codes (IBC, CBC, SBCCI, BOCA, Life Safety and CA 01350).
- B. American Society for Testing and Materials (ASTM).
- C. Underwriters Laboratories (UL).
- D. Section 01 35 00.

1.4 SUBMITTALS

- A. Submit under provisions of General Conditions and Attachment G.
- B. Shop Drawings: Wall covering; showing locations, extent and installation details of wall covering products.
Large scale items; showing layout, construction, mounting heights, profiles, and anchorage.
- C. Product data and detailed specifications for each system component and installation accessory required, including installation methods for each type of substrate.

- D. Submit two Samples illustrating materials and finish, color, texture, pattern and thickness of material.

1.5 MAINTENANCE DATA

- A. Submit under provisions of Section General Conditions.
- B. Include maintenance information on regular cleaning and stain removal.

1.6 QUALITY ASSURANCE

- A. Installer qualifications: Engage an installer who has no less than 3 years experience in installation of systems similar in complexity to those required for this project.
- B. Manufacturer's qualifications: Not less than 5 years experience in the production of specified products and a record of successful in-service performance.
- C. Code compliance: Assemblies should conform to all applicable codes including CBC, SBCCI, BOCA, Life Safety and CA 01350
- D. Fire performance characteristics: Provide engineered PETG wall protection system components with UL label indicating that they are identical to those tested in accordance with ASTM E84 for Class 1 characteristics listed below
Flame Spread: 25 or less
Smoke Developed 450 or less
- E. Impact Strength: Provide assembled wall protection units that have been tested in accordance with the applicable provisions of ASTM F476.
- F. Chemical and stain resistance: Provide wall protection system components with chemical and stain resistance in accordance with ASTM D543.
- G. Single source responsibility: Provide all components of the wall protection system manufactured by the same company to ensure compatibility of color, texture and physical properties

1.7 DELIVERY STORAGE AND HANDLING

- A. Deliver materials to the project site in unopened original factory packaging clearly labeled to show manufacturer.
- B. Comply with requirements of Section 1 60 00.
- C. Store materials in original, undamaged packaging in a clean, dry place out of direct sunlight and exposure to the elements. A minimum room temperature of 40°F (4°C) and a maximum of 100°F (38°C) should be maintained.
- D. Materials must be stored flat.

- E. Unload materials carefully and store on clean concrete surface or raised platform in safe, dry area. Do not dump on ground.
- F. Deliver, store, and handle packaged materials in original containers with seals unbroken and labels intact until time of use.

1.8 PROJECT CONDITIONS

- A. Materials must be acclimated in an environment of 65-75°F (18-24°C) for at least 24 hours prior to beginning the installation
- B. Installation areas must be enclosed and weatherproofed before installation commences

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Construction Specialties, "Acrovyn" , Orange, CA 92865. Contact-McCurrie & Associates, sharol McQuarrie (415) 495-4475.
- B. Interior surface protection products specified herein and installed on the submittal drawings shall be manufactured by Construction Specialties, Inc.
- C. Marlite; 1 Marlite Drive, Dover, OH 44622. 800-377-1221 FAX (330) 343-46668
Email: info@marlite.com
www.marlite.com.
- D. Substitutions: Under provisions of General Conditions and Section 01 25 00.

2.2 SHEET MATERIALS

- A. Engineered PETG: Rigid sheet should be high impact C/S Acrovyn 4000 Model with nominal .078" (1.98mm) thickness and supplied in 4' x 8' or 10' (1.22m x 2.44m or 3.05m) sheet sizes in standard Shadowgrain texture, nominal. Quatro, Single Tread, Beadboard (specify nominal 1-5/8" or 2-5/8"), Mesa, Stone Chips, Irish Linen, Pindot, Leather, Pinstripe, Dado and Stipple textures shall be 43" x 90" or 114" (1.09m x 2.29m or 2.90m). Select from one of (64)* Acrovyn solid colors or (18)* Chameleon patterned colorways which include (16) woodgrains and (2) metals. Specify color-matched caulk, plastic trims or metal trims as needed for joints/transitions.
- B. Marlite Panel:
 - 1. Product:

- a. Standard FRP
- b. Induro FRP
- c. Artizan FRP with Sani-Coat
 - d. Envue with Sani-Coat
 - e. Symmetrix with Sani-Coat
 - f. Laminated FRP
2. Fiberglass Panels – reinforced thermosetting polyester resin panel sheets complying with ASTM D 5319:
 - a. Coating: Multi-layer print, primer and finish coats or applied over-layer.
 - b. Dimensions:
 - c. Thickness – 0.090" (2.29" (2.29mm) nominal
 - d. Width – 4'-0" (1.22m) nominal
 - e. Length As indicated on the drawings
3. Tolerance - Length and Width: +/- 1/8" (3.175mm)

2.3 BUMPERRAILS

- A. HRB-4CCMHLN Handrail; Combination handrail/bumper guard configuration with quick lock mounting system. See I.D. sheets for color selection. Surface mounted assembly consisting of a continuous extruded aluminum retainer with snap-on cover and integral shock absorbing cushions where indicated. Color-matched mounting brackets shall be spaced as indicated on installation instructions. Color-matched end caps and corners shall be attached to allow post installation adjustment. Attachment hardware shall be appropriate for wall construction.

2.4 CORNER GUARDS

- A. Engineered PETG Corner Guards to be Acrovyn 4000, surfaced mounted guards consisting of continuous aluminum retainer with snap-on Acrovyn 4000 cover. Color matched end caps to be provided for both partial and full height applications. Attachment hardware shall be appropriate for wall construction. Fabricate wall covering to comply with requirements indicated for design, dimensions, detail, finish and sizes.
 1. Model SSM-20AN 90 degree surface mounted corner guard with 2" (51mm) legs, 1/4" radiused cover and continuous aluminum retainer. Acrovyn solid colors (64) available, as indicated on drawing finish scheduled.
 2. Model SM-20AN 90 degree surface mounted corner guard with 3" (51mm) legs, 1/4" radiused cover and continuous aluminum retainer. Acrovyn solid colors (64) available, as indicated on drawing finish scheduled.
 3. Model SM-20MN 135 degree surface mounted corner guard with 3" (51mm) legs, 1/4" radiused cover and continuous aluminum retainer. Acrovyn solid colors (64) available, as indicated on drawing finish scheduled.

2.5 CRASH RAILS

- A. Crash Rail – SCR-48MN Crash Rail; Aluminum and Acrovyn in length up to 20'-0". AF-6 plastic anchors should seat flush with gypsum wall. Continuous aluminum retainer.

2.6 WALL COVERINGS

- A. Wall Covering; Acrovyn 4000 Wall Covering. Wall covering shall be installed in accordance with the manufacturer's instructions. Ideal room temperature during installation is between 65 degrees F – 80 degrees F (18°C – 24°C).

2.7 PANELS

- A. Marlite Product:
 - 1. Standard FRP
 - 2. Induro FRP
 - 3. Artizan FRP with Sani-Coat
 - 4. Envue with Sani-Coat
 - 5. Symmetrix with Sani-Coat
 - 6. Laminated FRP

- B. Fiberglass Panels – reinforced thermosetting polyester resin panel sheets complying with ASTM 5319.:
 - 1. Coating: Multi-layer primer, primer and finish coats or applied over-layer.
 - 2. Dimensions:
 - a. Thickness – 0.090" (2.29" (2.29mm) nominal
 - b. Width – 4'-0" (1.22m) nominal
 - c. Length As indicated on the drawings
 - 3. Tolerance - Length and Width: +/- 1/8" (3.175mm)

2.8 FABRICATION

- A. Fabricate wall covering to comply with requirements indicated for design, dimensions, detail, finish and sizes.

2.9 ACCESSORIES

- A. Acrovyn Wall Covering shall be furnished as a complete packaged system, containing all adhesive. Adhesive shall be water based and non-hazardous. Water based primer is also available for purchase.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verification of conditions: Examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion. Do not proceed until unsatisfactory conditions have been corrected.
- B. That dimensions are correct to receive items.
- C. That adjacent or adjoining surfaces are clean, dry, reasonably smooth, and free from defects.
- D. Absence of other conditions that will adversely affect installation.

3.2 PREPARATION

- A. Surface preparation: Prior to installation, clean substrate to remove dirt, debris and loose particles. Perform additional preparation procedures as required by manufacturer's instructions.
- B. Protection: Take all necessary steps to prevent damage to material during installation as required in manufacturer's installation instructions.

3.3 INSTALLATION

- A. Install the work of this section in strict accordance with the manufacturer's recommendations using approved adhesive.
- B. Temperature at the time of installation must be between 65-75°F (18-24°C) and be maintained for at least 48 hours after the installation to allow for proper adhesive set up.
- C. Relative humidity shall not exceed 80%.
- D. Do not expose wall covering to direct sunlight during or after installation. This will cause the surface temperature to rise, which in turn will cause bubbles and delimitation. Resilient Corner Guards:

each guard; fasten through finish wall surface to studs.

1/16 inch.

E. Resilient Bumper Guards:

(3) Snap guards into place: ensure hairline joints with end caps.

F. Install items plumb, true, rigid, and neatly trimmed out. Corner guards shall run from top of base to finished ceiling, unless otherwise indicated.

G. Protect dissimilar metals and materials from contact with each other or with other materials which cause corrosive action.

3.4 CLEANING

A. General: Immediately upon completion of installation, clean wall covering and accessories in accordance with manufacturer's recommended cleaning method.

B. Remove surplus materials, rubbish and debris resulting from installation as work progresses and upon completion of work.

3.5 PROTECTION

A. Protect installed materials to prevent damage by other trades. Use materials that may be easily removed without leaving residue or permanent stains.

END OF SECTION

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SECTION 09 72 16 WALL COVERINGS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Surface preparation.
- B. Prime painting.
- C. Wall covering.
- D. Adhesives and accessories.

1.2 REFERENCES

- A. ASTM E84 - Test Method for Surface Burning Characteristics of Building Materials.
- B. CFFA-W-101-B - Chemical Fabrics and Film Association Quality Standard for Vinyl Coated Fabric Wall Covering.
- C. FS CCC-W-408 A and B - Wall Covering, Vinyl Coated.
- D. UL - Underwriters Laboratories, Inc.

1.3 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in manufacturing commercial wall coverings with five years documented experience.
- B. Applicator: Company specializing in installing commercial wall coverings with five years documented experience.

1.4 REGULATORY REQUIREMENTS

- A. Conform to flame/smoke developed ratings of no more than 25/50 when tested according to ASTM E84 by UL.
- B. Each roll of material used shall have UL labels affixed thereto verifying tests.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Submit two 12-inch square samples of wall covering illustrating color, finish, and texture.

- C. Submit manufacturer's installation instructions under provisions of Section 01 33 00.
- D. Submit test reports verifying flame/smoke ratings.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and protect products under provisions of Section 01 87 00.
- B. Inspect roll materials on site to verify acceptance.
- C. Protect packaged adhesive from temperature cycling.
- D. Do not store roll goods on end.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Provide continuous ventilation and heating facilities to maintain substrate surface and ambient temperatures above 60 degrees Fahrenheit, unless required otherwise by manufacturer's instructions.
- B. Do not apply adhesive when substrate surface temperature or ambient temperature is below 60 degrees Fahrenheit or relative humidity is above 40 percent.
- C. Maintain these conditions 72 hours before, during, and after installation of wall covering.

1.8 EXTRA STOCK

- A. Provide 25 lineal feet of each pattern and color of wall covering under provisions of Section 01 70 00.
- B. Package and label each roll by manufacturer, color, and pattern, and designated room number; store where directed.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. MDC; 400 High Grove Blvd., Glendale Heights, IL 60139; Phone: 800-621-4006; Website: www.mdcwall.com
- B. Substitutions: or equal

2.2 MATERIALS

- A. Wall Covering: Vinyl fabric roll stock, conforming to FS CCC-W-408 A and B and CFFA W-101-B for Type II wallcovering and the following:

1. Total Weight: 20.0 oz/lin yd.
2. Roll Width: 54 inches
3. Pattern and Color: See Finish Schedule Sheet ID2.00.

4. Fire Rating, ASTM E84: Class A.
 - a. Flame Spread: 15.
 - b. Smoke Developed: 20.

5. Stain Resistance (If Required): ASTM D-1308, Method B: 24 hour exposure followed by washing with soap and water.
 - a. Ethanol Pencil Tea 10 percent Hydrochloric Acid
 - b. Vinegar Mayonnaise Milk 10 percent Sodium Hydroxide
 - c. Detergent Bleach Coca-Cola Oleic Acid
 - d. Lemon Juice Crayon Pot Wine 10 percent Ammonia
 - e. Coffee Ketchup Hydrogen Peroxide

2.3 ACCESSORIES

- A. Adhesive: Type recommended by wall covering manufacturer to suit application to substrate. Mildew-resistant, non-staining, and strippable.
- B. Substrate Filler: As recommended by adhesive and wall covering manufacturers; compatible with substrate.
- C. Substrate Primer and Sealer: As recommended by adhesive and wall covering manufacturer.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Verify that substrate surfaces are ready to receive Work, and conform to requirements of the wall covering manufacturer.
- B. Verify flatness tolerance of surfaces does not vary more than 1/8 inch in 10 feet nor vary at a rate greater than 1/16 inch/foot.

- C. Beginning of installation means acceptance of substrate.

3.2 PREPARATION

- A. Fill cracks and smooth irregularities with filler; sand smooth.
- B. Sand glossy surfaces. Shellac stains or marks which may bleed.
- C. Remove electrical and telephone wall plates, covers and wall mounted fixtures.
- D. Vacuum clean surfaces free of loose particles.
- E. Prime and seal substrate in accordance with manufacturer's recommendations. Apply surface sealer to gypsum drywall which will permit subsequent removal of wallcovering without damage to paper facing.

3.3 INSTALLATION

- A. Apply adhesive and wall covering in accordance with manufacturer's instructions.
- B. Apply adhesive to fabric surface immediately prior to application of wall covering.
- C. Use wall covering in roll number sequence.
- D. Register or reverse pattern of wall covering to insure color uniformity.
- E. Razor trim edges on flat work table. Do not razor cut on gypsum board surfaces.
- F. Apply wall covering smooth, without wrinkles, gaps or overlaps. Eliminate air pockets and ensure full bond to substrate surface. Butt edges tight.
- G. Horizontal seams are not acceptable.
- H. Do not seam within 6 inches of internal or external corners.
- I. Install wall covering before installation of bases, cabinets, hardware, or items attached to or spaced slightly from wall surface. Do not install wall covering more than 1/4 inch below top of resilient base.
- J. Cover spaces above and below windows, above doors, in sequence from roll.
- K. Where wall covering tucks into door frame reveals, or metal wallboard or plaster stops, apply covering with contact adhesive within 6 inches of wall covering termination. Ensure full contact bond.
- L. Remove excess wet adhesive from seam before proceeding to next wall covering sheet. Wipe clean with dry cloth.

3.4 CLEANING

- A. Clean wall coverings of excess adhesive, dust, dirt, and other contaminants.
- B. Replace wall plates and accessories removed prior to Work of this Section.

3.5 PROTECTION

- A. Protect finished installation under provisions of Section 01 87 00.

END OF SECTION

SECTION 09 84 00 FABRIC WRAPPED ACOUSTICAL WALL PANELS

PART 1 – GENERAL

1.1 SUMMARY

- A. Section Includes: Fabric Wrapped Acoustical Wall Panels
- B. Related Section/Items
 - 1. Gypsum Board – Section 09250
 - 2. Wallcoverings – Section 09720

1.2 SUBMITTALS

- A. Product Data:
 - 1. Manufacture Specifications and other data needed that provides proof of compliance with specified requirements.
 - 2. Include technical information, maintenance instructions and the following test data: Class 1 or A flame spread rating per ASTM E-84, NRC rating in accordance with ASTM C-423.
- B. Shop Drawing:
 - 1. Provide complete shop drawings showing all wall layouts, to include panel joints, detailed references, dimensions and the method of attachment.
- C. Samples:
 - 1. Submit 2 each 12 X 12 inch samples of actual acoustical / tackable panel core showing edge detail illustrating specified fabric covering, to include mounting device.
 - 2. Submit full range of manufacturer's color selection of fabric specified.
 - 3. Submit manufacturer's installation instructions under provisions of Section 01300.
 - 4. Submit test reports verifying flame/smoke ratings Class 1/A ASTM E-84.
- D. Approved Alternates:
 - 1. Substitutions or changes to this specification will only be permitted by prior written approval by the architect.

1.3 QUALITY ASSURANCE

- 2. Single Source Responsibility: Obtain acoustical panel materials from a single manufacture with 10 years documented experience. Provide acoustical panels and fabrics of each type required from one (1) manufacturer, of uniform texture and color.
- 3. Installer/Applicator: Company specializing in installing acoustical/tackable panel systems with 10 years documented experience and that installation method proposed is acceptable to panel manufacturer.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Protect all products during shipment, storage and installation.
- B. Deliver fabricated units and components to job site in unopened packages or crates, store elevated above floor in an enclosed space with proper ventilation and protection from damage.
- C. On-site storage to be secured within a storage area that is climatically controlled to normal operational levels.

1.5 EXTRA MATERIAL

- A. Provide 30 feet of each fabric pattern and color for future repair use.
- B. Package and label each roll by manufacturer, color, pattern and designated room number; store where directed.

PART 2 – PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Vertical Interior Solutions
2275 Auto Centre Dr.
Glendora, CA 91740
(800) 472-7891 Phone
(909) 592-7037 Fax –
Contact: Peter Southorn Psouthorn@lbiboyd.com
- B. Or approved equal

2.2 MATERIALS

- A. Acoustical Panels shall be APS ECOCORE ACOUSTICAL PANELS.
Represented by: LBI/BOYD (800) 472-7891
- B. Flame Spread: Acoustical Panels to have a Class 1 or A flame spread rating per ASTM E-84.
- C. Acoustical/Tackable Panels shall be constructed of a 100% Polyester core (60% PET-Recycled Fiber, 40% PET-Virgin Fiber).
- D. Panel thickness: 1" thickness
- E. Sizes: As noted on drawings and field verified with Architect prior to order, not to exceed 4' x 10' in overall width & height and to coordinate with any fabric

repeat that exists. Panels are to be manufactured according to field verified dimensions supplied by the installing contractor. Standard tolerances are to be +/- 1/16" in width and height.

- F. Edge Profile: Shall be either a square or beveled chemically treated hardened edge profile. Field verify with Architect prior to order.
- G. Acoustical Performance: Panels shall maintain a minimum NRC rating of .80 in accordance with ASTM C-423 (Type "A" mounting).
- H. Fabric Finish: Fabric shall be applied directly to face and all edges of the panel, returning onto the back side of the panel providing a full finish detail. Corners are to be fully tailored.
Selected fabric:
Vertical Interior Solutions approved fabric
Pattern Name: _____
Item Number: _____
Color Name: _____
(To be selected by Architect prior to order.)
- I. Fabric Direction: Shall be applied to face of panel vertically, aligning repeats on panel joints achieving a uniform and continuous match pattern.
- J. Mounting of Panels: Construction grade adhesive & finish nails.

PART 3 – EXECUTION

3.1 INSPECTION

- A. Verify all dimensions to ensure proper fabrication of materials.
- B. Contractor shall be responsible for the final examination of all surfaces & edges | to accept conditions prior to the panel installation.

3.2 INSTALLATION

- A. Installation of acoustical panels shall not begin until all wet work (plastering, concrete, gypsum board finishing, painting, etc.) is completed and completely dry. Building shall be properly sealed and under standard occupancy conditions (temperature shall be 60-85° F and not more than 60% relative humidity) before installation begins.
- B. Mounting of Panels: Construction grade adhesive & finish nails.
- C. Install panels and fabrics in accordance with manufacturer's instructions / approved shop drawings.
- D. Arrange panels symmetrically on each wall, unless otherwise indicated.

- E. Arrange acoustical panels in orientate directional pattern, if any.
- F. Remove panels that are damaged and unacceptable to Architect, replace with acceptable finished panels at no expense to owner.
- G. Installation can not commence until unacceptable conditions are corrected.

3.3 WARRANTY

- A. Products to carry a 2 year limited warranty against workmanship or product defects.

END OF SECTION

SECTION 09 91 00 PAINTING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Surface preparation.
- B. Products and application.
- C. Surface finish schedule.
- D. Patch to match existing.

1.2 REFERENCES

- A. ASTM D16 - Definitions of Terms Relating to Paint, Varnish, Lacquer, and Related Products.
- B. ASTM D2016 - Test Method for Moisture Content of Wood.

1.3 SYSTEM DESCRIPTION

- A. Preparation of all surfaces to receive final finish.
- B. Painting and finishing Work of this Section using coating systems of materials including primers, sealers, fillers, and other applied materials whether used as prime, intermediate, or finish coats.
- C. Surface preparation, priming, and finish coats specified in this Section are in addition to shop-priming and surface treatment specified under other Sections.
- D. Painting and finishing all exterior and interior surfaces of materials including structural, mechanical, and electrical Work on site, in building spaces, and above or on the roof.
- E. Paint exposed surfaces except where a surface or material is specifically indicated not to be painted or is to remain natural. Where an item or surface is not specifically mentioned, paint the same as similar adjacent materials or surfaces.

1.4 DEFINITIONS

- A. Conform to ASTM D16 for interpretation of terms used in this Section.

1.5 QUALITY ASSURANCE

- A. Product Manufacturer: Company specializing in manufacturing quality paint and finish products with five years experience.
- B. Applicator: Company specializing in commercial painting and finishing with five years documented experience.
- C. Regulatory Requirements: Comply with applicable codes and regulations of governmental agencies having jurisdiction including those having jurisdiction over airborne emissions and industrial waste disposal. Where those requirements conflict with this specification, comply with the more stringent provisions. Comply with the current applicable regulations of the California Air Resources Board (CARB) and the Environmental Protection Agency (EPA).
- D. Coats: The number of coats specified is the minimum number acceptable. If full coverage is not obtained with the specified number of coats, apply such additional coats as are necessary to produce the required finish.
- E. Employ coats and undercoats for all types of finishes in strict accordance with the recommendations of the paint manufacturer.
- F. Provide primers and undercoat paint produced by the same manufacturer as the finish coat.

1.6 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Provide manufacturer's technical information and instructions for application of each material proposed for use by catalog number.
- C. List each material by catalog number and cross-reference specific coating with specified finish system.
- D. Provide manufacturer's certification that products proposed meet or exceed specified materials.
- E. Submit two 8-1/2 inch x 11 inch Samples of each paint color and texture applied to cardboard. Resubmit Samples until acceptable color, sheen and texture is obtained.
- F. On same species and quality of wood to be installed, submit two 4 x 8 inch Samples showing system to be used.
- G. Provide product data, MSDS, and other official literature from manufacturer identifying that the INTERIOR APPLIED products meet the testing requirements and threshold limits of the State of California Department of Health Services (DHS) *Standard Practice for the Testing of Volatile Organic Compounds*. Such products shall be identified by a 3rd party certification program listing low-emitting

material products. Contractor to clearly highlight, circle and call out on the product literature, identifying how the product complies.

1.7 FIELD SAMPLES

- A. Provide field samples under provisions of Section 01 33 00.
- B. On wall surfaces and other exterior and interior components, duplicate specified finishes on at least 100 square feet of surface area.
- C. Provide full-coat finishes until required coverage, sheen, color and texture are obtained.
- D. Simulate finished lighting conditions for review of field samples.
- E. After finishes are accepted, the accepted surface may remain as part of the Work and will be used to evaluate subsequent coating systems applications of a similar nature.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver the products to site and store and protect under provisions of Section 01 87 00.
- B. Deliver products to site in sealed and labeled containers; inspect to verify acceptance.
- C. Container labeling to include manufacturer's name, type of paint, brand name, brand code, coverage, surface preparation, drying time, cleanup, color designation, and instructions for mixing and reducing. Paint containers not displaying product identification will not be acceptable.
- D. Store paint materials at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in well ventilated area, unless required otherwise by manufacturer's instructions.
- E. Take precautionary measures to prevent fire hazards and spontaneous combustion.

1.9 ENVIRONMENTAL REQUIREMENTS

- A. Provide continuous ventilation and heating facilities to maintain surface and ambient temperatures above 45 degrees F for 24 hours before, during, and 48 hours after application of finishes, unless required otherwise by manufacturer's instructions.
- B. Do not apply exterior coatings during rain or snow, or when relative humidity is above 50 percent, unless required otherwise by manufacturer's instructions.

- C. Minimum Application Temperatures for Latex Paints: 45 degrees F for interiors; 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.
- D. Minimum Application Temperature for Varnish and Urethane Finishes: 65 degrees F for interior or exterior, unless required otherwise by manufacturer's instructions.
- E. Provide lighting level of 80 feet candles measured mid-height at substrate surface.

1.10 EXTRA STOCK

- A. Provide a ten gallon container of each finish paint color to Owner for touchup.
- B. Label each container with color, texture, and room locations in addition to the manufacturer's label.

1.11 QUALITY ASSURANCE

- A. Product Manufacturer: Company specializing in manufacturing quality paint and finish products with five years experience.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Unless specifically identified otherwise, product designations are those of the Dunn-Edwards Corporation, (800) 537-4098 and shall serve as the standard for kind, quality, and function.
- B. Subject to compliance with requirements, other manufacturers offering equivalent products are:
 - 1. Benjamin Moore Paints.
 - 2. Frazee Paint (McCloskey, Ameron).
 - 3. ICI Paint Stores.
 - 4. Kelly-Moore Paint Company.
 - 5. Pittsburgh Paints.
 - 6. Sherwin Williams.
 - 7. Spectra-Tone Paint Corp.

8. Tnemec Company, Inc.
9. Vista Paint Corporation.
- C. Substitutions: Under provisions of Section 01 62 00.

2.2 MATERIALS

- A. Ready mixed, except field catalyzed coatings. Process pigments to a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating.
- B. Good flow and brushing properties; capable of drying or curing free of streaks or sags.
- C. Accessory Materials: Linseed oil, sheila, turpentine, paint thinners and other materials not specifically indicated but required to achieve the finishes specified, of commercial quality.
- D. INTERIOR APPLIED Paint shall be low-emitting and must meet the testing requirements and threshold limits of the State of California Department of Health Services (DHS) *Standard Practice for the Testing of Volatile Organic Compounds*. Such products shall be identified by a 3rd party certification program listing low-emitting material.

2.3 FINISHES

- A. Refer to schedule at end of Section for surface finish schedule.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Verify that surfaces are ready to receive Work as instructed by the product manufacturer.
- B. Examine surfaces to be finished prior to commencement of Work. Report any condition that may potentially affect proper application.
- C. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
 1. Plaster and Gypsum Wallboard: 12 percent.
 2. Masonry, Concrete, and Concrete Unit Masonry: 12 percent.
 3. Interior Located Wood: 15 percent, measured in accordance with ASTM D2016.

4. Exterior Located Wood: 15 percent, measured in accordance with ASTM D2016.

D. Beginning of installation means acceptance of existing surfaces.

3.2 SURFACE PREPARATION

- A. Remove electrical plates, hardware, light fixture trim, and fittings prior to preparing surfaces or finishing.
- B. Correct minor defects and clean surfaces which affect Work of this Section.
- C. Shellac and seal marks which may bleed through surface finishes.
- D. Impervious Surfaces: Remove mildew by scrubbing with solution of tri-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
- E. Aluminum Surfaces: Remove surface contamination by steam or high pressure water. Remove oxidation with acid etch and solvent washing. Apply etching primer immediately following cleaning.
- F. Insulated Coverings: Remove dirt, grease, and oil from canvas and cotton.
- G. Concrete Floors: Remove contamination, acid etch, and rinse floors with clear water. Verify required acid-alkali balance is achieved. Allow to dry.
- H. Gypsum Board: Repair all voids, nicks, cracks and dents with patching materials and finish flush with adjacent surface. Latex fill minor defects. Spot prime defects after repair.
- I. Galvanized Surfaces: Remove surface contamination and oils and wash with solvent. Pretreat with phosphoric acid etch or vinyl wash. Apply coat of etching primer the same day as pretreatment is applied.
- J. Concrete and Unit Masonry: Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry. Remove stains caused by weathering of corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.
- K. Plaster: Fill hairline cracks, small holes, and imperfections with latex patching plaster. Make smooth and flush with adjacent surfaces. Wash and neutralize high alkali surfaces.
- L. Uncoated Steel and Iron: Remove grease, scale, dirt, and rust. Where heavy coatings of scale are evident, remove by wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Spot prime paint after repairs.

- M. Shop Primed Steel: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces.
- N. Interior Wood: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats.
- O. Exterior Wood: Remove dust, grit, and foreign matter. Seal knots, pitch streaks, and sappy sections. Fill nail holes with tinted exterior caulking compound after prime coat has been applied.
- P. Glue-Laminated Beams: Prior to finishing, wash surfaces with solvent, remove grease and dirt.
- Q. Wood Doors: Seal top and bottom edges with 2 coats of spar varnish sealer.

3.3 PROTECTION OF ADJACENT WORK

- A. Protect elements surrounding the Work of this Section from damage or disfiguration.
- B. Repair damage to other surfaces caused by Work of this Section.
- C. Furnish drop cloths, shields, and protective methods to prevent spray or droppings from disfiguring other surfaces.
- D. Remove empty paint containers from site.

3.4 WORK NOT TO BE PAINTED

- A. Painting is not required on surfaces in concealed and inaccessible areas such as furred spaces, foundation spaces, utility tunnels, pipe spaces and duct shafts.
- B. Do not paint metal surfaces such as stainless steel, chromium plate, brass, bronze, and similar finished metal surfaces.
- C. Do not paint anodized aluminum or other surfaces which are specified to be factory pre-finished.
- D. Do not paint sandblasted or architecturally finished concrete surfaces.
- E. Do not paint over Underwriters Laboratories, Factory Mutual or other code-required labels or identifications.

3.5 APPLICATION

- A. Apply products in accordance with manufacturer's instructions.
- B. Do not apply finishes to surfaces that are not dry.
- C. Apply each coat to uniform finish.

- D. Apply each coat of paint slightly darker than preceding coat unless otherwise approved.
- E. Sand lightly between coats to achieve required finish.
- F. Allow applied coat to dry before next coat is applied.
- G. The number of coats specified is the minimum that shall be applied. Apply additional coats when undercoats, stains or other conditions show through final paint coat, until paint film is of uniform finish, color and appearance.
- H. Where clear finishes are required, tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.
- I. Prime back surfaces of interior and exterior woodwork with primer paint.
- J. Prime back surfaces of interior woodwork scheduled to receive stain or varnish finish with gloss varnish reduced 25 percent with mineral spirits.
- K. Paint mill finished door seals to match door or frame.
- L. Paint primed steel glazing stops in doors to match door or frame.
- M. Cloudiness, spotting, lap marks, brush marks, runs, sags, spikes and other surface imperfections will not be acceptable.
- N. Where spray application is used, apply each coat of the required thickness. Do not double back to build up film thickness of two coats in one pass.
- O. Where roller application is used, roll and redistribute paint to an even and fine texture. Leave no evidence of roller laps, irregularity of texture, skid marks, or other surface imperfections.
- P. For painting of exterior patchwork, paint to the nearest surface break.

3.6 FINISHING MECHANICAL AND ELECTRICAL EQUIPMENT

- A. Paint shop primed equipment. Do not paint shop prefinished items.
- B. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
- C. Prime and paint insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, except where items are prefinished.
- D. Replace identification markings on mechanical or electrical equipment when painted accidentally.

- E. Paint both sides and edges of plywood backboards for electrical and telephone equipment before installing equipment.
- F. Replace electrical plates, hardware, light fixture trim, and fittings removed prior to finishing.
- G. Paint grilles, registers, and diffusers which do not match color of adjacent surface.
- H. Paint all mechanical and electrical equipment, vents, fans, and the like occurring on roof.
- I. Do not paint moving parts of operating units; mechanical or electrical parts such as valve operators; linkages; sensing devices; and motor shafts.
- J. Do not paint over labels or equipment identification markings.
- K. Do not paint mechanical room specialties such as compressors, boilers, pumps, control panels, etc.
- L. Do not paint switch plates, light fixtures, and fixture lenses.

3.7 CLEANING

- A. As Work proceeds, promptly remove paint where spilled, splashed, or spattered.
- B. During progress of Work maintain premises free of unnecessary accumulation of tools, equipment, surplus materials, and debris.
- C. Collect cotton waste, cloths, and material which may constitute a fire hazard, place in closed metal containers and remove daily from site.

3.8 PROTECTION OF COMPLETED WORK

- A. Protect finished installation under provisions of Section 01 87 00.
- B. Erect barriers and post warning signs. Maintain in place until coatings are fully dry.
- C. Confirm that no dust generating activities will occur following application of coatings.

3.9 PATCHING

- A. After completion of painting in any one room or area, repair surfaces damaged by other trades.
- B. Touch-up or re-finish as required to produce intended appearance.

3.10 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed under provisions of Section 01 45 29.
- B. The Owner reserves the right to invoke the following test procedure at any time and as often as the Owner deems necessary.
- C. The Owner will engage the services of an independent testing agency to sample paint material being used.
- D. Samples of material delivered to the Project will be taken, identified, sealed, and certified in the presence of the Contractor.
- E. The testing agency will perform appropriate quantitative materials analysis and other characteristic testing of materials as required by the Owner.
- F. If test results show materials being used and their installation do not comply with specified requirements or manufacturer's recommendations, the Contractor may be directed to stop painting, remove noncomplying paint, pay for testing and repaint surfaces to acceptable condition.

3.11 COLOR SCHEDULE

- A. Paint and finish colors shall be custom color, mixed and formulated to meet color as specified by Architect.
- B. Interior Colors: 10 interior paint colors to be selected and located by Architect.
- C. Exterior Colors: 4 exterior paint colors to be selected and located by Architect.
- D. Access doors, registers, exposed piping, electrical conduit and mechanical/electrical panels if not stainless steel; generally the same color as adjacent walls.
- E. Exterior and interior steel doors, frames and trim; match adjacent existing door frames.
- F. Doors: Match adjacent existing door paint or varnish.
- G. Interior and Exterior Steel Fabrications, if not Stainless Steel: Match existing or adjacent walls.

3.12 SCHEDULE - EXTERIOR SURFACES

- A. The following Dunn-Edwards paint systems or Architect approved equal shall be used:
 - 1. Wood-Painted (Flat Acrylic) - Exterior Trim and Exposed Wood Framing

- | | |
|-----------|------------------|
| 1st coat: | W708 EZ Prime |
| 2nd coat: | W701V Evershield |
| 3rd coat: | W701V Evershield |
2. Wood-Painted (Semi-Gloss Acrylic)
- | | |
|-----------|------------------|
| 1st coat: | W708 EZ Prime |
| 2nd coat: | W901V Permasheen |
| 3rd coat: | W901V Permasheen |
3. Wood-Painted (Gloss Alkyd)
- | | |
|-----------|------------------|
| 1st coat: | W708 EZ Prime |
| 2nd coat: | W960V Permagloss |
| 3rd coat: | W960V Permagloss |
4. Wood - Semi-Transparent
- | | |
|-----------|------------------------|
| 1st coat: | WPT3 "OKON Weatherpro" |
|-----------|------------------------|
5. Concrete (Flat Acrylic) - Exposed concrete indicated on drawings to be painted
- | | |
|-----------|------------------|
| 1st coat: | W709 Eff-Stop |
| 2nd coat: | W701V Evershield |
| 3rd coat: | W701V Evershield |
6. Concrete Masonry Units (Flat Acrylic)
- | | |
|------------|------------------|
| Fill coat: | W305 Blocfil |
| 1st coat: | W701V Evershield |
| 2nd coat: | W701V Evershield |
7. Cement Plaster (Flat Elastomeric)
- | | |
|-----------------------|-----------------|
| 1st coat: | Enduraseal W360 |
| 2nd coat: | Endurawall W370 |
| 3 rd coat: | Eudurawall W370 |
8. Steel-Primed or Unprimed (Flat Acrylic)
- | | |
|-----------------------|-------------------|
| 1 st coat: | 43-5 Corrobar |
| 2nd coat: | W-701V Evershield |
| 3 rd coat: | W-701V Evershield |
9. Steel-Primed or Unprimed (Semi-Gloss Acrylic)
- | | |
|-----------------------|---------------|
| 1 st coat: | 43-5 Corrobar |
|-----------------------|---------------|

- 2nd coat: W901V Permasheen
- 3rd coat: W901V Permasheen
- 10. Steel-Primed or Unprimed (Gloss-Alkyd)
 - 1st coat: 43-5 Corrobar
 - 2nd coat: 10 Syn-Lustro
 - 3rd coat: 10 Syn-Lustro
- 11. Steel-Galvanized (Flat Acrylic)
 - 1st coat: GE 123 Galva Etch, Etching Liquid
 - 2nd coat: 43-7 Galv-Alum
 - 3rd coat: W701V Evershield
 - 4th coat: W701V Evershield
- 12. Steel-Galvanized (Semi-Gloss - Acrylic)
 - 1st coat: GE 123 Galva Etch, Etching Liquid
 - 2nd coat: 43-7 Galv-Alum
 - 3rd coat: W901V Permasheen
 - 4th coat: W901V Permasheen
- 13. Steel-Galvanized (Gloss - Alkyd)
 - 1st coat: GE 123 Galva Etch, Etching Liquid
 - 2nd coat: 43-7 Galv-Alum
 - 3rd coat: 10 Syn-Lustro
 - 4th coat: 10 Syn-Lustro
- 14. Pavement Marking –Refer to Section 32 12 16 & Section 32 13 13

3.13 SCHEDULE - INTERIOR SURFACES

- A. The following Dunn-Edwards paint systems or Architect approved equal shall be used:
 - 1. Wood-Painted (Semi-Gloss Alkyd) - Wood Trim
 - 1st coat: W707 Unikote
 - 2nd coat: W901V Permasheen
 - 3rd coat: W901V Permasheen
 - 2. Wood-Painted (Gloss Alkyd)
 - 1st coat: W707 Unikote

- 2nd coat: W960V Permagloss
- 3rd coat: W960V Permagloss
- 3. Glue-Laminated Wood and Wood Timber Members (Satin-Flat Varnish)
 - 1st coat: V-QYB Series Stainseal
 - 2nd coat: MC80-2025 McCloskey
 - 3rd coat: MC80-0007 McCloskey
- 4. Wood - Transparent (Stain - Semi-Gloss Varnish)
 - 1st coat: V-QYB Series Stainseal
 - Filler coat (Open grain wood only): Jasco Paste Wood Filler
 - 2nd coat: MC80-2025 McCloskey
 - 3rd coat: MC80-6702 McCloskey
 - 4th coat: MC80-6702 McCloskey
- 5. Wood - Transparent (Stain-Semi-Gloss Lacquer)
 - 1st coat: V-QYB Series Wood Stain
 - 2nd coat: V-NRS-1620 (Sanding Sealer)
 - 3rd coat: V-NRF1626 LUSTER-LAC (Lacquer)
 - 4th coat: V-NRF 1626 LUSTER-LAC (Lacquer)
- 6. Concrete (Flat-Latex)
 - 1st coat: W709 Eff-Stop
 - 2nd coat: W401V Decovel
 - 3rd coat: W401V Decovel
- 7. Concrete (Semi Gloss Latex)
 - 1st coat: W709 Eff-Stop
 - 2nd coat: W450V Decoglo
 - 3rd coat: W450V Decoglo
- 8. Concrete Floors - Sealed (Low Sheen Epoxy Acrylic)
 - 1st coat: Tuff Floor W-810
 - 2nd coat: Tuff Floor W-810
- 9. Concrete Block (Flat-Latex)
 - 1st coat: W305 Blocfil
 - 2nd coat: W401V Decovel

- 3rd coat: W401V Decovel
10. Concrete Block (Semi Gloss-Latex)
- 1st coat: W305 Blocfil
- 2nd coat: W450V Decoglo
- 3rd coat: W450V Decoglo
11. Concrete Block (Semi Gloss-Epoxy)
- 1st coat: W305 Blockfiller
- 2nd coat: 9100 Series RUST-OLEUM
- 3rd coat: 9100 Series RUST-OLEUM
12. Steel - Primed or Unprimed (Flat-Latex) - Exposed Duct Work
- 1st coat: 43-5 Corrobar (or Touch up)
- 2nd coat: W401V Decovel
- 3rd coat: W401V Decovel
13. Steel - Primed or Unprimed (Semi-Gloss-Alkyd) - Steel Doors/Frames
- 1st coat: 43-5 Corrobar (or touch up)
- 2nd coat: 9 Syn-Lustro Semi-Gloss
- 3rd coat: 9 Syn-Lustro Semi-Gloss
14. Steel - Primed or Unprimed (Gloss-Alkyd)
- 1st coat: 43-5 Corrobar (or touch up)
- 2nd coat: 10 Syn-Lustro Gloss
- 3rd coat: 10 Syn-Lustro Gloss
15. Steel - Galvanized (Flat-Latex) - Exposed Duct Work
- 1st coat: 43-7 Galv-Alum
- 2nd coat: W401V Decovel
- 3rd coat: W401 V Decovel
16. Steel - Galvanized (Semi-Gloss - Alkyd) - Steel Handrails
- 1st coat: 43-7 Galv-Alum
- 2nd coat: 9 Syn-Lustro Semi-Gloss
- 3rd coat: 9 Syn-Lustro Semi-Gloss

17. Steel - Galvanized (Gloss - Alkyd)

1st coat: 43-7 Galv-Alum
2nd coat: 10 Syn-Lustro Gloss
3rd coat: 10 Syn-Lustro Gloss

18. Gypsum Board (Flat - Latex)

1st coat: W101V PVA
2nd coat: W401V Decovel
3rd coat: W401V Decovel

19. Gypsum Board (Eggshell-Acrylic) - Gypsum Board Walls and Ceilings

1st coat: W101V PVA
2nd coat: W440V Decosheen
3rd coat: W440V Decosheen

20. Gypsum Board (Semi-Gloss -Acrylic) - Kitchenette areas; all Interior Wood Trim

1st coat: W101V PVA
2nd coat: W901V Permasheen
3rd coat: W901V Permasheen

21. Gypsum Board (Gloss -Acrylic)

1st coat: W101V PVA
2nd coat: W960V Permagloss
3rd coat: W960V Permagloss

22. Gypsum Board (Gloss -Epoxy)

1st coat: W102 Proseal
2nd coat: 9100 Series RUSTOLEUM
3rd coat: 9100 Series RUSTOLEUM

23. Plaster (Flat-Latex)

1st coat: W709 Eff-Stop
2nd coat: W401V Decovel

24. Plaster (Eggshell-Acrylic)

1st coat: W709 Eff-Stop
2nd coat: W440V Decosheen
3rd coat: W440V Decosheen

25. Plaster (Semi Gloss-Latex) - Wet Areas U.O.N.

1st coat: W709 Eff-Stop
2nd coat: W450V Decoglo
3rd coat: W450V Decoglo

26. Plaster (Semi Gloss-Acrylic)

1st coat: W709 Eff-Stop
2nd coat: W901V Permagloss
3rd coat: W901V Permagloss

27. Plaster (Gloss-Alkyd)

1st coat: W709 Eff-Stop
2nd coat: W960V Permagloss
3rd coat: W960V Permagloss

28. Plaster (Gloss-Epoxy)

1st coat: 9100 Series RUSTOLEUM
2nd coat: 9100 Series RUSTOLEM
3rd coat: 9100 Series RUSTOLEUM

29. Acoustic Panels (Flat Poly Vinyl Acetate)

1st coat: W615 AcoustiKote
2nd coat: W615 AcoustiKote

END OF SECTION

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SECTION 09 96 53 ELASTOMERIC COATING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Surface preparation and application of elastomeric coating on exterior cement plaster finish.

1.2 SUBMITTALS

selection and installations.

1.3 QUALITY ASSURANCE

1. American Society for Testing and Materials: ASTM D16, Definitions of Terms Relating to Paint, Varnish, Lacquer and Related Products.
2. PDCA (Painting and Decorating Contractors of America): Painting, Architectural Specifications Manual.

1.4 QUALIFICATIONS

minimum of five years experience.

1.5 REGULATORY REQUIREMENTS

1.6 DELIVERY, STORAGE AND HANDLING

manufacturers' labels intact and legible. Inspect to verify acceptability.

number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

- D. Store paint materials at minimum ambient temperature of 45 degrees Fahrenheit and a maximum of 90 degrees Fahrenheit, in a ventilated area, and as required by manufacturer's instructions.

1.7 PROJECT CONDITIONS

45 degrees Fahrenheit or higher than 95 degrees Fahrenheit.

- C. Do not apply exterior coatings during rain or snow, or when relative humidity is outside of the RH ranges required by the paint product manufacturer.
- D. Do not apply materials until finish coat has been allowed to cure a minimum of 28 days and sealants have been allowed to cure a minimum of 5 days.
- E. Application shall be rescheduled if there is rain is expected within 24 hours.

1.8 EXTRA MATERAILS

- A. Provide five gallons of each color, type, and surface texture to Owner.
- B. Label each container with color, type texture and locations, in addition to the manufacturer's label.

1.9 MOCK-UP

- A. Construct a mock-up of coating installation before proceeding with work. The location of the mock-up will be selected by the Owner. Provide a separate mock-up for all colors selected by the Owner.
- B. Provide adhesion test in the presence of the manufacturer's representative, Owner's representative and Architect of mock-up coating to confirm acceptability.

1.10 QUALITY CONTROL

- A. Wall Coating:
 - 1. Inspector of Record will perform tape adhesion tests on the coating after application to ensure proper bonding of coating to substrate. Inspector of Record] will also inspect a measure dry film thickness at various locations. If inspection shows that proper adhesion or specified dry film thickness has not been achieved, Contractor shall perform corrective Work to the satisfaction of the Inspector at no extra cost to the Owner.

2. Coating manufacturer shall observe the application of the coating and provide a written report to the Architect regarding the acceptability of the Contractor's application techniques, means and methods.

1.11 WARRANTY

- A. Colors of the surfaces coated as part of the Work in the Section shall, at the end of the one year, have remained free of noticeable fading.

PART

2.1 MANUFACTURERS

- B. Kelley-Moore "Kel-Seal" or Dow Corning "AllGuard" is permitted.

2.2 MATERIALS

- A. Vapor Permeable Elastomeric Coating:
 1. Elastomeric Coating:
 - a. First Coat (at Patch Locations Only): "Sikaguard" 552W Primer.
 - b. Second Coat and Third Coats: "Sikaguard" 550W "Elastocolor".
 - c. Coating colors to be selected by architect.

PART

3.1 EXAMINATION

product manufacturer, where applicable.

3.2 PREPARATION

- A. Mask all elements not scheduled to receive coating prior to preparing surfaces or finishing, including windows, sprinkler pipes, boxes, pipes, cables, landscaping, cars, and other surrounding elements.
- B. All surfaces must be clean, dry, sound, and frost-free with all residues and other contaminants removed.
- C. Pressure wash wall surface to remove all residues. Take all appropriate

measures to contain water so as to avoid overspray onto adjacent properties and street.

3.3 APPLICATION

- A. Apply all products in accordance with manufacturer's instructions.
- B. Do not apply finishes to surfaces that are not dry.
- C. Install sealant at required location including, but not limited to, reveal intersection joints, reveal to plaster cracks, failed sealant joints, and any other location that will not allow for the continuous waterproof applications of the wall coating.
- D. Apply primer to areas of patched cement plaster as recommended by manufacturer:
 - 1. Apply primer at a rate of 320 square feet per gallon.
 - 2. Allow primer to fully dry before commencing coating.
- E. Start and stop coating application at inconspicuous locations each day so as to avoid discontinuities at noticeable wall surfaces.
 - 1. Do not allow water to run into cavity between building wall and walls of adjacent properties.
- F. Apply two coats in uniform finish using roller or airless spray or nylon brush.
 - 1. Apply each coat at a rate of 100 square feet per gallon.
 - 2. Allow a minimum of 2 hours drying time between coats period. Allow more time as required based on climatic conditions.
- G. Fill all surface irregularities and rough spots per manufacturer's guidelines.
- H. Apply first coat of elastomeric coating. Allow applied coat to dry a minimum of 2 hours prior to application of second coat.
- I. Total nominal dry film thickness of elastomeric coating shall be 16 mils (8 mils per coat).
- J. Finished elastomeric coating shall have no pinholes or any holidays or any other visible defects and shall fully coat the wall surface.

3.4 QUALITY ASSURANCE

- A. Perform a minimum of one adhesive test for every 2,500 square feet in the presence of the manufacturer's representative (as required) to ensure compliance with warranty.
- B. Manufacturer shall provide bi-weekly visits to observe coating and adhesion tests.

3.5 CLEANING

- A. Collect waste material which may constitute a fire hazard, place in closed container, and remove daily from site.
- B. Dispose of waste as required by local, state, and federal regulations.
- C. Clean each surface that is inadvertently coated.

END OF SECTION

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SECTION 09 97 23 CONCRETE SEALER

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. High-performance sealer for interior concrete slabs.
- B. Sealer to be applied in all interior rooms that will remain bare concrete (i.e. Mechanical & Electrical rooms – refer to drawings)

1.2 SYSTEM DESCRIPTION

- A. Liquid-applied, proprietary penetrating treatment for concrete slab surfaces. System shall protect sealed areas against unsightly oil, chemical and grease stains, in addition to damage caused by moisture intrusion. Clear, water-repellant, non-membrane-forming.

1.3 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Product Data: Submit manufacturer's technical bulletins for each product.
- C. Provide protection plan for surrounding areas and for surfaces not to be coated.

1.4 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Manufacturer Qualifications: Company with a minimum of 15 years experience in manufacturing of specified products and systems.
 - 2. Applicator Qualifications: Company with a minimum of 2 years experience in application of specified products and systems on projects of similar size and scope, which is acceptable to product manufacturer.
- B. Field Sample:
 - 1. Install field sample, as directed by Architect.
 - a. Provide mock-up of at least 100 square feet. To allow for evaluation of slip resistance and appearance.

- b. Apply material in accordance with manufacturer's suggested application procedures.
2. Do not alter, move, or destroy field sample until Work is completed and approved by Architect.
3. Obtain Architect's written approval of field sample before start of material application, including approval of aesthetics, color, texture, and appearance.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Comply with manufacturer's ordering instructions and lead-time requirements to avoid construction delays.
- B. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

1.6 PROJECT CONDITIONS

- A. Environmental Requirements:
 1. Minimum application temperature shall be 40 degrees Fahrenheit and rising.
 2. Do not apply in rain or when rain is expected within 24 hours. Do not apply above 90 degrees Fahrenheit or below 40 degrees Fahrenheit or when temperatures are expected to fall below 40 degrees Fahrenheit within 24 hours.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. BASF Building Systems, telephone (800) 433-9517; "Hydrozo Enviroseal Surface Guard."
- B. Tamms Industries, Inc., telephone (800) 862-2667; "Chemstop WB."
- C. Substitutions: Under provisions of Section 01 25 00.

2.2 MATERIALS

- A. Water-based, VOC-compliant, silane liquid.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that substrate, adjacent materials, are clean and dry and ready for installation.

3.2 SURFACE PREPARATION

- A. Ensure substrates are sound and free of dust, dirt, laitance, paints, oils, grease, curing compounds, or any other contaminants.
- B. Verify that no residue from curing compounds or membrane forming sealers is present on or within surface to be treated.
 - 1. Test of penetrability by applying droplets of potable water and observing absorption. If water is not absorbed within 30 minutes, contamination is present and must be removed. Contact sealer manufacturer's technical service for recommendations.
- C. Verify that substrate has properly cured. If efflorescence is present, mechanically remove it before proceeding. For extreme cases where this is not adequate, contact sealer manufacturer's technical service.
 - 1. Concrete shall have minimum compressive strength of 3,000 pounds per square foot and be cured for minimum of 28 days or to 80 percent of design strength.

3.3 APPLICATION

- A. Apply line stripping prior to application of sealer.
- B. Complete all surface repairs, and/or joint filling procedures prior to application of sealer. Allow appropriate cure time for repair materials and joint fillers.
- C. Apply with spray equipment, (low pressure), manual or drum type, to match approved field sample mock-up.
- D. Coverage rate will vary based on porosity of concrete; minimum 200 square feet per gallon, maximum 100 square feet per gallon. Use mock-up to determine coverage rate.
- E. Allow minimum twenty four hours drying time before exposing slab to liquids.

3.4 CLEAN UP

- A. Clean tools and equipment with warm water as soon as possible after using.
- B. Remove spills and remove sealer from surfaces not required to receive sealer.

END OF SECTION

SECTION 10 11 00 VISUAL DISPLAY SURFACES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1) Markerboards.
 - 2) Tackboards.
 - 3) Bulletin boards cabinets
- B. Related Sections:
 - 4) Section 10 14 00 - Signage

1.2 SUBMITTALS

- A. Submit in accordance with Sections 01 33 00 and 01 33 23.
- B. Product Data: Submit manufacturer's product specifications.
- C. Samples: Submit samples of standard surface material, patterns and colors for color selection.
- D. Manufacturer's installation and cleaning instructions.

1.3 DELIVERY, STORAGE, AND HANDLING

- A. Provide factory wrapping, packaging, and other means necessary to prevent damage or deterioration during shipment, handling, and storage, in accordance with the specifications.
- B. Follow any special handling instructions of the manufacturer.

1.4 COORDINATION

- A. Coordinate placement of internal wall reinforcement in supporting wall construction.
- B. Do not install display boards until painting is complete and thoroughly dry within the rooms in which they will be installed.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Claridge Products and Equipment, Inc.
- B. Chatfield Clarke Co., Inc.
- C. Polyvision Corporation.
- D. Substitutions: Under provisions of Section 01 25 00.

2.2 MATERIALS

- A. Steel Sheet: ASTM A424, Type I, commercial quality.
- B. Aluminum Extrusions: ASTM B221, 6063 alloy, T5 temper.
- C. Cork: Fine grain natural cork, homogeneous composition.
- D. Particleboard: ANSI A208.1; wood shavings set with waterproof resin binder, sanded faces.
- E. Fiberboard: Industrial insulation board, ironed and prime coated, ASTM C208, 3/8 inch thick, 4 foot wide x required length.
- F. Foil Backing: Aluminum foil sheet.
- G. Honeycomb: Honeycell/Honeycomb.
- H. Tackboard Covering: Vinyl wall covering as specified in Section 09 72 16.
- I. Adhesives: Type recommended by manufacturer to suit applicable to substrate.

2.3 ACCESSORIES

- A. Map Rail Accessories: Formed aluminum display hooks, map roller brackets, and flag holder. Sliding type to fit map rail. One pair of display hooks and map roller brackets for every two feet of map rail. One flag holder per map rail.
- B. Temporary Protective Cover: Sheet polyethylene, 8 mil thick.
- C. Blocking Pads: Manufacturers standard padding designed to prevent deflection.
- D. Metal Mounting Clips: Steel angle clips, 2 inches long x 16 gage thick.

2.4 FABRICATION - MARKERBOARDS

- A. Outer Face Sheet: Steel, 24 gage thick. Equivalent to Claridge LCS.
- B. Core: Particleboard, 3/8 inch thick.
- C. Backing Surface: Aluminum foil, 0.005 inch thick.
- D. Units in 8 foot increments shall be one piece construction, no joints.

2.5 FABRICATION - TACKBOARDS

- A. Outer Facing: Vinyl wall covering as specified in Section 09 72 16.
- B. Underlayment: Cork, 1/8 inch thick.

- C. Backing: Hardboard, 1/4 inch thick.
- D. Units in 8 foot increments shall be one piece construction, no joints.

2.6 FRAME AND TRIM

- A. Frame: Extruded aluminum, equivalent to Claridge Series 1; concealed fasteners; map rail with 1/4 inch thick cork insert above markerboard surfaces.
- B. Chalktray: Extruded aluminum, equivalent to Claridge No. 271A profile; one piece, full length of markerboard; concealed fasteners.

2.7 HORIZONTAL SLIDING PANEL ASSEMBLY

- A. 4 x 8 Single Sided Panel; Markerboard:
 - 1. Surface: Porcelain markerboard, unlined or lined as indicated.
 - 2. Core: 7/8 inch thick honeycomb.
 - 3. Subframe: Polyvision SF-78, 2 inch x 7/8 inch aluminum tube, 4 sides.
 - 4. Moisture Barrier: .012 inch thick aluminum sheet.
- B. 4 x 8 Single Sided Panel; Tackboard:
 - 1. Surface: Tackboard covering. (As specified in Section 09 72 16)
 - 2. Underlayment: Cork, 1/4 inch thick.
 - 3. Core: 5/8 inch thick honeycomb.
 - 4. Subframe: Polyvision SF-58, 2 inch x 5/8 inch aluminum tube, 4 sides.
 - 5. Moisture Barrier: .012 inch thick aluminum sheet.
- C. 4 x 8 Double Sided Panel; Markerboard Combination:
 - 1. Front Surface: Porcelain markerboard.
 - 2. Back Surface: Porcelain markerboard.
 - 3. Core: 7/8 inch thick honeycomb.
 - 4. Subframe: Polyvision SF-78, 2 inch x 7/8 inch aluminum tube, 4 sides.
- D. 4 x 8 Double Sided Panel; Markerboard and Tackboard Combination:
 - 1. Front Surface: Porcelain [chalkboard] [markerboard].

2. Front Core: 5/8 inch thick honeycomb.
 3. Back Surface: Tackboard covering.
 4. Back Underlayment: Cork, 1/4 inch thick.
 5. Subframe: Polyvision SF-58, 2 inch x 5/8 inch aluminum tube, 4 sides.
- E. Frame, Hardware, and Accessories
1. Trim: Polyvision C-12 extruded aluminum with punched and wrapped safety corner.
 2. Top Track: Polyvision C-1 extruded aluminum guide.
 3. Bottom Track: Polyvision BT-1 extruded aluminum track.
 4. Filler Strip: Polyvision BT- extruded aluminum series.
 5. Rollers: Polyvision HB Series, Model MAL-33 bottom rollers.
 6. Sheaves: Polyvision 1607 adjustable brass ball bearing sheaves. Two wheels per sheave and two sheaves per panel.
 7. Pulls: IVES chrome retractable edge pulls, two per panel, fully recessed.
 8. Locks: Polyvision JK-39 locking mechanism, one per panel.
 9. Chalkrail: Polyvision CRA-4D modified as indicated with rounded corner.
 10. Maprail: Polyvision MR-3 with vinyl backed cork and end caps.
 11. Maprail Accessories: Formed aluminum display hooks, map roller brackets and flag holder. Sliding type to fit map rail. One pair of display hooks and map roller brackets for every two feet of map rail.
- F. Standard [markerboard] [tackboard] configuration as indicated in the schedule at the end of this Section. [Non-standard configuration as indicated on Drawings.]

2.8 BULLETIN BOARD CABINETS

- A. Claridge Model No. 2046 4'-0" x 8'-0" with 4 doors, and Model No. 2040 4'-0" x 4'-0" with 2 doors, recessed, installation, 3/16 inch tempered glass doors, anodized aluminum satin finish with 934 hook-fab fabric, color as selected.
- B. Claridge Model No. 2035 3'-0"H x 2'-0"W with one 3/16 inch tempered glass door, recessed installation, and Model No. 2040 4'-0"H x 4'-0"W with two 3/16 inch tempered glass doors, surface mount installation, weather proof, anodized aluminum satin finish, backpanel of black vinyl directory panel. Locate where

indicated. Provide storage box filled with 100 white Roman style letters and numerals 3/4" high and 1-1/2 inch high for each unit.

- C. Claridge Model No. 2041 3'-0" x 4'-0" with 2 doors, 3/16 inch tempered glass with piano hinges and flat key tumbler locks. 1-1/2 inch x 3 inch rectangular aluminum trim with clear satin anodized finish. Cabinet shall be 1-3/4 inch deep inside, and shall project not more than 3 inches from wall. Tackable back panel with vinyl wall covering finish equivalent to Claridge "Fabricork." Provide manufacturer's concealed fasteners and z-bar hangers for surface mounting.

2.9 FINISHES

- A. Porcelain Enamel: Glass fibered enamel, baked to vitreous surfaces; Porcelain Enamel Institute Type A; white color.
- B. Tackboard Surface: Vinyl of pattern and color as indicated.
- C. Aluminum Frame and Accessories: Clear satin anodized.

2.10 LINING AND LETTERING

- A. Silk screened board graphics shall be permanently fused on boards.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Verify that surfaces and internal wall blocking are ready to receive work, and dimensions are as indicated on Shop Drawings.
- B. Beginning of installation means acceptance of substrate construction.

3.2 INSTALLATION

- A. Install markerboards and tackboards in accordance with manufacturer's instructions.
- B. Install blocking pads behind [markerboards] [and] [tackboards] at 16 inches on center.
- C. Install metal clips at 16 inches on center at sides and bottom of boards.
- D. Secure units level and plumb.
- E. Butt markerboard tight with concealed spline to hairline joint. Join markerboard with batten joint.

3.3 CLEANING

- A. Clean all surfaces in accordance with manufacturer's instructions.
- B. Cover all surfaces with protective cover, taped to frame.
- C. Remove temporary protective cover at date of Substantial Completion.

3.4 SCHEDULE

- A. Note: See construction drawings.

END OF SECTION

SECTION 10 11 16 MARKERBOARDS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Fixed Markerboards, lined and unlined.

1.2 REFERENCES

- A. ANSI A208.1 - Mat Formed Wood Particleboard.
- B. ASTM B221 - Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes.
- C. ASTM A424 - Steel Sheets for Porcelain Enameling.
- D. ASTM C208 - Insulation Board (Cellulose Fiber).
- E. ASTM E84 - Test Method for Surface Burning Characteristics of Building Materials.
- F. CFFA-W-101-A - Chemical Fabrics and Film Association Quality Standard for Vinyl Coated Fabric Wallcovering.
- G. UL - Underwriters Laboratories, Inc.

1.3 SUBMITTALS

- A. Submit under provisions of Section 01 25 00.
- B. Shop Drawings: Indicate wall elevations, dimensions, joint locations.
- C. Provide complete Product Data on all items specified.
- D. Submit two 12-inch square Samples illustrating materials and finish, color, and texture of markerboard and tackboard surfacing, including lined boards if used.
- E. Horizontal Sliding Panel System (Where Used): Submit 18 x 24 inch Sample illustrating materials and construction.

1.4 MAINTENANCE DATA

- A. Submit under provisions of Section 01 77 00.

- B. Include maintenance information on regular cleaning and stain removal.

1.5 WARRANTY

- A. Provide one year warranty under provisions of Section 01 78 36.
- B. Include one-year warranty against discoloration of surfaces due to cleaning, crazing or cracking and staining.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Claridge Products and Equipment, Inc.
- B. Chatfield Clarke Co., Inc.
- C. Polyvision Corporation.
- D. Substitutions: Under provisions of Section 01 62 00.

2.2 MATERIALS

- A. Steel Sheet: ASTM A424, Type I, commercial quality.
- B. Aluminum Extrusions: ASTM B221, 6063 alloy, T5 temper.
- C. Cork: Fine grain natural cork, homogeneous composition.
- D. Particleboard: ANSI A208.1; wood shavings set with waterproof resin binder, sanded faces.
- E. Fiberboard: Industrial insulation board, ironed and prime coated, ASTM C208, 3/8 inch thick, 4 foot wide x required length.
- F. Foil Backing: Aluminum foil sheet.
- G. Honeycomb: Honeycell/Honeycomb.
- H. Adhesives: Type recommended by manufacturer to suit applicable to substrate.

2.3 ACCESSORIES

- A. Temporary Protective Cover: Sheet polyethylene, 8 mil thick.
- B. Blocking Pads: Manufacturers standard padding designed to prevent deflection.

- C. Metal Mounting Clips: Steel angle clips, 2 inches long x 16 gage thick.

2.4 FABRICATION - MARKERBOARDS

- A. Outer Face Sheet: Steel, 24 gage thick. Equivalent to Claridge LCS.
- B. Core: Particleboard, 3/8 inch thick
- C. Backing Surface: Aluminum foil, 0.005 inch thick.
- D. Units in 8 foot increments shall be one piece construction, no joints.

2.5 FRAME AND TRIM

- A. Frame: Extruded aluminum, equivalent to Claridge Series 1; concealed fasteners; map rail with 1/4 inch thick cork insert above markerboard surfaces.

2.6 FINISHES

- A. Porcelain Enamel: Glass fibered enamel, baked to vitreous surfaces; Porcelain Enamel Institute Type A; white color.
- B. Aluminum Frame and Accessories: Clear satin anodized.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Verify that surfaces and internal wall blocking are ready to receive work, and dimensions are as instructed by the manufacturer.
- B. Beginning of installation means acceptance of substrate construction.

3.2 INSTALLATION

- A. Install markerboards in accordance with manufacturer's instructions.
- B. Install blocking pads behind markerboards at 16 inches on center.
- C. Install metal clips at 16 inches on center at sides and bottom of boards.
- D. Secure units level and plumb.

3.3 CLEANING

- A. Clean all surfaces in accordance with manufacturer's instructions.
- B. Cover all surfaces with protective cover, taped to frame.
- C. Remove temporary protective cover at date of Substantial Completion.

END OF SECTION

SECTION 10 14 00 SIGNAGE

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Door and wall signage.
- B. Exterior metal signs.
- C. Cast letters and numbers.
- D. Traffic Signs.
- E. Cast metal plaques.

1.2 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Shop Drawings: Submit dimensioned elevations of each sign configuration.
 - 1. Show sign sections indicating materials, thicknesses and attachment methods.
 - 2. Show anchors and reinforcement.
 - 3. Provide complete signage schedule indicating all signs and locations, key to room numbers and elevations. Provide space for Architect to indicate sign type and location.
- C. Product Data:
 - 1. Manufacturer's current published specifications.
 - 2. Manufacturer's installation instructions.
- D. Samples:
 - 1. Provide two Samples of each sign type required in the profiles and sizes indicated on the Drawings. Signs approved with correct color and type may be used in the final installation at the request of the Contractor.
 - 2. Provide Samples of all proposed fasteners and accessories.
 - 3. Three copies of manufacturer's color chart indicating all available standard colors for selection by the Architect.

- E. Closeout: Manufacturer's warranty.

1.3 PROJECT CONDITIONS

- A. Environmental Requirements: Install signs only when interior air and substrates have reached equilibrium moisture and temperature approximating that of normal occupied conditions.
- B. Do not install adhesive tape mounted signs when ambient temperature is below 70 degrees Fahrenheit. Maintain this temperature during and after installation of signs.

1.4 REGULATORY REQUIREMENTS

- A. Conform to C.C.R., Title 24, Part 2, Chapter 11, ADA Accessibility Guidelines (ADAAG), and American Disability Act (ADA) for accessibility requirements.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver signs safely packed to prevent damage during shipment and prior to installation.
- B. Keep signs in protective wrapping until ready for installation.
- C. Handle carefully to prevent damage. Replace damaged parts at no cost to the Owner.
- D. Comply with the additional requirements specified in Section 01 60 00.

1.6 SCHEDULING

- A. Do not install signs until walls and/or doors have received final finish.

1.7 WARRANTY

- A. Procedures: In accordance with Section 01 78 36.
- B. Furnish manufacturer's written warranty agreeing to replace signs which fade or discolor under normal environmental exposure.
- C. Warranty Period: 5 years.

PART 2 - PRODUCTS

2.1 MANUFACTURERS AND PRODUCTS

- A. Subject to compliance with requirements specified herein.

B. Substitutions: Under provisions of Section 01 62 00.

2.2 DOOR AND WALL SIGNAGE

- A. Cast Acrylic Sheet: ASI Modulux, Mohawk Sign Systems Inc., or approved equal.
1. Monolithic tactile plaque sign with fully integrated graphics composed of high-impact polyester acrylate resins, pressure molded into a single polymerized component, using manufacturer's co-molding process.
 - a. Depth: 0.25 inch thickness.
 - b. Panel Appearance: Specify from manufacturer's standard, high contrast semi-matte color chart.
 - c. Surface Texture: Matte non-glare.
 - d. Letter Styles and Sizes and Layout Position: Specify from manufacturer's standard letter styles and color chart.
 - e. Text Schedule: Verify correct capitalization.
 - f. Sign Size: As indicated on the Drawings.
 - g. Sign Shape: As indicated on the Drawings. Square or rectangular shapes shall have radiused corners.
 - h. Installation: Provide countersunk mounting holes for mechanical fasteners.
 - i. Sign Copy: Shall be integrally molded with sign body per manufacturer's standard bonding process.
 - j. Application: Rated for exterior and interior applications.
 - k. Background Appearance: Solid color from manufacturer's standard color charts.
 - l. Braille: Integral domed-shaped California Grade 2 Braille dots, each distinct and separate.
 2. Flame Resistance: Application of a lighted match shall not produce melting, flashing, flaring or distortion. Signs shall not ignite at a temperature less than 800° F.
 3. Vandal resistant surface which can be cleaned using industrial cleansers, including acetone.

- B. Fasteners: All screws, bolts and fasteners to be tamper resistant stainless steel. All fasteners to be provided with solid anchorage to studs, blocking or concrete; do not use toggle bolts.
- C. Colors: High contrast semi-matte integral colors for graphics. All integral resins are U.V stabilized resins utilizing automotive grade pigments.
- D. Location of signs as shown on Drawings.

2.3 EXTERIOR METAL SIGNAGE

- A. Galvanized steel plate, 0.0538 inch thick, mechanically mounted.
- B. Porcelain copy, 1 inch high, colors as selected by Architect. Text and size shall be all uppercase as indicated on Drawings.
- C. Location of signs as shown on Drawings.
- D. Shop Fabricated Signs: All joints, returns and the like shall be properly joined together and welded edges shall be ground smooth to proper aluminum finish.
- E. Shapes shall be saw-cut smooth and straight and shall be deburred prior to final finishing and assembly. Square or rectangular shapes shall have radiused corners.
- F. Vandal resistant surface which can be cleaned using industrial cleansers, including acetone.
- G. Fasteners: All screws, bolts and fasteners to be tamper resistant stainless steel. All fasteners shall be provided with solid anchorage to studs, blocking or concrete; do not use toggle bolts.
- H. Colors: High contrast non-glare or semi-matte integral colors for graphics. All integral resins are UV stabilized resins utilizing automotive grade pigments.

2.4 CAST LETTERS AND NUMBERS

- A. Manufacturer: ARK Ramos, Metal Arts Inc., ASI Modulux, or approved equal.
- B. Standard cast letters, No. 530 "Optima", F-1 satin aluminum face, color to be selected by Architect.
- C. Verify location as shown on Exterior Elevations. Verify all text with Owner prior to ordering signage.
- D. Size of Letters: 16 inches high x 1 inch stroke x 1/2 inch deep.

- E. Text: see drawings.

2.5 TRAFFIC SIGNS

- A. Manufacturer: Hawkins Sign Co, Inc. (510) 525-8500; Traffic Control Service Inc., (800) 884-8274; or approved equal.
- B. Types of Signs: Sheet metal with porcelain enamel finish.
1. Accessible Parking Stall Signs: Complying with Title 24, Part 2, Section 7102(e) at automobile stalls and Section 1129B.5 at van stalls. At van stalls, provide separate 12 inch wide x 4 inch high sign below main sign. Text on signs shall comply with ADAAG Article 4.6.4.
 2. Tow-Away Signs: Complying with Title 24, Part 2, Section 7102(e).
- C. Sign Posts: 2-inch outside diameter standard weight galvanized steel pipe, set in concrete footing.
- D. Mount signs on sign posts with bottom of sign 7 feet 2 inches above grade, unless indicated otherwise.

2.6 CAST METAL PLAQUES

- A. Manufacturer: ARK Ramos, Metal Arts Inc., ASI Modulux, or approved equal.
- B. Construction: [Cast aluminum, alloy C443.2,] [bronze] [painted pebble background] with raised graphics and single line bevel edge. Provide clear protective coating and satin highlighting finish at raised surfaces. Letter and border styles and painted background color to be selected by Architect from manufacturer's standard styles and colors.
- C. Size: 24 inches high x 12 inches wide.
- D. Text: prior to fabrication, verify content and spelling of text with Owner's representative.
- E. Mounting: Provide hardware and blocking for wall mounting in location indicated.

2.7 Wall Mounted Exterior Backlit Illuminated Sign Box

- A. Signarama Illuminated Sign Cabinet or accepted substitution
- Cabinet: Aluminum extrusions.
 - Illuminated sign face: Polycarbonate.
 - Illumination: LED preferred, or high-efficacy fluorescent.
 - Signage Artwork: TBD
 - Dimensions: 3' x 6' verify dimensions in field

- Signarama: San Jose ,CA 408-977-1450

Coordinate with electrical and city signage permit.

2.8 FABRICATION

A. General Requirements:

1. Shop-fabricate signs to requirements indicated for materials, thicknesses, designs, shapes, sizes and details of construction.
2. Sign panel surfaces shall be smooth, even and fabricated to remain flat under installed conditions. Ease all edges and corners of signs.
3. Provide lettering and graphics precisely formed, uniformly opaque to comply with relevant regulations and requirements indicated for size, style, spacing, content, position and colors.

B. Tactile Graphics and Text:

1. Conform to C.B.C. Title 24, Chapter 11, Section 11B-Division 7. 11B-703.2.5, Table 11B-703.3.1, 11b-703.3.1 11B-703.3.2.
2. California Grade 2 Braille must accompany raised text characters. Provide tactile copy and Grade 2 Braille raised 1/32 inch minimum from plaque using manufacturer's co-molding process:
 - a. Letters and numbers shall be raised 1/32 inch (0.794 mm) and shall be sans-serif uppercase characters accompanied by California Grade 2 Braille symbols.
 - b. Braille Symbols: Rounded or domed California Braille dots, each distinct and separate. Dots shall be 1/10 inch (2.54 mm) on centers in each cell with 2/10 inch (5.08 mm) space between cells. Dots shall be raised a minimum of 1/32 inch (0.794 mm) from a plaque surface.
 - c. Proportions: Characters shall be selected from fonts where the width of the uppercase letter "O" is 60 percent minimum and 110 percent maximum of the height of the uppercase letter "I".
 - d. Character Height: Characters and numbers on signs shall be 5/8-inch minimum and 2 inches maximum high and as shown on the Drawings.

- e. Contrast of Characters and Symbols: Characters and symbols shall be light characters with dark background with a contrast of 70 percent minimum.
3. Raised Characters and Pictorial Symbol Signs:
- a. Letter Type: Letters and numbers on signs shall be raised 1/32 inch (0.794 mm) minimum and shall be sans-serif uppercase characters accompanied by California Grade 2 Braille.
 - b. The stroke thickness of the uppercase letter "I" shall be 15 percent maximum of the height of the character. Reference to CBC 11B Division 7, 11B-703.2.6.
 - c. Symbol Size: Raised characters or symbols shall be a minimum of 5/8- inch (15.9 mm) and as shown on the Drawings.
 - d. Pictorial Symbol Signs (Pictograms): Pictorial symbol signs (pictograms) shall be accompanied by the equivalent verbal description placed directly below the pictogram as shown on the Drawings.
 - e. Contrast between letters and/or characters and background color must be 70 percent minimum.
- C. Silkscreening: All silkscreened graphics shall be produced with ABS paint compatible with the substrate, using mesh of 390 or finer to produce clean, sharp edges. All media are to be opaque, with full even coverage, and free from dust bubbles, blemishes and other foreign matter. Characters and symbols shall contrast 70 percent minimum with their background. Characters shall be light colors with dark background.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that substrate surfaces to receive units are true and plumb. Correct inadequate surfaces before installation of signs.
- B. Verify that moisture and temperature levels of substrate and environment have been stabilized and are acceptable prior to proceeding with the Work.
- C. Take field measurements prior to shop fabrication where necessary in order to ensure proper fitting of Work.
- D. Do not begin Work until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install units in locations and at mounting heights indicated on Drawings.

1. Keep perimeter lines straight, plumb, and level.
2. Install within 1/4 inch tolerance vertically and horizontally of intended location and in accordance with manufacturer's recommendations.
3. Install product at heights to conform to C.C.R., Title 24, Part 2 and ADA Accessibility Guidelines (ADAAG).

B. Installation on Walls: Attach securely through finish wall to rigid backing.

C. Installation Method: Install with vandal - resistant fasteners.

3.3 CLEANING, PROTECTION AND REPAIR

A. Repair scratches and other damage which might have occurred during installation. Replace components where repairs were made but are still visible to the unaided eye from a distance of 5 feet.

B. Clean installed products in accordance with manufacturer's instructions prior to Owner's acceptance.

END OF SECTION

SECTION 10 28 00 TOILET AND BATH ACCESSORIES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Toilet and washroom accessories.
- B. Mirror units.
- C. Concealed anchor devices and backing plate reinforcements furnished to other Sections.
- D. Attachment hardware.

1.2 REFERENCES

- A. ADAAG - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities.
- B. CCR - California Code of Regulations, Title 24, Part 2, California State Accessibility Standards.
- C. ASTM A123 - Zinc (Hot-Dip Galvanized) Coatings on Products Fabricated from Rolled, Pressed, and Forged Steel Shapes, Plates, Bars and Strips.
- D. ASTM A366 - Steel, Carbon, Cold-Rolled Sheet, Commercial Quality.
- E. ASTM A386 - Zinc Coating (Hot-Dip) on Assembled Steel Products.
- F. ASTM B456 - Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.
- G. ASTM A167 - Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip.
- H. ASTM A269 - Seamless and Welded Austenitic Stainless Steel Tubing for General Service.

1.3 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Provide Product Data on accessories, describing size, finish, details of function, attachment methods.
- C. Submit manufacturer's installation instructions.

1.4 KEYING

- A. Supply two keys for each accessory to Owner.
- B. Master key all accessories.

1.5 REGULATORY REQUIREMENTS

- A. Conform to CCR, Title 24, Part 2, and ADAAG for access for the handicapped.

1.6 COORDINATION

- A. Coordinate the Work of this Section under provisions of Section 01 31 19.
- B. Coordinate the Work of this Section with Section 11 00 00 - Baby Changing Station.
- C. Coordinate the Work of this Section with the placement of internal wall reinforcement and reinforcement of toilet partitions to receive anchor attachments.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Bobrick Washroom Equipment, Inc.
- B. American Specialties, Inc. (ASI).
- C. Bradley Corporation.
- D. Gamco
- E. Koala Kare
- F. Provon
- G. Substitutions: Under provisions of Section 01 62 00.

2.2 MATERIALS

- A. Sheet Steel: ASTM A366.
- B. Stainless Steel Sheet: ASTM A167, Type 304.
- C. Tubing: ASTM A269, stainless steel, Type 304.
- D. Adhesive: Two-component epoxy type waterproof.
- E. Fasteners, Screws, and Bolts: Hot-dip galvanized, tamperproof.
- F. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.

2.3 FABRICATION

- A. Weld and grind smooth joints of fabricated components.
- B. Form exposed surfaces from single sheet of stock, free of joints.
- C. Form surfaces flat without distortion. Maintain flat surfaces without scratches or dents.
- D. Back-paint components where contact is made with building finishes to prevent electrolysis.
- E. Shop-assemble components and package complete with anchors and fittings.
- F. Provide steel anchor plates, adapters, and anchor components for installation.
- G. Hot-dip galvanize all ferrous metal and fastening devices.

2.4 FACTORY FINISHING

- A. Galvanizing: ASTM A123 to 1.25 ounces per square yard.
- B. Shop Primed Ferrous Metals: Pretreat and clean, spray apply one coat primer and bake.
- C. Stainless Steel: No. 4 satin finish.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that site conditions are ready to receive Work and dimensions are as instructed by the manufacturer.
- B. Beginning of installation means acceptance of existing conditions.

3.2 PREPARATION

- A. Deliver inserts and rough-in frames to site at appropriate time for building-in.
- B. Provide templates and rough-in measurements as required.
- C. Verify exact location of accessories for installation.

3.3 INSTALLATION

- A. Install fixtures, accessories and items in accordance with manufacturers' instructions.
- B. Install plumb and level, securely and rigidly anchored to substrate.

- C. Verify that no equipment in accessible toilet stalls protrudes past the face of the wall by more than 3 inches.

3.4 SCHEDULE

Where shown on the Drawings, as specified herein, or as needed for a complete and proper installation, provide the following items manufactured by Bobrick, Georgia-Pacific Professional, DEB SBS Incorporated and Gamco.

<u>Item:</u>	<u>Manufacturer</u>	<u>Model</u>
Paper Towel / Waste Receptacle	Bobrick	B-3974 (At Restrooms)
Paper Towel Dispenser	Bobrick	B-2621 (At All Other Loc.)
Toilet Tissue Dispenser	Bobrick	B-2888
Soap dispenser	Provon	O.F.C.I.
Mirror	Bobrick	B-165 2436
Coat Hook	Bobrick	B-6717
Seat-cover Dispenser	Bobrick	B-221
Sanitary Napkin Disposal	Bobrick	B-5270
Grab Bars - 1-1/4" dia.	Bobrick	B-6806 Series
Mop / Broom Holder	Bobrick	B-239 x 34
Recessed Medicine Cabinet	Bobrick	B-398
Recessed Specimen Pass-Through Cabinet	Bobrick	B-50516 B-50517
Baby Changing Station	Koala Kare	KB110-SSRE

OTHER MATERIALS

Provide other materials not specifically described but required for a complete and proper installation. The Contractor shall be responsible for installation of all mounting brackets, hardware, clips, fasteners, adhesives, backing in structure, or other materials, and all labor required for complete and proper installation of all toilet room accessories.

END OF SECTION

SECTION 10 44 00
FIRE EXTINGUISHERS AND CABINETS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Fire extinguishers.
- B. Non-rated cabinets.
- C. Accessories.

1.2 REFERENCES

- A. ASTM E814 - Fire Tests of Through-Penetration Fire Stops.
- B. NFPA 10 - Portable Fire Extinguishers.
- C. WARNOCK - HERSEY - Fire Test and Certification.

1.3 QUALITY ASSURANCE

- A. Conform to Title 19, CCR requirements for fire extinguishers.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Shop Drawings: Include physical dimensions, operational features, color and finish, mounting and anchorage details, rough-in measurements, location, and details.
- C. Submit manufacturer's installation instructions.

1.5 OPERATION AND MAINTENANCE DATA

- A. Submit manufacturer's operation and maintenance data under provisions of Section 01 70 00.
- B. Include test, refill or recharge schedules, procedures, and re-certification requirements.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Do not install extinguishers when ambient temperatures may cause freezing.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. J. L. Industries.
- B. Larsen's Mfg. Co.
- C. Potter-Roemer, Inc.
- D. Watrous, Inc.
- E. Substitutions: Under provisions of Section 01 25 00.

2.2 EXTINGUISHERS

- A. In IT Room #191, Communications Room #176, Janitor's Closet # 153 and in the Attic adjacent each Access Hatch:
Multi-Purpose Dry Chemical Type: steel tank, model "Cosmic 10E" manufactured by J.L. Industries; with pressure gage, 10 lb. capacity rated 4A-80BC with #MB846C wall bracket (cabinet not required).
- B. For Semi-Recessed Cabinet Applications: Multi-Purpose Dry Chemical Type: steel tank, model "Cosmic 10E" Manufactured by J.L. Industries; with pressure gage, 10 lb. capacity rated 4A-80BC with valid certification tag attached. (See the following paragraph for cabinets).

2.3 CABINETS

- A. Semi-Recessed cabinet: J.L. Industries "Ambassador" Series #1812 with 4" rolled edge trim, full glazed doors, clear acrylic glazing and ADA compliance.

2.4 FABRICATION

- A. Form body of cabinet with tight inside corners and seams.
- B. Fabricate body of fire-rated cabinet of double-wall construction filled with a 5/8 inch thick layer of protective fire barrier insulation.
- C. Predrill holes for anchorage.
- D. Form perimeter trim by welding, filling, and grinding smooth.

- E. Hinge doors for 180 degree opening with continuous piano hinge. Provide nylon catch.
- F. Glaze doors with resilient channel gasket glazing.

2.5 ACCESSORIES

- A. Steel Cable Theft Device: Model STI 6200 as manufactured by STI Inc.

2.6 FINISHES

- A. Extinguisher: Red enamel.
- B. Cabinet, Trim and Door: Electrostatic white powder coat finish.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Verify that rough openings for cabinet are correctly sized and located.
- B. Beginning of installation means acceptance of existing conditions.

3.2 INSTALLATION

- A. Install cabinets plumb and level in wall openings.
- B. Secure rigidly in place in accordance with manufacturer's instructions.
- C. Install fire-rated cabinets in strict conformance with manufacturer's instructions and listing requirements of Warnock-Hersey.
- D. Attach steel cable theft device to each extinguisher. Locate inside cabinet.

3.3 SCHEDULE

- A. See Enlarged Floor Plans and Item 2.2 above for locations.

END OF SECTION

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SECTION 12 49 40 ROLLER SHADES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Manually Operated Sunscreen roller shades.

1.2 RELATED SECTIONS

- A. Section 06100 - Rough Carpentry: Wood blocking and grounds for mounting roller shades and accessories.
- B. Section 09260 - Gypsum Board Assemblies: Coordination with gypsum board assemblies for installation of shade pockets, closures and related accessories.
- C. Section 09510 - Acoustical Ceilings: Coordination with acoustical ceiling systems for installation of shade pockets, closures and related accessories.
- D. Division 16 - Electrical: Electric service for motor controls.

1.3 REFERENCES

- A. ASTM G 21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.
- B. NFPA 70 - National Electrical Code.
- C. NFPA 701 - Fire Tests for Flame-Resistant Textiles and Films.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. **[Product Data]**: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Styles, material descriptions, dimensions of individual components, profiles, features, finishes and operating instructions.
 - 3. Storage and handling requirements and recommendations.
 - 4. Mounting details and installation methods.
 - 5. Typical wiring diagrams including integration of motor controllers with building management system, audiovisual and lighting control systems as applicable..
- C. Shop Drawings: Plans, elevations, sections, product details, installation details, operational clearances, wiring diagrams and relationship to adjacent work.
 - 1. Prepare shop drawings on Autocad or Microstation format using base sheets provided electronically by the Architect.

- D. Window Treatment Schedule: For all roller shades. Use same room designations as indicated on the Drawings and include opening sizes and key to typical mounting details.
- E. Selection Samples: For each finish product specified, one set of shade cloth options and aluminum finish color samples representing manufacturer's full range of available colors and patterns.
- F. Verification Samples: For each finish product specified, one complete set of shade components, unassembled, demonstrating compliance with specified requirements. Shadecloth sample and aluminum finish sample as selected. Mark face of material to indicate interior faces.
- G. Maintenance Data: Methods for maintaining roller shades, precautions regarding cleaning materials and methods, instructions for operating hardware and controls.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Obtain roller shades through one source from a single manufacturer with a minimum of twenty years experience in manufacturing products comparable to those specified in this section.
- B. Installer Qualifications: Installer trained and certified by the manufacturer with a minimum of ten years experience in installing products comparable to those specified in this section.
- C. Fire-Test-Response Characteristics: Passes NFPA 701 small and large-scale vertical burn. Materials tested shall be identical to products proposed for use.
- D. Electrical Components: NFPA Article 100 listed and labeled by either UL or ETL or other testing agency acceptable to authorities having jurisdiction, marked for intended use, and tested as a system. Individual testing of components will not be acceptable in lieu of system testing.
- E. Anti-Microbial Characteristics: 'No Growth' per ASTM G 21 results for fungi ATCC9642, ATCC 9644, ATCC9645.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver shades in factory-labeled packages, marked with manufacturer and product name, fire-test-response characteristics, and location of installation using same room designations indicated on Drawings and in the Window Treatment Schedule.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Install roller shades after finish work including painting is complete and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

1.8 WARRANTY

- A. Roller Shade Hardware and Chain Warranty: Manufacturer's standard non-

- depreciating twenty-five year limited warranty.
- B. Standard Shadecloth: Manufacturer's standard twenty-five year warranty.
 - C. Ecoveil Shadecloth: Manufacturer's standard ten year warranty.
 - D. Roller Shade Installation: One year from date of Substantial Completion, not including scaffolding, lifts or other means to reach inaccessible areas.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: MechoShade Systems, Inc., which is located at: 42-03 35th St.; Long Island City, NY 11101; Local Representative: Lyndsey Harper Tel: 925-557-6675; Email:lyndsey.harper@mechosystems.com; Web:www.mechoshade.com
- B. Substitutions: or equal
- C. Requests for substitutions will be considered in accordance with provisions of Section 01600.
- D. Alternates: The following products and manufacturers may be bid as an alternate product in accordance with Section 01230 - Alternates. Any pricing for alternate products shall be listed separately from the base bid specified product. Any alternate pricing must include line-by-line compliance or non-compliance with the specifications. If the alternate product is acceptable to the Architect, the specified manufacturer will be given the opportunity to provide an equivalent proposal.
 - 1. UrbanShade System by MechoShade Systems, Inc.
 - 2. ((List other manufacturer or product here.))

2.2 ROLLER SHADE TYPE AND SHADECLOTH

- A. Manually Operated Shades:
 - 1. Mounting: Recess mounted with #4124 ceiling pocket.
 - 2. Configuration: Single solar shadecloth.
 - 3. Solar Shade cloths – To Be Selected by Architect in Submittal Process.
 - a. Fabric: ThermoVeil 1500, 3 percent open, 2 by 2 dense basket-weave pattern.
-OR-
 - b. Fabric: EcoVeil 1550, TPO fabric, Cradle to Cradle Certified, non-PVC, 1 X 1, basket-weave pattern at 3 percent open.
-OR-
 - c. Fabric: SoHo 1600, (3 percent open), 2 x 2 basket-weave pattern of fine yarn PVC and polyester blend.

2.3 SHADE BAND

- A. Shade Bands: Construction of shade band includes the fabric, the hem weight, hem-pocket, shade roller tube, and the attachment of the shade band to the roller tube. Sewn hems and open hem pockets are not acceptable.
 - 1. Hem Pockets and Hem Weights: Fabric hem pocket with RF-welded seams (including welded ends) and concealed hem weights. Hem weights shall be of appropriate size and weight for shade band. Hem weight shall be continuous inside a sealed hem pocket. Hem pocket construction and hem weights shall be similar, for all shades within one room.
 - 2. Shade Band and Shade Roller Attachment:
 - a. Use extruded aluminum shade roller tube of a diameter and wall thickness required to support shade fabric without excessive deflection. Roller tubes less than 1.55 inch (39.37 mm) in diameter for manual shades, and less than 2.55 inches (64.77 mm) for motorize shades are not acceptable.
 - b. Provide for positive mechanical engagement with drive / brake mechanism.
 - c. Provide for positive mechanical attachment of shade band to roller tube; shade band shall be made removable / replaceable with a "snap-on" "snap-off" spline mounting, without having to remove shade roller from shade brackets.
 - d. Mounting spline shall not require use of adhesives, adhesive tapes, staples, and/or rivets.
 - e. Any method of attaching shade band to roller tube that requires the use of: adhesive, adhesive tapes, staples, and/or rivets are not acceptable.

2.4 SHADE FABRICATION

- A. Fabricate units to completely fill existing openings from head to sill and jamb-to-jamb, unless specifically indicated otherwise.
- B. Provide battens in standard shades as required to assure proper tracking and uniform rolling of the shadebands. Contractor shall be responsible for assuring the width-to-height (W:H) ratios shall not exceed manufacturer's standards or, in absence of such standards, shall be responsible for establishing appropriate standards to assure proper tracking and rolling of the shadecloth within specified standards. Battens shall be roll-formed stainless steel or tempered steel, as required.
- C. For railroaded shadebands, provide seams in railroaded multi-width shadebands as required to meet size requirements and in accordance with seam alignment as acceptable to Architect. Seams shall be properly located. Furnish battens in place of plain seams when the width, height, or weight of the shade exceeds manufacturer's standards. In absence of such standards, assure proper use of seams or battens as required to, and assure the proper tracking of the railroaded multi-width shadebands.

- D. Provide battens for railroaded shades when width-to-height (W:H) ratios meet or exceed manufacturer's standards. In absence of manufacturer's standards, be responsible for proper use and placement of battens to assure proper tracking and roll of shadebands.

2.5 COMPONENTS

- A. Access and Material Requirements:
 - 1. Provide shade hardware allowing for the removal of shade roller tube from brackets without removing hardware from opening and without requiring end or center supports to be removed.
 - 2. Provide shade hardware that allows for removal and re-mounting of the shade bands without having to remove the shade tube, drive or operating support brackets.
 - 3. Use only Delrin engineered plastics by DuPont for all plastic components of shade hardware. Styrene based plastics, and /or polyester, or reinforced polyester will not be acceptable.
- B. Manual Operated Chain Drive Hardware and Brackets:
 - 1. Provide for universal, regular and offset drive capacity, allowing drive chain to fall at front, rear or non-offset for all shade drive end brackets. Universal offset shall be adjustable for future change.
 - 2. Provide hardware capable for installation of a removable fascia, for both regular and/or reverse roll, which shall be installed without exposed fastening devices of any kind.
 - 3. Provide shade hardware system that allows for removable regular and/or reverse roll fascias to be mounted continuously across two or more shade bands without requiring exposed fasteners of any kind.
 - 4. Provide shade hardware system that allows for operation of multiple shade bands (multi-banded shades) by a single chain operator, subject to manufacturer's design criteria. Connectors shall be offset to assure alignment from the first to the last shade band.
 - 5. Provide shade hardware system that allows multi-banded manually operated shades to be capable of smooth operation when the axis is offset a maximum of 6 degrees on each side of the plane perpendicular to the radial line of the curve, for a 12 degrees total offset.
 - 6. Provide positive mechanical engagement of drive mechanism to shade roller tube. Friction fit connectors for drive mechanism connection to shade roller tube are not acceptable
 - 7. Provide shade hardware constructed of minimum 1/8-inch (3.18 mm) thick plated steel or heavier as required to support 150 percent of the full weight of each shade.
 - 8. Drive Bracket / Brake Assembly:
 - a. MechoShade Drive Bracket model M5 shall be fully integrated with all MechoShade accessories, including, but not limited to: SnapLoc fascia, room darkening side / sill channels, center supports and connectors for multi-banded shades.
 - b. M5 drive sprocket and brake assembly shall rotate and be supported on a welded 3/8 inch (9.525 mm) steel pin.

- c. The brake shall be an over-running clutch design which disengages to 90 percent during the raising and lowering of a shade. The brake shall withstand a pull force of 50 lbs. (22 kg) in the stopped position.
- d. The braking mechanism shall be applied to an oil-impregnated hub on to which the brake system is mounted. The oil impregnated hub design includes an articulated brake assembly, which assures a smooth, non-jerky operation in raising and lowering the shades. The assembly shall be permanently lubricated. Products that require externally applied lubrication and or not permanently lubricated are not acceptable.
- e. The entire M5 assembly shall be fully mounted on the steel support bracket, and fully independent of the shade tube assembly, which may be removed and reinstalled without effecting the roller shade limit adjustments.
- f. Drive Chain: #10 qualified stainless steel chain rated to 90 lb. (41 kg) minimum breaking strength. Nickel plate chain shall not be accepted.

2.6 ROLLER SHADE SCHEDULE

- A. Roller Shade Schedule: Refer to the Drawings for locations.
- B. Shade Type WT-1: Manual operating, chain drive, sunscreen roller shades at all exterior windows of rooms and spaces shown on the Drawings, recessed above ceiling in #4124 shade pocket.
- C. Shade Type WT-2 **FTS Skylight Roller Shades**: Located at conference/training room. Tensioned motorized shade designed for applications that require a taught, flat shade. The system consists of two synchronized tubular motors and a special electronic control unit to control the taughtness of the shade band. One motor handles fabric roll-up while the second motor handles cable take-up. An electronic unit controls each motor independently and maintains dynamic (moving) tension on the shade band as well as final tension adjustment. Thus, minimizing shadecloth sag while the shadecloth is both moving and stationary. Adjustments are made via the electronic control. The size and weight of the shade will determine if idler rollers, guide cables, and/or guide track are necessary.

2.7 ACCESSORIES

- A. Roller Shade Pocket: For recessed mounting in acoustical tile, or drywall ceilings as indicated on the Drawings.
 - 1. Provide either extruded aluminum and or formed steel shade pocket, sized to accommodate roller shades, with exposed extruded aluminum closure mount.
- B. Pocket Accessories: As indicated on the Drawings.
- C. Fascia:
 - 1. Continuous removable extruded aluminum fascia that attaches to shade mounting brackets without the use of adhesives, magnetic strips, or exposed fasteners.
 - 2. Fascia shall be able to be installed across two or more shade bands in one

- piece.
3. Fascia shall fully conceal brackets, shade roller and fabric on the tube.
 4. Provide bracket / fascia end caps where mounting conditions expose outside of roller shade brackets.
 5. Notching of Fascia for manual chain shall not be acceptable.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Install roller shades level, plumb, square, and true according to manufacturer's written instructions, and located so shade band is not closer than 2 inches (50 mm) to interior face of glass. Allow proper clearances for window operation hardware.
- B. Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.
- C. Clean roller shade surfaces after installation, according to manufacturer's written instructions.
- D. Engage Installer to train Owner's maintenance personnel to adjust, operate and maintain roller shade systems.

3.4 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 27 51 19 SOUND MASKING SYSTEM

PART 1 GENERAL

1.1 SUMMARY

- A. The sound masking system provides a spatially uniform and stable sound field which blends with ambient noise.
- B. The corridors/hallways outside all patient serving rooms (Exam, Counseling, Office, Clinician, Group, Family Meeting, Conference Rooms), shall be treated with an intelligent sound masking system. The distributed loudspeaker system shall be configured to provide uniform sound masking where necessary, and will be divided into multiple individually addressable zones.
- C. Digital sound masking system with individual zone programming capability for level and frequency response.
- D. Background music capabilities in select zones.

1.2 REFERENCES

- A. California Building Code (CBC); California Electrical Code (CEC)
- B. American National Standards Institute (ANSI).
- C. Electronic Industries Association (EIA).
- D. UL6500 – Standard for Audio/Video and Musical Instrument Apparatus for Household, Commercial and Similar General Use
- E. UL 2043 – Standard for Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air-Handling Spaces; 1996
- F. ASTM E 1374-06 – Standard Guide for Open Office Acoustics and Applicable ASTM Standards
- G. ASTM E 1573-09 – Standard Test Method for Evaluating Masking Sound in Open Office Using A-Weighted and One-Third Octave Band Sound Pressure Levels
- H. ASTM E 1130-02e1 – Standard Test Method for Objective Measurement of Speech Privacy in Open Offices Using Articulation Index
- I. UL CL3P/CMP 75C – Wiring Standards for plenum rated cable.
- J. RoHS Restriction of Hazardous Substances

- K. FCC Part 15 Class A – EMI standards for test and performance

1.3 SCOPE OF WORK

- A. Furnish and install sound masking system including cabling and loudspeakers and the necessary equipment, interconnections, transducers, labor, and services required to meet specifications herein.
- B. All installation will occur according to the project schedule. All testing will be conducted during off peak and unoccupied hours. No testing will be conducted while any employee is on site. Provide a project schedule from award of contract through installation and testing and coordinate with Owner's representative.
- C. Verify site conditions including dimensions, clearances, and routing. Coordinate the location of the main control equipment with the Owner's representative. Coordinate the exact location of the loudspeakers and equipment with the architectural drawings, and ceiling conditions.
- D. Verify AC power requirements for the main equipment location and coordinate installation of related cabling and conduit.
- E. Verify network requirements for the main equipment location.
- F. Coordinate network requirements including, but not limited to, IP addresses, Subnets, MAC addresses, VLANs, and QoS as necessary.
- G. Provide penetrations at walls, ceilings, and floors as required for sound masking system cable routing.
 - 1. Conduit installation and penetrations must be provided in a manner that will not jeopardize the integrity of the systems, structures, and installations.
 - 2. Coordinate with structural engineer for penetrations through structure.
 - 3. Fire block and/or acoustically seal penetrations as required.
- H. Conduct preliminary testing and adjustment. Submit documentation required by this specification. Participate in approval testing for acceptance. Perform final adjustments as required to meet specifications.
- I. Provide maintenance and repair services for 12 months following acceptance of the system, at no additional cost.
- J. Deliver bound "as-built" system documentation including equipment instruction and operation manuals. Transfer all warranties and equipment guarantees, and provide a general description of system operation to the Owner at the time of acceptance of the work by the Owner.

1.4 PERFORMANCE REQUIREMENTS

A. General

1. The sound masking system is centrally controllable from a control panel and/or a computer connected via the network.
2. The system is able to automatically assign an address to individual network components.

B. Sound Masking Performance

1. The system uses digital signal processing (DSP) technology for masking sound generation and adjustment of masking signals.
2. The masking sound is random and provides no noticeable repetitive pattern.
3. The primary network devices shall provide a 1/3 octave band equalizer for the masking signal, capable of equalizing zones of 1 to no more than 3 speakers.
4. The masking volume is digitally adjustable in at least 0.5 dB increments at each primary network device over a range of 35 dB to 85 dB @ 1m from any loudspeaker.
5. The system is capable of muting the masking volume at each primary network device.
6. Sound levels referenced in this specification are A-weighted sound pressure levels measured at 5 feet above finished floor.
7. After adjustment, the system provides a spatial uniformity of + or - 2 dB for the masking volume with furnishings in-place.
8. In each area, set the nominal level of masking as noted below. The upper and lower limit for 1/3 octave band sound pressure levels are listed in the table below:

		Frequency (Hz)																				
		125	160	200	250	315	400	500	630	800	1k	1.25k	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	dB(A)
NC 40	Upper Limit	49	47.4	45.8	44.1	42.5	40.9	39.3	37.6	36	34.1	32.2	30.3	28.4	26.5	24.5	22.6	20.7	18.8	16.9	15	46
	Lower Limit	40	39.7	39.3	39	37.5	36	34.5	33	31.5	30	27.5	25	22.5	20	17.5	15	12.5	10	7.5	5	42

C. Timer Performance

1. System provides a timer function allowing masking volume levels to be automatically adjusted according to a programmed schedule.
2. System provides a calendar-based programmable timer function. Timer schedules are assigned to an individual or group of primary network devices.
3. System provides automatic daylight saving time adjustments.
4. System provides an acclimatization process that automatically increases the masking volume over a period of time according to a programmed schedule. The system must allow for independent acclimatization schedules for each timer zone. The system should be set to “ramp up” to the specified level over a period of (5) five consecutive work days.
5. System allows for up to nine independent timer zones per control panel/programmable timer.
6. System allows independent timer schedules for each day of the week.
7. System allows variable rates of scheduled volume adjustments.
8. System provides exception timer schedules for calendar days requiring a different schedule from the normal schedule.
9. System offers a programmed system activation date.

D. Control Panel

1. The main control panel is centrally located in non-public, secure room.
2. The main control panel is capable of adjusting masking volumes independently.
3. The main control panel is capable of restricting access to masking control.
4. The main control panel is capable of restricting the range of allowable volume adjustment for masking.
5. The main control panel is capable of individually muting the masking output.
6. The system is also programmable by computer. The installed controller is capable of retaining the levels, the masking equalization curves and the calendar clock.

E. Diagnostic Performance

1. The system is capable of ensuring that the expected correct amount of network connected masking devices are present and communicating properly with the networked control panel.
2. The system is capable of identifying the network devices that are not communicating properly over the masking network.

F. Reporting Performance

1. The network control panel is capable of reading and displaying the current settings for all networked devices.
2. The system is capable of generating detailed reports of all system settings down to the level of individual masking network devices.

G. Security Performance

1. The network control panel is contained in a locked metal enclosure.
2. Access to the control panel functions is password protected.
3. No physical controls are located on the system loudspeakers or masking network devices.
4. The system shall allow for all settings to be backed up on an electronic storage medium, including a personal computer.
5. The system shall monitor performance at each network component.

1.5 SUBMITTALS

A. With the bid, submit complete equipment list by manufacturer, model number and type. Also submit a proposed schedule for completion of the work. Submit any deviations from the specifications.

B. Post-Award Submittals:

1. Product Data: Manufacturer's specifications and installation instructions.
2. Network Design: Drawings of the sound masking network showing quantity and location of network components and related cabling and accessories.
3. Warranty Documents: Warranty documents covering the network components.

- C. Acceptance Test Submittals: Prior to requesting the completion of the acceptance tests, submit the preliminary test and adjustment information in accordance with Section 3.9. Installation of the sound masking system will be reviewed by the Design Consultant as outlined in the schedule established at the time of contract award.

1.6 QUALITY ASSURANCE

- A. All materials must be newly manufactured current production models and must conform to all applicable codes and the relevant standards listed below:
 - 1. American National Standards Institute (ANSI)
 - 2. Electronic Industries Association (EIA)
 - 3. Institute of Electrical and Electronic Engineers (IEEE)
 - 4. Underwriters Laboratories (UL)
- B. Single Source Responsibility – Source Network Control Panels, Primary and Secondary Network Devices, Loudspeaker Assemblies, Programmable Keypads and Cable Assemblies all fully compatible and from a single manufacturer source.
- C. Manufacturer Qualifications: Minimum of 10 years manufacturing sound masking systems.
- D. Installer Qualifications: Approved by manufacturer representative and are trained with the specified products. Contractor shall have a minimum of three years of documented experience with the installation of similar products to those specified and specialize in the installation of audio systems.
- E. Supervision: The Contractor shall designate a single supervisor to oversee the installation work for the duration of the project to ensure that the system is installed in accordance with the specifications and drawings.
 - 1. The supervisor shall maintain adequate staff and be responsible for installation and test the system on schedule.
 - 2. The supervisor shall have at least five years of documented recent project experience similar to this project.
- F. Coordination: The Sound Masking System Contractor shall coordinate with other trades in scheduling work. Where electrical work is required for the masking system, the Sound Masking System Contractor is responsible for coordination with the General Contractor and Owner.
- G. Approvals: The Contractor shall obtain and necessary approvals concerning his work from local building officials.
- H. Codes: Contractor shall comply with all applicable laws, regulations and codes.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Protect from moisture during shipping, storage and handling.
- B. Deliver in manufacturer's original unopened and undamaged packages with manufacturer's labels legible and intact.
- C. Inspect manufacturer's packages upon receipt.
- D. Store onsite so that no visible damage results to packaging or contents.

1.8 WARRANTY AND MAINTENANCE

- A. Transfer all manufacturers' warranties to the Owner at the time of acceptance.
- B. Provide a written warranty that products installed are free from defects in parts or assembly for a 5-year period from date of first use (the date of initialization).
- C. Provide a written warranty that the installation is free from defects for a 1-year period from date of acceptance (the date of initialization).

PART 2 PRODUCTS

2.1 MANUFACTURER

- A. Acceptable Manufacturer: K.R. Moeller Associates Ltd.; 3-1050 Pachino Court, Burlington, Ontario L7L 6B9 Canada. Toll Free: 866 LOGISON (1-866-564-4766). Tel: (905) 847-8633. Fax: (905) 847-7709. Email: info@logison.com. Web: www.logison.com.
 - 1. Requests for substitutions will be considered provided that the all performance requirements in Section 1.3 of this specification are met. Other manufacturers seeking approval must provide a signed compliance statement from an executive officer of the manufacturer.
 - 2. The listed model numbers are the design basis of this specification. Any substitution must meet the specific characteristics of the design basis devices and be submitted for approval.

2.2 MASKING SYSTEM DEVICES

- A. General System Overview
 - 1. The sound masking system is a networked system with complete digital, central control down to individually addressable speakers.
 - 2. The system is comprised of a selection of:

- a. Distributed network devices.
 - b. Loudspeaker assemblies.
 - c. One (1) or more network control panels.
 - d. PC network control software.
 - e. Cable assemblies.
 - f. Audio input modules.
 - g. Ceiling-mount adaptors.
 - h. One (1) or more power supplies.
- B. Each primary network device shall provide:
1. A DSP-based masking sound generator
 2. An individual 1/3 octave, 23-band equalizer for masking
 3. An individual volume control for masking
 4. Network communication components
 5. An audio amplifier
 6. Acceptable Device: Logison Model Number PNH-2, or approved equal
- C. Each secondary network device shall provide:
1. A loudspeaker connection
 2. Signal connections to/from other primary/secondary devices
 3. Acceptable Device: Logison Model Number SNH-1, or approved equal
- D. Each ceiling loudspeaker assembly shall provide:
1. A connection to the network devices
 2. A suspension chain at least 20 inches (51 cm) in length and tool-less length adjustment clip
 3. An acoustically damped enclosure
 4. Tool-less, on-site adjustment of upward / downward loudspeaker orientation
 5. A loudspeaker driver with:

6. Power Rating 25 Watts RMS minimum
7. Sensitivity 87 dB @ 1W / 1m
8. Frequency Response 100 - 10,000 Hz (+/- 6 dB)
9. Acceptable Device: Logison Model Number LA-1, or approved equal

E. Each wall-mount loudspeaker assembly shall provide:

1. A connection to the network devices
2. An acoustically damped enclosure
3. A loudspeaker driver with:
 4. Power Rating 10 Watts RMS minimum
 5. Sensitivity 84 dB @ 1W / 1m
 6. Frequency Response 100 - 10,000 Hz (+/- 6 dB)
 7. Acceptable Device: Logison Model Number LA-IWM, or approved equal

F. Each network control panel shall provide:

1. Network communication components
2. Network control electronics for masking and timer functions
3. Connections for audio input modules
4. Connections to network devices, additional control panels and a computer
5. Ethernet connection and IP addressability
6. Acceptable Device: Logison Model Number NCP-2 with keypad PK-1, or approved equal

G. The PC network control software to:

1. Allow control of all system adjustments from a computer, including:
 - a. Network setup
 - b. Sound masking volume and equalization
 - c. Sound masking timer programs

- d. Allow the reporting of all system settings
 - e. Perform network diagnostics
- H. Paging and music module
 - 1. Designate music, paging, or masking signal for each zone
 - 2. Acceptable Device: Logison Model Number AIM-2A, or approved equal
- I. Cable assemblies to:
 - 1. Provide power, audio and control signals over a single cable assembly
 - 2. Provide overmolded micro-connectors
 - 3. Be rated for use within a plenum ceiling space
- J. Power Supplies to:
 - 1. Power the network devices and control panels

PART 3 EXECUTION

3.1 SYSTEM INTEGRATION

- A. Install the masking system according to the manufacturer's specifications.
- B. Loudspeaker interval is calculated to provide edge-to-edge coverage at standing ear level (5'-0") throughout the masked environment, including enclosed office spaces as indicated on plans. The goal is uniform coverage throughout the masked space so that no listener can localize on any individual loudspeaker nor detect a change in background noise level as they move through the space.
- C. Masking loudspeakers installed must not be closer than two feet to a structural beam (open web trusses excepted), plenum ductwork, or other large acoustically opaque obstructions. The installed loudspeaker coverage is to be uniform in level at standing ear level regardless of any plenum mounting condition.
- D. The installed loudspeaker coverage is to be uniform in level and spectral character without regard to ceiling conditions such as penetrations and varying ceiling construction.
- E. Masking in the transitional zones shall be provided so that persons entering a masked area do not walk into or out of a "wall of sound," and that coverage level ramps up as the occupant walks into or out of an area with sound masking.
- F. Never provide wall mounted user level controls. The control panel is to be centralized and out of the hands of any user group. Masking is to be part of the building background environment and to, in no way, call attention to itself.

- G. Masking network control panel and power supplies are to be wall mounted in a non-public utility space. Masking power supply is connected to a constant power source. Coordinate for an adjacent line power receptacle. Label or verify labeling of the line power receptacle on the panelboard. Label circuit breaker "LEAVE ON" or "DO NOT TURN OFF".

3.2 EXAMINATION

- A. Ensure that facility build out is at a stage suitable for the system installation.
- B. Ensure that facility is constructed according to plans including wall locations, ceiling types and plenum barriers.
- C. Ensure that the plenum height is compatible with the manufacturer's recommendations.
- D. Ensure power and data requirements have been provided.
- E. Ensure sufficient space for centrally located components is available as per manufacturer's specifications.
- F. Ensure any third-party components required to be interfaced with the network have been provided.

3.3 PERMITS

- A. Obtain necessary permits for installation work.

3.4 INSTALLATION

- A. Follow all applicable codes for the area.
- B. Follow manufacturer's recommendations regarding installation as found in the Manufacturer's Installation Manual.
- C. Follow the system design for location of loudspeakers.
- D. System wiring may not contact ceiling tiles. All masking system wiring is to be suspended above the tiles and supported with support points no farther than six feet apart.
- E. No wiring between devices is to depend upon the termination for support. Wire weight is to be supported within two feet of the device.
- F. Record any necessary changes to the system design and implementation on the As-Built Plan and Functional Diagram.
- G. Ensure that supplementary materials are used meet applicable safety standards.

- H. Masking loudspeakers are installed in the plenum space with the output audio directed upwards for maximum coverage of the occupied space below.
- I. Attach label to the power supply power plug with tag “DO NOT REMOVE”.

3.5 FIELD QUALITY CONTROL

- A. Ensure that plenum heights meet the minimum recommended by the manufacturer for the loudspeakers.
- B. Ensure that distance between the top of the loudspeaker and the deck meets manufacturer’s minimum specifications.
- C. Ensure that loudspeakers are suspended plumb and level.
- D. Ensure that loudspeakers are not obstructed as much as possible. Where obstructions exist and cannot be changed, the number and location of loudspeakers and/or the masking sound level and spectrum should be adjusted to provide uniform masking levels at standing ear height in the occupied space.
- E. Verify cables are properly supported in the ceiling. No cabling shall be allowed to come into contact with the ceiling system. All cables shall be attached to ceiling support wires or structure. No wires shall be attached to fire sprinkler pipes or other life safety systems.
- F. Separate sound masking system cabling from other cable types and trades.
- G. Coordinate cable jacket colors so that the color of the sound masking wire is unique and not to be confused with any IT category cable.
- H. Ensure cables are securely terminated.
- I. Perform final test for sound masking level uniformity at standing ear height and adjust loudspeakers as required to achieve uniformity and performance requirements in part one of this specification.

3.6 SYSTEM CONFIGURATION AND ADJUSTMENT

- A. Follow manufacturer’s recommendations for system settings as found in the Manufacturer’s Manual.
- B. Base local control loudspeaker zoning on acoustical conditions, space type and function, loudspeaker type and installation method.
- C. Where masked spaces are adjacent to unmasked spaces a transition zone is required. The transition zone is one or more loudspeakers set at a reduced level to “ramp up” the background noise as the occupant moves from the unmasked to the masked space. This is to prevent a listener sensation of entering a noisy room. The initial setting for the masking system in “transition zones” is 6dB below the adjacent higher level area.

- D. Initial settings shall decrease the masking level by 6 dBA during evening and weekend periods. Evening level decrease shall ramp down at 3 dB per 30 minute period. Evening ramp-down shall start at 6:00 p.m. unless otherwise directed by the Owner. Morning ramp-up shall begin at 6:30 a.m. unless otherwise directed by the Owner.
- E. Masking level for Saturday, Sunday, and holidays shall not ramp-up, but shall maintain the masking at the reduced level.
- F. No portion of the system shall be turned on during occupied hours until the entire installation is complete.

3.7 CLEANING

- A. Ensure that empty packaging or material waste is removed and recycled in compliance with the recycling plan of the Project General Contractor.
- B. Ensure the product is clean and presentable at all times.

3.8 DEMONSTRATION AND TRAINING

- A. Demonstrate operational system to the Owner's designated representative. This should be executed in non-occupied hours where this activity will not call attention to itself nor the masking system.
- B. Demonstrate functionality of the system to the Owner's representative. This includes training on setting the system controls.
- C. Train Owner's representative on system maintenance as recommended per manufacturer.
- D. Submit a training date to the customer in advance of the training date so that the Owner can notify the appropriate staff. Maintain a sign-in sheet at the training and include this sign in sheet in the final system documentation.
- E. Provide installer name, address and contact information during training and in the final system documentation.
- F. Provide a label inside the controller with the installer name, address and contact information for service call purposes.

3.9 TESTING AND REPORTING

- A. Test area for consistency of masking volume and spectrum.
- B. Verify that zoning and levels are appropriate and meet performance requirements.

- C. If possible, test masking volumes with mechanical ventilation systems off and with space unoccupied.
- D. Provide a printed report detailing system settings and testing results, including all system settings for review by the Owner's system designer.
- E. Installer is to maintain final settings in digital form for two years.

3.10 PROJECT CLOSE OUT

- A. Provide As-Built drawings in both PDF and DWG formats to the Owner's representative. Drawings shall include a Reflected Ceiling Plan with all loudspeaker locations clearly shown, wire runs clearly shown and control panel locations clearly shown.
- B. Provide all manufacturer and installer documentation.
- C. Include all final test and measurement information in the final close-out documents.
- D. Provide two copies of the documents; one ring bound for use by the corporate engineering staff, and a second flat bound copy for filing in the facilities file cabinet and copying as needed.
- E. This project will not be considered complete until all final documentation and training have been delivered to the appropriate Owner's representatives.

END OF SECTION

**SECTION 22 05 00
COMMON WORK FOR PLUMBING DESIGN BUILD**

PART 1 – GENERAL

1.01 SCOPE

- A. Design and construct (design build) complete plumbing systems. The work shall include the building plumbing system. The system designs shall be energy efficient and provide ample capacity.
- B. Plumbing systems include, but are not necessarily limited to the following:
 - 1. Drain, waste and vent, rain water piping system, including cleanouts, drains and piping with sewer connections to site utilities.
 - 2. Domestic cold water piping system, including backflow preventer assembly.
 - 3. Domestic hot water, hot water return piping, including domestic hot water heaters, recirculating pumps, control and thermal insulation for piping.
 - 4. Fuel gas systems as required, including piping from meter to all equipment and appliances.
 - 5. Plumbing fixtures and trim, including traps, tailpieces, stops supplies, tubing, as required, and drains and cleanouts.
 - 6. Rough-ins and final connections to equipment and fixtures furnished under other sections of work, including kitchen and laundry facility.
 - 7. Sleeves, inserts, anchorage, hangers and required attachments.
 - 8. Stands and supports for equipment requiring them including seismic restraints.
 - 9. Coordinate work with other sub-contractors and trades, including other drawings and specifications.
 - 10. Excavation and backfill necessary for work and restoration of damaged surfaces as required.
 - 11. Cutting, patching, sleeves, chases, hangers, testing, roof jacks, flashing, sheet metal, and other items required for complete plumbing systems.
 - 12. Submit plumbing design for review.
 - 13. HVAC condensate drains, primary and secondary.
 - 14. Provide acoustical isolation for plumbing system per acoustical consultant guidelines.

1.02 DESCRIPTION

- A. Work included in this Section:
 - 1. It is the intent of these specifications that the Contractor design and provide the various systems to meet the specifications herein, including the various performance criteria delineated in sections included above and to be responsible for the actual performance of the systems according to the criteria.
 - 2. Contract documents indicate configuration and materials for the project. Design the entire plumbing system, based on specified performance, material and installation requirements while maintaining the required configuration and materials.
 - 3. Propose and, after approval of Architect, conduct a design process with the following general characteristics:

- a. Design: Preparation and submittal of design documents by Contractor, including submittal of Product Data.
 - b. Design Review: After review by Architect, Owner, Architect and Contractor meet to discuss design and any required revisions.
 - c. Revisions: Any required revisions to documents to be made by Contractor, submitted to Architect.
 - d. Governing Authorities: Submit required documentation to governing authorities, review submittals with governing authorities, permits, etc.
 - e. Submittals: Submit shop drawings, any additional product data, etc.
4. Organize, prepare and submit sufficient numbers of copies so that the Architect may retain two copies of all design drawings, shop drawings, calculations, product data, etc., required to design and construct the Mechanical Systems, including but not necessarily limited to the following:
- a. Design Drawings: Complete plumbing, piping and equipment for the project, including accurate location of all required piping and equipment.
 - b. Shop Drawings: After approval of design concept by Architect, submit any required shop drawings, showing detailed layout, dimensions, relationship to adjacent materials, anchorage, etc., cross-referenced to Architectural Drawings and Design Drawings.
 - c. Calculations: Prepared by a Mechanical Engineer licensed to practice in the jurisdiction of Governing Authorities.
- B. The work includes but is not necessarily limited to the providing of work as shown and noted on the Drawings and specified herein. This Section describes the General requirements for the materials, equipment and installation applicable to all Sections of the work under this Division. The following summary is included to indicate some items common to work. It is not necessarily all inclusive.
- 1. Labor, material, equipment, tools, rigging, hoisting, temporary scaffolding, transportation, supervision, inspections, services, insurance, fees and taxes.
 - 2. Repair of damage done to premises or other property as a result of the work and removal of debris left by those engaged in the work.
 - 3. Preparation of submittal, Shop Drawings, Project Record Drawings.
 - 4. Leave all exposed metal and insulated surfaces clean to receive paint, including piping, ductwork, equipment and related items.
 - 5. Access doors and panels required for the work.
 - 6. Identification of piping and equipment.
 - 7. Service connection to items installed by other Contractors and Trades.

1.03 DESIGN PROCEDURE

- A. General: Provide complete plumbing drawings and supplementary specifications for a complete and operable plumbing system conforming to all Codes and requirements specified herein, and including the plumbing items shown on architectural drawings and the intent outlined herein.
- B. Engineer of Record
 - 1. The mechanical/plumbing contractor shall contract with a licensed California professional mechanical engineer to prepare the drawings and supplementary specifications for this project. This engineer shall be known as the Engineer of Record who will be completely, and fully,

responsible for the design of the plumbing systems for this project. He shall have in force minimum \$1,000,000 of Errors and Omissions Liability Insurance (or higher, if so required by the Owner) and coverage shall be maintained in force from the date of execution of contract until the statutes of repose expire for the State of California.

2. The Engineer of Record shall attend design and related meetings with the Architect and other consultants, representative of various contractors, Fire Marshal, local inspection authorities, Owner's representatives, etc. as necessary to prepare coordinated and complete set of plumbing documents conforming to the requirements and code.

C. Drawings and Calculations

1. Drawings shall be prepared by Engineer of Record. The construction documents shall be prepared over Architectural backgrounds on AutoCAD version compatible with Architectural. The backgrounds/CAD files and base sheets shall be obtained from the Architect. Drawings, format, size and scale shall be the same as drawings prepared by the Architect. Coordinate with project team for final drawing format and composite drawing coordination.
2. The drawings shall be professionally prepared incorporating all minimum criteria and requirements as well as necessary components for complete and fully operable plumbing systems. In particular, space and clearance constraints shall be coordinated with the Architect. Any changes required in the architectural drawings shall be brought to the attention of the Architect immediately.
3. Prepare and submit drawings, stamped and signed by Engineer of Record, to the appropriate code enforcing authority.
4. Provide necessary documentation for Title 24 compliance.
5. Review and respond to possible comments from permit and plan review authorities; modify plans and specifications as necessary.

1.04 Documentation Review: Correct any deficiencies on the documents and answer questions addressed in the review(s) by the inspection agencies, Architects, Owner and their representatives. RELATED WORK

- A. Firestopping: Refer to Section, Firestopping.
- B. Flashing sheet metal materials and labor: Refer to Section, Flashing and Sheet Metal.
- C. Electrical material and labor: Refer to Electrical.

1.05 QUALITY ASSURANCE

- A. Work and materials shall be in full accordance with the latest rules of the Administrative Code, State Fire Marshal, and Building Standards; the National Electric Code; the National Fire Codes, National Fire Protection Association; California Plumbing and Mechanical Codes with California amendments, California Building Code; and other applicable City and County ordinances, codes, laws and/or regulations.

1.06 REFERENCES

- A. Specified References
 1. AGA: American National Gas Association
 2. ANSI: American National Standards Institute
 3. ASME: American Society of Mechanical Engineers
 4. OSHA: Occupational safety and health Administration
 5. CISPI: Cast Iron Soil Pipe Institute

6. CS: Commercial Standards
 7. IAPMO: International Association of Plumbing and Officials
 8. UL: Underwriter's Laboratories, Inc.
 9. SMACNA: Sheet Metal and Air-Conditioning Contractors' Association
 10. California AB 1953 lead free fixture and components.
- B. Provide without extra charge, any additional material and labor required to comply with the Regulations and Standards.
- 1.07 SUBMITTALS
- A. Submit a complete list of materials and equipment. Submittals shall be approved before purchase.
 - B. Submit shop drawings to show installation of equipment and piping in greater detail.
- 1.08 DELIVERY, STORAGE AND HANDLING
- 1.09 Refer to Architectural Section for General Requirements for material and equipment.
- 1.10 WARRANTY
- A. Submit warranties or guarantees to the Architect for equipment as required. Contractor shall guarantee material and workmanship for a period of one (1) year from date of acceptance.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Access doors shall be Karp or equal, stainless steel model DSC-214M, model KRP-150FR for fire rated assemblies, of sizes adequate for service intended (minimum 10-inch x 10-inch). Doors shall be compatible with wall and ceiling construction in which to be installed. Doors shall be equipped with concealed spring hinges and flush, screwdriver operated locks, except that key operated locks shall be keyed alike.
- B. Pipe Hangers:
 1. Super Strut, B-Line or equal with assemblies and component parts "Electro-Chromated" or galvanized steel finish.
 2. Individually suspended piping shall be supported by hangers complete with all-threaded rod. Pipe hangers to be manufactured of 1-inch minimum width steel (metal straps are not acceptable).
 3. Trapeze Suspension, for three or more pipes in the same place, use Super Strut 1-5/8-inch width channel of a size suitable for load in deflection to exceed 1/180 of a span.
 4. Trapeze Supporting rods shall be of a diameter sufficient to support the load with a safety factor of 5. Rods shall be securely anchored to the building structure.
 5. Pipe strap, to attach pipe to channel, shall be compatible with pipe material.
 6. Hanger Spacing horizontal piping shall be supported with hangers spaced at maximum as listed below and at changes in direction.

- a. Copper tubing shall be supported as follows: 1-1/2-inch and smaller at 6-foot intervals, 2-inch and larger at 10-foot intervals.
 - b. Cast iron pipes shall be supported every 4 feet and within 18 inches joint at each horizontal branch connection.
 - c. Support screwed and welded steel pipes at 10-foot intervals.
 - d. Gas Piping: 1/2 inch at 6 feet intervals, 3/4 and 1 inch at 8 feet intervals, 1-1/4 inch and larger at 10 feet intervals.
 - e. CPVC and PEX piping: Not allowed.
7. Isolators install pipe shields, Inc. isolators at hangers and clamps.
8. Attachments to roof structural members with brackets, rods and channels as reviewed by the Architect.
- C. Pipe Protection: Penetrations of rated assemblies shall be fire-stopped per U.L. standards. Fire stopping shall be an approved material as specified and as prescribed in State Fire Marshal Standard.
- 1. Insulated pipe shall be protected at the point of support by a 360-degree sheet metal shield. Insert to be same thickness as adjoining pipe insulation. Shield length and minimum sheet metal gauges shall be as recommended by manufacturer.
 - 2. Bare-Copper - Tube shall be protected at the point of support by a 360-degree felt pad, minimum 1/4" thick.
- D. Pipe and Fittings:
- 1. Soil, waste, storm and vent piping shall be no hub coated cast iron pipe and fittings with stainless steel neoprene sleeves 24-gauge stainless steel bands with worm drive clamps. Provide corrosion protection, if necessary, per Cast Iron Soil Pipe Institute's recommendation. Install per CPC installation standard.
 - 2. Hot Water/Cold Water:
 - a. Above ground shall be Type "L" copper pipe. Tubing joints shall be made with Camfield lead-free solder 95-5 tin-antimony with matching flux. Underground piping shall be hard type "K" copper tubing, joints shall be silver brazed. Buried piping joints shall be silver soldered or brazed for 300 psi test. Wrap copper buried piping with Protector Wrap No. 2002 tape, single layer with 50% overlap to make a double thickness of the tape throughout.
 - 3. Gas piping: Above ground Schedule 40 black steel pipe; gas pipe below ground shall be Schedule 40 black steel with plastic coating. Gas piping 4" and smaller shall be threaded with screwed fittings; piping 5" and larger shall be welded. Fittings shall be tube turn, standard weight long radius pattern. All welding shall be performed by a certified welder. Gas piping installed outdoors shall be galvanized steel. Where permitted by code, may use corrugated stainless-steel tubing that is part of a system listed by an approved agency.
 - 4. Condensate and miscellaneous drains: copper tubing type "L" with DWV copper solder joint drainage fittings, lead free equivalent to 50-50 solder.
- E. Valves: Shall be lead free, Nibco, Hammond And Watts.
- 1. Gate valves: 2" and smaller Nibco S-180, ring gate, or gate valve. 2-1/2" and 3" Nibco T-113.
 - 2. Ball Valves: Nibco 580 series two-piece bronze. At contractor's option can be used in lieu of gate valves for valves 3" and smaller.

3. Gas Cocks: For individual appliances: Crane #298; cocks for shut-offs in main or branch lines, plug lubricated Nordstrom; 1/2-inch and 3/4-inch.
4. Backflow preventer assembly: Watts, Febco or equal as approved per local regulations.
5. Thermometers: Weksler, Weiss, Palmer or Equal. Dial type, 4-1/2-inch diameter 5 to 250-degree F.
6. Globe: Size 2-inch and smaller: Bronze, Class 150, union bonnet, disc for 250 degree F hot water service, 150 SWP, 20-0 WOG screwed ends.
7. Check: 2-inch and smaller: Bronze, Class 150, swing Y-patter, screwed cap, bronze disc, 150 SWP, 200 WOG screwed ends.
8. Gate: Size 4-inch and larger: Iron body, bronze mounted Class 200, bolted bonnet, non-rising stem, solid wedge, flanged ends.
9. Check: Size 2-1/2-inch and larger: Iron body, bronze mounted, Class 200,, bolted bonnet, horizontal swing, renewable seat and discs, flanged ends.
10. Butterfly Valves: 200 psi, wafer type, extended neck, streamlined alloy disc, reinforced resilient seat. May be used in lieu of valves sizes 3-inch and larger.
11. Pressure Reducing Valves: Watts, bronze body with strainer, screwed ends sizes 2 1/2 inch and smaller.

F. Piping Specialties:

1. Unions: Grinnell, Epco or equal, bronze to iron seat, black or galvanized to match piping. Anaconda or equal for copper piping.
2. Shock Absorbers: Zurn, J.R. Smith or equal, Shoktrol Z-1700. Sized per manufacturer's recommendations. Provide access doors at each shock absorber. Provide at flush valve water closets, dishwasher, and cloth washers.
3. Floor Cleanouts: Zurn, J.R. Smith or equal, series Z-1400-Series. Wall clean-outs, Z-1443 with square stainless steel access cover and frame. Floor clean outs, and clean-out to grade Z-1400, clean-outs in carpet area ZN-1400-CM with carpet marker, clean-outs in tiled areas ZN-1400T square top. Provide cast iron cover and with nickel bronze frame and top for heavy traffic areas. Set drains and clean-out flush with finish floor.
4. Wall Cleanouts: Zurn, J.R. Smith, or equal, model Z-1443 wall clean-out with square access cover and frame.
5. Trap Primers: E and S, J.R. Smith, Precision plumbing products, or equal, suitable for dead-end service, all bronze with vacuum breaker with gasketed bronze cover, union connection. At each trap primer provide gate valve and access door.
6. Pipe Isolators: Stoneman "Trisolator" or equal. Provided on all bare branch pipe runs at point of attachment.
7. Plumbing Vent Flashing: Furnish 2 piece, 4 lbs. lead flashing with a 4" flange, manufactured per SMACNA Manual. Lead shall extend a minimum of 8" above roof deck. Lead cap shall turn down over lead flashing.
8. Wall Sleeves: R-K Industries, No. 100 (wall) and No. 10 (deck), or equal.
9. Provide one piece, 4 lbs. lead sheet for drain sumps. Lead shall be sized to extend uninterrupted up cants or tapered edge strips, and to terminate just below deck line.
10. Pipe Sleeves: Zurn Z-195 and/or fabricated sleeve. Sleeves shall have membrane clamping

rings and penetrations shall be sealed, water-proof sleeves. Provide pipe sleeve for piping through footing or where embedded in concrete slab.

11. Provide link seal pipe sleeves at perimeter wall penetrations below grade. Provide link seal pipe sleeve as an alternate for all pipe penetration at courtyard and podium penetration.
 12. Dielectric Unions: 6" brass nipple and union in place of dielectric unions, or premanufactured dielectric unions.
 13. Escutcheons: Chrome plated cast brass or stamped stainless steel plates, split type, with chrome plated set screw. Provide at all exposed locations where pipe penetrates floor, wall or ceiling.
 14. Temperature gauge: Weksler 5A02 with poly lens.
 15. Pressure Gauge: Weksler BAL4P with poly lens.
 16. Balancing valves: Griswold pressure independent circuit setter.
 17. Strainers: Watts 777S. All strainers must have ball valve or drain port.
- G. Pipe Coating: All underground gas piping shall be coated with X-Tru-Coat, extruded plastic high density polyethylene coating. Field joints shall be made with Protecto Wrap No. 2002 tape, single layer with 50% overlap to make a double thickness of the tape throughout. Overlap factory wrapping by not less than 4". Clean all pipe and fittings and prime with protector wrap #1170AP primer before applying tape.
- H. Insulation: Insulate all hot water main piping and hot water return with Owens Corning, fiberglass 25ASJ 2-piece heavy density pipe insulation 1" thick for piping up to 2"; 1-1/2" thick for piping 2-1/2" and larger; 1/2-inch thick for cold water piping located in attic. Apply insulation as per manufacturer's instructions.
- I. Fixtures and Trim:
1. Install all fixtures at locations shown on Architectural Drawings. Unless otherwise noted. All fixtures to be white.
 2. Install chrome-plated escutcheons plate on all pipes through walls, ceilings or floor. Provide 17 ga. Chrome plated brass P-trap and tail pieces. P-traps at kitchen sinks shall be furnished with clean-out plug.
 3. Install stop valves on hot and cold-water supplies to each fixture. Provide stainless steel braided by brass craft or equal. For exposed supplies, provide chrome plated brass tubing.
 4. Make sink/lavatory trap and waste line adaptable to adjustment with only the replacement of the drain tailpipe. Hot and cold-water supply tubes shall be configured so that their length may be changed without modifying the slip joints. Where cabinets are installed initially in the wheelchair accessible configuration, the hot water and sink drain lines shall be insulated with Skal-Guard insulation.
 5. Provide shock absorbers at washing machines, dishwashers and flush valve water closets. Size per manufacturer recommendation.
 6. Plumbing Fixtures: See Plumbing Fixture Specifications schedule.
 7. Flexible Pipe Connectors: At equipment connections where equipment is mounted on vibration isolators. Use Metraflex Co. or equal flexible pipe connectors, 200 psi rated.
 8. Balancing Valves: Griswold pressure independent balancing valve.
 9. Pressure and Temperature Test Stations: Supply and install "Pete's Plug", 1-1/4"-inch MPT fittings to receive either a temperature or pressure probe 1/8-inch DO. Fittings shall be sold with valve core of Nordel, fitted with a color coded marked cap with gasket, and shall be rated at 1000 psig. Install at

boiler supply and return connections.

10. Trap Primer: PPP Model P-1 and P-2.

2.02 EQUIPMENT

A. Central Domestic Hot Water Systems.

Provide central heating equipment as manufactured by California Hydronics Corporation or approved equal.

The system shall include, as a minimum, the following components: hot water heaters, pumps, expansion tanks, solid state temperature sensor, control panel, thermometers, gauges, isolation valves, check valves.

1. Hot water heaters shall be AO Smith, 95% efficiency rating. The unit shall be design certified by the American Gas Association Laboratories. The unit shall be built and tested to the AMSE Section IV requirements for 160 psi.
 - a. Water heaters shall be high efficiency units with Category III stainless steel venting system. May use PVC ventilating system if allowed by manufacturer and building department.
 - b. Heat Exchanger
 - ASME Inspected and Stamped for 160 PSIG Max Working Pressure
 - Natural Gas, spiral Shaped, glass lined heat exchanger, glass lined heat exchanger, high efficiency modulating pre-mix powered burner.
 - Advance Electronic gas control system, direct spark ignitor.
 - Steel tank construction, powered anodes for corrosion protection, Blue Diamond glass-line.
 - c. ASME Pressure Relief Valve
 - 125 PSI
 - Front Water Connections
 - Front Exhaust & back intake Air Connection
 - Internal Automatic Air Vent
 - d. CSA Design Certified – ETL Listed
 - Gas Water Heaters Volume III
 - ANSI Z21.10.3 / CSA 4.1-2004
 - e. Controls
 - 120v, 1Ø Power Supply w/Integrated Flame Sensor.
 - Direct Spark Ignition Systems w/Integrated Flame Sensor.
 - Modulating Digital Control System
 - High Limit Control, Manual Reset
 - Flow Switch
 - Blocked Vent/Condensate Pressure Switch
 - Cascade Control Board and Software
 - f. Burner
 - 316L Stainless Steel Premix
 - Ultra-Low NOx: Less than 13 PPM adjusted for 3% O₂.
 - California Safety Code items
 - g. Stainless Pump
 - 120V, 1Ø, 60Hz
 - Condensate Neutralizer/Drain
 - Electrical Panel w/Service Disconnects
 - Common Gas Manifold
2. Hot water return circulating pump: Bell and Gossett or equal circulator with one piece dynamically balanced impeller, stainless steel shaft, bronze sleeve bearing, one piece spring coupling, resilient

mounted, split phase motor with built-in overload protector.

3. Expansion Tank: Amtrol's "ST" bladder-type, ASME code thermal expansion tank with California code required site-glass assembly. Working pressure to be 125 psi minimum. Tank shall be provided with flanged access connections to allow field replacement of bladder.
4. Start-up Service: Manufacture of water heater system shall provide a minimum of one-day to start up for control adjustments and for instruction of operation procedures to owner's representative. A complete, detailed instruction manual shall be provided to the Owner. It shall include a detailed description of the controls and operation instruction along with individual component parts and service information.

2.03 FIRESTOPPING AT RATED WALLS AND CEILINGS

- A. Provide fire stop per U.L. Code.

PART 3 – PERFORMANCE REQUIREMENTS

3.01 PERFORMANCE REQUIREMENTS

- A. Utilities:

1. Verify existing services are adequate.

- B. Domestic water system:

1. Water distribution systems shall be protected against backflow. Backflow prevention units shall be provided where required by Code and Governing Authority. Master meter will serve public restrooms units and common area, retails will be provided with sub-meters. A dedicated water meter will serve irrigation system.
2. Minimum water pressure required on the top floor shall not be less than 20 psig for plumbing fixtures. Maximum water pressure allowed shall not exceed 60 psig for plumbing fixtures.
3. Provide complete domestic hot water system including following:
 - a. Central hot water system shall consist of multiple water heaters, storage tanks and pumps. Hot water return system with circulating pump and automatic control.
 - b. Systems to be set to deliver 120°F hot water supply to units.
 - c. Insulation for hot water supply and hot water return piping, from water heaters to point of use. Hot water return piping shall serve all fixtures to within 30 feet of the farthest fixtures. Run hot water supply and return piping at garage ceiling.
4. Size of water piping. Refer to the latest edition of the California Plumbing Code. Maximum velocities in cold water lines shall be 4 feet per second (fps) for ½" and ¾" pipes. For larger pipes, 6 fps is allowable. All hot water supply and return piping shall not exceed 4 fps for pipes 1" and larger and 3 fps for pipes smaller than 1".
5. Do not place water piping above ornamental suspended ceiling, over electrical switchboard rooms or elevator machinery rooms.
6. Run main hot water, cold water and hot water return at garage ceiling with HW, CW, HWR risers serving each stack of plumbing fixtures. Provide shut-off valve for hot and cold-water piping serving each stack of units.
7. Provide irrigation water piping for podium landscaping. Irrigation piping within garage shall be copper piping. Provide stub-outs to planters at podium level for continuation by landscape section of work.

- C. Sanitary sewer and vent system: Provide sanitary sewer and vent piping system. Pipe sizing shall be in accordance with latest edition of the California Plumbing Code and local regulations. Route piping to maintain minimum 8'-2" clearance height at handicap parking and drive isles.
1. Coordinate with site section of work for sanitary sewer connection points. Due to large size of the building, take special precaution in design of sanitary sewer system to minimize sewage pumping system.
 2. Provide flexible connection and provisions at building seismic joints.
- D. Storm sewer system:
1. Revise rain water leaders where required to coordinate with the new floor plan.
 2. Pipe sizing shall be in accordance to latest edition of California Plumbing Code.
 3. Provide drains for balconies and pipe to storm system. Provide trench drain at garage entrance, discharge per city requirements.
- E. Gas piping: Provide gas piping rough-ins and connection to equipment including: domestic hot water heaters. Coordinate with heating, ventilation and air conditioning section of work.
1. Gas piping shall be designed in accordance with the latest edition of NFPA Standard No. 54, Installation of Gas Appliances and Gas Piping and California Plumbing Code.
 2. Gas piping shall not be run below ground slab.
- F. Plumbing fixtures: Provide plumbing fixtures, trim and complete plumbing system. Refer to Architectural drawings for fixture locations.
1. Floor drains:
 - a. Provide floor drain in public toilets, trash rooms, mechanical equipment room.
 - b. Provide trap primer and piping for all floor drains and floor sinks, except shower drains.
 - c. Coordinate with fire protection section of work for any drain receptor requirements.
 2. Hose bibbs: Brass hose bibbs. Provide hose bibbs at each public toilet, at each end of the building (recessed and keyless). Provide cold water connection at top of trash chutes per chute manufacturer requirement. Provide hose bibbs at each parking garage (minimum 2 hose bibbs). Provide hot water hose bibb (if required by city) and cold hose bibbs at trash rooms in parking garage.
 3. Handicap Units shall be provided with handicap fixtures including water closet, lavatory, shower and kitchen sink. Insulate water and drain lines below lavatory with Scal-Guard pre-molded insulation. Refer to Architectural Drawings for handicap units.
- G. Provide primary and secondary condensate drain for air conditioning units. Drains shall terminate over approved receptors.
- H. Noise control guidelines for plumbing and drain systems.
1. General

To minimize water-flow noise, supply, hot-water heating, and waste piping must be vibration isolated at showers, sinks, clothes-washing machines and dishwashers. In addition, all piping concealed within noise sensitive areas, such as bedroom, living/dining room, offices, video room, club room and party walls must be isolated from the building structure. Isolation of all supply piping is a recommended option.

 - a. For supply water piping 1-inch diameter or smaller, use either (1) the Hubbard HoldRite Silencer family of products (http://www.holdrite.com/product_results.asp), or (2) the Acousto-Plumb System of orange and blue plastic pipe isolators, holders, and guides, as

manufactured by LSP Products Group

- b. (<http://www.lspproducts.com/Catalog/Acousto.asp>). Alternatively, wrap pipe in sections where fastening to the structure is necessary or where piping penetrates structural members with short sections of closed-cell neoprene sleeves $\frac{1}{4}$ " minimum thickness such as those manufactured by Armstrong Armaflex of approved equal and attached piping to structure with oversized clamps.
- c. Isolate waste pipes and supply water pipes more than 1 inch in diameter (or more than $\frac{1}{4}$ " inch if Hubbard Silencer System is used on supply piping). May use Stoneman Trisolator system of pipe isolators for pipe sizes larger than 2" diameter as manufactured by Stoneman Engineering and Manufacturing, Tel: (213) 776-2920.
- d. Do not allow the piping, pipe connectors, pipe hangers, or valves to directly touch the structure, studs, gypsum board, or other pipes. Metal wire and strap hangers are not allowed without providing neoprene isolating material between the strap and pipe.
- e. Support pipe is required by Uniform Plumbing Code. Wrap pipe with neoprene at all hangers.
- f. Neoprene material must also be provided between structure and screw-attached supporting elements such as copper solder plates (sinks, toilets, etc.) and drop-eared 90s (shower and tub spouts, etc.).
- g. Riser clamps for supply and waste lines shall be isolated from structure (subfloor) by Mason Super W neoprene waffle pads, Hubbard HoldRite Silencer Model #275-T riser pads, or approved equal.
- h. Plumbing pipes should have 1-1/2 inches of clearance between the pipe and gypsum board at noise sensitive rooms (bedrooms) and one-inch clearance at less noise sensitive spaces (living rooms).
- i. Supply water, waste, drain, vent (within two feet of drain piping), condenser water, and rainwater leaders need to be vibration isolated from the structure, other piping, ductwork, gypsum board, etc. This includes pipe penetrations through framing, pipes running along framing members, and hangers. This applies for all pipes attached to a partition adjacent to habitable spaces and also to pipes suspended from structure that supports the floor of residences or other occupied spaces.
- j. In double-stud assemblies, plumbing piping may not be attached to both stud bays. A length of plumbing piping shall only be attached to one stud bay.
- k. The contractor shall submit proposed plumbing isolation devices for approval. The orange-and-blue Acousto-Plumb system, the blue-and-white Hubbard Holdrite Silencer system, and the Trisolator system are acceptable.
- l. J-hangers shall incorporate minimum $\frac{1}{4}$ -inch thick stick-back felt or ribbed neoprene between the hanger and the pipes. The isolation intended shall be cut so that it wraps completely around the pipe. In addition, the isolation material shall not extend out a minimum $\frac{1}{4}$ -inch past the hanger edges. The Hubbard Silencer 300 and 320 Series of neoprene-lined hangers are acceptable manufactured pre-isolated hangers. Alternatively, non-isolated hangers can be purchased, and the isolation material added in the field.
- m. At trapeze installations, a resilient material shall be required between the piping and the clamp. If a "resilient" insert is to be used, it must be submitted to verify that it is sufficiently resilient some "cushioned" inserts are actually not resilient.
- n. $\frac{3}{4}$ -inch thick neoprene waffle pads (mason Super W, Hubbard Holdrite Silencer 275-T, or approved equal) are needed between pipe riser clamps and the structure.
- o. Cast iron pipe shall be used for waste, drain, rainwater, or similar systems. If thin-walled copper, PVC, or other lightweight piping is used, then it must be completely using Lowry's acoustical pipe wrap. The wrap is manufactured by Harry A. Lowry, (818) 768-4661.
- p. Supply water flow rates shall not exceed four (4) feet per second (fps) in $\frac{1}{2}$ -inch and $\frac{3}{4}$ -inch diameter pipes. For larger pipes, six (6) fps is allowable.
- q. Maintain a maximum water pressure of 55 psi at plumbing fixtures as consistent with adequate flow rates.

- r. All stud and joist spaces including piping shall have a minimum of R-11 (3-1/2-inch thick) batt insulation installed.
 - s. Walls containing plumbing piping should be sized so that there is two-inch clearance between the piping and the gypsum board at non-plumbing rooms and one-inch clearance at plumbing rooms. This is especially important at interior, non-demising walls that are often thin, single-stud assemblies.
 - 2. Control Water Pressure
 - a. Water pressure shall be limited to maximum 55 psi at plumbing fixtures as consistent with adequate flow rate.
 - 3. Execution
 - a. Install 3-1/2-inch batt insulation in otherwise un-insulated stud and joist spaces containing water piping, waste, drain and rainwater piping.
 - b. Provide water hammer arrestors at all solenoid operated fixtures (clothes washers, dishwashers) and any tank-less toilets.
- I. CalGreen Compliance
 - 1. Coordinate with design team for CalGreen related items.
 - 2. Integrate CalGreen related design, installation and compliance.
 - 3. Provide water efficient plumbing fixtures: use 2 GPM shower heads, use 1.8 GPM kitchen faucet.
 - 4. Provide dual flush or 1.28 GPF toilets as alternate bid.

3.02 RELATED WORK SPECIFIED ELSEWHERE INCLUDES

- 1. Handicapped adjustable kitchen and bath counter-tops: See Specification for CABINETWORK.
- 2. Firestopping: See Specification for FIRESTOPPING.
- 3. Access Doors: See Specification for ACCESS DOORS.
- 4. Acoustical Isolation: Refer to Acoustical Consultant design recommendations.

PART 4- EXECUTION

4.01 INSPECTION

- A. Contractor is responsible for complete, properly installed system, Installation and material shall comply with all rules, codes and regulations.

4.02 SERVICES

- A. Materials, methods and locations of service mains connecting the new construction to all new services shall be in strict accordance with rules, regulations, codes and requirements of all agencies having jurisdiction over this installation. Coordinate location of water and sewer connections with Site Utility Work.

4.03 INSTALLATION

- A. Electrical work: Motors, electrical apparatus and wiring specified in this section shall conform to the National Electrical Manufacturer's standards and the National Electrical Code and bear the Underwriters' label of approval.
- B. Cutting and Patching: Sleeving, cutting and patching of rough construction for piping and ductwork

shall be a part of the work. No cutting shall be done without Architect's approval.

- C. Cleaning and Closing: Piping and equipment shall be inspected before placing and the interior cleaned before closing. Piping shall be closed at the end of each day's work.
- D. FABRICATION: Manufacturers' Directions: follow Manufacturers' directions for equipment and devices installation.
- E. Flashing: Pipes passing through roof shall be flashed and counter flashed. Except where lead flashings are to be used, sheet metal material shall be 24-gauge galvanized steel (minimum) zinc alloy. Such sheet metal work shall conform to the requirements of Section Thermal and moisture protection.

4.04 SEISMIC RESTRAINTS

- A. Piping:
 - 1. Provide pipe bracing for piping suspended 12-inches or more from structure with 2-1/2" and larger diameter, and gas piping 1" and larger diameter, per "SMACNA".
- B. Equipment:
 - 1. Equipment shall be accurately set and leveled; supports shall be neatly placed and properly fastened. Equipment shall be fastened in place with bolts and seismic restraints. Equipment anchorage shall comply with Title 24, Section 1613A.

4.05 EXCAVATION

- A. Trenches: Dig straight and true to lie and grade, bottom smoothed of any rock points. Where rock is encountered, excavate 3-inches below grade of the pipe and fill with sand properly compacted. Pipe shall be supported for the entire length of undisturbed original earth or compacted sand. The bottom of trenches shall be shaped or compacted for the pipe, hubs and couplings, using templates to fit the outside periphery of the lower third of the piping. Compaction requirements shall conform to the site work section.
- B. Backfill: In accordance with soil report recommendations.
 - 1. After piping has been installed, tested and approved, excavations shall be backfilled, tamped and compacted to 95 percent by compressed air tampers.
 - 2. Backfill to 6-inches above crown of pipe shall consist of unwashed sand or pea gravel, with remainder of trench backfilled and mechanically tamped in 6-inches maximum layers of selected non-expansive structural fill (free of organic matter and rocks).
 - 3. In any asphalt, concrete paved areas or slab floors backfill shall be made only to the subgrade level.

4.06 COORDINATION AND APPROVAL

- A. Coordinate new work and existing conditions with other Contractors and Trades. If conflicts are discovered, a set of prints marked with red pencil showing recommended installation methods shall be submitted to the Architect for approval prior to installation of work in question.

4.07 PIPE

- A. Install all piping clean, free of tool marks, plumb with building lines and to avoid conflict with structural members. Make ample provisions for expansion and contraction using special bends or swings where required. Provide unions as required to facilitate convenient removal of valves and similar fittings. Install valves where required for the proper functioning of the plumbing system. Valves, strainers, cocks, etc., shall be the same size as the pipes in which they are installed, unless otherwise indicated. Provide chrome plated escutcheon plates wherever a pipe enters the wall, floor or ceiling in finished

portions of the building. Vent all traps and run separately or combine to a point 6" above the roof and leave open. Fixture vents may be connected to the main vent at a point 6" above the highest fixture and not less than 3'-6" above the floor. While work is in progress, plug or cap all openings in plumbing work. Provide sound control on all water piping not installed in the ground. Install dielectric couplings wherever a non-ferrous pipe connects to a ferrous pipe or piece of equipment. Sanitary piping shall run at minimum slope of 1/4 inch per foot, unless otherwise authorized by local authorities.

- B. CPVC piping installation, supports and fittings shall be per CPC. Provide expansion loop as required.
- C. Seismic restraints shall be installed on all water heaters using supply tubing. The use of solid non-flexible supply materials shall be considered adequate seismic restraint.
- D. Piping subject to expansion and contraction shall be arranged with flexibility to prevent exceeding allowable stress in pipe, valves, or connected equipment.
- E. To the greatest extent possible, domestic cold-water piping shall be kept separate from hot piping and, where there is a choice, shall be run in the coolest portion of the available space. Provide expansion loops to allow for piping system expansion and contraction.
- F. Bends and junctions in piping shall be made with acceptable fittings.
 - 1. Bushings shall not be used for gas piping in concealed spaces.
 - 2. Changes in size shall be made with reducers or reducing fittings.
- G. Joints in threaded piping shall be made up with an acceptable pipe rope applied to the male threads only.

4.08 PIPE JOINTS

- A. Copper and Brass Pipe and Tubing: Make up all joints below slab with silver brazing alloy, 1100 degrees F melting point or greater, ASTM B-260; piping not buried in the ground make up with lead free solder. Joints above grade shall be made with lead free solder.
- B. Make all other pipe joints and connections in accordance with CPC Installation Standards.

4.09 CLEANOUTS

- A. Install where required by ordinances and in the following locations:
At the ends of house drains, at all changes in directions, in all straight runs at 50 foot intervals, where horizontal mains change size, and at all ends of all branch pipes which are 5' or over in length.

4.10 FLUSH-OUT

- A. Flush-out entire plumbing system at the end of job per CPC.

4.11 TESTS

- A. Pressure test entire hot and cold piping and drainage system from capped connections, to and including vents above roof.
 - 1. Furnish the necessary materials, test pumps, gauges and labor required for testing.
 - 2. System shall be tested in accordance with the following schedule without pressure loss or visible leaks within four (4) hours duration:

<u>System Tested</u>	<u>Test Pressure PSIG</u>	<u>Test With</u>
Sanitary Sewer, Drain and Vent	Fill system to top of highest vent in the system	Water
Storm Sewer	Fill system to	Water

Hot and Cold Water
Gas

Roof drains
150 % of Line Pressure
50 lb. gauge

Water or Air
Air

4.12 OPERATION

- A. After completion, operate the different systems and equipment under their normal working conditions.
- B. Should any piece of apparatus or any material or work fail in any of these tests, immediately remove and replace with new materials and test the portion of the work replaced.

4.13 IDENTIFICATION

- A. Identification Markers shall be SETON Nameplate Corp.
 - 1. Piping:
 - a. Piping which is accessible for maintenance shall be identified with semi-rigid plastic identification markers as reviewed by the Architect. Use of tape is not permitted.
 - 2. Identification of Equipment:
 - a. Items of mechanical equipment, such as control panels and water heaters, shall be identified by approved nameplates. Nameplates shall be securely affixed to each individual piece of equipment.

4.14 PROJECT RECORD DOCUMENTS

- A. Provide and keep up to date a complete set of prints which shall be corrected regularly and shall show every change from the original contract drawings, including change orders and existing condition. Submit a set of reproducible "As-Builts" to architect at the end of the job.

4.15 ACCESS AND CLEARANCES

- A. Equipment shall be placed, and connections made in such manner that all routine adjustments and maintenance operation may be performed without inconvenience and so that all code requirements for clearances are maintained. The following provisions are included:
 - 1. Maintain 36" clear in front of electrical panels.
- B. Provide access panels and clearance for all items requiring adjustments or maintenance.

4.16 ADJUSTING AND CLEANING

- A. Provide labor/test equipment; disconnect equipment from the system that can be damaged by pressure.
- B. Thoroughly clean equipment and piping, free from rust, scale, fillings, plaster and dirt before and after covering and painting is done, or systems are put in operation.

4.17 OPERATION AND MAINTENANCE MANUAL

- A. Provide operation and maintenance manual with index list and specification of all equipment, fixtures, devices and material installed, including repair and replacement instructions.

END OF SECTION

SECTION 23 05 00 COMMON WORK FOR HVAC DESIGN BUILD

PART 1 – GENERAL

1.01 SCOPE

A. Work Included in this Section:

1. Design and construct (Design Build) complete heating, ventilating and air conditioning system. Design shall be illustrated by complete construction drawings. Specifications and calculations required to complete the work.
 - a. The work shall include the building heating, ventilating, and air conditioning system to provide controlled environments for the buildings. The systems design shall be energy efficient and provide ample capacity and zoning flexibility.

B. The heating, ventilating and air conditioning (HVAC) System includes, but is not necessarily limited to, the following:

1. Roof mounted gas fired, packaged roof top units.
2. Exhaust fans
3. Complete ducted air systems, toilet exhaust and other environmental exhaust as required. Supply, return and exhaust fans, curbs and supports, ducts, dampers, air devices, diffusers and registers, fire dampers, fire and smoke damper and devices as required. Provide motor starters and trim for mechanical equipment.
4. Dedicated split system air-conditioning units for IDF room, elevator equipment rooms and similar areas as required.
5. Automatic controls including thermostats, central time switches, by-pass timers, wiring, relays and devices.
6. Motors required. Furnish and install starters as apart of a packaged system.
7. Thermal insulation ductwork and acoustic ductliner.
8. Access doors required for the work.
9. Stands and supports for equipment requiring them, including seismic restraints.
10. Sleeves, inserts, anchorage, hangers, etc., required for installation.
11. Flashing and counterflashing of piping and ductwork for roof and wall penetrations.
12. Testing, adjusting and balancing of all equipment and systems.
13. Calculation for California Energy Standards (Title 24) Compliance as approved by the City and the Architect.
14. Cutting and patching of building construction where required to install the work.
15. Coordinate all work with all other trades, drawings and specification, under the direction of the General Contractor.
16. Work with design team members to provide a LEED Gold certified building. This includes....
17. Provide vibration and noise control for HVAC systems per acoustic consultant specifications.

18. Envelope and mechanical systems shall perform a minimum of 15% better than Title 24 standards, in order to obtain energy credits for LEED Gold.

1.02 DESCRIPTION

A. Work included in this Section:

1. It is the intent of these specifications that the Contractor design and provide the various mechanical systems to meet the specifications herein, including the various performance criteria delineated in sections included above and to be responsible for the actual performance of the systems according to the criteria.
2. Contract documents indicate configuration and materials for the project. Design the entire mechanical system, based on specified performance, material and installation requirements while maintaining the required configuration and materials.
3. Propose and, after approval of Architect, conduct a design process with the following general characteristics:
 - a. Design: Preparation and submittal of design documents by Contractor, including submittal of Product Data.
 - b. Design Review: After review by Architect, Owner, Architect and Contractor meet to discuss design and any required revisions.
 - c. Revisions: Any required revisions to documents to be made by Contractor, submitted to Architect.
 - d. Governing Authorities: Submit required documentation to governing authorities, review submittals with governing authorities, permits, etc.
 - e. Submittals: Submit shop drawings, any additional product data, etc.
4. Organize, prepare and submit sufficient numbers of copies so that the Architect may retain two copies of all design drawings, shop drawings, calculations, product data, etc., required to design and construct the Mechanical Systems, including but not necessarily limited to the following:
 - a. Design Drawings: Complete piping, equipment and ductwork layout for the project, including accurate location of all required equipment, diffusers, grilles, dampers, controls, etc.
 - b. Shop Drawings: After approval of design concept by Architect, submit any required shop drawings, showing detailed layout, dimensions, relationship to adjacent materials, anchorage, etc., cross-referenced to Architectural Drawings and Design Drawings.
 - c. Calculations: Prepared by a Mechanical Engineer licensed to practice in California.
 - d. Specifications: If required by owner, shall be prepared using Masterspec 2004 format.

B. The work includes but is not necessarily limited to the providing of work as shown and noted on the Drawings and specified herein. This Section describes the General requirements for the materials, equipment and installation applicable to all Sections of the work under this Division. The following summary is included to indicate some items common to work. It is not necessarily all inclusive.

1. Labor, material, equipment, tools, rigging, hoisting, temporary scaffolding, transportation, supervision, inspections, services, insurance, fees and taxes.
2. Repair of damage done to premises or other property as a result of the work and removal of debris left by those engaged in the work.
3. Preparation of submittal, Shop Drawings, Project Record Drawings.
4. Leave all exposed metal and insulated surfaces clean to receive paint, including piping,

ductwork, equipment and related items.

5. Access doors and panels required for the work.
6. Identification of devices and equipment.
7. Service connection to items installed by other Contractors and Trades.

1.03 RELATED WORK

- A. Firestopping: Refer to Section, Firestopping.
- B. Flashing sheet metal materials and labor: Refer to Section, Flashing and Sheet Metal.
- C. Electrical material and labor: Refer to Electrical.

1.04 QUALITY ASSURANCE

- A. Work and materials shall be in full accordance with the latest rules of the Administrative Code, State Fire Marshal, and Building Standards; the National Electric Code; the National Fire Codes, National Fire Protection Association; California Plumbing and Mechanical Codes with California amendments, California Building Code; and other applicable County ordinances, codes, laws and/or regulations.

1.05 REFERENCES

- A. Specified References
 1. ANSI: American National Standards Institute
 2. ASHRAE: American Society of Heating, Refrigerating and Air-Conditioning Engineers.
 3. ASME: American Society of Mechanical Engineers
 4. AABC: American Air Balance Council
 5. OSHA: Occupational Safety and Health Administration
 6. CS: Commercial Standards
 7. SMACNA: Sheet Metal and Air-Conditioning Contractor's Association
 8. UL: Underwriter's Laboratories, Inc.
- B. Provide without extra charge, any additional material and labor required to comply with the Regulations and Standards.

1.06 SUBMITTALS

- A. Submit a complete list of materials and equipment. Submittals shall be approved before purchase.
- B. Submit shop drawings to show installation of equipment and ductwork in greater detail.

1.07 DELIVERY, STORAGE AND HANDLING

- A. Refer to Architectural Section for General Requirements for material and equipment.

1.08 WARRANTY

- A. Submit warranties or guarantees to the Architect for equipment as required. Contractor shall guarantee material and workmanship for a period of one (1) year from date of acceptance.

1.09 CalGreen Compliance

1. Coordinate with design team for CalGreen related items.

2. Integrate CalGreen related design, installation and compliance.

PART 2 – PROJECT REQUIREMENTS

2.01 PERFORMANCE REQUIREMENTS

A. System Description:

1. Codes and Standards: As a minimum, the design of the HVAC system shall meet the following codes and standards (Latest Adopted Edition):
 - a. California Mechanical Code
 - b. Comply with special city ordinance or any other city requirements.
 - c. American Society of Heating, Ventilating and Air Conditioning Engineers (ASHRAE) Handbooks and Standards
 - d. National Fire Protection Association (NFPA) Standards.
 - e. Underwriter's Laboratories (UL)
 - f. Sheet Metal and Air Conditioning Contractors National Association (SMACNA) Handbooks and Standards
 - g. National Electrical Manufacturer's Association (NEMA) Standards
 - h. American Society for Testing and Materials (ASTM) Standards
 - i. California Title 24 Energy Requirements
 - j. California Building Code
 - k. California Fire Code
 - l. California Green Building Standards Code

B. Design Criteria:

1.

Outdoor Conditions:	Winter	21°F median of extreme.
Hollister, CA	Summer	89°FDB; 67°FWB; @ 0.5% ASHRAE outdoor design condition
Indoor Conditions: Room Area	Temperature Summer / Winter	Humidity Summer/Winter
Lobbies	78°F/70°F	40% to 60%
Public Restrooms	78°F / 70°F	40% to 60%
Electric Rooms	90°F	N/A

2. Internal Heat Gains:

- a. Office Areas: The HVAC system shall be sized to handle an average load of 1 watt per square foot for lighting and 0.5 watts per square foot for miscellaneous equipment load.

- b. Common areas: HVAC system shall be sized to handle an average load of 1.1 watts per square foot for lighting and 0.5 watts per sq. ft. for process load in common areas except where equipment loads are known.
- c. Occupancy Loads: HVAC system shall be sized to handle number of occupants based on CBC requirements with heat gains and ventilation quantities as prescribed by ASHRAE.
- d. Ductwork shall be concealed above ceiling or furred spaces. Duct sizing for air ducts shall be based on a maximum loss of 0.08 inches per 100 feet duct run.
- e. Provide sufficient balancing dampers in branch ductwork to permit system balancing. All dampers shall be accessible or otherwise provided with means of actuation.
- f. The manufacturer of mechanical equipment shall have a parts and service representative located with a reasonable distance of the building location.
- g. Provide access to mechanical equipment as required by the California Building Code with prior review by the Architect.

3. Vibration and Noise Control Criteria

- a. Noise criteria for various space types, due to ventilation system noise, are listed below (based on the ASHRAE¹ guidelines):

Space Type	Noise Criteria (NC)	Maximum Air Speed in Register Neck
Offices	30	380
Restrooms	40	650

- b. Manufacturer-provided sound levels shall be submitted for all noise-generating mechanical and electrical equipment.
- c. The design-build contractor shall provide complete shop drawings (prior to the start of their construction) so that the acoustical consultant can determine whether the project noise and vibration criteria have been met.
- d. Provide internally lined ductwork and/or acoustically rated flexible duct downstream of fan-coil units/fans. Use one-inch thick ductliner board unless otherwise approved by the Architect. Do not penetrate sound-rated constructions with flexible duct.
- e. Medium and high-pressure ductwork riser supports shall be isolated from the structure with captive neoprene mounts (Mason BR or equal).
- f. The garage exhaust fans shall be centrifugal units with ducted intakes; propeller-type fans are not to be used. The fans shall include CO sensors and be placed on VFD.
- g. All vibration isolation shall conform to ASHRAE standards. The ASHRAE guidelines include items such as spring isolators and inertia bases as well as ancillary items such as flexible piping and electrical connections. Submittals for all proposed isolation are required. All vibration isolation devices shall be from a single manufacturer.
- h. The acoustical vibration isolation must not compromise seismic code requirements and vice-versa. As such, housed springs are not allowed; instead, unhoused springs with separate seismic snubbers shall be used.
- i. The rooftop condenser units are to be spring isolated; just using neoprene isolation is not allowed. Suspended indoor units are to be spring isolated; floor-mounted units may be isolated with neoprene pads (e.g. Mason BR mounts or Super W pads).
- j. Bathroom exhaust fans shall be rated at a maximum of 1.5 sones.

- k. Install air registers with NC ratings at least five points less than the criterion for the space being served (see Item a).
- 4. Comply with USGBC LEED related items.
 - a. Exceed Title 24 energy standard by 15%.
 - b. Use of HCFC refrigerants shall be prohibited.

2.02 SHOP DRAWINGS AND SUBMITTALS

- A. Prepare complete layouts for the ductwork, diffusers and equipment systems, including complete calculations for sizing and selection. Load calculation shall be based on the ASHRAE Guide. Standard manufacturer's forms may be used for load calculation sheets. Calculations for compliance with California Title-24 Energy Standards shall use the required approved forms and shall be approved by the City.
- B. Drawings shall indicate accurate locations of all equipment, piping, ductwork, diffusers, fan locations, etc.
- C. Design-Build Contractor will generate and submit progress documentation at key design points to assist with the coordination of other building systems and for general review by the Architect's design engineers such as Acoustical, Mechanical and Structural. Design-Build Contractor will identify and document conditions that conflict with the intended design and work with the design team to resolve. Documentation to include, but not limited to the following:
 - 1. Schedule of all equipment.
 - a. Configuration and type of device, including but not limited to:
 - 1) Variable Refrigerant Flow (VRF) split-system heat pump system (i.e., condensing units, branch circuit controller).
 - 2) Energy Recovery Ventilator (ERV)
 - 3) Fans (i.e., centrifugal, airfoil, utility, axial, "mushroom")
 - 4) Grilles and diffusers (i.e., design air volume and terminal velocity).
 - b. Performance Parameters: Horsepower of fan and motor, rotation speed, air volume and static pressure.
 - c. Weight and location within building (level, room number, etc.):
 - 2. Vibration Isolation Control indication:
 - a. Configuration (i.e., base mount or suspended hanger)
 - b. Type of isolation device (i.e. steel spring, neoprene, fiberglass, etc.)
 - c. Additional equipment (i.e. seismic snubbers, slack cables, steel frames or concrete inertia bases).
 - d. Provide sound power levels (PWL) for all the noise-generating mechanical equipment.
 - 3. Control Devices:
 - 4. Clearly indicate on the plans location and extent of the following:
 - a. Duct location, size and type of cross section.
 - b. Air volumes at all terminal locations.

c. Acoustical duct lining and thickness.

5. Design-Build Contractor will otherwise execute their services in conformance with the requirements in the general project and mechanical performance specifications.

2.03 DESIGN PROCEDURE

A. General: Provide complete mechanical drawings and supplementary specifications for a complete and operable mechanical system conforming to all Codes and requirements specified herein, and including the mechanical items shown on architectural drawings and the intent outlined herein.

B. Engineer of Record

1. The mechanical contractor shall contract with a licensed California professional mechanical engineer to prepare the drawings and supplementary specifications for this project. This engineer shall be known as the Engineer of Record who will be completely, and fully, responsible for the design of the mechanical systems for this project. He shall have in force minimum \$1,000,000 of Errors and Omissions Liability Insurance (or higher, if so required by the Owner) and coverage shall be maintained in force from the date of execution of contract until the statutes of repose expire for the State of California.

2. The Engineer of Record shall attend design and related meetings with the Architect and other consultants, representative of various contractors, Fire Marshal, local inspection authorities, Owner's representatives, etc. as necessary to prepare coordinated and complete set of mechanical documents conforming to the requirements and code.

C. Drawings and Calculations

1. Drawings shall be prepared by Engineer of Record. The construction documents shall be prepared over Architectural backgrounds on AutoCAD version compatible with Architectural. The backgrounds/CAD files and base sheets shall be obtained from the Architect. Drawings, format, size and scale shall be the same as drawings prepared by the Architect. Coordinate with project team for final drawing format and composite drawing coordination.

2. The drawings shall be professionally prepared incorporating all minimum criteria and requirements as well as necessary components for complete and fully operable mechanical systems. In particular, space and clearance constraints shall be coordinated with the Architect. Any changes required in the architectural drawings shall be brought to the attention of the Architect immediately.

3. Prepare and submit drawings, stamped and signed by Engineer of Record, to the appropriate code enforcing authority.

4. Provide necessary documentation for Title 24 compliance.

5. Review and respond to possible comments from permit and plan review authorities; modify plans and specifications as necessary.

6. Documentation Review: Correct any deficiencies on the documents and answer questions addressed in the review(s) by the inspection agencies, Architects, Owner and their representatives.

PART 3 – PRODUCTS

3.01 GENERAL MATERIALS

A. Access doors shall be Karp or equal, stainless steel model DSC-214M, model KRP-150FR for fire rated assemblies, of sizes adequate for service intended (minimum 10-inch x 10-inch). Doors shall be compatible with wall and ceiling construction in which to be installed. Doors shall be equipped with concealed spring hinges and flush, screwdriver operated locks, except that key operated locks shall be

keyed alike.

B. Pipe Hangers:

1. Super Strut, B-Line or equal with assemblies and component parts "Electro-Chromated" or galvanized steel finish.
2. Individually suspended piping shall be supported by hangers complete with all-threaded rod. Pipe hangers to be manufactured of 1-inch minimum width steel (metal straps are not acceptable).
3. Trapeze Suspension, for three or more pipes in the same place, use Super Strut 1-5/8-inch width channel of a size suitable for load in deflection to exceed 1/180 of a span.
4. Trapeze Supporting rods shall be of a diameter sufficient to support the load with a safety factor of 5. Rods shall be securely anchored to the building structure.
5. Pipe strap, to attach pipe to channel, shall be compatible with pipe material.
6. Hanger Spacing horizontal piping shall be supported with hangers spaced at maximum as listed below and at changes in direction.
 - a. Copper tubing shall be supported as follows: 1-1/2-inch and smaller at 6-foot intervals, 2-inch and larger at 10-foot intervals.
7. Isolators, install pipe shields, Inc. isolators at hangers and clamps.
8. Attachments to roof structural members with brackets, rods and channels as reviewed by the Architect.
9. Provide isolation of mechanical piping as per project acoustical engineer requirements.

C. Pipe Protection: Penetrations of rated assemblies shall be fire-stopped per U.L. standards. Fire stopping shall be an approved material as specified and as prescribed in State Fire Marshal Standard.

1. Insulated pipe shall be protected at the point of support by a 360-degree sheet metal shield. Insert to be same thickness as adjoining pipe insulation. Shield length and minimum sheet metal gauges shall be as recommended by manufacturer.
2. Bare-Copper - Tube shall be protected at the point of support by a 360-degree felt pad, minimum 1/4" thick.

3.02 FIRESTOPPING AT RATED WALLS AND CEILING

- A. Provide fire stop per U.L. Code.

3.03 MATERIALS FOR DUCTWORK

- A. Shall be as specified in the following schedule. Materials shall be clearly stamped or marked with grades and gauges.

1. Ductwork:
 - a. Ductwork construction shall be in strict accordance with the recommendations and requirements of the HVAC Metal Duct Standards, latest edition, as issued by the Sheet Metal and Air Conditioning Contractors' National Association, Inc. (SMACNA).
 - b. Materials shall be galvanized steel, of gauges shown in the SMACNA HVAC Metal Duct Standards low pressure construction. Also, for all return and exhaust air ductwork.
 - c. Sheet Metal Round Duct: Shall be United Sheet Metal or equal, Spiral "Uniseal" with "Uniform" fittings, machine formed.
 - 1) All round duct shall be United Sheet Metal or equal, Spiral "Uniseal" duct

manufactured from galvanized steel, meeting ASTM A-93-59T.

- 2) All fittings shall be United Sheet Metal or equal, "Uniform" manufactured from galvanized steel, meeting ASTM A-93-59T with continuous welds.
- B. Provide smoke and/or fire dampers with motors and fire links where required by the City and the Code. Provide access doors in walls, ceilings, and in ductwork for resetting dampers. Provide motorized smoke/fire dampers as required to meet standard of the City. Provide control interface with the Electrical Contractor for Fire Life Safety building control panel.
1. Smoke and Fire Dampers: Ruskin Manufacturing Co., or equal. Smoke damper shall be a motorized assembly for use with smoke detectors. All dampers shall be U.L. labeled and State Fire Marshal approved. Provide unit with built-in smoke detector.
 - a. Fire/smoke dampers shall be minimum 1-1/2-hour fire rated under U.L. Standard 555 and shall be qualified under U.L. Standard 555S as a leakage rated damper for use in smoke control systems. Verify penetration rating requirement with architect for proper damper selection.
 - b. Damper shall incorporate double skin airfoil-shaped blades for minimum loss in an open position.
 - c. Electrical damper motors shall be full stall type, heavy duty, oil immersed gear train type. Voltage shall be verified with fire alarm system before ordering.
- C. Ductwork Accessories:
1. Damper Operators:
 - a. Ducts with external insulation: Ventlok #637, Dura-Dyne, Young or equal.
 - b. Ducts with internal and/or no insulation: Ventlok #635, Dura-Dyne, Young or equal.
 2. Flexible Connections: Ventfabrics "Ventglas", Dura-Dyne or approved equal, U.L. approved with metal attachment.
 3. Air Extractor: Tuttle-Bailey, Krueger or equal.
 4. Turning Vanes: SMACNA HVAC Metal Duct Standards with Tuttle-Bailey or equal, Ductturns for hollow vanes.
 5. Flexible Ducts: Casco Silent Flex II acoustical flex ducts, Genflex or equal, Class I, U.L. approved, 250°F for maximum temperature with compression fittings.
 - a. For Low pressure duct system use Casco model SF-181M or Genflex type SLR-30M or equal rated to 2 inches working pressure. For use on low pressure duct systems.
 6. Bracing, Hangers, Nuts, etc., shall be galvanized.
 7. Curved elbows shall have centerline radius equal to 1-1/2 times duct width in plane of turn.
 8. Square elbows shall have turning vanes. Miter elbows (not square) shall have splitter vanes 3-inches o.c.
 9. Joint taping materials for Supply, Return and Exhaust Ducts:
 - a. On all air ducts and plenums, use Hardcast or Arbol and canvas.
 - b. On air ducts exposed to view or where installed on roof, exposed to weather, including plenums, use Hardcast or Arbol and canvas.
 - d. On flexible ducts use duct sealer, stainless steel bands and duct tape as recommended by the flexible ducts' manufacturer.

- e. On sheet metal round ducts, use an approved duct sealer with Hardcast or Arbol and canvas suitable for the pressure classification and applied as recommended by the manufacturer.
- D. Duct Hardware: Ventlok, Dura-Dyne, Young, or equal.
- E. Spin-In Fittings: Product of General Environmental Corp., or equal.
- F. Access Doors in Ductwork: Shall be Ventlok, Krueger, Milcor, or equal, stamped or formed insulated access doors complete with all hardware and sealant, except access doors at fire dampers shall be "Fire Seal" approved type only.

3.04 DIFFUSERS, GRILLES AND REGISTERS

- A. Titus, Metal Air, Shoemaker or equal. Each register and diffuser shall be equipped with a volume damper or air extractor. Paint interior surface of all units' flat black. Face and trim of all units shall be finished. Size, finish, drop frames, accessories, capacity and pattern specify. Finish as selected by the Owner. For common area, provide commercial type registers similar to Titus 300RL, double deflection for side walls and TDC ceiling diffusers.

3.05 INSULATION

- A. Supply and Return Air Ductwork: Insulated with minimum 1-1/2-inch thick Owens-Corning Fiberglas Faced Duct Wrap with factory applied flame retardant Foil-Reinforced Kraft Facing (FRK-25, UL labeled), or equal. Do not insulate exposed ductwork located in condition space unless otherwise noted.
- B. Acoustical Duct and Plenum and Casing Liner: On all exposed supply and return air ductwork/outdoor ductwork and where required for acoustical control, line with minimum 1-inch thick Owners-Corning Fiberglas coated ductliner board, or equal. Increase sizes of ducts with lining to maintain clear inside dimensions on drawings.

3.06 EQUIPMENT

- A. Variable Refrigerant Flow (VRF) System: The variable capacity, heat pump recovery air conditioning system shall be a Mitsubishi Electric CITY MULTI VRF, Daiken, LG or equal. The system shall consist of an outdoor unit, BC (Branch Circuit) Controller, multiple indoor units and DDC (Direct Digital Controls). Each indoor unit or group of indoor units shall be capable operating in any mode independently of other indoor heating units or groups. System shall be capable of changing mode (cooling to heating, heating to cooling) with no interruption to system operation. The sum of connected capacity of all indoor air handlers shall range from 50% to 150% of outdoor rated capacity.
- B. Energy Recovery Ventilator: Innovent or equal. Unit construction suitable for outdoor installation, insulated cabinet with plug type supply fan, merv 8 filtration, flat plate heat exchanger, mounting base with vibration isolators.
- C. Exhaust Fans:
 1. Ceiling Exhaust Fan, Greenheck, or equal, centrifugal blower, housing insulation, ceiling grille and back draft damper. Sones rating 1 sone or lower for continuous operation and 1.5 sones or lower for fans with intermittent operation.
 2. Utility Fans: Greenheck utility type exhaust fan, SWB series or equal. Centrifugal belt driven type. Fan wheel shall be centrifugal backward inclined, constructed of aluminum. Wheels shall be statically and dynamically balanced. The fan housing shall be constructed of heavy gauge aluminum with a rigid internal support structure. Motors shall be heavy duty ball bearing type. Motors and drives shall be mounted on vibration isolators, out of the airstream. Fresh air for motor cooling shall be drawn into the motor compartment from an area free of discharge contaminants. Motors shall be readily accessible for maintenance.
 3. Inline Fan: Greenheck duct mounted supply or exhaust fan of the centrifugal belt or direct driven in-line type. Fan construction shall include two removable access panels.

3.07 TEMPERATURE CONTROL SYSTEM

- A. Provide labor, equipment, and materials for a complete installation and property operating control system as indicated on the drawings and as described herein. Temperature control systems shall be designed and provided by temperature control contractor, Automatic Control & Engineering, Inc., Johnson Controls, or equal.
1. Provide control wiring, and interlock wiring.
 2. Provide all control valves, pressure sensors, time switches, and other items to be installed by the Piping and Contractor in adequate time to allow for meeting of schedules.
 3. Provide complete start-up and field calibration of all control devices and systems. The set points shown are suggested starting points only. This Contractor must set the controls at the proper values to assure that all systems are stable, hold the required conditions, and function as intended.
 4. All panels shall be provided factory wired and piped and shall meet all codes.
 5. Provide complete Owner instruction for the proper operation of the system and all devices
 6. Provide complete operating and maintenance instruction booklets in hard cover binders that are fully indexed and include a complete parts listing.
 7. Provide complete and accurate as built drawings.
 8. Provide complete engineering/detailed control drawings showing all devices, terminal numbers, schedules, legends, labels, etc., as required to properly display the systems to be installed and to allow easy trouble-shooting in the future. The diagrams shall also indicate set points, throttling range, integral setting, ratios, and all other switch settings and adjustments.
 9. Provide a non-fading reproduction of the final control diagrams framed and mounted under glass and installed permanently where directed by the Owner.
 10. Provide a detailed written sequence of operation that specifically describes the system operation in terms easily understandable by the Owner's representative.
 11. Warranty the system for a period of one year from the date of final acceptance. Respond to problem calls as required to smooth out and maintain proper operation of the systems.
- B. General Criteria:
1. The temperature controls have been shown diagrammatically on the drawings and shall be installed to operate in the manner indicated. The final design and installation shall be the responsibility of the Control Contractor and he shall make the necessary modifications and additions to the control design in order to have an operational system.
 2. The control devices shall be checked, sized, and supplied to handle the function intended.
- C. Sequence of Operation:
1. RTU Systems: Provide smart electronic programmable thermostat. Additionally, all units shall have a solid-state UPM safety control circuit with the following features:
 - a. Anti-short cycle time delay on compressor operation
 - b. Random start on power up mode.
 - c. Brown out/Surge/Power Interruption protection.
 - d. Low Pressure Switch 90 second bypass timer.
 - e. Shutdown on high or low refrigerant pressure safety switch inputs, and shutdown for the

optional freezestat or optional high-level condensate sensor.

2. Split System Heat Pumps: Provide smart electronic programmable thermostat interlock with indoor unit fan coil and heat pump.
 3. Exhaust Fans:
 - a. Toilet exhaust fan. Wall switch with time delay relay.
 - b. Electrical room. Provide with line voltage wall mounted thermostat.
 - c. Elevator machinery. HVAC with wall mounted thermostat.
- D. Materials:
1. Control Panels:
 - a. TCP shall be NEMA 1 for indoor use and NEMA 3R for outdoor use.
 - b. Time switches: Paragon, Tork or equal.
 - c. The control panels shall be fully-wired with easily accessible and labeled terminal strips. All wiring and tubing shall be run in conduit and shall be color-coded for easy trouble-shooting. All devices will be permanently labeled to match the drawings and to indicate their function. The labels shall not be installed on any removable device such as control covers, etc., that over time could be misplaced.
 2. Wiring:
 - a. All wiring shall meet the requirements of the Electrical Specifications of the project.
 - b. All wiring shall meet local codes.
 - c. The temperature control contractor is responsible for all conduit and wiring, both line and low voltage, control and mechanical Interlock wiring required under this section. All such wiring shall be performed only by electricians in the direct employ of the control systems contractor. Minimum wire size shall be 22 gauge regardless of voltage.
 - d. Power wiring 120 VAC or less to all control devices is the responsibility of the temperature control contractor.
 - e. Low voltage temperature control wiring that is in concealed but accessible spaces may be installed using multi-conductor plenum rated cable, 22 gauge minimum. All exposed wiring shall be conduit. Wiring installed in fire rated walls shall be in conduit. Wiring above 30V shall be installed in conduit.
 - f. Wire sizing shall be in accordance with NEC standards.

PART 4 – EXECUTION

4.01 INSPECTION

- A. Contractor is responsible for complete, properly installed system, Installation and material shall comply with all rules, codes and regulations.

4.02 INSTALLATION

- A. Electrical work: Motors, electrical apparatus and wiring specified in this section shall conform to the National Electrical Manufacturer's standards and the National Electrical Code and bear the Underwriters' label of approval.

- B. Cutting and Patching: Sleeving, cutting and patching of rough construction for piping and ductwork shall be a part of the work. No cutting shall be done without Architect's approval.
- C. Cleaning and Closing: Piping, ductwork and equipment shall be inspected before placing and the interior cleaned before closing. Piping and ductwork shall be closed at the end of each day's work.
- D. Fabrication:
 - 1. Manufacturers' Directions: follow Manufacturers' directions for equipment and devices installation.
- E. Flashing: Pipes and ducts passing through roof shall be flashed and counterflashed. Except where lead flashings are to be used, sheet metal material shall be 24-gauge galvanized steel (minimum) zinc alloy. Such sheet metal work shall conform to the requirements of Section Thermal and moisture protection.

4.03 SEISMIC RESTRAINTS

- A. Ductwork:
 - 1. Work, materials and methods used shall conform to the Drawings, and to the "Guidelines for Seismic Restraints of Mechanical Systems and Plumbing Piping Systems," CAL SMACNA, "The Sheet Metal Fund of Los Angeles," and "The Plumbing and Piping Industry Council, Inc."
- B. Equipment:
 - 1. Equipment shall be accurately set and leveled; supports shall be neatly placed and properly fastened. Equipment shall be fastened in place with bolts and seismic restraints. Equipment anchorage shall comply with Title 24, Section 1613A.

4.04 COORDINATION AND APPROVAL

- A. Coordinate new work and existing conditions with other Contractors and Trades. If conflicts are discovered, a set of prints marked with red pencil showing recommended installation methods shall be submitted to the Architect for approval prior to installation of work in question.

4.05 IDENTIFICATION

- A. Identification Markers shall be SEATON Nameplate Corp. or equal.
 - 1. Identification of Equipment:
 - a. Items of mechanical equipment, such as air conditioning and fan units, shall be identified by approved nameplates. Nameplates shall be securely affixed to each individual piece of equipment. Identify heat pump units with unit number which it serves (for each apartment unit).

4.06 PROJECT RECORD DOCUMENTS

- A. Provide and keep up to date a complete set of prints which shall be corrected regularly and shall show every change from the original contract drawings, including change orders and existing condition. Submit a set of reproducible "As-Builts" to architect at the end of the job.

4.07 ACCESS AND CLEARANCES

- A. Equipment shall be placed, and ductwork and connections made in such manner that all routine adjustments and maintenance operation may be performed without inconvenience and so that all code requirements for clearances are maintained. The following provisions are included:
 - 1. Maintain 36" clear in front of electrical panels.
 - 2. Allow space to replace air filters.

3. Provide access panels and clearance for all items requiring adjustments or maintenance.

4.08 ADJUSTING AND CLEANING

- A. Provide labor/test equipment; disconnect equipment from the system that can be damaged by pressure.
- B. Thoroughly clean equipment, piping, and ducts, free from rust, scale, fillings, plaster and dirt before and after covering and painting is done, or systems are put in operation.

4.09 DUCTWORK INSTALLATION REQUIREMENTS

- A. Duct branches shall be fitted with volume dampers. All accessible volume controls shall have locking quadrants and end bearings on both sides of damper shaft. All inaccessible controls (dampers, etc.) shall be provided with permanent extensions to accessible spaces. Branch volume controls are in addition to volume controls at registers and diffusers.
- B. Air inlets, outlets shall be properly set in place. Registers and grilles shall be tight sealed. Provide frames for all grilles and registers and provide supports for same where required by the construction. Seal gaps between wall registers frames and mechanical room wall opening.
- C. Exhaust air grilles shall be installed with minimum visibility through grille vanes from room.
- D. Transitions in size of ducts shall be made by uniformly tapering sections having 1-inch increase in width for each 7-inches of run unless construction limitations require a more abrupt transition.
- E. Diffusers, Grilles and Registers: Each register and diffuser shall be equipped with a volume damper or air extractor. Paint interior surface of all units' flat black. Face and trim of all units shall be finished. Size, finish, frames, accessories, capacity and pattern as shown on Drawings.
- F. Casings and Plenums shall be constructed in accordance with SMACNA HVAC Metal Duct Standards including curbs, access doors, pipe penetrations, eliminators and drain plans. Access doors shall be hollow metal, insulated, with latches and door pulls.
- G. Volume dampers shall be single blade or opposed blade, multi-louver type as detailed in SMACNA HVAC Metal Duct Standards. Provide end bearings on both ends of damper rods for all dampers. Quadrant or other operator for externally insulated duct shall have stand-off mount so operation is clear of the insulation. Mark position of all volume dampers, after air balancing, on the handles so that "balanced" position is indicated.
- H. Where duct connections are made to fans and air conditioning units, install a non-combustible flexible connection of neoprene coated fiber glass fabric approximately 4-inches wide.
- I. Fabricate and install ductwork and accessories in accordance with SMACNA HVAC Metal Duct Standards.
- J. Install duct hangers and supports in accordance with SMACNA HVAC Metal Duct Standards.
- K. Install fire dampers and combination fire/smoke dampers in accordance with the manufacturer's instructions to conform to the installation used for the rating test.
- L. Seal openings around duct penetrations of floors and fire rated partitions with fire stop material as required by NFPA 90A and the City requirements.
- M. Exposed ductwork within occupied spaces shall be fabricated with seams flat, cleaned and prime coat painted. Ductwork shall be free of tool marks, dents and tape. All joints and seams shall be sealed with an approved sealant. Provide sheet metal collar at all exposed ductwork penetrations. Duct collar shall cover the annular space around duct with minimum 1" overlay.

4.10 VIBRATION ISOLATION AND ACOUSTICAL CONTROL REQUIREMENTS

- A. All mechanical equipment (fan coil units, fans.) shall be isolated from the building structure by means of noise and vibration isolators. No rigid contact shall be allowed between pipes or ducts and building

structures or support frames. Submit all isolation systems to acoustical engineer for review.

1. The rooftop condenser units to be spring isolated; just using neoprene isolation is not allowed. Suspended fan-coil units and heat pumps are to be spring isolated; floor-mounted units may be isolated with neoprene pads (e.g. Mason BR mounts or Super W pads).
2. Bathroom exhaust fans shall be rated at a maximum of 1.5 sones.
3. Install air registers with NC ratings at least five points less than the criterion for the space being served (see Item 1).

4.11 BALANCING

- A. All air balancing shall be done by the Contractor.
- B. The Contractor shall be experienced in the balancing of water and air systems.
- C. Testing and balancing shall be performed in complete accordance with AABC National Standards for Field Measurements and Instrumentation. SMACNA Standards for Air Balancing may also be used.
- D. Instruments used for testing and balancing of air systems must have been calibrated within a period of six (6) months and checked for accuracy prior to start of work.
- E. Three (3) copies of the complete test report shall be submitted to the Architect prior to the final acceptance of the project.
- F. Do not operate supply fan before filters are properly installed. Do not operate exhaust fans without supply fans running. After completion of balancing and before acceptance, filters shall be changed.
- G. Air quantities at each outlet, inlet: within 5% of quantities shown.
- H. Balancing of Air Handling Equipment: Air handling equipment is specified for certain conditions listed in catalogs. Contractor shall set air monitoring equipment, fan RPM for delivering air quantities shown on drawings at actual field conditions as to pressure and leakage. Contractor shall change drive sheaves, if necessary, during balancing. At final setting there shall be reasonable leeway for increasing RPM without changing sheaves.

4.12 ELECTRICAL REQUIREMENTS

- A. Motors and motor control equipment shall conform to the standards of the National Electrical Manufacturers Association.
- B. Motors and motor control equipment shall be as specified below.
- C. The work under this section shall include:
 1. Provide all motors, motor starters, and control devices.
 2. Provide conduit and line voltage interlock wiring. Installation of wire includes the connection of devices.
 3. Provide conduit and low voltage (24 volts or less) wiring.

4.13 CLEANING

- A. Completely cover motor and other moving machinery to protect from dirt and water during construction. Cap all openings into ducts and pipes to protect from foreign matter while under construction.
- B. During the process of work, premises shall be kept reasonably free of all debris, cuttings and waste material resulting from work under this heading. All debris, rubbish, leftover materials, tools and equipment shall be removed from the site prior to final acceptance.

- C. Thoroughly clean all parts of apparatus and equipment. Exposed parts, which will be painted, shall be thoroughly cleaned of cement, plaster and other materials. All grease or oil spots shall be removed with carbon tetrachloride. Such surfaces shall be carefully brushed down with a wire brush to remove rust and other spots and left smooth and clean.
- D. Damaged factory applied finishes shall be "touched up". "Touch up" shall be accomplished with preparation, prime and finish coats applied in strict accordance with manufacturer's recommendations.

4.14 EQUIPMENT OPERATING INSTRUCTIONS

- A. Furnish the Owner with a hard-bound brochure titled "Mechanical System" which shall contain the following information typed, indexed, tabbed and bound inside:
 - 1. An alphabetical list of all equipment excepting pipe and fittings; the manufacturer; the catalog number; and the local distributing agent, including his address and telephone number.
 - 2. Manufacturer's instructions for all items requiring maintenance. This shall include, but not be limited to, all motor driven equipment, controls, pressure regulating devices, packaged equipment, etc. Where manufacturer's directions are not clear, are incomplete or do not exist, develop information necessary to service, clean, adjust, etc., all items. Delete all information in manufacturer's literature which is not applicable. Identify all equipment in the manual. List the time intervals that all maintenance tasks should be performed.
- B. Submit three (3) copies of the brochure to the Architect for approval and furnish the Owner with at least two (2) corrected brochures.
- C. Provide for and fasten to each piece of equipment a permanent nameplate fabricated of engraved laminated plastic, white between black laminations, indicating the identifying mark. Provide identification tag for each heat pump unit to identify which area it serves.

END OF SECTION

SECTION 26 05 19

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes building wire and cable; service entrance cable; metal clad cable; and wiring connectors and connections.

1.2 REFERENCES

- A. International Electrical Testing Association:
 - 1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.
- B. National Fire Protection Association:
 - 1. NFPA 70 - National Electrical Code with California Amendments.
 - 2. NFPA 262 - Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces.
- C. Underwriters Laboratories, Inc.:
 - 1. UL 1277 - Standard for Safety for Electrical Power and Control Tray Cables with Optional Optical-Fiber Members.

1.3 SYSTEM DESCRIPTION

- A. Product Requirements: Provide products as follows:
 - 1. Stranded conductor for feeders and branch circuits.
 - 2. Stranded conductors for control circuits.
 - 3. Solid conductors for fire alarm circuits.
 - 4. Conductor not smaller than 12 AWG for power and lighting circuits.
 - 5. Conductor not smaller than 14 AWG for control circuits.
 - 6. Increase wire size in branch circuits to limit voltage drop to a maximum of 3 percent.
 - 7. 10 AWG conductors for 20 ampere or larger as designated on plans for 120 volt branch circuit home runs longer than 75 feet.
 - 8. 10 AWG conductors for 20 ampere or larger as designated on plans for 277 volt branch circuit home runs longer than 200 feet.
- B. Wiring Methods: Provide the following wiring methods:

1. Concealed Dry Interior Locations: Use only building wire, Type THHN/THWN-2 insulation, in raceway.
2. Exposed Dry Interior Locations: Use only building wire, Type THHN/THWN-2 insulation, in raceway.
3. Above Accessible Ceilings: Use only building wire, Type THHN/THWN-2 insulation, in raceway.
4. Wet or Damp Interior Locations: Use only building wire, Type THHN/THWN-2 insulation, in raceway.
5. Exterior Locations: Use only building wire, Type XHHW-2 insulation, in raceway.
6. Underground Locations: Use only building wire, Type XHHW-2 insulation, in raceway.
7. Metal clad cable can be utilized at concealed dry interior locations and above accessible ceilings.

1.4 DESIGN REQUIREMENTS

- A. Conductor sizes are based on copper unless indicated as aluminum or "AL".
- B. When aluminum conductor is substituted for copper conductor, size to match circuit requirements, terminations, conductor ampacity and voltage drop. Contractor shall be responsible for verifying maximum number of aluminum conductors for substituted copper conductors in specified conduit.

1.5 SUBMITTALS

- A. Product Data: Submit for building wire and each cable assembly type.
- B. Design Data: Indicate voltage drop and ampacity calculations for aluminum conductors substituted for copper conductors.
- C. Test Reports: Indicate procedures and values obtained.

1.6 CLOSEOUT SUBMITTALS

- A. Project Record Documents: Record actual locations of components and circuits.

1.7 QUALITY ASSURANCE

- A. Provide wiring materials located in plenums with peak optical density not greater than 0.5, average optical density not greater than 0.15, and flame spread not greater than 5 feet when tested in accordance with NFPA 262.
- B. Perform Work in accordance with State, Municipality, Highways, and Public Work's standard.
- C. Maintain one copy of each document on site.

1.8 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

1.9 FIELD MEASUREMENTS

- A. Verify field measurements are as indicated on Drawings.

1.10 COORDINATION

- A. Where wire and cable destination is indicated and routing is not shown, determine routing and lengths required.
- B. Wire and cable routing indicated is approximate unless dimensioned.
- C. Determine required separation between wire, cable and other work. Determine cable routing to avoid interference with other work.

PART 2 - PRODUCTS

2.1 BUILDING WIRE

- A. Product Description: Single conductor insulated wire.
- B. Conductor: Copper.
- C. Insulation Voltage Rating: 600 volts.
- D. Insulation Temperature Rating: 90 degrees C.
- E. Insulation Material: Thermoplastic.

2.2 SERVICE ENTRANCE CABLE

- A. Conductor: Copper.
- B. Insulation Voltage Rating: 600 volts.
- C. Insulation: Type SE.

2.3 METAL CLAD CABLE

- A. Conductor: Copper.
- B. Health Care Facility (HCF) rated.
- C. Insulation Voltage Rating: 600 volts.
- D. Insulation Temperature Rating: 90 degrees C.
- E. Insulation Material: Thermoplastic.
- F. Full-sized equipment grounding/bonding conductor.
- G. Interlocked Armor: The interlocking metal tape armor shall be aluminum and shall be green.
- H. Aluminum interlocking metal tape shall be formed and helically wrapped around the cable assembly such that the interlocked armor and aluminum grounding/bonding conductor are in intimate contact throughout the entire cable.
- I. Interlocked armor shall be listed as being suitable for grounding.

2.4 PLASTIC TAPE:

- A. Black 7 mil thick general purpose electrical tape, Scotch 33 plus or equal.

2.5 INSULATING RESIN:

- A. Use two part liquid epoxy resin with resin and catalyst in premeasured, sealed mixing pouch. Scotchcast 4 or equivalent.

2.6 REDUCING ADAPTERS:

- A. Burndy, Thomas and Betts or approved equal.

2.7 TERMINATIONS

- A. Terminal Lugs for Wires 6 AWG and Smaller: Solderless, compression type copper.
- B. Lugs for Wires 4 AWG and Larger: Color keyed, compression type copper, with insulating sealing collars.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify interior of building has been protected from weather.
- B. Verify mechanical work likely to damage wire and cable has been completed.
- C. Verify raceway installation is complete and supported.

3.2 PREPARATION

- A. Completely and thoroughly swab raceway before installing wire.

3.3 INSTALLATION

- A. Route wire and cable to meet Project conditions.
 - 1. Wire and cable routing indicated is approximate unless dimensioned.
 - 2. Where wire and cable destination is indicated and routing is not shown, determine exact routing and lengths required.
 - 3. Include wire and cable of lengths required to install connected devices within 10 ft. of location shown.
- B. Neatly train and lace wiring inside boxes, equipment, and panelboards.
- C. Identify and color code wire and cable. Identify each conductor with its circuit number or other designation indicated.
- D. Special Techniques--Building Wire in Raceway:
 - 1. Pull conductors into raceway at same time.
 - 2. Install building wire 4 AWG and larger with pulling equipment.

E. Special Techniques - Cable:

1. Protect exposed cable from damage.
2. Support cables above accessible ceiling, using spring metal clips to support cables from structure. Do not rest cable on ceiling panels.
3. Use suitable cable fittings and connectors.

F. Special Techniques - Wiring Connections:

1. Clean conductor surfaces before installing lugs and connectors.
2. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.
3. Tape uninsulated conductors and connectors with electrical tape to 150 percent of insulation rating of conductor.
4. Install split bolt connectors for copper conductor splices and taps, 6 AWG and larger.
5. Install solderless pressure connectors with insulating covers for copper conductor splices and taps, 8 AWG and smaller.
6. Install insulated spring wire connectors with plastic caps for copper conductor splices and taps, 10 AWG and smaller.
7. Terminate aluminum conductors with tin-plated, aluminum-bodied compression connectors only. Fill with anti-oxidant compound before installing conductor.
8. Install suitable reducing connectors or mechanical connector adaptors for connecting aluminum conductors to copper conductors.
9. Encapsulate below grade splices at outlet, pull and junction boxes with specified insulating resin kits. Make all splices watertight.
10. Install waterproof wire connectors with plastic caps for copper conductor splices and taps, 10 AWG and smaller in outdoor or wet locations.
11. Where oversized cables are used to accommodate voltage drop, whether a single or parallel feeder, provide appropriate reducing adapter and conductors for termination.

G. Install stranded conductors for branch circuits 10 AWG and smaller. Install crimp on fork terminals for device terminations. Do not place bare stranded conductors directly under screws.

H. Install terminal lugs on ends of 600 volt wires unless lugs are furnished on connected device, such as circuit breakers.

I. Size lugs in accordance with manufacturer's recommendations terminating wire sizes. Install 2-hole type lugs to connect wires 4 AWG and larger to copper bus bars.

J. For terminal lugs fastened together such as on motors, transformers, and other apparatus, or when space between studs is small enough that lugs can turn and touch each other, insulate for dielectric strength of 2-1/2 times normal potential of circuit.

3.4 WIRE COLOR

A. General:

1. For wire sizes 10 AWG and smaller, install wire colors in accordance with the following:
 - a. Black, red, and blue for circuits at 120/208 volts single or three phase.
 - b. Orange, brown, and yellow for circuits at 277/480 volts single or three phase.
2. For wire sizes 8 AWG and larger, identify wire with colored tape at terminals, splices and boxes. Colors are as follows:
 - a. Black, red, and blue for circuits at 120/208 volts single or three phase.
 - b. Orange, brown, and yellow for circuits at 277/480 volts single or three phase.

B. Neutral Conductors: White. When two or more neutrals are located in one conduit, individually identify each with proper circuit number.

C. Branch Circuit Conductors: Install three or four wire home runs with each phase uniquely color coded.

D. Feeder Circuit Conductors: Uniquely color code each phase.

E. Ground Conductors:

1. For 6 AWG and smaller: Green.
2. For 4 AWG and larger: Identify with green tape at both ends and visible points including junction boxes.

3.5 FIELD QUALITY CONTROL

- A. Inspect and test in accordance with NETA ATS, except Section 4.
- B. Perform inspections and tests listed in NETA ATS, Section 7.3.1.

END OF SECTION

SECTION 26 05 26 GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Rod electrodes.
2. Wire.
3. Mechanical connectors.
4. Exothermic connections.

1.2 REFERENCES

A. Institute of Electrical and Electronics Engineers:

1. IEEE 142 - Recommended Practice for Grounding of Industrial and Commercial Power Systems.
2. IEEE 1100 - Recommended Practice for Powering and Grounding Electronic Equipment.

B. International Electrical Testing Association:

1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

C. National Fire Protection Association:

1. NFPA 70 - National Electrical Code, with California Amendments.
2. NFPA 99 - Standard for Health Care Facilities.

1.3 SYSTEM DESCRIPTION

A. Grounding systems use the following elements as grounding electrodes:

1. Metal underground water pipe.
2. Metal building frame.
3. Concrete-encased electrode.
4. Ground ring.
5. Rod electrode.
6. Plate electrode.

1.4 PERFORMANCE REQUIREMENTS

A. Grounding System Resistance: 25 ohms maximum.

1.5 SUBMITTALS

A. Product Data: Submit data on grounding electrodes and connections.

B. Test Reports: Indicate overall resistance to ground and resistance of each electrode.

1.6 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of components and grounding electrodes.

1.7 QUALITY ASSURANCE

A. Provide grounding materials conforming to requirements of NEC, IEEE 142, and UL labeled.

B. Perform Work in accordance with State, Municipality, Highways, and Public Work's standard.

C. Maintain one copy of each document on site.

1.8 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years documented experience.

B. Installer: Company specializing in performing work of this section with minimum 3 years documented experience.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Accept materials on site in original factory packaging, labeled with manufacturer's identification.

B. Protect from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original packaging.

C. Do not deliver items to project before time of installation. Limit shipment of bulk and multiple-use materials to quantities needed for immediate installation.

1.10 COORDINATION

A. Complete grounding and bonding of building reinforcing steel prior concrete placement.

PART 2 - PRODUCTS

2.1 ROD ELECTRODES

A. Product Description:

1. Material: Copper.
2. Diameter: 0.75 inch.
3. Length: 10 feet.

B. Connector: Connector for exothermic welded connection.

2.2 WIRE

- A. Material: Stranded copper.
- B. Foundation Electrodes: 4/0 AWG or as indicated on drawings.
- C. Grounding Electrode Conductor: Copper conductor insulated.
- D. Bonding Conductor: Copper conductor insulated.

2.3 MECHANICAL CONNECTORS

- A. Description: Bronze connectors, suitable for grounding and bonding applications, in configurations required for particular installation.

2.4 EXOTHERMIC CONNECTIONS

- A. Product Description: Exothermic materials, accessories, and tools for preparing and making permanent field connections between grounding system components.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify final backfill and compaction has been completed before driving rod electrodes.

3.2 PREPARATION

- A. Remove paint, rust, mill oils, surface contaminants at connection points.

3.3 INSTALLATION

- A. Install in accordance with IEEE 142 and 1100.
- B. Install rod electrodes at locations as indicated on Drawings. Install additional rod electrodes to achieve specified resistance to ground.
- C. Install grounding and bonding conductors concealed from view.
- D. Install grounding well pipe with cover at each rod location. Install well pipe top flush with finished grade.
- E. Bond together metal siding not attached to grounded structure; bond to ground.
- F. Bond together reinforcing steel and metal accessories in pool and fountain structures.
- G. Bond together each metallic raceway, pipe, duct and other metal object entering space under access floors. Bond to underfloor ground grid. Install 2 AWG bare copper bonding conductor.
- H. Install grounding and bonding in patient care areas to meet requirements of NFPA 99.
- I. Equipment Grounding Conductor: Install separate, insulated conductor within each feeder and branch circuit raceway. Terminate each end on suitable lug, bus, or bushing.
- J. Connect to site grounding system.

- K. Install continuous grounding using underground cold water system and building steel as grounding electrode. Where water piping is not available, install artificial station ground by means of driven rods or buried electrodes.
- L. Permanently ground entire light and power system in accordance with NEC, including service equipment, distribution panels, lighting panelboards, switch and starter enclosures, motor frames, grounding type receptacles, and other exposed non-current carrying metal parts of electrical equipment.
- M. Install branch circuits feeding isolated ground receptacles with separate insulated grounding conductor, connected only at isolated ground receptacle, ground terminals, and at ground bus of serving panel.
- N. Accomplish grounding of electrical system by using insulated grounding conductor installed with feeders and branch circuit conductors in conduits. Size grounding conductors in accordance with NEC. Install from grounding bus of serving panel to ground bus of served panel, grounding screw of receptacles, lighting fixture housing, light switch outlet boxes or metal enclosures of service equipment. Ground conduits by means of grounding bushings on terminations at panelboards with installed number 12 conductor to grounding bus.
- O. Grounding electrical system using continuous metal raceway system enclosing circuit conductors in accordance with NEC.
- P. Permanently attach equipment and grounding conductors prior to energizing equipment.

3.4 FIELD QUALITY CONTROL

- A. Inspect and test in accordance with NETA ATS, except Section 4.
- B. Grounding and Bonding: Perform inspections and tests listed in NETA ATS, Section 7.13.
- C. Perform ground resistance testing in accordance with IEEE 142.
- D. Perform leakage current tests in accordance with NFPA 99.
- E. Perform continuity testing in accordance with IEEE 142.
- F. When improper grounding is found on receptacles, check receptacles in entire project and correct. Perform retest.

END OF SECTION

SECTION 26 05 29

HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Conduit supports.
2. Formed steel channel.
3. Spring steel clips.
4. Sleeves.
5. Mechanical sleeve seals.
6. Equipment bases and supports.

1.2 REFERENCES

A. ASTM International:

1. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
2. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
3. ASTM E814 - Standard Test Method for Fire Tests of Through-Penetration Fire Stops.
4. ASTM E1966 - Standard Test Method for Fire-Resistive Joint Systems.

B. FM Global:

1. FM - Approval Guide, A Guide to Equipment, Materials & Services Approved by Factory Mutual Research for Property Conservation.

C. National Fire Protection Association:

1. NFPA 70 - National Electrical Code with California Amendments.

D. Underwriters Laboratories Inc.:

1. UL 263 - Fire Tests of Building Construction and Materials.
2. UL 723 - Tests for Surface Burning Characteristics of Building Materials.
3. UL 1479 - Fire Tests of Through-Penetration Firestops.
4. UL 2079 - Tests for Fire Resistance of Building Joint Systems.
5. UL - Fire Resistance Directory.

1.3 DEFINITIONS

- A. Firestopping (Through-Penetration Protection System): Sealing or stuffing material or assembly placed in spaces between and penetrations through building materials to arrest movement of fire, smoke, heat, and hot gases through fire rated construction.

1.4 QUALITY ASSURANCE

- A. Through Penetration Firestopping of Non-Fire Rated Floor and Roof Assemblies: Materials to resist free passage of flame and products of combustion.
 - 1. Noncombustible Penetrating Items: Noncombustible materials for penetrating items connecting maximum of three stories.
 - 2. Penetrating Items: Materials approved by authorities having jurisdiction for penetrating items connecting maximum of two stories.
- B. Surface Burning Characteristics: Maximum 25/450 flame spread/smoke developed index when tested in accordance with ASTM E84.
- C. Perform Work in accordance with State, Municipality, Highways, and Public Work's standard.
- D. Maintain one copy of each document on site.

1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years documented experience.
- B. Installer: Company specializing in performing work of this section with minimum 3 years documented experience.

PART 2 - PRODUCTS

2.1 CONDUIT SUPPORTS

- A. Hanger Rods: Threaded high tensile strength galvanized carbon steel with free running threads.
- B. Beam Clamps: Malleable Iron, with tapered hole in base and back to accept either bolt or hanger rod. Set screw: hardened steel.
- C. Conduit clamps for trapeze hangers: Galvanized steel, notched to fit trapeze with single bolt to tighten.
- D. Conduit clamps - general purpose: One-hole malleable iron for surface mounted conduits.
- E. Cable Ties: High strength nylon temperature rated to 185 degrees F. Self-locking.

2.2 FORMED STEEL CHANNEL

- A. Product Description: Galvanized 12 gage thick steel.

2.3 SPRING STEEL CLIPS

- A. Product Description: Mounting hole and screw closure.

2.4 SLEEVES

- A. Sleeves for Through Non-fire Rated Floors: 18 gage thick galvanized steel.
- B. Sleeves for Through Non-fire Rated Beams, Walls, Footings, and Potentially Wet Floors: Steel pipe or 18 gage thick galvanized steel.

2.5 MECHANICAL SLEEVE SEALS

- A. Product Description: Modular mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill annular space between object and sleeve, connected with bolts and pressure plates causing rubber sealing elements to expand when tightened, providing watertight seal and electrical insulation.

2.6 FIRESTOPPING ACCESSORIES

- A. Primer: Type recommended by firestopping manufacturer for specific substrate surfaces and suitable for required fire ratings.
- B. Dam Material: Permanent:
 - 1. Mineral fiberboard.
 - 2. Mineral fiber matting.
 - 3. Sheet metal.
 - 4. Plywood or particle board.
 - 5. Alumina silicate fire board.
- C. Installation Accessories: Provide clips, collars, fasteners, temporary stops or dams, and other devices required to position and retain materials in place.
- D. General:
 - 1. Furnish UL listed products.
 - 2. Select products with rating not less than rating of wall or floor being penetrated.
- E. Non-Rated Surfaces:
 - 1. Stamped steel, chrome plated, hinged, split ring escutcheons or floor plates or ceiling plates for covering openings in occupied areas where conduit is exposed.
 - 2. For exterior wall openings below grade, furnish modular mechanical type seal consisting of interlocking synthetic rubber links shaped to continuously fill annular space between conduit and cored opening or water-stop type wall sleeve.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify openings are ready to receive sleeves.
- B. Verify openings are ready to receive firestopping.

3.2 INSTALLATION - HANGERS AND SUPPORTS

- A. Anchors and Fasteners:
 - 1. Concrete Structural Elements: Provide precast inserts and expansion anchors.
 - 2. Steel Structural Elements: Provide beam clamps, spring steel clips, steel ramset fasteners, and welded fasteners.
 - 3. Concrete Surfaces: Provide self-drilling anchors and expansion anchors.
 - 4. Hollow Masonry, Plaster, and Gypsum Board Partitions: Provide toggle bolts.
 - 5. Solid Masonry Walls: Provide expansion anchors and preset inserts.
 - 6. Sheet Metal: Provide sheet metal screws.
 - 7. Wood Elements: Provide wood screws.
- B. Install conduit and raceway support and spacing in accordance with NEC.
- C. Do not fasten supports to pipes, ducts, mechanical equipment, or conduit.
- D. Install multiple conduit runs on common hangers.
- E. Supports:
 - 1. Fabricate supports from structural steel or formed steel channel. Install hexagon head bolts to present neat appearance with adequate strength and rigidity. Install spring lock washers under nuts.
 - 2. Install surface mounted cabinets and panelboards with minimum of four anchors.
 - 3. In wet and damp locations install steel channel supports to stand cabinets and panelboards 1 inch off wall.
 - 4. Support vertical conduit at every floor.

3.3 INSTALLATION - FIRESTOPPING

- A. Install material at fire rated construction perimeters and openings containing penetrating sleeves, piping, ductwork, conduit and other items, requiring firestopping.
- B. Apply primer where recommended by manufacturer for type of firestopping material and substrate involved, and as required for compliance with required fire ratings.
- C. Apply firestopping material in sufficient thickness to achieve required fire and smoke rating.
- D. Place intumescent coating in sufficient coats to achieve rating required.
- E. Remove dam material after firestopping material has cured.
- F. Non-Rated Surfaces:
 - 1. Seal opening through non-fire rated wall, partition, floor, ceiling, and roof opening as follows:
 - a. Install sleeve through opening and extending beyond minimum of 1 inch on both sides of building element.

- b. Size sleeve allowing minimum of 1-inch void between sleeve and building element.
 - c. Install type of firestopping material recommended by manufacturer.
- 2. Install floor plates or ceiling plates where conduit, penetrates non-fire rated surfaces in occupied spaces. Occupied spaces include rooms with finished ceilings and where penetration occurs below finished ceiling.
 - 3. Exterior wall openings below grade: Assemble rubber links of mechanical seal to size of conduit and tighten in place, in accordance with manufacturer's instructions.
 - 4. Interior partitions: Seal pipe penetrations at clean rooms, laboratories, hospital spaces, computer rooms, telecommunication rooms, and data rooms. Apply sealant to both sides of penetration to completely fill annular space between sleeve and conduit.

3.4 INSTALLATION - EQUIPMENT BASES AND SUPPORTS

- A. Provide housekeeping pads of concrete, minimum 3-1/2 inches thick and extending 6 inches beyond supported equipment.
- B. Using templates furnished with equipment, install anchor bolts, and accessories for mounting and anchoring equipment.
- C. Construct supports of formed steel channel. Brace and fasten with flanges bolted to structure.

3.5 INSTALLATION - SLEEVES

- A. Exterior watertight entries: Seal with adjustable interlocking rubber links.
- B. Conduit penetrations not required to be watertight: Sleeve and fill with silicon foam.
- C. Set sleeves in position in forms. Provide reinforcing around sleeves.
- D. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.
- E. Extend sleeves through floors 1 inch above finished floor level. Caulk sleeves.
- F. Where conduit or raceway penetrates floor, ceiling, or wall, close off space between conduit or raceway and adjacent work with fire stopping insulation and caulk airtight. Provide close fitting metal collar or escutcheon covers at both sides of penetration.
- G. Install chrome plated steel escutcheons at finished surfaces.

3.6 FIELD QUALITY CONTROL

- A. Inspect installed firestopping for compliance with specifications and submitted schedule.

3.7 CLEANING

- A. Clean adjacent surfaces of firestopping materials.

3.8 PROTECTION OF FINISHED WORK

- A. Protect adjacent surfaces from damage by material installation.

END OF SECTION

SECTION 26 05 33

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes conduit, surface raceways, wireways, outlet boxes, pull and junction boxes.

1.2 REFERENCES

- A. American National Standards Institute:

- 1. ANSI C80.1 - Rigid Steel Conduit, Zinc Coated.
- 2. ANSI C80.3 - Specification for Electrical Metallic Tubing, Zinc Coated.
- 3. ANSI C80.5 - Aluminum Rigid Conduit - (ARC).

- B. National Electrical Manufacturers Association:

- 1. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
- 2. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.
- 3. NEMA OS 1 - Sheet Steel Outlet Boxes, Device Boxes, Covers, and Box Supports.
- 4. NEMA OS 2 - Nonmetallic Outlet Boxes, Device Boxes, Covers, and Box Supports.
- 5. NEMA RN 1 - Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.
- 6. NEMA TC 2 - Electrical Polyvinyl Chloride (PVC) Tubing and Conduit.
- 7. NEMA TC 3 - PVC Fittings for Use with Rigid PVC Conduit and Tubing.

1.3 SYSTEM DESCRIPTION

- A. Raceway and boxes located as indicated on Drawings, and at other locations required for splices, taps, wire pulling, equipment connections, and compliance with regulatory requirements. Raceway and boxes are shown in approximate locations unless dimensioned. Provide raceway to complete wiring system.
- B. Underground More than 5 feet outside Foundation Wall: Provide thickwall nonmetallic conduit. Provide cast metal boxes or nonmetallic handhole.
- C. Underground Within 5 feet from Foundation Wall: Provide thickwall nonmetallic conduit. Provide cast metal or nonmetallic boxes.
- D. In Slab Above Grade: Not permitted.
- E. Below Slab on Grade: Use thickwall nonmetallic conduit. Terminate with coated rigid steel elbows and short length of coated rigid steel conduit out of concrete.
- F. Outdoor Locations, Above Grade: Provide galvanized rigid steel conduit. Provide cast metal outlet, pull, and junction boxes.

- G. Wet and Damp Locations: galvanized rigid steel conduit. Provide cast metal outlet, junction, and pull boxes. Provide flush mounting outlet box in finished areas.
- H. Concealed Dry Locations: Provide electrical metallic tubing. Provide sheet-metal boxes. Provide flush mounting outlet box in finished areas. Provide hinged enclosure for large pull boxes where shown on drawings.
- I. Exposed Interior Dry Locations: Use rigid steel conduit or intermediate metal conduit below eight feet or where subject to damage. Use rigid steel conduit, intermediate metal conduit, or electrical metallic tubing above eight feet or in electrical, mechanical or telecommunication rooms. Use sheet-metal or cast metal boxes. Use flush mounting outlet box in finished areas. Provide hinged enclosure for large pull boxes.

1.4 DESIGN REQUIREMENTS

- A. Minimum Raceway Size: 0.75 inch unless otherwise specified.

1.5 SUBMITTALS

- A. Product Data: Submit for the following:

1. Flexible metal conduit.
2. Liquidtight flexible metal conduit.
3. Nonmetallic conduit.
4. Raceway fittings.
5. Conduit bodies.
6. Surface raceway.
7. Wireway.
8. Pull and junction boxes.

- B. Manufacturer's Installation Instructions: Submit application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of Product.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.
- B. Protect PVC conduit from sunlight.

1.7 COORDINATION

- A. Coordinate mounting heights, orientation and locations of outlets mounted above counters, benches, and backsplashes.
- B. Coordinate Work of this Division and Work of other Divisions in advance of installation. Provide additional Work to overcome tight conditions at no increase in Contract Sum.
- C. Coordinate installation of outlet boxes for equipment specified in other divisions.

PART 2 - PRODUCTS

2.1 METAL CONDUIT

- A. Rigid Steel Conduit: ANSI C80.1.
- B. Rigid Aluminum Conduit: ANSI C80.5.
- C. Intermediate Metal Conduit (IMC): Rigid steel.
- D. Fittings and Conduit Bodies: NEMA FB 1. Fittings shall be steel/malleable iron with threaded fittings. Use insulated metallic bushings with lug where ground connections are required. Use plastic bushing for non-bonding applications.

2.2 PVC COATED METAL CONDUIT

- A. Product Description: NEMA RN 1; rigid steel conduit with external PVC coating, 40 mil thick.
- B. Fittings and Conduit Bodies: NEMA FB 1; steel fittings with external PVC coating to match conduit.

2.3 FLEXIBLE METAL CONDUIT

- A. Product Description: Interlocked steel construction.
- B. Fittings: NEMA FB 1.

2.4 LIQUIDTIGHT FLEXIBLE METAL CONDUIT

- A. Product Description: Interlocked steel construction with PVC jacket.
- B. Fittings: NEMA FB 1.

2.5 ELECTRICAL METALLIC TUBING (EMT)

- A. Product Description: ANSI C80.3; galvanized tubing.
- B. Fittings and Conduit Bodies: NEMA FB 1; steel couplings and connectors. Box connectors shall have with insulated throat. Set screw type couplings.

2.6 NONMETALLIC CONDUIT

- A. Product Description: NEMA TC 2; Schedule 40 PVC for normal power and 80 PVC for emergency power.
- B. Fittings and Conduit Bodies: NEMA TC 3.

2.7 WIREWAY

- A. Product Description: General purpose for indoor applications and raintight type for outdoor locations wire way.
- B. Knockouts: Manufacturer's standard.
- C. Cover: Hinged cover with full gaskets.
- D. Connector: Flanged.

E. Fittings: Lay-in type with removable top, bottom, and side; captive screws and drip shield for outdoor.

F. Finish: Rust inhibiting primer coating with gray enamel finish.

2.8 OUTLET BOXES

A. Sheet Metal Outlet Boxes: NEMA OS 1, galvanized steel.

1. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported; furnish 0.5-inch male fixture studs where required.
2. Boxes for shall be 1.5-inch-deep by 4-inch square minimum.
3. Boxes for telecommunications outlets shall be 2-7/8-inch-deep by 4-11/16-inch square minimum. Provide 1-gang device ring.
4. Concrete Ceiling Boxes: Concrete type.

B. Cast Boxes: NEMA FB 1, Type FD, aluminum. Furnish gasketed cover by box manufacturer. Furnish threaded hubs.

2.9 PULL AND JUNCTION BOXES

A. Sheet Metal Boxes: NEMA OS 1, galvanized steel.

B. Hinged Enclosures: As specified in Section 262716.

C. Surface Mounted Cast Metal Box: NEMA 250, Type 4X; flat-flanged, surface mounted junction box:

1. Material: Galvanized cast iron.
2. Cover: Furnish with ground flange, neoprene gasket, and stainless-steel cover screws.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify outlet locations and routing and termination locations of raceway prior to rough-in.

3.2 INSTALLATION

A. Ground and bond raceway and boxes.

B. Fasten raceway and box supports to structure and finishes.

C. Identify raceway and boxes.

D. Arrange raceway and boxes to maintain headroom and present neat appearance.

3.3 INSTALLATION - RACEWAY

A. Raceway routing is shown in approximate locations unless dimensioned. Route to complete wiring system.

B. Arrange raceway supports to prevent misalignment during wiring installation.

- C. Support raceway using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.
- D. Group related raceway; support using conduit rack. Construct rack using steel channel and provide space on each for 25 percent additional raceways.
- E. Do not support raceway with wire or perforated pipe straps. Remove wire used for temporary supports
- F. Do not attach raceway to ceiling support wires or other piping systems.
- G. Construct wire way supports from steel channel.
- H. Route exposed raceway parallel and perpendicular to walls.
- I. Route raceway installed above accessible ceilings parallel and perpendicular to walls.
- J. Route conduit in and under slab from point-to-point.
- K. Maintain clearance between raceway and piping for maintenance purposes.
- L. Maintain 12-inch clearance between raceway and surfaces with temperatures exceeding 104 degrees F.
- M. Cut conduit square using saw or pipe cutter; de-burr cut ends.
- N. Bring conduit to shoulder of fittings; fasten securely.
- O. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure for minimum 20 minutes.
- P. Install conduit hubs to fasten conduit to sheet metal boxes in damp and wet locations and to cast boxes.
- Q. Install no more than equivalent of three 90-degree bends between boxes. Install conduit bodies to make sharp changes in direction, as around beams. Install factory elbows for bends in metal conduit larger than 2-inch size.
- R. Avoid moisture traps; install junction box with drain fitting at low points in conduit system.
- S. Install fittings to accommodate expansion and deflection where raceway crosses seismic and expansion joints.
- T. Install suitable pull string or cord in each empty raceway except sleeves and nipples.
- U. Install suitable caps to protect installed conduit against entrance of dirt and moisture.
- V. Surface Raceway: Install flat-head screws, clips, and straps to fasten raceway channel to surfaces; mount plumb and level. Install insulating bushings and inserts at connections to outlets and corner fittings.
- W. Close ends and unused openings in wire way.

3.4 INSTALLATION - BOXES

- A. Adjust box location up to 10 feet prior to rough-in to accommodate intended purpose.
- B. Orient boxes to accommodate wiring devices.

- C. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.
- D. In Accessible Ceiling Areas: Install outlet and junction boxes no more than 6 inches from ceiling access panel or from removable recessed luminaire.
- E. Locate flush mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening.
- F. Do not install flush mounting box back-to-back in walls; install with minimum 6 inches separation. Install with minimum 24 inches separation in acoustic rated walls.
- G. Secure flush mounting box to interior wall and partition studs. Accurately position to allow for surface finish thickness.
- H. Install stamped steel bridges to fasten flush mounting outlet box between studs.
- I. Install flush mounting box without damaging wall insulation or reducing its effectiveness.
- J. Install adjustable steel channel fasteners for hung ceiling outlet box.
- K. Do not fasten boxes to ceiling support wires or other piping systems.
- L. Support boxes independently of conduit.
- M. Install gang box where more than one device is mounted together. Do not use sectional box.
- N. Install gang box with plaster ring for single device outlets.

3.5 INTERFACE WITH OTHER PRODUCTS

- A. Install conduit to preserve fire resistance rating of partitions and other elements.
- B. Route conduit through roof openings for piping and ductwork or through suitable roof jack with pitch pocket. Coordinate location with roofing installation.
- C. Locate outlet boxes to allow luminaires positioned as indicated on reflected ceiling plan.
- D. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices.

3.6 ADJUSTING

- A. Adjust flush-mounting outlets to make front flush with finished wall material.
- B. Install knockout closures in unused openings in boxes.

3.7 CLEANING

- A. Clean interior of boxes to remove dust, debris, and other material.
- B. Clean exposed surfaces and restore finish.

END OF SECTION

SECTION 26 05 53 IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Nameplates.
2. Labels.
3. Wire markers.
4. Lockout Devices.

1.2 SUBMITTALS

A. Product Data:

1. Submit manufacturer's catalog literature for each product required.
2. Submit electrical identification schedule including list of wording, symbols, letter size, color coding, tag number, location, and function.

B. Manufacturer's Installation Instructions: Indicate installation instructions, special procedures, and installation.

1.3 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of tagged devices; include tag numbers.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with State, Municipality, Highways, Public Work's standard.

1.5 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years documented experience.

B. Installer: Company specializing in performing Work of this section with minimum three years documented experience.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Accept identification products on site in original containers. Inspect for damage.

B. Accept materials on site in original factory packaging, labeled with manufacturer's identification, including product density and thickness.

C. Protect insulation from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original wrapping.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Install labels and nameplates only when ambient temperature and humidity conditions for adhesive are within range recommended by manufacturer.

PART 2 - PRODUCTS

2.1 NAMEPLATES

- A. Product Description: Laminated three-layer plastic with engraved black letters on white contrasting background color.
- B. Letter Size:
 - 1. 0.125 inch high letters for identifying individual equipment and loads.
 - 2. 0.25 inch high letters for identifying grouped equipment and loads.

2.2 LABELS

- A. Labels: Embossed adhesive tape, with 0.125 inch white letters on black background.

2.3 WIRE MARKERS

- A. Description: Self-adhering, pre-printed, machine printable or write-on, self-laminating vinyl wrap around strips. Blank markers shall be inscribed using the printer or pen recommended by manufacturer for this purpose.
- B. Legend:
 - 1. Power and Lighting Circuits: Branch circuit or feeder number as indicated on Drawing
 - 2. Control Circuits: Control wire number as indicated on shop drawings.

2.4 LOCKOUT DEVICES

- A. Lockout Hasps:
 - 1. Anodized aluminum hasp with erasable label surface; size minimum 7.25 x 3 inches.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Degrease and clean surfaces to receive adhesive for identification materials.

3.2 INSTALLATION

- A. Install identifying devices after completion of painting.
- B. Nameplate Installation:
 - 1. Install nameplate parallel to equipment lines.
 - 2. Install nameplate for each electrical distribution and control equipment enclosure with corrosive-resistant mechanical fasteners, or adhesive.

3. Install nameplates for each control panel and major control components located outside panel with corrosive-resistant mechanical fasteners, or adhesive.
 4. Secure nameplate to equipment front using screws.
 5. Secure nameplate to inside surface of door on recessed panelboard in finished locations.
 6. Install nameplates for the following:
 - a. Distribution Panelboards
 - b. Panelboards.
 - c. Transformers.
 - d. Service Disconnects.
 - e. Fused and Non-Fused Disconnects.
- C. Provide color coded nameplates that present, as applicable, the following information:
1. Equipment or device designation.
 2. Amperage, kVA, or horsepower rating where applicable.
 3. Voltage or signal system name.
 4. Source or power or control.
 5. Examples:
 - a. Boards: CH2A; 1000A; 277/480V, 3-Phase, 4-Wire.
 - b. Feeder Power Supply for Panel "XXX" Originates at Panel "XXX".
 - c. Transformers: T-1; 112.5kVA; 480V to 120/208V, 3-Phase, 4-Wire; Served from H2A; Load Served L2A.
 - d. Disconnects and Individual Motor Starters: AHU-1; 25HP; 480V, 3-Phase, 3-Wires; Served from EHD5.
 - e. Available Fault Current: XX,XXX Amperes. Date Calculated: XX/XX/XX.
- D. Color coding for nameplates for power systems:
1. 277/480V Normal – Yellow with black letters.
 2. 277/480V Emergency/Battery – Red with white letters.
 3. 120/208V Normal – Blue with white letters.
 4. 120/208V Emergency/Battery – Red with white letters.
 5. UPS Power – Orange with black letters.
- E. Color coding for nameplates for signal systems:

1. Fire alarm and life safety - Red with black letters.
2. Nurse call - Light Blue with white letters.
3. Security - Green with white letters.
4. Energy Management System – White with black letters.

F. Label Installation:

1. Install label parallel to equipment lines.
2. Install label for identification of individual control device stations, receptacles, and switches.
3. Install labels for permanent adhesion and seal with clear lacquer.

G. Wire Marker Installation:

1. Install wire marker for each conductor at panelboard gutters, pull boxes, outlet and junction boxes, and each load connection.
2. Mark data cabling at each end. Install additional marking at accessible locations along the cable run.
3. Install labels at data outlets identifying patch panel and port designation as indicated on Drawings.

H. Conduit Marker Installation:

1. Install conduit marker for each conduit longer than 6 feet.
2. Conduit Marker Spacing: 20 feet on center.

I. Junction Box Identification

1. Color code and identify all junction boxes located above suspended ceilings and below ceilings in non-public areas.
2. Use finish paint suitable for use on metal surfaces.
3. Boxes shall be identified with permanent felt tip marker on cover indicating panel and circuit numbers. Paint junction box covers using the color coding listed below.
 - a. 480/277 Volt System: Orange.
 - b. 208/120 Volt System: Blue.
 - c. Fire Alarm System: Red.
 - d. Security System: Green.
 - e. Nurse Call System: Yellow

J. BRASS TAGS:

1. Provide brass tags for all feeder cables in underground vaults and pull boxes.
2. Provide brass tags for empty conduits in underground vaults, pull boxes and stubs.

K. WARNING, CAUTION AND INSTRUCTION SIGNS

1. Provide warning, caution or instruction signs where required by OSHA, where indicated, or where reasonably required to assure safe operation and maintenance of electrical systems.
 - a. Install engraved plastic-laminated instruction signs with approved legend where instructions or explanations are needed for system of equipment operation
 - b. Provide polyester film self-adhesive signs for indoor/outdoor equipment and door warning. Use rigid polyethylene non-adhesive signs where adhesives will not work; for example, installing on a metal fence. Provide sign color and marking that meets OSHA regulations. For example, DANGER (red background with white letters), HIGH VOLTAGE (white with black letters).
 - 1) Use 2 by 4 inch signs for small equipment or enclosure doors.
 - 2) Use 7 by 10 inch or 10 by 14 inch signs for large equipment or enclosure doors.
2. Emergency Operating Signs: Install engraved laminate signs with white letters on red background with minimum 3/8 inch high lettering for emergency instructions on power transfer, load shedding, or other emergency operations.

END OF SECTION

SECTION 26 22 00 LOW-VOLTAGE TRANSFORMERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Two-winding transformers.

1.2 REFERENCE STANDARDS

A. National Electrical Manufacturers Association:

1. NEMA ST 20 - Dry Type Transformers for General Applications.

B. International Electrical Testing Association:

1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

1.3 SUBMITTALS

A. Product Data: Submit outline and support point dimensions of enclosures and accessories, unit weight, voltage, kVA, and impedance ratings and characteristics, tap configurations, insulation system type, and rated temperature rise.

B. Test and Evaluation Reports: Indicate loss data, efficiency at 25, 50, 75 and 100 percent rated load, and sound level.

C. Source Quality Control Submittals: Indicate results of factory tests and inspections.

D. Field Quality Control Submittals: Indicate results of Contractor furnished tests and inspections.

1.4 CLOSEOUT SUBMITTALS

A. Record Documentation: Record actual locations of transformers.

1.5 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store in clean, dry space. Maintain factory wrapping or provide additional canvas or plastic cover to protect units from dirt, water, construction debris, and traffic.

B. Handle in accordance with manufacturer's written instructions. Lift only with lugs provided. Handle carefully to avoid damage to transformer internal components, enclosure, and finish.

PART 2 - PRODUCTS

2.1 TWO-WINDING TRANSFORMERS

- A. Description: NEMA ST 20, factory-assembled, air-cooled, dry type transformers, ratings as indicated on Drawings.
- B. Operation:
 - 1. Primary Voltage: 480 volts, 3-phase.
 - 2. Secondary Voltage: 208Y/120 volts, 3-phase.
 - 3. Insulation system and average winding temperature rise for rated kVA as follows:
 - 4. 1-15 kVA: Class 185 with 80 degrees C rise.
 - 5. 16-500 kVA: Class 220 with 150 degrees C rise.
 - 6. Case temperature: Do not exceed 35 degrees C rise above ambient at warmest point at full load.
 - 7. Winding Taps:
 - a. Transformers Less than 15 kVA: Two 5 percent below rated voltage, full capacity taps on primary winding.
 - b. Transformers 15 kVA and Larger: NEMA ST 20.
 - 8. Sound Levels: NEMA ST 20.
 - 9. Basic Impulse Level: 10 kV for transformers less than 300 kVA, 30 kV for transformers 300 kVA and larger.
 - 10. Mounting as indicated on drawings.
- C. Materials:
 - 1. Ground core and coil assembly to enclosure by means of visible flexible copper grounding strap.
 - 2. Coil Conductors: Continuous copper windings with terminations brazed or welded.
 - 3. Enclosure: NEMA ST 20, Type 1 for indoor and Type 3R for outdoor applications ventilated. Furnish lifting eyes or brackets.
- D. Fabrication:
 - 1. Isolate core and coil from enclosure using vibration-absorbing mounts.
 - 2. Nameplate: Include transformer connection data and overload capacity based on rated allowable temperature rise.

2.2 SOURCE QUALITY CONTROL

- A. Production test each unit according to NEMA ST20.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify mounting supports are properly sized and located including concealed bracing in walls.

3.2 PREPARATION

- A. Provide concrete pads.

3.3 INSTALLATION

- A. Set transformer plumb and level.
- B. Use flexible conduit, 2 feet minimum length, for connections to transformer case. Make conduit connections to side panel of enclosure.
- C. Support transformers.
 - 1. Mount wall-mounted transformers using integral flanges or accessory brackets furnished by manufacturer.
 - 2. Mount floor-mounted transformers on vibration isolating pads suitable for isolating transformer noise from building structure.
 - 3. Mount trapeze-mounted transformers as indicated on Drawings.
- D. Provide seismic restraints.
- E. Install grounding and bonding.

3.4 FIELD QUALITY CONTROL

- A. Inspect and test in accordance with NETA ATS, except Section 4.
- B. Perform inspections and tests listed in NETA ATS, Section 7.2.1.

3.5 ADJUSTING

- A. Measure primary and secondary voltages and make appropriate tap adjustments.

END OF SECTION

SECTION 26 24 16

PANELBOARDS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Distribution and branch circuit panelboards.

1.2 REFERENCE STANDARDS

A. Institute of Electrical and Electronics Engineers:

1. IEEE C62.41 - Recommended Practice on Surge Voltages in Low-Voltage AC Power Circuits.

B. National Electrical Manufacturers Association:

1. NEMA FU 1 - Low Voltage Cartridge Fuses.
2. NEMA ICS 2 - Industrial Control and Systems: Controllers, Contactors, and Overload Relays, Rated Not More Than 2000 Volts AC or 750 Volts DC.
3. NEMA ICS 5 - Industrial Control and Systems: Control Circuit and Pilot Devices.
4. NEMA KS 1 - Enclosed and Miscellaneous Distribution Equipment Switches (600 Volts Maximum).
5. NEMA PB 1 - Panelboards.
6. NEMA PB 1.1 - General Instructions for Proper Installation, Operation, and Maintenance of Panelboards Rated 600 Volts or Less.

C. International Electrical Testing Association:

1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

D. National Fire Protection Association:

1. NFPA 70 - National Electrical Code with California Amendments.

E. UL:

1. UL 50 - Cabinets and Boxes
2. UL 67 - Safety for Panelboards.
3. UL 489 - Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures.
4. UL 1283 - Electromagnetic Interference Filters.
5. UL 1449 - Transient Voltage Surge Suppressors.
6. UL 1699 - Arc-Fault Circuit Interrupters.

1.3 SUBMITTALS

- A. Product Data: Submit catalog data showing specified features of standard products.
- B. Shop Drawings: Indicate outline and support point dimensions, voltage, main bus ampacity, integrated short circuit ampere rating, circuit breaker, and fusible switch arrangement and sizes.
- C. Source Quality control submittals: Indicate results of factory tests and inspections.
- D. Field Quality Control Submittals: Indicate results of Contractor furnished tests and inspections.

1.4 QUALITY ASSURANCE

- A. Qualifications
 - 1. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' documented experience.

PART 2 - PRODUCTS

2.1 DISTRIBUTION PANELBOARDS

- A. Description: NEMA PB 1, circuit breaker type panelboard.
- B. Operation:
 - 1. Minimum integrated short circuit rating as indicated on Drawings.
- C. Materials
 - 1. Panelboard Bus: Copper current carrying components, ratings as indicated on Drawings. Furnish copper ground bus in each panelboard.
 - 2. Molded Case Circuit Breakers: UL 489, circuit breakers with integral thermal and instantaneous magnetic trip in each pole. Furnish circuit breakers UL listed as Type HACR for air conditioning equipment branch circuits.
 - 3. Molded Case Circuit Breakers with Current Limiters: UL 489, circuit breakers with replaceable current limiting elements, in addition to integral thermal and instantaneous magnetic trip in each pole.
 - 4. Current Limiting Molded Case Circuit Breakers: UL 489, circuit breakers with integral thermal and instantaneous magnetic trip in each pole, coordinated with automatically resetting current limiting elements in each pole. Interrupting rating 100,000 symmetrical A, let-through current and energy level less than permitted for same size NEMA FU 1, Class RK-5 fuse.
 - 5. Circuit Breaker Accessories: Trip units and auxiliary switches as indicated on Drawings.
 - 6. Surge Suppressers: Integrated in panelboard.
 - 7. Enclosure: NEMA PB 1, Type 1 for indoor applications.
 - 8. Cabinet Front: Surface door-in-door type, fastened with concealed trim clamps, hinged door with flush lock, and metal directory frame.
- D. Finishes:

1. Manufacturer's standard gray enamel.

2.2 BRANCH CIRCUIT PANELBOARDS

- A. Description: NEMA PB1, circuit breaker type, lighting and appliance branch circuit panelboard.
- B. Materials:
 1. Panelboard Bus: Copper current carrying components, ratings as indicated on Drawings. Furnish copper ground bus in each panelboard.
 2. For non-linear load applications subject to harmonics furnish 200 percent rated, plated copper, solid neutral.
 3. Minimum Integrated Short Circuit Rating or as indicated on Drawings.
 4. Molded Case Circuit Breakers: UL 489, bolt-on type thermal magnetic trip circuit breakers, with common trip handle for all poles, listed as Type SWD for lighting circuits, Type HACR for air conditioning equipment circuits, Class A ground fault interrupter circuit breakers as indicated on Drawings. Provide UL class 760 arc-fault interrupter circuit breakers as indicated on Drawings. Do not use tandem circuit breakers.
 5. Current Limiting Molded Case Circuit Breakers: UL 489, circuit breakers with integral thermal and instantaneous magnetic trip in each pole, coordinated with automatically resetting current limiting elements in each pole. Interrupting rating 100,000 symmetrical A, let-through current and energy level less than permitted for same size NEMA FU 1, Class RK-5 fuse.
 6. Surge Suppressor: Integrated in panelboard.
 7. Enclosure: NEMA PB 1, Type 1 for indoor and Type 3R outdoor applications.
 8. Cabinet Box: 6 inches deep, 20 inches.
- C. Cabinet Front: Flush or surface cabinet front as indicated on drawings with door-in-door concealed trim clamps, concealed hinge, metal directory frame, and flush lock keyed alike. Finishes:
 1. Finish in manufacturer's standard gray enamel.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install panelboards according to NEMA PB 1.1.
- B. Install panelboards plumb.
- C. Install recessed panelboards flush with wall finishes.
- D. Height: 6 feet to top of panelboard; install panelboards taller than 6 feet with bottom no more than 4 inches above floor.
- E. Install filler plates for unused spaces in panelboards.
- F. Provide typed circuit directory for each branch circuit panelboard. Revise directory to reflect circuiting changes to balance phase loads. Identify each circuit as to its clear, evident and specific purpose of use.

- G. Install engraved plastic nameplates.
- H. Install spare conduits out of each recessed panelboard to accessible location above ceiling. Minimum spare conduits: five empty 1 inch. Identify each as spare.
- I. Ground and bond panelboard enclosure. Connect equipment ground bars of panels according to NFPA 70.
- J. Modifications to existing panelboards shall be as indicated on the Drawings. New equipment shall match existing where possible and in all cases be compatible with existing. Where new breakers are installed in existing equipment, provide all hardware and trim pieces as required for a complete closed installation. Provide new nameplates at equipment where existing breakers are identified by nameplates and provide new breaker identification in directory where existing breakers are identified in a directory.
- K. Where new breakers are indicated to be installed in existing panel, but insufficient space exists, provide enclosed circuit breakers externally and tap existing bussing. Tap conduit and wire sizes shall be same as breaker line side conduit and wire.

3.2 FIELD QUALITY CONTROL

- A. Inspect and test according to NETA ATS, except Section 4.
- B. Perform circuit breaker inspections and tests listed in NETA ATS, Section 7.6.
- C. Perform switch inspections and tests listed in NETA ATS, Section 7.5.
- D. Perform controller inspections and tests listed in NETA ATS, Section 7.16.1.

3.3 ADJUSTING

- A. Measure steady state load currents at each panelboard feeder; rearrange circuits in panelboard to balance phase loads to within 20 percent of each other. Maintain proper phasing for multi-wire branch circuits.

END OF SECTION

SECTION 26 27 26 WIRING DEVICES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes wall switches; receptacles; device plates; and decorative box covers.

1.2 REFERENCES

- A. National Electrical Manufacturers Association:
 - 1. NEMA WD 1 - General Requirements for Wiring Devices.
 - 2. NEMA WD 6 - Wiring Devices-Dimensional Requirements.

1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's catalog information showing dimensions, colors, and configurations.

1.4 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

PART 2 - PRODUCTS

2.1 WALL SWITCHES

- A. Product Description: NEMA WD 1, Heavy-Duty, AC only general-use snap switch.
- B. Body and Handle: White plastic with toggle handle.
- C. Indicator Light: Lighted handle type switch; red color handle.
- D. Locator Light: Lighted handle type switch; red color handle.
- E. Ratings:
 - 1. Voltage: 120-277 volts, AC.
 - 2. Current: 20 amperes.
 - 3. Wiring: Back and side wired. Back wiring with clamp type terminals suitable for stranded or solid wire.

2.2 RECEPTACLES

- A. Product Description: NEMA WD 1, Hospital and Specification grade receptacle.
- B. Device Body: White plastic.
- C. Configuration: NEMA WD 6.

- D. Convenience Receptacle: Type 5-20.
- E. GFCI Receptacle: Convenience receptacle with integral ground fault circuit interrupter to meet regulatory requirements.
- F. Wiring: Back and side wired. Back wiring with clamp type terminals suitable for stranded or solid wire.
- G. Tamper Resistant Receptacle: Convenience receptacle with internal spring loaded mechanical shutter. Type 5-20.
- H. Special Purpose Receptacles: Type and rating and number of poles indicated or required for the anticipated purpose.

2.3 WALL PLATES

- A. Decorative Cover Plate: White plastic.
- B. Jumbo Cover Plate: White plastic.
- C. Weatherproof Cover Plate: Gasketed cast metal plate with hinged and gasketed device cover. Provide extended cover for receptacles located in wet locations when attachment plug is inserted

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify outlet boxes are installed at proper height.
- B. Verify wall openings are neatly cut and completely covered by wall plates.
- C. Verify branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.

3.2 PREPARATION

- A. Clean debris from outlet boxes.

3.3 INSTALLATION

- A. Install devices plumb and level.
- B. Install switches with OFF position down.
- C. Install wall dimmers to achieve full rating specified and indicated after derating for ganging as instructed by manufacturer.
- D. Do not share neutral conductor on load side of dimmers.
- E. Install receptacles with grounding pole on top.
- F. Connect wiring device grounding terminal to outlet box with bonding jumper and branch circuit equipment grounding conductor.
- G. Hospital grade receptacles shall be installed in patient care areas, such as patient rooms, exam rooms, procedure rooms, x-ray rooms, treatment rooms, etc.
- H. Install wall plates on flush mounted switches, receptacles, and blank outlets.

- I. Install decorative plates on switch, receptacle, and blank outlets in finished areas.
- J. Connect wiring devices by wrapping solid conductor around screw terminal. Install stranded conductor for branch circuits 10 AWG and smaller. When stranded conductors are used in lieu of solid, use crimp on fork terminals for device terminations. Do not place bare stranded conductors directly under device screws.
- K. Use jumbo size plates for outlets installed in masonry walls.
- L. Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas, above accessible ceilings, and on surface mounted outlets.
- M. Provide weather resistant GFI receptacles with specified weatherproof covers for all receptacles installed outdoors or in damp or wet locations.
- N. Provide GFI receptacles for all receptacles installed within 6 feet of sinks.
- O. Provide GFI receptacles for all receptacles installed in kitchens.
- P. Provide GFI receptacles for all receptacles serving electric drinking fountains.
- Q. Unless noted otherwise, do not use combination switch/receptacle devices.
- R. For flush floor service fittings, use tile rings for installations in tile floors.
- S. For flush floor service fittings, use carpet flanges for installations in carpeted floors.

3.4 INTERFACE WITH OTHER PRODUCTS

- A. Coordinate locations of outlet boxes to obtain mounting heights [as specified and] as indicated on Architectural elevations.
- B. Install wall switch 44 inches to center of box above finished floor.
- C. Install convenience receptacle 18 inches to center of box above finished floor.
- D. Install convenience receptacle 6 inches to center of box above counter or back splash of counter.
- E. Install dimmer 44 inches to center of box above finished floor.

3.5 FIELD QUALITY CONTROL

- A. Inspect each wiring device for defects.
- B. Operate each wall switch with circuit energized and verify proper operation.
- C. Verify each receptacle device is energized.
- D. Test each receptacle device for proper polarity.
- E. Test each GFCI receptacle device for proper operation.

3.6 ADJUSTING

- A. Adjust devices and wall plates to be flush and level.

3.7 CLEANING

A. Clean exposed surfaces to remove splatters and restore finish.

END OF SECTION

SECTION 26 28 16.16 ENCLOSED SWITCHES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Fusible.
2. Nonfusible switches.

1.2 REFERENCE STANDARDS

A. National Electrical Manufacturers Association:

1. NEMA FU 1 - Low Voltage Cartridge Fuses.
2. NEMA KS 1 - Enclosed and Miscellaneous Distribution Equipment Switches (600 Volts Maximum).

B. International Electrical Testing Association:

1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

1.3 SUBMITTALS

A. Product Data: Submit switch ratings and enclosure dimensions.

1.4 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of enclosed switches and ratings of installed fuses.

1.5 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

PART 2 - PRODUCTS

2.1 FUSIBLE SWITCH ASSEMBLIES

A. Description: NEMA KS 1, Type HD with externally operable handle interlocked to prevent opening front cover with switch in ON position, enclosed load interrupter knife switch. Handle lockable in OFF position.

B. Operation:

1. Switch Ratings
 - a. Switch Rating: Horsepower rated for AC or DC as indicated on Drawings.
 - b. Short Circuit Current Rating: UL listed for 10,000 rms symmetrical amperes when used with or protected by Class H or K fuses (30-600 ampere). 200,000 rms symmetrical amperes

when used with or protected by Class R or Class J fuses 30-600 ampere switches employing appropriate fuse rejection schemes). 200,000 rms symmetrical amperes when used with or protected by Class L fuses (800-1200 ampere).

C. Materials:

1. Fuse clips: Designed to accommodate NEMA FU 1, Class R fuses.
2. Enclosure: NEMA KS 1, to meet conditions. Fabricate enclosure from steel finished with manufacturer's standard gray enamel.
 - a. Interior Dry Locations: Type 1.
 - b. Exterior Locations: Type 3R.
 - c. Industrial Locations: Type 12.
3. Service Entrance: Switches identified for use as service equipment are to be labeled for this application. Furnish solid neutral assembly and equipment ground bar.
4. Furnish switches with entirely copper current carrying parts.

2.2 NONFUSIBLE SWITCH ASSEMBLIES

A. Description: NEMA KS 1, Type HD with externally operable handle interlocked to prevent opening front cover with switch in ON position enclosed load interrupter knife switch. Handle lockable in OFF position.

B. Operation:

1. Switch Ratings
 - a. Switch Rating: Horsepower rated for AC or DC as indicated on Drawings.
 - b. Short Circuit Current Rating: UL listed for 10,000 rms symmetrical amperes when used with or protected by Class H or K fuses (30-600 ampere). 200,000 rms symmetrical amperes when used with or protected by Class R or Class J fuses 30-600 ampere switches employing appropriate fuse rejection schemes). 200,000 rms symmetrical amperes when used with or protected by Class L fuses (800-1200 ampere).

C. Materials:

1. Enclosure: NEMA KS 1, to meet conditions. Fabricate enclosure from steel finished with manufacturer's standard gray enamel.
 - a. Interior Dry Locations: Type 1.
 - b. Exterior Locations: Type 3R.
 - c. Industrial Locations: Type 12.
2. Service Entrance: Switches identified for use as service equipment are to be labeled for this application. Furnish solid neutral assembly and equipment ground bar.
3. Furnish switches with entirely copper current carrying parts.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install enclosed switches where indicated.
- B. Install enclosed switches plumb. Provide supports.
- C. Height: 5 feet to operating handle.
- D. Install fuses for fusible disconnect switches.
- E. Install engraved plastic nameplates. Engrave nameplates with the equipment served and the panel and circuit number supplying the switch.
- F. Apply adhesive tag on inside door of each fused switch indicating NEMA fuse class and size installed.

3.2 FIELD QUALITY CONTROL

- A. Inspect and test in accordance with NETA ATS, except Section 4.
- B. Perform inspections and tests listed in NETA ATS, Section 7.5.

END OF SECTION

SECTION 26 51 00 INTERIOR LIGHTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Interior luminaires, Diodes, LED drivers, and accessories.

1.2 REFERENCE STANDARDS

- A. Underwriters Laboratories (UL):

1. UL 66 – Fixture Wire.
2. UL 1598 – Luminaires.
3. UL 2108 – Low Voltage Lighting Systems.

- B. Illumination Engineering Society of North America (IESNA):

1. IESNA LM-79-2008 – Approved Method for Electrical and Photometric Measurements of Solid-State Lighting Products.
2. IESNA LM-80-2008 – Approved Method for Measuring Lumen Maintenance of LED Light Sources.

- C. National Electrical Manufacturers Association:

1. NEMA WD 6 - Wiring Devices-Dimensional Requirements.

1.3 SYSTEM DESCRIPTION

- A. Performance Requirements:

1. Provide and install all luminaire as indicated, complete with LEDs, wiring, and control. Securely attach to support system to meet all seismic code requirements.
2. Where catalog number and narrative or description are provided, the written description shall take precedence and prevail.

1.4 COORDINATION

- A. Coordinate Work of this Section with Work of other Sections.

1.5 SUBMITTALS

- A. Product Data: Submit dimensions, ratings, and performance data.
- B. Provide luminaires complete with LEDs, wired, controlled and securely attached to supports.
- C. Contractor shall provide entire lighting specification (including fixture catalog cuts and sketches) for each specified manufacturer with complete information about the fixture they will supply.
- D. Type of fixtures shall be indicated as scheduled on plans.

1.6 QUALITY ASSURANCE

- A. All materials, equipment, and parts comprising the units specified herein shall be new, unused, and currently under production.

1.7 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' documented experience.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage. Equipment damaged during shipment shall be replaced and returned to manufacturer at no cost to Owner.
- B. Store materials protected from exposure to harmful weather conditions and at temperature and humidity conditions recommended by manufacturer.
- C. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 2. Provide additional protection according to manufacturer instructions.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

- A. Product Description: Complete interior luminaire assemblies, with features, options, and accessories as scheduled.

2.2 GENERAL

- A. Refer to schedule shown on the plans.
- B. All luminaires shall have LED light source.
- C. The finish of all luminaires and trims shall be submitted to and approved by the architect prior to ordering.
- D. All luminaires must bear UL label. Attaching of labels after delivery of luminaire is not acceptable.
- E. All labels affixed to the luminaire shall be in a location not visible from normal viewing angles.
- F. Luminaires shall be free of light leaks and shall be designed to provide sufficient ventilation of LED arrays.
- G. Architectural Coordination
 - 1. Consult Architectural Drawings for details of ceiling construction, finish, reflected ceiling plans and other applicable details and provide mounting suitable for the particular type of ceiling at each location.

2. Where luminaire are surface mounted or suspended to match the length of walls or other architectural elements, the contractor shall verify all length in the field prior to releasing luminaire order.

2.3 LED LUMINAIRES

- A. LED drivers shall include the following features unless otherwise indicated:
 1. Drivers shall be integral to luminaire housing or remotely located, when specified, within 15 feet of diode assembly.
 2. Input Voltage: 120 - 277V ($\pm 10\%$) at 60 Hz.
 3. Integral short circuit, open circuit, and overload protection.
 4. Power Factor: ≥ 0.90 .
 5. Total Harmonic Distortion: $\leq 20\%$.
- B. LED modules shall include the following features unless otherwise indicated:
 1. Comply with IES LM-79 and LM-80 requirements.
 2. Minimum CRI 80 and color temperature 3500° K unless otherwise specified in schedule on plan.
 3. Minimum Rated Life: 50,000 hours per IES L70.
 4. Light output lumens as indicated in schedule on plan.
- C. LED luminaire shall be capable of continuous dimming, without flicker or noise, from 10-100 percent, using 0-10V dimming.
- D. LED Downlights:
 1. Housing, driver, and module shall be products of the same manufacturer.
- E. LED troffers:
 1. Housing, driver, and module shall be products of the same manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Locate recessed ceiling luminaires as indicated on drawings.
- B. Install surface mounted luminaires plumb and adjust to align with building lines and with each other. Secure to prevent movement.
- C. Install recessed luminaires to permit removal from below.
- D. Install recessed luminaires using accessories and firestopping materials to meet regulatory requirements for fire rating.
- E. Install clips to secure recessed grid-supported luminaires in place.
- F. Install wall-mounted luminaires at height as scheduled.

- G. Install accessories furnished with each luminaire.
- H. Make wiring connections to branch circuit using building wire with insulation suitable for temperature conditions within luminaire.
- I. Ground and bond luminaires and exit signs.

3.2 FIELD QUALITY CONTROL

- A. Operate each luminaire after installation and connection. Inspect for proper connection and operation.

3.3 PROTECTION

- A. Protect installed product and finish surfaces from damage during construction.

3.4 CLEANING

- A. Repair or replace damaged installed products. Clean installed products in accordance with manufacturer's instructions prior to Owner's acceptance. Remove construction debris from project site and legally dispose of debris.

3.5 ADJUSTING

- A. Aim and adjust lamp fixtures as indicated on Drawings.

END OF SECTION

SECTION 26 52 00 SAFETY LIGHTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes emergency lighting units and exit signs.

1.2 REFERENCES

- A. National Electrical Manufacturers Association:
 - 1. NEMA WD 6 - Wiring Devices-Dimensional Requirements.

1.3 SYSTEM DESCRIPTION

- A. Emergency lighting to comply with requirements.

1.4 SUBMITTALS

- A. Product Data: Submit dimensions, ratings, and performance data.

1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

PART 2 - PRODUCTS

2.1 EMERGENCY LIGHTING UNITS

- A. Product Description: Self-contained LED emergency lighting unit.
- B. Battery: 12 volt, nickel-cadmium type, with 1.5 hour capacity.
- C. Battery Charger: Dual-rate type, with sufficient capacity to recharge discharged battery to full charge within twelve hours.
- D. Remote Fixtures: Match fixtures on unit.
- E. Housing: Steel with gray hammer tone finish. White plastic.
- F. Indicators: Lamps to indicate AC ON and RECHARGING. Voltmeter to indicate battery voltage.
- G. TEST switch: Transfers unit from external power supply to integral battery supply.
- H. Electrical Connection: Conduit connection.
- I. Input Voltage: 120/277 volts.

2.2 EXIT SIGNS

- A. Product Description: Exit sign fixture suitable for use as emergency lighting unit.

- B. Housing: Extruded aluminum.
- C. Face: Aluminum stencil face with red letters or color and finish as indicated on drawings.
- D. Directional Arrows: As indicated on Drawings.
- E. Mounting: As indicated on Drawings.
- F. Battery: 12-volt, nickel-cadmium type, with 1.5 hour capacity.
- G. Battery Charger: Dual-rate type, with sufficient capacity to recharge discharged battery to full charge within twelve hours.
- H. Lamps: LED, 5 W per side, maximum.
- I. Input Voltage: 120/277 volts.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install suspended exit signs using pendants supported from swivel hangers. Install pendant length required to suspend sign at indicated height.
- B. Install surface-mounted emergency lighting units and exit signs plumb and adjust to align with building lines and with each other. Secure to prevent movement.
- C. Install wall-mounted emergency lighting units and exit signs at height as indicated on Drawings.
- D. Install accessories furnished with each emergency lighting unit and exit sign.
- E. Connect emergency lighting units and exit signs to branch circuit outlets as indicated on Drawings.
- F. Make wiring connections to branch circuit using building wire with insulation suitable for temperature conditions within unit.
- G. Ground and bond emergency lighting units and exit signs.

3.2 FIELD QUALITY CONTROL

- A. Operate each unit after installation and connection. Inspect for proper connection and operation.

3.3 ADJUSTING

- A. Aim and adjust lamp fixtures as indicated on Drawings.
- B. Position exit sign directional arrows as indicated on Drawings.

3.4 PROTECTION OF FINISHED WORK

- A. Relamp emergency lighting units and exit signs having failed lamps at Substantial Completion.

END OF SECTION